Adult Vaccination: Legal and Public Policy Reforms to Address Herpes Zoster Vaccination Uptake

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Marina Draper
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ABSTRACT OF DISSERTATION

Submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Law and Public Policy in the College of Social Sciences and Humanities of Northeastern University

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ABSTRACT

*Background:* Shingles (herpes zoster), a medical condition caused by reactivation of the latent chickenpox virus and characterized by a rash and painful skin eruptions, will affect almost a third of Americans during their lifetime. Complications affect functionality and can be costly. A licensed vaccine, recommended by the Centers for Disease Control and Prevention for individuals ≥60 years-old, reduces the risk of developing shingles to 50%, and if shingles does develop, reduces pain intensity and PHN development. The U.S. shingles vaccination goal in ≥ 60 years-olds is 30%; as of 2013, it stood at 24%.

*Methods:* To understand consumer choice and decision-making, focus groups and a telephone survey examined knowledge, attitudes, behaviors, and barriers (KABB) that influenced or posed barriers to shingles vaccination in a stratified sample of Massachusetts residents >50 who i) responded to the 2012 Massachusetts Behavioral Risk Factor Surveillance System (BRFSS) (n=10,822), ii) agreed to a follow-up survey (n=6,873), iii) were sampled (n=2,528) and aware of the shingles vaccination (n=1,000; n=591 vaccinated respondents (VR) and n=471 non-vaccinated respondents (NVR)). Various framing theories were used to explain differences between vaccinated and unvaccinated individuals—whether family or friends influenced the decision-making process (social network theory), or high-prestige people (influence theory), or the effect of prevention and health priorities (planned behavior theory). Additional questions were posed about safety and efficacy perceptions, what respondents were willing to pay for the vaccine, or would they chose to get the vaccine for free. Also posed was the question of whether other adult vaccinations were received, and convenience of obtaining the vaccine. Multivariable logistic regression and predictive marginal models identified factors independently associated with shingles vaccination.
Results: Most respondents were aware of shingles (n=989, 99%) and all are aware of the vaccination (n=1,000, 100%, required inclusion criteria). The physician was the most frequently cited source of awareness for VR (n=244, 45%). Television and radio were common sources for NVR (n=190, 32%). Both groups perceived shingles as painful (p>0.05) and knew of others with shingles (p<0.01). VR believed that they would get shingles (p<0.001), that the risk of shingles decreased post-vaccination (p<0.001), received other vaccinations (influenza [p<0.001], tetanus and pneumococcal [p<0.05]), talked about the shingles vaccination with, and received physician recommendation for vaccination (p<0.001), valued the vaccination as an effective prevention tool (females>males, p<0.001), knew that the vaccination was a live virus vaccine (males>females, p<0.05), and paid less for the vaccine (<$25) than non-vaccinated respondents were willing to pay (<$50) (p<0.001).

NVR cited lack of doctor recommendation (p<0.001), did not believe that would get shingles (p<0.05), did not trust the vaccine (whites>non-whites, p<0.05), were afraid of needles (whites>non-whites, p<0.001), believed that might get sick from the vaccine (whites>non-whites, p<0.05) and that the vaccine as ineffective at preventing shingles (whites>non-whites, p<0.05). Cost was a major reason not to vaccine (65+ years-old group) (p<0.05) and inconvenience was a reason by gender (p<0.05). The influence of the live virus formulation was apparent across gender, age, and race strata (p<0.05).

Conclusion: More than half (≥50%) of sampled NVR reported not knowing about the shingles vaccine, therefore opportunities to increase awareness should be prioritized. Additionally, because provider recommendation has the greatest odds of increasing shingles vaccination, standard practice should include adding it to the flu vaccine recommendations in patients over 60. A more comprehensive set of adult vaccines in appropriate venues to should be pursued.
To my mother, Ludmila Shayn who brought me to the United States from the former Soviet Union when I was a little girl and and pushed me to pursue and persevere. She was with me when I started this Ph.D. degree ten years ago but did not live to see me finish it. I dedicate this work to her and to all other parents who give up so much of themselves so that their children may have better lives.

To Ludmila Shayn (1955-2007)
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<tr>
<td>American Community Survey</td>
<td>ACS</td>
<td>Massachusetts Immunization Information System</td>
<td>MIIS</td>
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<td>ACIP</td>
<td>Organization for Economic Co-operation and Development</td>
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<td>Behavioral Risk Factor Surveillance System</td>
<td>BRFSS</td>
<td>Post Herpetic Neuralgia</td>
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<td>Council of American Survey Research Organizations</td>
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<td>Knowledge, Attitudes, Behavior and Barriers</td>
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<td>Diphtheria, Pertussis, and Tetanus vaccine</td>
<td>DPT</td>
<td>Patient Protection and Affordable Care Act</td>
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<td>Theory of Planned Behavior</td>
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<td>Institute of Clinical and Economic Review</td>
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CHAPTER 1: HERPES ZOSTER VACCINATION

Part A Problem Definition Statement

*Herpes Zoster, the Vaccine and US Vaccination Coverage*

Shingles (herpes zoster) is a medical condition, which affects approximately one-third of the U.S. population over their lifetime and causes an estimated one million episodes per year. It is caused when latent zoster virus (from childhood chickenpox, known as varicella) reactivates in adults to cause cutaneous eruptions. Shingles manifests as a rash and is characterized by debilitating pain (CDC, 2008). Presenting symptoms often include a crop of blisters in a “dermatomal distribution” (ACIP, 2011). Shingles may also cause (1) neural pain, known as post herpetic neuralgia (PHN), a chronic pain condition of variable duration that affects 10%-18% of zoster patients, and (2) herpes zoster ophthalmicus (HZO), which threatens vision, causes facial pain and affects 10-25% of zoster patients. The incidence increases with age with 40-50% of the cases occurring in individuals aged 60 years or older (Betts, 2007; Shingles VIS, 2009), affects both males and females, (although there is increased incidence in females [Fleming, 2004]), and all racial groups (although whites are twice as likely as blacks to develop shingles, Hispanics are at lowest risk). For the most susceptible patients—the elderly and immune compromised—these complications may lead to hospitalization and even death.

A licensed vaccine has been available for shingles since 2006 (Endnote 1) and since 2008, the Centers for Disease Control and Prevention (CDC) recommends its routine use for people over 60. The vaccination reduces the risk of developing herpes zoster (efficacy ~50% across all age groups ≥60 years of age), and while it does not fully eliminate the risk of developing shingles, it
reduces the magnitude of pain and the chances of developing PHN in people who actually develop the condition.

The U.S. shingles vaccine program has an established national goal of increasing the percentage of adults (≥60 years) who are vaccinated to a target of 30% (Healthy People 2020 Objective IID-14). Vaccination uptake continues to be slow, and overall coverage among the indicated age-group is below national health objectives (MMWR, 2015). The baseline shingles vaccination coverage in 2007 was 2% in ≥60 year-olds (Lu, 2009), and while subsequent national surveys (2008-2013, inclusive) have recorded increased vaccination coverage (6.7%, 10.0%, 14.4%, 15.8%, 20.1%, and 24.2% inclusive), there is variability in coverage by age groups, gender, and ethnic disparities (2008 NHIS; 2009 NHIS; Lu, 2011, CDC, 2012, CDC, 2013, MMWR, 2014).

Despite some gains, challenges remain with meeting shingles vaccination goals, especially in light of an aging demographic that can most benefit from it (MMWR, 2014, MDPH, 2010). The gap between current coverage and the national goal identifies under-utilization of this vaccine as an unmet need, and from a public policy perspective, raises questions about the effectiveness of public investment in this vaccination program (MMWR, 2014; MDPH, 2010). Bolstering national preventative priorities, like shingles vaccination, is important given the boom in the ≥65-year-old segment, their increased use of medical care, and the national focus on health care cost containment.
Consider influenza, which is generally not deadly for the general adult cohort (although older groups are more cognizant about preventing the flu due to its serious illness [Merck, 2013]). The flu vaccination is different from the shingles vaccine in that it: (1) exhibits the spillover, herd-immunity protections, (2) is heavily promoted, and (3) is cost-effective and cost saving (Nichol, 2003). The patient perceived benefits of the influenza vaccination are evident; 66% of adults ≥ 65 years are vaccinated (Healthy People 2020, IID-12.7). The distinctions that shift the cost benefit calculus for shingles, include the fact that (1) shingles is not as contagious, although shingles can be transmitted from contact with its blisters (CDC, 2008), (2) the disease is generally not fatal (Shingles VIS, 2009), and (3) zoster immunization is absent of the herd immunity protections and free rider effects. Therefore, non-adherence to shingles vaccination recommendations does not threaten the health of the “commons” (Hardin, 1968) in the same way that non-adherence does with other communicable, vaccine preventable diseases, such as influenza, measles, or human papilloma virus (HPV).

Moreover, the American system of administering health care gives rise to system level barriers that contribute to low shingles vaccination coverage. Cost is an issue. The shingles vaccine is the costliest adult vaccine (ranging from as high as $187.89 [private sector] to $117.59 /dose [CDC manufacturer contract]) (Adult Vaccine Price List, 2015). There are also issues with insurance coverage and out-of-pocket costs, lack of vaccine promotion and awareness, and competing office visit priorities for older patients due to persistent chronic ailments (ACIP, 2001; Hurley, 2010). Other issues with the zoster vaccine are that it is the only vaccine with unique storage and handling requirements. Manufacturing disruptions and supply shortages can be problematic, although the supply disruptions have been resolved (Current Vaccine Shortages & Delays, 2014).
These barriers require attention as they influence vaccination practices (GAO, 2011; Hurley, 2010).

The explanation of the variability in vaccination coverage is multifactorial; notably, that the shingles vaccination “does not seem to represent a good value for all patients,” (Rothberg, 2007, p. 1287, 1st paragraph, 3rd sentence) neither for the originally recommended age group (≥60 years old), or the subsequently expanded age group (≥50 years old) (Le, 2015). The cost-effectiveness of the shingles vaccine—expressed as a ratio of dollars per quality adjusted life year (QALY) with its unofficial ceiling of $100,000 for decisions regarding resource allocation—varies across age groups and gender. The vaccination is only cost-effective for women ≥70 years (<$50,000 per QALY), but exceeds $100,000 per QALY in other groups, making it too expensive. There is also a concern with the vaccine’s duration of protection that decreases after 5 years and a lack of a recommended booster to address this waning efficacy (Hales, et al. 2014). Only 33% of physicians recommend the shingles vaccine in their practice (GAO, 2011; Rothberg, 2007).

The above considerations highlight the fact that the shingles vaccination is unlike other routinely recommended vaccines. This places the zoster vaccination in a category of a personalized commercial commodity that does not require the same degree of government support/pull strategies that may be appropriate for other vaccinations. Instead, the shingles vaccine is a commodity that needs to be sold to consumers, like any other consumer good. This emphasizes the need to study consumers’ decision-making behaviors and determine how best to market to them. It is also vital to determine how to refine vaccination recommendations to target those at increased risk, and remove barriers to enable consumers to better access this vaccination.
The decision of whether to invest public funds, and strain public budgets to support vaccination programs for diseases that truly do not pose a public health threat, is an important public policy consideration of how best to use limited resources in a cost effective manner. Some governments, such as the U.K. for example, include the shingles vaccine as part of their national financing framework: it is purchased centrally by the National Health Service (NHS) and provided for free (Guidance U.K., 2013). Other governments take a more measured approach in determining whether to invest public funds. Since 2007, the Australian government has funded human papilloma virus (HPV) vaccination, a sexually transmitted disease (communicable). This decision has resulted in large declines in the incidence of HPV (Garland, 2011; HPV VIS, 2011). At the same time, the Australian government has chosen not to fund the herpes zoster vaccine (non-communicable) even though the shingles vaccine is approved and recommended for use (NCIRS Fact sheet, 2009). This variation highlights the differences behind some public financing decisions for vaccines for preventable communicable versus non-communicable disease. Financing considerations are especially relevant for shingles vaccination in the U.S. where there is a dichotomy in coverage. For some Americans, private insurance companies cover the vaccine with no out of pocket liabilities (but only for recommended age groups), whereas Medicare which covers the vaccine for older Americans does so with variable, and sometimes considerable out of pocket liabilities.
Part B  Issue Framing

Vaccination Decision-Making

The focus of this dissertation is to identify societal reasons for vaccination decision-making behavior for the recommended shingles (herpes zoster virus) vaccine for adults ≥60 years. Specifically, with this research, consumer decision-making behaviors are studied to understand reasons for shingles vaccination use and determine if these behaviors are influenced by social perceptions or rooted in barriers to access. Policy strategies to increase vaccination coverage are explored by addressing social perceptions and barriers to uptake through a sociological decision-making lens.

The conceptual base of this dissertation is comprised of several inter-related social and public policy frames—(1) a population boom in the ≥65-year-old demographic and the increase in medical care consumption (*Frame 1: The Aging of America*); (2) escalating U.S. medical care utilization and costs, which are especially pronounced with the >65 year cohort and which strains publicly financed health care programs (*Frame 2: Rising Medical Care Costs*), (3) U.S. investment in public health and preventative health services (*Frame 3: Prevention, Policy and National Health Objectives*), (4) a national health imperative for clinical prevention as a cost containment strategy (*Frame 4: Clinical Prevention as Cost Containment Strategy*), and lastly, (5) influencing and shaping society’s health behaviors by individual choice and social networks (*Frame 5: Consumer Decision Making Behavior, Informed Choice, and Surveillance*). The problem definition statement joins the above frames, emphasizes the driver for this research, defines the gap between the goal and status quo, and is followed by a research overview and objective section.
**Frame 1: The Aging of America**

As of 2010, 40.3 million Americans or 13% of the U.S. population, were aged 65 years and over, which is up from 35 million, or 12.4% of the U.S. population in 2000 (Werner, 2011; U.S. Census Brief, 2010). The largest population segment is the *baby boomer generation* (born between 1946 and 1964), the last of which will turn 65 in 2029 (U.S. Census Brief, 2010). In the last decade, the \( \geq 65 \)-year-old segment recorded substantial growth (15.1%), (compared to 9.7% growth in the same population segment from 1990 to 2000) (U.S. Census Brief, 2010). While the largest distribution is in the 65 to 74-year-old group (representing 21.7 million Americans, or 53.9% of the \( \geq 65 \) segment), the majority of baby boomer growth belongs to the 65-69 age-group, which grew 30.4% and represents 12.4 million Americans. Across genders, the greatest increase is with older men aged 65 years and over, which narrows the gap with older women (U.S. Census Brief, 2010). By 2030, the \( \geq 65 \) years-old segment is projected to grow to 69 million, making up 16% of the U.S. population (Day, 1996).

**Frame 2: Rising Medical Care Costs**

The U.S. spent $3.0 trillion on medical care in 2014. This was up from $2.7 trillion and $2.5 trillion in 2011 and 2010, respectively. The US ranks first in medical care spending per capita ($9,523 per person), among other Organization for Economic Co-operation and Development (OECD) member countries, making national medical care spending almost 18% of the Gross Domestic Product (GDP) (Hartman, 2013; GAO, 2012; CMS, 2015). While holding largely stable between 2009-2011, by 2021 total local, state, and federal government spending on medical care is projected to account for 50% of national medical care spending. Medical care consumption expenditures are projected to nearly double to $4.5 trillion, and the percent of GDP allotted to medical care costs is projected to rise to almost 20% (Keehan, 2012).
The projected rise in medical care spending is attributed to a number of factors: namely, an aging U.S. demographic, which with chronic disease, declining health, and increased disability, consumes a disproportionate number of medical care services (increased utilization of physician, hospital visits, and pharmaceuticals) (Bernstein, 2003; Healthy People 2020 Older Adults, 2012; King, 2013). As baby boomers enter the Medicare eligibility age, medical care costs increase and a greater proportion of medical care spending is shifted to the federally funded Medicare Program. In addition to increased demand, medical care costs are also projected to rise as key provisions of the 2010 Patient Protection and Affordable Care Act (PPACA) (P. L. 111–148) are implemented, making the Federal government bear the largest percentage of the cost for the subsidy demand of expanded enrollment in the joint Federal-State funded Medicaid program (Keehan, 2012).

**Frame 3: Prevention, Policy and National Health Objectives**

*Prevention* and *preventative health services* are interventions that avert disease, increase health, and decrease medical care expenditures (Mathers, 1999; P.L. 103-417; Framework, Healthy People 2020) (Endnote 2). In 2010, the US spent $88 billion (3.5% of the $2.5 trillion spent on medical care, or 0.6% of the $14.4 trillion GDP) on preventative health services, ranking the U.S. third in prevention investment as a percentage of GDP (GAO, 2012).

At the core of preventative health services are *vaccinations*, which contribute to numerous public health and economic advances by preventing millions of diseases and tens of thousands of deaths and by reducing costs by tens of billions of dollars (Roush and Murphy, 2013; Healthy People, 2020, Immunization and Infectious Diseases). These gains and savings have shaped a long-standing public health interest and public policy priority in vaccination (MMWR, 1999;
Orenstein, 2005). As a matter of public policy and monetary investment, the U.S. Department of Health and Human Services (DHHS) promotes preventative health services by establishing national health objectives, such as Healthy People 2020 that issue 10-year health goals, establishes benchmarks, and monitors implementation. Highlighting the national importance of vaccination, Healthy People 2020 dedicates an entire module to goals for vaccination coverage across all recommended vaccines and charges numerous DHHS agencies, centers and programs with implementing policy priorities for licensing, recommending, promoting and monitoring vaccination by the public.

The PPACA reaffirmed the longstanding national commitment to public health and prevention and established, by including among other things:

(1) The Prevention and Public Health Fund, which allocated nearly $1 billion to “provide for expanded and sustained national investment in prevention and public health … to improve health and … restrain the rate of growth in … health care costs”. (PPACA Title IV, section 4002(a); APHA Release, 2014; Public Health Newswire, 2014).

(2) The National Prevention, Health Promotion, and Public Health Council, which is charged with improving health outcomes and containing health care costs (National Prevention, Health Promotion and Public Health Council, 2010; Rigby, 2011).

(3) Federal funds have been made available to states, in part, to strengthen immunization infrastructure and programs, such as supporting the CDC’s Immunization Grant Program, otherwise known as Section 317 (CDC News Release, 2011, Stewart and Richardson, 2010).
Frame 4: Clinical Prevention as a Cost Containment Strategy

Embracing a utilitarian doctrine, the U.S. government values the amount spent on clinical preventative services in order to maximize individuals’ health and happiness, and to that end, has established numerous Health People 2020 (HP2020) benchmarks across many public health areas that emphasize the goal of detecting, delaying, or alleviating disease. A sample of these goals include increasing the proportion of older Americans who are vaccinated with the shingles vaccine (HP2020 Goal IID-14), and are up to date on other clinical preventive services (HP2020 Goal OA-2). For men, this means receiving influenza and a pneumococcal vaccination, and having either a colonoscopy/sigmoidoscopy in the past 10 years or a fecal occult blood test in the past year. For older women, a mammogram is required. Other HP2020 clinical preventative service goals seek to increase diabetes management training services for older adults with diabetes (HP2020 Goal OA-4), increase wellness checkup adolescents (HP2020 Goal AH-1), increase cervical cancer screenings for women (HP2020 Goal C-15), increase blood cholesterol check ups for adults (HP2020 Goal HDS-6), increase HIV testing in adolescents and adults (HP2020 Goal HIV-14.1), and maintaining effective vaccination coverage for diphtheria-tetanus-acellular pertussis (DTaP) (HP2020 Goal IID-7.1). The government’s commitment to improve American’s quality of lives is exemplified by DHHS having spent nearly $24 billion of taxpayer’s dollars for clinical preventative services in Fiscal Year 2010/2011 (GAO, 2012). This underscores the intrinsic link between money and public policy towards attaining Bentham’s maximization utilitarianism concept, and stresses the importance of using taxpayer money to achieve national health goals in a cost-effective and just manner.
Frame 5: Consumer Decision Making Behavior, Informed Choice, and Surveillance

The principles of *behavioral intervention* and *individual informed choice* are central tenets of public health and policy. Public health messaging can provide information to empower individuals to make healthier decisions (Breslow, 1998). The 1952 President’s Commission on the Health Needs of the Nation described “individual responsibility [over one’s] health,”…[as a goal that] “depend[s] largely on education, culture, living circumstances, and a sense of power over health...Only then can individual responsibility for health exercised through personal action reach its full potential” (President’s Commission, 1952).

Another facet of preventative health strategy is that the use of a preventative service is voluntary. Absent compulsion, the individual decides whether to receive a medical service, which gives rise to the concept of *consumer choice that may be influenced* by the use of *social networks* to leverage the culture and living circumstances and “empower [consumers] to make choices about preventive health care programs …” (P.L. 103–417, Sec 2, Congressional Findings, 1994).

Moreover, evaluation of the effectiveness of behavioral interventions require *measurement* of society’s health behavior through surveillance---“the radar of public health…[a data collection tool capable of]…provid[ing] the foundation for public health planning” and national health goal attainment (Bayer and Fairchild, 2000).
Part C  Call for Research

Vaccination decision-making behaviors are particularly relevant for shingles, in lieu of the general sensitivities to vaccination, and the distinguishing factors around shingles itself—the disease is not as contagious and is generally not as fatal as other infectious diseases. The absence of herd immunity protections and free rider effects does not threaten the “commons” in the same way that non-adherence does with other communicable, vaccine preventable diseases. These concepts highlight that the cost benefit calculus with shingles vaccination is unlike that of other routinely recommended adult vaccines. The shingles vaccination should therefore be viewed as a personalized commercial commodity that does not require the same degree of government support/pull strategies as with other vaccinations. Instead, it should be viewed as a commodity that is sold to consumers, like other consumer goods.

Vaccination and vaccination policy are highly sensitive areas that juxtapose two counter prevailing foci—government interest toward the common good contrasted with individual rights and self-determination. This dissertation explores motivations behind government vaccination policy, such as compulsory vaccination programs, and patient decision-making and informed choice. Hardin’s “tragedy of the commons,” Bentham’s maximization utilitarianism concept, and Rawl’s redistributive justice form the basis for government vaccination policy (Bentham, 1832; Hardin, 1968; Wenar, 2013). Nozick’s libertarianism and negative rights theories, and Samuelson’s revealed preference frameworks repudiate government coercion and are at the core of individual decision-making and informed choice (Libertarian Paternalism, 2007; Samuelson, 1938).
Studying population-based, vaccination decision-making behaviors with respect to herpes zoster vaccination uptake is imperative to meet national shingles vaccination goals. Data in this space may be useful to spur vaccination policy change: whether vaccine use and non-use is rooted in social misperceptions (which may require public education and awareness campaigns through social networks) or rooted in policy generated system level barriers (which may lead to changes in cost and access variables). Moreover, this dissertation operationalizes a priority suggested by the Patient-Centered Outcomes Research Institute (PCORI) to research patient and provider shared decision-making. Taken together, this scholarship may enable policymakers and other stakeholders to re-design vaccination policy, programs, outreach strategies and tactics to increase herpes zoster vaccination coverage.

This research uses CDC’s Behavioral Research Factor Surveillance System (BRFSS) system—the principal epidemiologic survey for behavioral and chronic disease surveillance in the U.S. BRFSS is the largest, ongoing, probability sampled, telephone based, US public health surveillance instrument to obtain population-based estimates on a multitude of health topics. The BRFSS is conducted by the U.S. Centers for Disease Control and Prevention (CDC) and administered within each state, which then pool data to obtain nationally representative results. BRFSS reaches a large sample size of non-institutionalized adults (≥18 years residing in private residences) and contains a wide range of topics (modules), among them, an immunization module on vaccination (adult influenza and pneumococcal vaccination coverage). States may add questions to the primary national core component at their discretion. Arizona, Iowa, Massachusetts, Minnesota, and Vermont have elected to add the state optional herpes zoster vaccination module to their state BRFSS surveys in order to measure shingles vaccination
prevalence on individuals within their states (Section 23, Module 20, [Shvac variable >50 years old], however such data is sparse and has no national significance. In order to fulfill its national statistical reporting obligations, e.g. for HP2020 benchmarks, etc., CDC has had to use other, non-BRFSS instruments to report on shingles vaccination coverage. The national shingles vaccination rates were measured starting in 2007 through 2013 (latest year for which data is available) using the National Immunization Survey-Adult (NIS-Adult) and the National Health Interview Survey (NHIS) (see Chapter 3, Literature Review, Part A Shingles Vaccination Coverage). It is noteworthy that the NIS and NHIS sample sizes are much smaller relative to the sample size potential of the BRFSS tool. While the NHIS sample size for the shingles vaccination question has increased over the years (2007 NIS n=3,662 and 2013 NHIS n= 10,160), it is nowhere near what the BRFSS instrument can deliver. Consider that the Massachusetts BRFSS reaches ~17,000 households (>18 years-old) of which ~10,000 households are >50 years old. Magnifying that capacity nationally transforms the sample size multiple fold. This highlights the fact that BRFSS is underused as the premier national epidemiologic radar, compelling the CDC to perform other nationally representative surveys.

Additional research on zoster vaccination is possible with the BRFSS ‘call-back’ option, which is a re-contact survey of a panel of state BRFSS respondents who have self-selected and agreed to be re-contacted to participate in another follow-up survey. This option is available to states and can test patient reported knowledge of shingles and shingles vaccine, impact of system level barriers, affects of reimbursement and immunization policy on vaccination practices, and effects of social networks on decision-making. In 2012, additional questions were added to the MA BRFSS for the study discussed herein (MA BRFSS shingles survey).
The survey research was made possible by a grant (5H23IP122540-10) from the Massachusetts Department of Public Health (DPH) Immunization Program (Endnote 3), with additional funding support from Northeastern University (Boston, MA) to conduct focus groups at area senior centers.

CHAPTER 2: LAW AND PUBLIC POLICY PERSPECTIVES AND THEORY

Part A Vaccination and Government Intervention Policy

Considered one of “the greatest achievements of biomedical science and public health” (CDC MMWR, 1999, p.247), vaccines have vastly improved public health through the eradication of smallpox, and reduced morbidity of diphtheria, poliomyelitis, measles, mumps, and rubella — communicable infectious diseases that a century ago claimed hundreds of thousands of lives each year (US PSTF, 2012) (Endnote 4). These gains have contributed to an increased lifespan, a more developed society (Muzumdar and Cline, 2009), and were made possible in large part via universal government recommendations and compulsory vaccination programs (CDC MMWR, 1999, Orenstein, 2005, Fenner, 1988, Stewart and Devlin, 2006, Jackson, 1969).

Contemporary vaccination spans a lifetime; with recommended vaccinations in childhood, adolescence, and adulthood, and is bifurcated into child and adolescent vaccination (ages 0-18 years) and adult vaccination (aged 19 years and older). The primary success of vaccination programs is measured by surveillance systems that assess vaccine uptake, or utilization in recommended populations (also vaccination coverage) (CDC MMWR, 1999; Leung, 2011;
Generally, vaccination programs for the younger cohort have attained greater success relative to adult vaccination programs (MMWR, 1994; MMWR, 2008; Health, United States, 2011, table 85), with notable exceptions (Endnote 5). Overall, higher pediatric coverage is due to state compulsory immunization laws and school attendance policies that require vaccination prior to admittance (with permitted exemptions [Endnote 6]), as well as differences in health care delivery, financing mechanisms, provider attitudes, and government leadership (Orenstein, 1999; Hinman and Orenstein, 2007; State Law & Vaccine Requirements, 2013).

In contrast to pediatric vaccination coverage, adult vaccination coverage trails national benchmark goals, despite approval of new vaccines and continued government efforts to recommend their routine use (push strategies). While latest data from 2013 show modest increases in uptake for some vaccinations (tetanus, diphtheria and pertussis (Tdap), shingles (herpes zoster) (HZV), and human papillomavirus (HPV)), uptake for most other adult vaccinations remains largely unchanged (MMWR, 2012; MMWR, 2015). The reason is that adult vaccination is clouded by several distinctions. Diseases for contemporary adult vaccination programs are generally not as prevalent, life threatening, or debilitating as they were a century ago, e.g. smallpox, typhoid fever, or polio. The fact that the deadliest of diseases have been eradicated (or are on the verge of eradication) contributes to the perception of a lack of urgency and overall complacency. State laws requiring immunization of the civilian, consumer population are largely absent, and there are no work attendance immunization policies. Moreover, differences in health care delivery, financing and provider attitudes with adult vaccination influence vaccination coverage (GAO, 2011).
The reality is that adult vaccination rests on consumer decision-making behavior that is grounded entirely on a *right to choose* (freedom of choice principle- America’s favorite legal doctrine) and *informed consent* (an ethical obligation rooted in the Nuremberg Code). The task of influencing vaccination decision-making is left to prodding government policy officials and inconsistent provider recommendations, which are passive at best and not binding. Vaccine manufacturers are influential only in that they have an economic motivation to promote and sell their product.

Government’s intervention in vaccination is shaped not only by its "long standing [national] interest" (GAO Report, 2011) in, and commitment to, preventive medicine (Neustadt and Fineberg, 1978), but also by the economic imperative of the “capitalist order of production” (Hoppe, 1989, p.28, Foulkes, 2004, CDC MMWR, 1999). Not only does vaccinating one individual impart positive health implications to that person, but nearby, non-vaccinated individuals, also receive immune protection (Muzumdar and Cline, 2009; NVAC, 2009), via the spillover effect (Feeney and Bozeman, 2007), and benefit from vaccination in much the same way that the vaccinated person does. This is termed the *free-rider effect* (a positive externality).

While imparting positive externalities, vaccines are not public goods (Endnote 7). A unit dose of vaccine manufactured and administered to one individual is consumed by that individual and depletes the number of all doses available to others. Moreover, few “pay for and accept the vaccinations, and any possible untoward effects from it,” while the herd passively benefits from the vaccine without actually “pay[ing] for their share,” (Perloff, 2007, p. 626, Muzumdar and Cline, 2009). This in turn creates market force inefficiencies that shift the equilibrium to sub-
optimal demand and consumption, and contributes to insufficient quantity and/or quality of manufactured product. All of this creates “market failure due to the non production…or “deficient” production of … goods” (Hoppe, 1989, p. 33). Conversely, when individuals within a herd refuse vaccination due to risk aversion, e.g. side effects and/or costs of vaccination, or because general complacency sets in when the disease is under control—a positive externality of robust vaccination coverage—the health of the herd, and by extension society, is jeopardized, which further shifts the vaccine market to suboptimal demand and consumption.

In order to avoid Hardin’s “tragedy of the commons,” and promote public health while addressing economic market inefficiencies, the National Vaccine Program (NVP) designed strategies to address market inefficiencies and induce drug innovation, development, and utilization. These include (1) push policies directed at increasing vaccine supply, e.g. government support of intramural research, liability protection, and others, (2) pull strategies directed at increasing vaccine demand, e.g. recommending vaccine use, advanced purchasing of vaccines, government stockpiles, and (3) subsidizing vaccinations (Hardin, 1968; Goodman, 2007; DHHS, 2010; CRS Report, 2005; Orenstein, 2005; Mazumdar and Cline, 2009) (Endnote 8). These government tactics work alongside vaccine developers’ efforts to promote vaccination while respecting consent of the individual.

**Vaccination: Compulsion Laws and Exemption Rights**

Compulsory vaccination policies are used to address communicable, vaccine preventable diseases such as polio, measles, mumps, rubella, and Hepatitis B to name a few. They are justified on the basis of beneficence, non-maleficence, and justice (Pediatric Infectious Diseases Society, 2011). Such policies, at their core, rest on a benefit-based theory of obligation where
government makes a calculation of what is best for society—from a public health point of view—and through legislative and policy powers, obligates action that bypasses individual consent and moves into the realm of coercion (Sandel, 2009).

Aside from laws mandating vaccination for school attendance for the pediatric cohort, there are several instances of compulsion for adult vaccination. The U.S. Military requires that all personnel receive vaccinations, and that they participate in investigational new drug research involving vaccines. In fact, federal regulations (which are in place to ensure informed consent of all subjects participating in investigational studies) expressly exempt the US Military from this requirement (21CFR 50.23). Outside the military, many state immunization laws call for mandatory vaccination of civilians, such as hospital employees (Endnote 9), residents in long-term care (Endnote 10), and students at colleges and universities (Endnote 11) (IAC, 2011). The above mandates are prudent for controlling infectious diseases in high-risk environments.

On the other hand, it is inherently troubling to compel vaccination for non-contagious, vaccine preventable diseases like shingles because it galvanizes a societal backlash on the grounds that such a policy is coercive, paternalistic, infringes on personal beliefs, removes freedom of choice and consent, invokes fear that vaccination is dangerous, and fuels chronic mistrust in government and public health officials. Therefore, unless there is a compelling government interest in vaccination (an unlikely finding with shingles vaccination), a compulsion framework is not suggested for the civilian, non-institutionalized population (Goodman, 2007).

Under most state immunization laws, vaccination mandates generally allow for exemptions, either for legitimate medical excuses or personal beliefs, under religious or philosophical
emblems (IAC, 2011). Medical exemption policy is in place to safeguard the individual patient’s health (beneficence), specifically in instances where the recipient is immune-compromised, has a contraindicated medical condition, or is allergic to a vaccine ingredient. Typically, the individual can still benefit from protection because of the herd immunity “spill-over” advantage (Salmon, 1999). Other permissible exemptions are personal belief objections, which are justified by subjective philosophical and religious beliefs. Such exemption policies offer a state sanctioned mechanism for individuals to object to, and abdicate from social responsibility to vaccinate, which in turn compromise public health protections, which are the cornerstone of disease containment, especially for those who are unable to vaccinate. Moreover, personal belief exemptions shift the call and burden of vaccination onto other members of society. Such exemptions are generally easier to obtain (although exemption criteria vary by state), have become more common, and have contributed to the public’s perception that vaccination is voluntary. This has caused a decrease in vaccination coverage, a sharp increase in communicable infections, such as measles and pertussis including outbreaks of measles, and resulted in an avoidable “tragedy of the commons” for public health goals (Omer, 2012; Hardin, 1968; Salmon, 2006, Gastañaduy, 2014).

Vaccination policy, which spans vaccination recommendations and equitable distribution of vaccine, juxtaposes sociological perspectives about how best to maximize the common good and safeguard individual rights (Sandel, 2009). Does the utility of, and preference for a healthy society— one that maximizes use of preventative medicines—mean that government should mandate and subsidize vaccination? Bentham’s (1832) doctrine of utilitarianism, which calls for the “greatest happiness system of morals and legislation,” posits that government should
intervene to “maximize human happiness” (Sandel, 2009, p.35) by structuring laws and policies that recommend, and even mandate, use of disease preventing vaccinations, and that government should even subsidize vaccination. In Bentham’s view, this is justified on the grounds that vaccination is a public health maximization tool. In practice, this is what is largely done for childhood vaccinations, especially against communicable diseases, in the name of maximizing welfare and averting a tragedy of the commons. The argument for mandatory vaccination for shingles is less strong than for contagious diseases, but if third parties such as government or insurance parties are expected to pay for ameliorating the painful symptoms of the illness, there may be an argument to prevent preventable costs. Libertarians respond to this issue by maintaining that sufferers must pay personally for any treatments that they wish to receive.

Shingles is generally not a communicable disease (except if one is in direct contact with blisters), and vaccination policy should consider different public policy decision-making approaches in terms of distributive justice. Nozick’s libertarianism and Lockean negative right theorists counter Bentham’s “utilitarian logic” (Sandel, 2009, p.59) by favoring freedom of choice decision-making, over paternalistic government mandates and incursions into privacy, even if the policy is designed to maximize welfare, e.g. public health. The libertarian paradigm opposes compulsory vaccination on the grounds that this is coercive and infringes on personal choice, and frowns on government subsidies since it involuntarily redistributes taxpayer moneys from the well-off group to poorer individuals. Libertarian theory is not troubled by the high cost of the shingles vaccination since it embraces free market forces, and sees no need for government to correct this through redistributive justice. Rawlsian theory opposes this argument, asserting that justice requires that governments provide special protections for the economically or otherwise
vulnerable populations. Rawls’ “difference principle” endorses policies that make the poor better off at the expense of the wealthy (Wenar, 2013). In recent years, the U.S. government has resorted to “libertarian paternalism” to “nudge” individuals toward desired behaviors (Libertarian Paternalism, 2007).

Part B Vaccination in America, Policy Problem, and Call for Research

The decentralized American legal, economic, and public health system forces the enterprise of vaccination to work in a disjointed manner. The government, in fulfilling its utilitarian role to safeguard public health, (1) invests in vaccination policies and programs, (2) publishes vaccination recommendations, (3) influences vaccine purchasing power, (4) funds demonstration projects (Endnote 12 and Endnote 13), and (5) builds a complex surveillance infrastructure to monitor vaccination coverage, among other push/pull strategies. There is no legally mandated requirement however, for providers to inform or recommend preventative vaccination, nor a legally mandated requirement for adults to comply with public health recommendations and get immunized. There are no compulsion laws or policies for vaccination for the general population. There would likely be considerable societal backlash (similar to the backlash that has contributed to the exemption policy for pediatric vaccination) if they existed, as it may be perceived as an infringement on individual liberty rights (NVAC, 1994).

Moreover, the US does not have a uniform national policy for financing vaccination. As a result, the public is responsible for out-of-pocket expenses and cost sharing requirements. This is an outdated insurance strategy to force an individual’s rational consideration of health care purchases (in the context of dollars and cents) with the goal of minimizing health care utilization and keeping costs down. It is also an ongoing insurance market practice that forces patients to
shoulder a portion of the cost amidst growing research that cost sharing is a “behavioral hazard” (Baicker, 2013; Health Policy Brief, 2010) that biases consumers to overwhelmingly focus on the costs, creating a barrier to medical adherence and underutilization of effective health modalities (Choudhry, 2011).

The focus on vaccination coverage was first addressed by the non-governmental Task Force on Community Preventive Services, which issued some of the first evidence-based interventions and recommendations for increasing vaccination for vaccine preventable diseases in children, adolescents, and adults (Guide to Community Preventive Services) (CDC, 1999). More than fifteen years have passed and adult vaccination remains a significant public health challenge, so much so that the NVAC, with a goal of supporting informed decision-making and reducing vaccine preventable diseases (NVAC, 2009), dedicated its agenda to understanding barriers to adult vaccination and “develop[ed] recommendations for … a comprehensive, sustainable, national adult immunization program that will lead to vaccine- preventable disease reduction by improving adult immunization coverage levels” (Public Health Reports, 2012). Among the NVAC’s activities to address low adult vaccination coverage is increased research on (1) vaccination prevalence, (2) impact of different reimbursement systems on vaccine uptake (3) knowledge, attitudes, behavior and barriers for vaccination, (4) impact of racial disparities, (5) social network optimization, and (6) state level policies. That research is needed in the above foci areas underscores that the US has far to go to “realize the promise of immunization of adults” (NVAC, 2009, 4th paragraph, 2nd sentence).
The present research advances scholarship in the above areas and has several practical implications affecting community level and policy level changes. This research explores influences on awareness and decision-making around shingles vaccination. These include: knowledge of shingles disease, ownership over one’s health, provider recommendation or other social network effects. Other possible influences are vaccine safety and efficacy, cost/insurance, convenience, or supply issues.

**Part C Theories and Influences**

This research is grounded in a mix of theoretical and ecological perspectives that clarify adult vaccination perceptions and decision-making behavior in order to inform stakeholders of outreach communication tactics and public policy changes to increase awareness and vaccination uptake. The ecological perspectives focus on influence stream theories: (1) *individual influence theory* and (2) *interpersonal influence theory*, which explain consumer knowledge and behavior (referred to as the Cognitive-Behavioral Theories), and (3) *community influence theory*, which forms the basis for public health outreach and policy change.

Individual level influences measure behavior, knowledge, attitudes and beliefs (constructs embedded within (1) *Health Belief Model (HBM)*), as well as individual intentions for behavior change (constructs embedded within (2) *Theory of Planned Behavior (TPB)*). Interpersonal level influences measure the effects of the system, environment, and social networks upon individual knowledge and decision-making behavior (constructs embedded within (3) *Social Cognitive Theory (SCT)*). The cognitive-behavioral findings explain consumer behavior and are the basis for guiding public health priorities for targeted community level interventions and public policy changes. Theories of change are embedded in (4) Communication Change: Use of Social

Information on how individual and interpersonal influence theories were operationalized into the shingles survey questions is given in Chapter 5, Research Methods, Subpart B Shingles Telephone Survey Development. Public health outreach and policy change recommendations as they pertain to community influence theory are presented in Chapter 7, Discussion, Policy Implications and Further Research, Subpart B, Policy Recommendations.

**Cognitive-Behavioral Theories**

**Health Belief Model**

The HBM explores patient reported perceptions of the threat, e.g. shingles, and tests vaccination decision influences. The Massachusetts BRFSS shingles survey, the primary data collection tool for this dissertation, operationalizes the HBM with questions about perceptions of likelihood of getting shingles (perceived susceptibility), the pathophysiological effects of shingles and safety and efficacy perceptions of the vaccination (perceived severity), awareness of the vaccine (perceived benefits), recommendations for vaccination (cue to action), measurement of taking action, e.g. getting vaccinated with influenza and pneumococcal vaccines, and the reason for getting vaccinated with shingles (self-efficacy) (Theory at a Glance, 2005).

**Theory of Planned Behavior**

TPB explores patients’ vaccination intentions and personal behavior attitudes. The MA BRFSS shingles survey operationalizes TPB with questions about how painful shingles is perceived, the primary reason that people got vaccinated/what symptom patients were most concerned with
avoiding (*behavioral intention*), the importance of preventing shingles, and whether respondents would have received the vaccine if they knew that the vaccine was a live virus vaccine (*behavioral control*). TPB also tests the concept of *subjective norm* by asking if respondents were concerned with missing work or loosing pay as the reason for getting vaccinated, whether cost or convenience considerations influenced the vaccination decision, and whether respondents would have received vaccine if it were free or administered by a pharmacist (these questions test potential public policy changes) (Theory at a Glance, 2005).

**Interpersonal Level Influences**

**Social Cognitive Theory**

SCT explores influences from social network interactions, specifically the influence of friends/peers, health care providers and communication messages on vaccination behavior (observational learning and reciprocal determinism) (Theory at a Glance, 2005). The Massachusetts BRFSS Shingles Survey operationalizes SCT influences with questions of how one heard about the shingles vaccination, if know anyone who was sick with shingles, and other questions that test individual vaccination behavior influenced by peer social networks and the effectiveness of outreach instruments and communication tools, e.g. CDC website, Facebook, television show (Drs. Oz/Phil or Oprah), magazine or billboard advertisement, pharmacy/store advertisement-intercom or poster.

Theories of influence suggest that high prestige people, such as medical experts have great influence over society’s vaccination decision making behavior (Reimer, Schommer, Houlihan, et al, 2014). There are gender dichotomies in terms of influencing patient decision making—females, who tend to have more of a “participatory decision-making style” (Cooper-Patrick L,
Gallo JJ, Gonzales JJ, et al., 1999, Conclusions, 6th paragraph, 2nd sentence), tend be more engaged with their physicians than their male counterpart patients. Plus, males are more resistant to seeking medical help than females (Addis and Mahalik, 2003), however, physicians are more engaged with male patients—there are more questions and more counseling offered by physicians to male patients (Roter, Lipkin, and Korsgaard, 1991).
CHAPTER 3: LITERATURE REVIEW

The literature review chapter presents an overview of pertinent publications pertaining to: (1) shingles vaccination coverage (national and state [Massachusetts] level data), including literature on patient reported knowledge, attitudes, behavior and barriers (KABB), (2) shingles vaccination recommendations, vaccine access, reimbursement, and cost-effectiveness studies, and lastly, (3) social network and imitation theory relative to vaccination coverage. Since this dissertation focuses on law and public policy elements of shingles vaccination, this chapter does not provide a literature overview of the clinical aspects of herpes zoster, rather the chapter focuses on those publications with public policy ramifications for shingles vaccination and vaccination in general. The chapter is organized thematically with the above focus areas and ends with discussion of the literature gaps and opportunities for further research.

Part A Shingles Vaccination Coverage

CDC National Level Data

Using surveillance radar to measure society’s health behavior towards achieving health goals, the CDC began collecting shingles vaccination coverage data beginning in 2007 through 2013 (latest available data) with its National Immunization Survey (NIS) and BRFSS tools. Since the vaccine was first available in 2006, in 2007 the NIS assessed US baseline zoster vaccination coverage (>60 years old, n= 3662). These estimates showed overall herpes zoster vaccination coverage at 1.9% (95% CI: 1.3-2.8) and showed variability by age and ethnicity. Across age groups, vaccination coverage was highest for respondents >75 years old (3.2% [95% CI: 1.8–5.6]) and lowest for respondents 60-74 years old (1.3% [95% CI: 0.8–2.0]). Non-Hispanic whites and non-Hispanic blacks were estimated to have the highest vaccination coverage
Vaccination coverage was lowest for Hispanics and ‘other’ (1.1% [95% CI: 0.5–2.2] and 1.6% [95% CI: 0.6–4.0]) [not statistically significant], respectively. Seventy-three percent (73%) of respondents were unaware of the vaccine and 78% of respondents reported that they would accept the vaccination if their doctor recommended it.

Subsequent national survey estimates showed herpes zoster vaccination coverage (>60 years old, n= 5751) increasing. Vaccination coverage in 2008 was estimated at 6.7% (95% CI: 5.9- 7.6), an increase of 4.8% percentage points over 2007 estimates. Coverage showed variability by age (60-64 years-old segment at 4.7% [95% CI: 3.5- 6.2] and ≥85 years-old segment at 8.2% [95% CI: 5.8- 11.5] and ethnic disparities. Ethnic groups with the highest and lowest vaccination coverage were non-Hispanic whites at 7.6% (95% CI: 6.7-8.7) and Hispanic at 2.1% (95% CI: 1.2- 3.7).

Herpes zoster vaccination coverage estimates in 2009 (>60 years old, n= 7,335) recorded increased coverage (10.0% [95% CI: 9.1-11.0]), however, variability by racial and ethnic disparities continued (2009 NHIS). The highest vaccination coverage was in the non-Hispanic whites (11.2 % [95% CI: 10.1-12.5], followed by Hispanics (4.8% [95% CI: 3.0-7.8]), and blacks (4.3% [95% CI: 2.8-6.4]) reported lowest vaccination coverage with the shingles vaccine.

Shingles vaccination coverage data stratified by age is not available for survey years 2009-2013.

Herpes zoster vaccination coverage estimates in 2010 (>60 years old, n= 7,290) showed vaccination coverage at an overall 14.4% (95% CI: 13.4–15.4), an increase of more than 4
percentage points from the 2009 NHIS data (MMWR, 2012). Non-Hispanic whites achieved the highest vaccination coverage (16.6% [95% CI: 15.4–17.8]), followed by blacks (4.5% [95% CI: 3.4–5.9]) and Hispanics (4.4% [95% CI: 3.2–6.2]). The 2010 data was also the first time that vaccination coverage was published for the Asian population (12.7% [95% CI: 9.4–17.0]).

Herpes zoster vaccination coverage estimates in 2011 (>60 years old, n=9,278) showed coverage at overall 15.8% [95% CI: 14.8–16.9], an increase of 1.4% percentage points from the 2010 NHIS data. Whites achieved highest vaccination coverage (17.6% [95% CI:16.4–18.9]). Moderate progress in vaccination coverage was observed for blacks (7.9% [95% CI:6.2–9.9]) and Hispanics (8.0% [95% CI:6.2–10.2])—these groups recorded >3 percentage points coverage increases compared with estimates in 2010. Vaccination coverage for Asians increased to 14.0% (95% CI: 10.4–18.6).

Herpes zoster vaccination coverage estimates in 2012 (>60 years old, n= 9,924) showed that vaccination coverage improved modestly to 20.1% (95% CI: 19.1–21.2), an increase of 4.4 percentage points over 2011 levels. Racial and ethnic disparities continued to persist. Whites achieved the highest vaccination coverage (22.8% [95% CI: 21.5–24.0]), Asians (16.9% [95% 13.2–21.5]), increases of 5.2 and 3.0 percentage points, respectively relative to 2011 estimates. The lowest vaccination coverage was estimated for Hispanics (8.7% [95% CI: 6.6–11.4]) and blacks (8.8% [95% CI: 6.9–11.2]), increases of 0.7 and 0.9 percentage points, respectively relative to 2011 estimates.
Herpes zoster vaccination coverage estimates in 2013 (>60 years old, n= 10,160) showed that coverage continued to increase (24.2% [95% CI: 22.9–25.6]), a modest increase of 4.1 percentage points over 2012 levels. Coverage across all ethnic groups increased, however racial disparities continued to be evident. Whites were estimated to have the highest vaccination coverage (27.4% [95% CI: 25.8–29.0]) followed by Asians (22.6% [95% CI: 18.2–27.7]), increases of 4.6 and 5.7 percentage points, respectively, relative to 2012 estimates. The lowest vaccination coverage was estimated with Hispanics (9.5% [95% CI: 7.4–12.1]) and blacks (10.7% [95% CI: 8.5–13.3]), increases of 0.8 and 1.9 percentage points, respectively, relative to 2012 estimates.

National shingles vaccination coverage levels for (2007-2013) are summarized in Table 1.
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<td><strong>Vaccination Coverage</strong></td>
<td>1.9 (1.3-2.8)</td>
<td>6.7 (5.9-7.6)</td>
<td>10.0 (9.1-11.0)</td>
<td>14.4 (13.4–15.4)</td>
<td>15.8 (14.8–16.9)</td>
<td>20.1 (19.1–21.2)</td>
<td>24.2 (22.9–25.6)</td>
</tr>
<tr>
<td><strong>Age (Yrs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>60–64</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>65–74</td>
<td>1.3 (0.8-2.0)</td>
<td>7.4 (6.1- 8.9)</td>
<td>-----d</td>
<td>-----d</td>
<td>-----d</td>
<td>-----d</td>
<td>-----d</td>
</tr>
<tr>
<td>75–84</td>
<td>3.2 (1.8–5.6)</td>
<td>8.2 (5.8-11.5)</td>
<td>-----d</td>
<td>-----d</td>
<td>-----d</td>
<td>-----d</td>
<td>-----d</td>
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<tr>
<td>85+</td>
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</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whites</td>
<td>2.0 (1.2–3.2)</td>
<td>7.6 (6.7-8.7)</td>
<td>11.2 (10.1-12.5)</td>
<td>16.6 (15.4–17.8)</td>
<td>17.6 (16.4–18.9)</td>
<td>22.8 (21.5–24.0)</td>
<td>27.4 (25.8–29.0)</td>
</tr>
<tr>
<td>Asians</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanics</td>
<td>1.1 (0.5–2.2)</td>
<td>2.1 (1.2-3.7)</td>
<td>4.8 (3.0-7.8)</td>
<td>4.4 (3.2-6.2)</td>
<td>8.0 (6.2-10.2)</td>
<td>8.7 (6.6–11.4)</td>
<td>9.5 (7.4–12.1)</td>
</tr>
<tr>
<td>Blacks</td>
<td>2.4 (1.3–4.6)</td>
<td></td>
<td>4.3 (2.8-6.4)</td>
<td>4.5 (3.4–5.9)</td>
<td>7.9 (6.2–9.9)</td>
<td>8.8 (6.9–11.2)</td>
<td>10.7 (8.5–13.3)</td>
</tr>
</tbody>
</table>

a. Vaccination coverage represents national overall shingles vaccination coverage by survey year. Data sourced from 2007/2008 NIS and 2009-2013 NHIS.
b. Estimate captures 60-74-year-old age group.
c. Estimate captures over 75-year-old age group.
d. Stratified data by age is not available for 2009-2013 NHIS publications.
State [Massachusetts] Level Data

Massachusetts began reporting state shingles vaccination coverage (using MA BRFSS state optional module) beginning in 2010. It is noteworthy that Massachusetts, for the first two years of data collection asked the shingles vaccination coverage question of respondents over age 50 whereas CDC’s national estimates are based on data from respondents aged 60 and over. The data is stratified across both age groups. Massachusetts data also revealed additional population level data such as gender, educational attainment, and household income.

MA BRFSS shingles coverage level for 2010 (n= 8991) recorded what amounted to be a baseline vaccination coverage for the state (10.0% [95% CI: 8.8-10.5]). Massachusetts observed variability in vaccination coverage by gender, age, ethnic disparities, and education. Gender analysis shows that more females (10.6% [95% CI: 9.5-11.7]) than males (8.5% [95 CI: 7.1-9.8]) received the shingles vaccine. Across age groups, the highest vaccination coverage was in the 70-75 years old group (16.7% [95% CI 14.2-19.2]), followed by >75 years old (15.6 [95% CI 12.4-18.7]) and 60-69 years old group (15% [95% CI 13.2-16.8]). Across race/ethnicity, whites had the highest vaccination coverage (10% [95% CI: 9.1-10.1]) and Hispanics reported lower vaccination coverage (6.4% [95% CI 3.3-9.6]). Data not reported for blacks and Asians. Across educational attainment, vaccination coverage was highest for college graduates (11.6% [95% CI 10.3-13.0]) and lowest for those with less than high school education (4.8 [95% CI 2.6-7.0]).

MA BRFSS shingles coverage level for 2011 (n= 11,122) recorded that 10.6% of respondents >50 years old received the shingles vaccine (95% CI: 9.8-11.4) and that 17.0% of respondents >60 years old received the shingles vaccine. Massachusetts continued to observe variability in
vaccination coverage by gender, age, ethnic disparities, and education. The shingles vaccine was
received by more females (11.7% [95% CI: 10.7-12.7]) than males (9.3% [95 CI: 8.1-10.5]).
Across age groups, the highest vaccination coverage was again in the 70-75 years old group
(20.5% [95% CI 18.0-23.0]). The second highest vaccination coverage was followed by the 60-
69 years old group (16% [95% CI 14.4-17.7]). Vaccination coverage in the >75 years old
decreased (13.6% [95% CI 11.2-16.0]). Across race/ethnicity, whites had the highest
vaccination coverage (11.3% [95% CI: 10.5-12.2]), followed by Hispanics (5.8% [95% CI 2.7-
8.8]). State level data are not reported for blacks and Asians. Across educational attainment,
vaccination coverage was highest for college graduates (13.3% [95% CI 12.0-14.5]), and lowest
for respondents with less than high school education (6.0 [95% CI 3.8-8.3]).

MA BRFSS shingles coverage level for 2012 (n= 7,369) recorded that 23.7% of respondents >60
years old received the shingles vaccine (95% CI: 22.3-25.2). Note that in 2012 data are reported
for respondents >60 years old, in contrast to data reporting from 2010 and 2011 which showed
data on >50 years-old cohort who received the shingles vaccine. There is also a change to the
reported age categories starting in 2012—50-59 years-old group no longer shown, 70-75 years
old age group is combined with 75+, and a new age group of 80+ is shown, making vaccination
comparisons across strata difficult.

The vaccination gains were higher for males (24.0% [95 CI: 21.6-26.4]) than females (23.5%
[95% CI: 21.8-25.3]). Across age groups, the highest vaccination coverage was in the 70-79
years-old group (27.4% [95% CI 24.7-30.1]). The second highest vaccination coverage was in
the 60-69 years old group (23% [95% CI 20.9-25.0]). Vaccination coverage in >80 years old was
19.0% (95% CI 17.1-22.7). There is insufficient coverage data across race/ethnicity for blacks, Hispanic and Asians, however, white respondents show vaccination coverage estimates of 25.5% (95% CI: 23.9-27.0). Across educational attainment, vaccination coverage was highest for college graduates (33.6% [95% CI 31.3-35.9]), and lowest for respondents with less than high school education (10.3 [95% CI 6.9-13.7]).

MA BRFSS shingles coverage level for 2013 (n= 4,904) recorded that 29.9% of respondents >60 years old received the shingles vaccine (95% CI: 28.0-31.9). Vaccination gains were recorded across both genders but were greatest for females (30.8% [95% CI: 28.4-33.3]). Males also recorded an increase in vaccination (28.8% [95 CI: 25.5-32.0]). Across age groups, the highest vaccination gain was in the 70-79 years old group (34.2% [95% CI 30.3-38.1]), followed by the 60-69 years old group (28.4% [95% CI 25.7-31.0]).

Vaccination coverage across race/ethnicity shows variability in coverage—whites reports vaccination coverage estimates (31.5% [95% CI: 23.9-27.0]), followed by blacks (17.9% [95% CI 8.9-26.8]) and Hispanics (15.8% [95% CI 7.9-23.7]). Data not reported for Asians. Across educational attainment, vaccination coverage was highest for college graduates (40.9% [95% CI 37.9 - 43.9]) and lowest for respondents with less than high school education (16.7 [95% CI 10.7 - 22.8]).

MA BRFSS shingles coverage level for 2014 (n= 6,017) recorded that Massachusetts surpassed the HP 2020 shingles vaccination goal (38.4% of respondents >60 years old received the shingles vaccine [95% CI: 36.4 - 40.4]). Vaccination gains were recorded across both genders but were
greatest for females (39.6% [95% CI: 37.2 - 42.0]). Males also recorded an increase in vaccination (36.9% [95 CI: 33.7-40.2]). Across age groups, the highest vaccination gain was in the 70-79 years-old group (42.5% [95% CI 39.0 - 45.9]) followed by the 60-69 year-old group (36.1% [95% CI 33.2 - 39.0]).

Variability in vaccination coverage across race/ethnicity continues— whites reports vaccination coverage estimates of 40.3% (95% CI: 38.3 - 42.4), Hispanics reported the greatest gains in vaccination coverage (27.9%, 95% CI 15.7-40.1), and blacks were at 17.9% (95% CI 8.9-26.8). Data not reported for Asians. Across educational attainment, vaccination coverage was highest for college graduates (47.7%, 95% CI 45.0 - 50.4), however, the highest vaccination coverage gain was seen for respondents with less than high school (27.8% [95% CI 21.0 - 34.6]) and high school education (35.2% [95% CI 31.5 - 38.9]).

Massachusetts BRFSS shingles vaccination coverage levels (2010-2014) are summarized in Table 2.
Table 2: Massachusetts Shingles Vaccination Coverage, Overall and Stratified, MA BRFSS Data (2010-2014)

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>% CI</td>
<td>(8.8-10.5)</td>
<td>(9.8-11.4)</td>
<td>(22.3-25.2)</td>
<td>(28.0 - 31.9)</td>
<td>(36.4 - 40.4)</td>
</tr>
</tbody>
</table>

**Vaccination Coverage**

<table>
<thead>
<tr>
<th>Gender</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>8.5 (7.1-9.8)</td>
<td>9.3 (8.1 - 10.5)</td>
<td>24.0 (21.6-26.4)</td>
<td>28.8 (25.5 - 32.0)</td>
<td>36.9 (33.7 - 40.2)</td>
</tr>
<tr>
<td>Female</td>
<td>10.6 (9.5-11.7)</td>
<td>11.7 (8.1 - 10.5)</td>
<td>23.5 (21.8-25.3)</td>
<td>30.8 (28.4 - 33.3)</td>
<td>39.6 (37.2 - 42.0)</td>
</tr>
</tbody>
</table>

**Gender**

<table>
<thead>
<tr>
<th>Age (Yrs)</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-59</td>
<td>1.7 (1.0-2.4)</td>
<td>2.1 (1.4 - 2.7)</td>
<td>----- b</td>
<td>---- b</td>
<td>----- b</td>
</tr>
<tr>
<td>60-69</td>
<td>15.0 (13.2-16.8)</td>
<td>16.0 (14.4 - 17.7)</td>
<td>23.0 (20.9–25.0)</td>
<td>28.4 (25.7-31.0)</td>
<td>36.1 (33.2-39.0)</td>
</tr>
<tr>
<td>70-75</td>
<td>16.7 (14.2-19.2)</td>
<td>20.5 (18.0 - 23.0)</td>
<td>27.4 (24.7–30.1) c</td>
<td>34.2 (30.3-38.1) c</td>
<td>42.5 (39.0-45.9) c</td>
</tr>
<tr>
<td>75+</td>
<td>15.6 (12.4-18.7)</td>
<td>13.6 (11.2 - 16.0)</td>
<td>19.9 (17.1–22.7) d</td>
<td>28.0 (23.9-32.0) d</td>
<td>38.3 (34.1-42.5) d</td>
</tr>
</tbody>
</table>

**Race**

<table>
<thead>
<tr>
<th>Race</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>10.0 (9.1-10.1)</td>
<td>11.3 (10.5 - 12.2)</td>
<td>25.5 (23.9-27.0)</td>
<td>31.5 (29.5-33.6)</td>
<td>40.3 (38.3 - 42.4)</td>
</tr>
<tr>
<td>Black</td>
<td>----- b</td>
<td>----- b</td>
<td>----- b</td>
<td>17.9 (8.9-26.8)</td>
<td>19.5 (11.3-27.7)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>6.4 (3.3-9.6)</td>
<td>5.8 (2.7 - 8.8)</td>
<td>----- b</td>
<td>15.8 (7.9-23.7)</td>
<td>27.9 (15.7-40.1)</td>
</tr>
<tr>
<td>Asian</td>
<td>----- b</td>
<td>----- b</td>
<td>----- b</td>
<td>----- b</td>
<td>----- b</td>
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**Education**

<table>
<thead>
<tr>
<th>Education</th>
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<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; High School</td>
<td>4.8 (2.6-7.0)</td>
<td>6.0 (3.8 - 8.3)</td>
<td>10.3 (6.9 – 13.7)</td>
<td>16.7 (10.7 - 22.8)</td>
<td>27.8 (21.0 - 34.6)</td>
</tr>
<tr>
<td>High School</td>
<td>7.8 (6.3 - 9.3)</td>
<td>9.2 (7.7 - 10.7)</td>
<td>19.8 (17.1 – 22.5)</td>
<td>25.5 (21.8 - 29.1)</td>
<td>35.2 (31.5 - 38.9)</td>
</tr>
<tr>
<td>College ≥3 Yrs</td>
<td>8.9 (7.3 - 10.5)</td>
<td>10.6 (9.0 - 12.3)</td>
<td>23.5 (20.5 – 26.5)</td>
<td>28.0 (24.1 - 31.9)</td>
<td>37.9 (34.2 - 41.5)</td>
</tr>
<tr>
<td>College 4+ Yrs</td>
<td>11.6 (10.3-13.0)</td>
<td>13.3 (12.0 - 14.5)</td>
<td>33.6 (31.3 – 35.9)</td>
<td>40.9 (37.9 - 43.9)</td>
<td>47.7 (45.0 - 50.4)</td>
</tr>
</tbody>
</table>

**Household Income**

<table>
<thead>
<tr>
<th>Income</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;$25,000</td>
<td>7.7 (6.0-9.4)</td>
<td>9.0 (7.4 - 10.6)</td>
<td>15.3 (13.0 – 17.7)</td>
<td>22.0 (18.3 - 25.7)</td>
<td>29.0 (24.9-33.0)</td>
</tr>
<tr>
<td>$25,000–34,999</td>
<td>9.5 (6.9-12.1)</td>
<td>12.2 (9.3 - 15.0)</td>
<td>21.6 (17.2 – 25.9)</td>
<td>25.8 (20.0 - 31.6)</td>
<td>39.3 (33.1-45.5)</td>
</tr>
<tr>
<td>$35,000–49,999</td>
<td>11.0 (8.2-13.8)</td>
<td>13.3 (10.7 - 16.0)</td>
<td>22.2 (18.1 – 26.3)</td>
<td>30.8 (25.0 - 36.6)</td>
<td>38.7 (33.4-44.1)</td>
</tr>
<tr>
<td>$50,000–74,999</td>
<td>10.2 (7.8-12.6)</td>
<td>11.0 (8.9 - 13.1)</td>
<td>26.7 (22.6 – 30.8)</td>
<td>34.3 (28.6 - 40.0)</td>
<td>49.1 (43.3-54.8)</td>
</tr>
<tr>
<td>$75,000+</td>
<td>9.3 (7.8-10.8)</td>
<td>9.5 (8.2 - 10.9)</td>
<td>33.6 (30.3 – 37.0)</td>
<td>36.9 (32.7 – 41.2)</td>
<td>45.7 (41.8–49.7)</td>
</tr>
</tbody>
</table>

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* a. Vaccination coverage data sourced from A Profile of Health Among Massachusetts Adults, 2010-2014, Results from the Behavioral Risk Factor Surveillance System.

b. b--=Data not reported.

c. c Shingles vaccination coverage for the 2012/2013/2014 BRFSS reports redefined the 70-75-year-old age group to 70-79 years-old.

d. d Shingles vaccination coverage for the 2012/2013/2014 BRFSS reports redefined the 75+ years age group to 80+ years.
Patient Reported Knowledge, Attitudes, Behavior and Barriers (KABB)

The first study to measure patient reported KABB with regard to herpes zoster vaccination behavior (specifically reasons for declining the vaccine) in community dwelling elderly population was in the Netherlands (Opstelten et al. 2009). The study population (n= 1778 patients) was ≥65 years old, who were offered free shingles vaccination together with their annual influenza vaccination. Thirty-nine percent of patients (39%) elected to received the shingle vaccination (n= 690) compared to 76% of patients (n=1349) who received the influenza vaccination. Determinants associated with refusing the shingles vaccination include lack of recommendation by the physician, non-compliance with physician advise, low perceptions of developing shingles and the associated pain, and perceptions that vaccines weaken one’s natural defenses. The authors conclude that to increase the acceptance of the shingles vaccination that information regarding the disease and the vaccine’s safety and efficacy should be provided to patients as well as physicians.

A second study evaluating qualitative research on HZ and PNH perceptions and associated attitudes towards the shingles vaccination was performed in Denmark (Mortensen, 2011). Three focus groups (total participants n=22 of both genders aged 50-65 years) were conducted with participants who either had shingles or PHN within the past year, were relatives of someone who had shingles, or participants with no prior knowledge of the disease and its severity. The majority of participants (73%) were not aware of the vaccine, 35% did not believe that they needed the HZ vaccine, and there were low (12.5%) perceptions of risk in developing shingles. Neither patients nor relatives knew of the first symptoms of the disease and were not familiar with the acute pain of the disease. There was also a poor understanding of shingles ideology. All
patients agreed that shingles pain was debilitating with substantial effects on quality of life. In terms of vaccination, half had misconceptions about adult vaccines, their side effects, and difficulty in choosing between vaccines. Patient’s interest in the zoster vaccine relied on its ability to treat or prevent future cases, and patients and relatives reported that they would want such a vaccine at any cost. After some education, most believed that the target population should get the shingles vaccine either for free or at little cost. Overall this study suggests that vaccine uptake rests on the public’s risk perceptions on developing the disease and on subjective acceptance of vaccination. Information and direct recommendation from physician is needed for target persons to consider vaccination.

Another study from Canada evaluated adult and health care providers’ knowledge, attitudes, beliefs and behaviors and evaluated perspectives on adult vaccinations (herpes zoster and others) (MacDougall et al, 2015). The study used a mixed method research design (survey and focus groups) and sampled adults (n=4,023 and n=62), and health care providers (n=1,167 and n=45) for the survey and focus group, respectively. Both the public and health care providers felt that vaccines for children were more important than for adults and believed that vaccines should be made publically available. An overwhelmingly large number of health care providers (92%) believed that vaccines like shingles have great potential to impact the public’s health, however, the public reported less confidence in the effectiveness of vaccines relative to providers. A mere 25% of Canadian adults reported that their providers had informed them of which vaccines they needed, yet a much greater percentage of Canadians (55%) reported willingness to receive vaccinations if they were recommended. Focus group showed that adults and providers felt that vaccines were generally helpful, however some providers expressed mistrust in the industry and
government recommendations. There was also ambiguity on the part of the public and providers about the general goals of vaccination—whether to embrace doing good for society or embrace individual choice. In fact, members of the public who refused vaccinations had little regard for society. Overall, vaccine hesitancy was not a dominant reason for not receiving vaccines, although lack of awareness, misinformation and inability of providers to dispel misperceptions contribute to some hesitancy. Cost did not contribute to vaccination hesitancy and uptake.

**Part B Vaccine Recommendations, Access, Reimbursement, and Cost-Effectiveness**

Shortly after the shingles vaccine was licensed and recommended for use in the U.S. (2008), Hurley et al. (2010) surveyed internists and physicians about vaccination access and reimbursement practices and barriers around the shingles vaccination. Their work revealed that nearly half of physicians stock the vaccine in their practice to administer to patients but that over one third of physicians refer patients to the pharmacy to purchase the vaccine and bring back for administration. The study also found that physicians do not recommend the shingles vaccine as frequently as they do influenza or pneumococcal vaccinations—less than half of physicians recommend or strongly recommend the shingles vaccines to patients while over 90% of providers recommend the latter vaccinations. Lastly, more than half of surveyed physicians did not know that the shingles vaccine was reimbursible through Medicare Part D and of those physicians that stocked the vaccine in their practice, 12% stopped because of vaccine cost and billing and reimbursement complexities.
Another study by the US Government Accountability Office (GAO, 2011) evaluated Medicare’s prescription drug benefits (Part D) program policies to assess Medicare beneficiaries’ ability to access routinely recommended Part D vaccinations (GAO analysis conducted per section 4204(e) of The 2010 Patient Protection and Affordable Care Act (PPACA, 2010)). GAO focused only on routinely recommended adult vaccines reimbursed by Medicare Part D prescription drug program (referred to as Part D covered vaccines)— (1) shingles (herpes zoster) and (2) tetanus and diphtheria (Td)/ or tetanus, diphtheria and pertussis (Tdap) (influenza and pneumococcal vaccinations were out of scope since these are covered by Medicare’s Part B Program).

GAO reviewed survey data, Medicare Part D prescription drug event data, and Medicare Part D beneficiary enrollment data. GAO evaluated applicable laws, regulations, and guidance on Medicare vaccination coverage, conducted additional surveys with health care providers and State Health Insurance Assistance Programs (SHIP), evaluated Part D reimbursement analysis and cost sharing data, and interviewed facility and Medicare Part D prescription drug plans administrators. GAO also interviewed relevant government agencies, advisory bodies and others to gain perspectives of government agencies and adult vaccination program stakeholders.

The study highlighted the difficulties of accessing the shingles vaccine and identified the Part D coverage and out-of-pocket costs as a central barrier to Part D vaccine uptake, citing that 86% of physicians would be more inclined to stock and administer the vaccine if it was covered under Medicare Part B (GAO, 2011). Its findings showed that few Medicare beneficiaries received the recommended shingles vaccine (obtained by 11% of Medicare beneficiaries), (NHIS 2009 data; GAO, 2011), and of those who received the Part D covered vaccine, few had it reimbursed by
Part D (Endnote 14). A small percentage of adults (almost 8%) received the shingles vaccination before age 65 (non Medicare beneficiaries).

Fewer than 5% and < 1% of Medicare beneficiaries had their shingles and/or Td/ Tdap vaccinations, respectively, reimbursed by Medicare Part D (GAO, 2011). GAO attributes the discrepancy between vaccination coverage and low Part D reimbursement to beneficiaries potentially receiving these vaccinations prior to Medicare enrollment or using some other form of health care insurance coverage for the vaccination, e.g. Medicare Advantage Plans [Part C], which may provide prescription drug coverage. These reimbursement statistics include beneficiaries in the donut hole, which is a period during which Medicare Part D does not reimburse for prescription drug related expenses, forcing beneficiaries to incur out of pocket costs. P.L. 111-148, §3301 phases out the donut hole by 2020.

A possible alternate explanation for the low number of beneficiaries seeking reimbursement for the Td/ Tdap vaccination under Part D may be attributed to Medicare’s bifurcated coverage policies with the Td or Tdap vaccine. Medicare allows Part B to cover Td/Tdap vaccinations when the vaccine is prescribed as an “incident to the treatment of an injury or incidence of exposure” to tetanus (GAO, 2010, footnote 2, p. 1), rather than as a prophylactic booster which in such cases would be covered by Part D. Therefore, it is possible that the 1% Part D reimbursement for the Td or Tdap vaccination was that the vaccine was reimbursed by Part B.

GAO also reports that Part D reimbursement rates for shingles vaccination varied by type of beneficiary, e.g. Medicare Advantage (Part C), other Part D prescription plans, a low-income
subsidy (LIS) for Part D premiums. Medicare Advantage beneficiaries were more likely to receive Part D reimbursement for the shingles vaccine, whereas LIS beneficiaries submitted fewer shingles vaccination reimbursement to Part D than did non-LIS beneficiaries. The decreased LIS beneficiary reimbursement rates are likely explained by LIS beneficiaries receiving prescription drugs at little or no out of pocket costs (GAO, 2011), which avoids the need to submit for out of pocket cost reimbursement.

Surveys with providers (physicians and pharmacists) found that many variables influence providers’ ability to offer, and hence Medicare beneficiaries’ ability to access the shingles vaccine (GAO, 2011). Specifically, providers face challenges in their ability to stock, administer, or recommend the shingles vaccine. These include the high vaccine cost which must be purchased in advance (ranges from $154-$162), Medicare Part D administrative billing challenges (physician’s Part D out of network status complicates the verification of Part D enrollment), low vaccine supplies (due to manufacturing supply disruptions), patient cost sharing responsibilities (due to inconsistency in insurance coverage and associated out of pocket costs and trouble with billing/reimbursement), uncertain patient demand, vaccine transport (requirement to obtain vaccine at pharmacy and transport to physician’s office to administration), and vaccine safety and efficacy concerns. At least one of these barriers was cited by more than 80% of physicians as a reason to not provide the shingles vaccine.

**Physician Vaccine Recommendation and Patient Declination Reasons**

GAO reported that physician recommendation of Part D covered vaccines is significantly less then physician recommendation of Part B covered vaccines. 33% and 46% of physicians reported that they always recommend the shingles and Td/Tdap vaccines, respectively, compared to 78%
of physicians always recommending the pneumococcal vaccine (GAO, 2011). Even when the shingles vaccine is recommended, the declination rates for the shingles vaccine are higher when compared to declination rate for the Td/Tdap and pneumococcal vaccines, although the pneumococcal vaccination has a 78% declination rate (the highest of the three vaccines) for “occasional” declination by beneficiaries. Practitioners cited that patients decline the shingles vaccine because of lack of insurance coverage (50%), difficulty in cost sharing (48%), concerns about safety (26%) and efficacy (15%), and the need to obtain the vaccine outside their doctor’s office (24%).

Few physicians (31%) stock the shingles vaccine in their practices, with over 70% of physicians referring patients to a pharmacy to purchase the vaccine, however, only 35% of pharmacists stock the vaccine. The 58% of physicians who do not stock the shingles vaccine do so because of uncertainty in demand by patients. 21% of physicians classified this as a major barrier with 37% as a minor barrier. This is a paradoxical statistic because when physicians do not recommend the vaccine (per GAO survey results, only 33% always recommend the shingles vaccine), then it follows that patient demand for the vaccine would be low and that this would affect vaccine stock in physician’s offices.

In addition, the standard Medicare Part D coverage has a deductible and an initial coverage period, which is shared between the enrollee and the plan (25% of drug cost is paid by enrollee and 75% paid by plan) up to a specified annual level of spending ($3,310.00 for FY2016) until a coverage gap phase is reached (otherwise known as the doughnut hole). In the coverage gap the enrollee out of pocket costs are increased (45%-58% of the prescription drug cost). If
prescription drug out of pocket spending continues to increase, catastrophic coverage kicks in ($4,850 for FY2016) and the enrollee pays 5% of the drug costs with the Medicare plan paying 15% and Medicare paying 80%) (Kaiser, 2015). In the case of the shingles vaccination, beneficiaries who have exceeded their initial coverage limit would pay for 45% of cost of the vaccine (brand name drug), unless they qualify for reimbursement under the Low- Income Subsidy (LIS). In 2006, a total of 7% of beneficiaries entered the coverage gap and were not eligible for reimbursement assistance (OIG, 2009). The percentage doubled in 2007 with a reported 14% of beneficiaries having entered the coverage gap who were not eligible for reimbursement assistance (Hoadley, 2008).

The dichotomy and overlap between Medicare’s Part B and D Programs, the complexity to providers in navigating the system and to patients in accessing Part D covered drugs was analyzed by Marrufo et al. (2011). Specifically regarding Part D covered vaccines, the authors document that consolidating Medicare Part D vaccines under Part B improves patient access, removes billing complexities, and improves patient adherence if vaccines are covered under Part B. Marrufo specifically indicates if the herpes zoster vaccine were consolidated under Part B, it would improve access. Overall moving vaccines to Part B lowers costs for beneficiaries and decreases the chances of beneficiaries reaching their Part D coverage gap.

Since economic considerations significantly influence adoption of vaccines, guide vaccination recommendations, and influence provider practice and insurance payment policy, numerous cost-effectiveness studies have been performed to assess cost-effectiveness of the shingles vaccine (Kawai et al, 2014). Depending on the assumptions used in each, some have determined that the
vaccine is cost-effective, while others have not. One study (Rothberg [2007]) evaluated the cost-effectiveness of the herpes zoster vaccine using a societal perspective of the cost (USD) and quality adjusted life expectancy, and concluded that while the vaccination did indeed reduce acute pain and the complication of postherpetic neuralgia, the vaccine may not be cost-effective in all, due to the fact that the incidence of shingles varies by age and gender and the cost per utility (QALY) also varies (range from $201,000 QALY for 60-69-year-old patients to $75,000 QALY for patients over 70). The vaccine was more cost-effective in older women ($44,000/QALY for a 70-year-old woman) than in older men ($191,000/QALY for an 80-year-old man).

Rothberg’s incremental cost effectiveness measurements incorporated cost and concluded that at $152 [the 2016 private market sector cost per dose of shingles vaccine is $187.89/ $117.12 CDC cost/dose], the vaccine is only cost-effective for women and not cost-effective for other groups at QALY’s exceeding $100,000 QALY. Lowering the cost to $46 would make the shingles vaccine universally recommended. An additional U.S. study by Hornberger and Robertus (2006) also with a societal perspective but before the vaccine pricing was established, concluded that at a price of $50 the shingles vaccine was cost-effective ($\leq$50,000 per QALY gained) but at a price of $200 the vaccine was not cost-effective ($\geq$100,000 per QALY gained). Only one U.S. based study (Pellisier, 2007) concluded that the vaccine was cost-effective at a payer perspective with cost effectiveness criteria of $50,000 per QALY.

Most recently, Le and Rothberg (2015) added data on individuals >50 years old into earlier cost-effectiveness models (societal perspective) in order to arrive at more updated cost-effectiveness
estimates for the shingles vaccine. Updated cost-effectiveness models concluded that at the current vaccine cost per dose, shingles vaccination for individuals >50 years old offers poor value (incremental cost effectiveness ratios (ICER) per QALY saved was above the established threshold standard of $100,000 at more than $300,000). If vaccine cost was lowered to $80 per dose only then would ICER be more in line with established resource allocation thresholds (>$100,000). Le et al. (2015) provide data to substantiate CDC’s ACIP decision not to recommend the shingles vaccine for the 50-59 years old group.

**Vaccine Access**

Massachusetts is also among the states that expanded the role of community pharmacists to provide vaccinations (APhA, 2016). Massachusetts’ regulations set forth in 105 CMR 700.004(B)(6), allow community pharmacists to administer vaccination beyond influenza and include the shingles vaccine, among other vaccinations. This represents an interesting case study of shifting policies affecting community pharmacy practice. In addition, Massachusetts is implementing an immunization registry—the Massachusetts Immunization Information System (MIIS), a data repository on immunization status that is populated by health care institutions and health care providers, including pharmacists as part of their expanded immunization role (MDPH MIIS Policy Statement, 2012; MDPH Policy, 2012). The present study tests the feasibility of Massachusetts 2012 policy that expanded community pharmacist’s ability to administer the shingles vaccination by asking patients if they would have the pharmacist administer the shingles vaccination. Information from the present survey may assist with the registry.
Part C  Social Network and Imitation Theory

Mbah et al. (2012) advanced a revised social network model of vaccination decision-making patterns, which the authors refer to as “imitation dynamics”. Unlike traditional economic game theory models, which assume a homogenous population mix and fully rational decision-making to maximize one’s payoff (perceived net benefits of vaccination), this revised model supposes that vaccination decision-making is influenced by a heterogeneous mix of population contacts, and the interplay of utility maximization and imitation dynamics. Mbah et al. (2012) simulated the effects of payoff maximization and imitation using three types of social network models—an urban network, a homogenous random network, and a highly heterogeneous network.

When vaccine cost is low the simulations showed that vaccination coverage increased because maximizers get vaccinated and imitators are influenced by this behavior. Even when vaccine cost is low, imitation dynamics may aggravate disease transmission especially in social clustering of non-vaccinators. When vaccine cost is increased, vaccination coverage decreases because maximizers incentive to get vaccinated is decreased and this influences imitation behavior. In other words, imitators who use maximizers as role models tend to amplify the trend towards increased vaccination coverage at low vaccine costs. In high vaccine cost simulations, the incentive to vaccinate is low for maximizers and, imitators amplify the trend toward decreased vaccination coverage and disease clusters.
Part D  Gap in Literature and Opportunities for Further Research

The preceding pages have provided an overview of the pertinent publications pertaining to: (1) shingles vaccination coverage data, including literature on patient reported knowledge, attitudes, behavior and barriers (KABB), (2) shingles vaccination recommendations, vaccine access, reimbursement, and cost-effectiveness studies, and, (3) social network and imitation theory relative to vaccination coverage. The next several pages identify the gaps in literature that are examined in this dissertation. The structure for the following pages is organized thematically and presents the following content topics: (1) influence of utilization, (2) influence of social networks, (3) influence of cost-effectiveness information, (4) vaccination coverage, (5) vaccine transport, pharmacist role, and patient convenience, (6) access barrier, (7) out-of-pocket responsibilities and willingness to pay, (8) vaccine reimbursement, and (9) improving access to prevention by harmonizing adult vaccination coverage. A description of the studies and their conclusions and the question that remains to be asked is given.

Influence of Utilization

To date, one study from the Netherlands, one from Denmark, and one from Canada examined utilization of the herpes zoster vaccine in the older population (Opstelten et al. 2009; Mortensen, 2011, MacDougall et al, 2015). Opstelten’s study of non-compliance determinants with herpes zoster vaccination provides useful data (Opstelten, 2009), however, the study was conducted with participants >65 years old in the Netherlands, hence the findings are not generalizable to the US population. Opstelten’s study is limited to those >65 years old and does not capture the patients’ perceptions from 50 years through 64 (the age range included in the sample frame of the shingles study discussed in this research is >50 years old). Mortensen’s (2011) study of vaccination perceptions provides useful qualitative (focus group data), but only used a Danish
population to assess disease knowledge and perceptions of shingles vaccination. MacDougall et al (2015) examined vaccination hesitancies for adult vaccinations from the Canadian public and health care providers for a range of adult vaccines (zoster vaccine included) but this study is not generalizable outside of Canada to countries with different vaccine programs and direct to consumer (DTCA) advertising influences.

A knowledge, attitudes, beliefs and behavior (KABB) study, such as the type Opstelten (2009), Mortensen (2011) and MacDougal et al (2015) conducted, but of the U.S. population (age ≥50 years old) and their perspectives on herpes zoster immunization decision-making behavior is lacking in literature. It is incumbent for U.S. researchers and policy makers to have empirical, U.S.-based KABB measurements to understand the factors that influence a patient’s decision to obtain (or refrain from) shingles vaccination. Data from such a study may be used to improve health policies and public health practices with the goal of improving the shingles vaccination rate.

The present research is the first in the U.S. to study patient perceptions concerning the shingles vaccination and reasons for and against vaccination. This includes respondents’ knowledge, attitudes, and behaviors (KABB) of severity and incidence of shingles disease; perceived safety and effectiveness of the shingles vaccine; and system level barriers influencing respondents’ decision to obtain (or not) the vaccination. The shingles survey conducted in this dissertation collects patient-reported data on declination reasons, which can be used to partially verify physician and pharmacist provided data in the GAO report, and asks about whether the physician expressly recommended that the patient not get the shingles vaccine. In addition, questions on
patient perceptions of the safety and efficacy of the shingles vaccine were asked, as well as a question about whether the live virus formulation of the shingles vaccine played a role in the vaccination decision. The shingles survey also asks respondents to classify different reasons for not obtaining the shingles shot as a major reason, a minor reason, or not a reason.

**Influence of Social Network**

Mbah et al. (2012) discuss the implications of social network imitation theory and the degree of payoff maximization and imitative decision making on vaccination coverage in the context of disease outbreaks, e.g. herd immunity protections to contain and eradicate communicable diseases. However, the notion that individuals imitate vaccination decisions based on social networks patterns is relevant in all vaccinations, notwithstanding the disease contagion and communicability patterns, and is a relevant paradigm through which to evaluate shingles vaccination coverage. Therefore, research on individual motivations to vaccinate or not and whether the decision is influenced by social networks will provide empirical support for Mbah’s social network theory. In addition, imitation dynamics helps explain the effects that are brought to bear by individuals imitating others who elect not to vaccinate because of vaccine safety and efficacy misconceptions. The non-vaccinating individuals model their behavior to imitators who continue this ripple effect, or cluster of non-vaccination.

**Influence of Cost-Effectiveness Information**

Rothberg (2007) and Le’s (2015) cost-effectiveness models considered multiple variables (incidence of shingles [by age and gender], vaccine cost, and duration of protection from the vaccination) and concluded that the vaccination is not a good value for all patients, at the generally accepted willingness-to-pay-threshold of $100,000 per QALY. The conclusions that the vaccination is not cost-effective for all carry significant weight in influencing provider
vaccination practices. In fact, GAO (2011) and Hurley (2010) report that few Medicare beneficiaries received the shingles vaccine due to several factors: physicians not stocking or recommending the vaccine, the physicians’ unwillingness to shoulder the high cost for the vaccine, and the vaccine being included in Part D rather than Part B of Medicare. This data, while providing reliable evidence to the administrative challenges of Part D enrollment verification and reimbursement, and physician and pharmacist experiences with vaccines, are not inclusive of patient perceptions and should not be relied upon as the sole data source of patient decision-making relative to obtaining the herpes zoster vaccination.

**Adult Vaccination Uptake**

GAO reports that the shingles and Td/Tdap vaccines were obtained by 11% and 53%, respectively by Medicare beneficiaries. While this aggregate statistic is useful, it does not inform researchers whether those who are electing to vaccinate for shingles are also electing to vaccinate with flu, Td/Tdap, and pneumonia. Therefore, the shingles survey asked respondents about receiving the influenza, Td/Tdap and pneumococcal vaccines and collected concurrent vaccination coverage status on shingles, influenza, tetanus/pertussis, pneumonia. This can answer the question of whether patients who are getting (or not getting) the shingles vaccine are also getting (or not getting) vaccinations for other diseases (flu, Td/Tdap, and pneumonia).

**Vaccine Transport, Pharmacist Role, and Patient Convenience**

One reason cited in literature for beneficiaries declining the shingles vaccine is the inconvenience with having to obtain the vaccine outside their doctor’s office (Hurley, 2010, GAO, 2011). GAO reports that 58% of physicians report the vaccine transport from pharmacy to physician’s office as a barrier to stocking, administering, or recommending the shingles vaccine,
however, GAO’s surveys with pharmacists did not gather information on how the vaccine was transported from the pharmacy to physician’s office. Therefore, the shingles survey sampled vaccinated patients (not practitioners, as was done by GAO) about the manner in which the vaccine was transported, e.g. whether the vaccine was shipped by the pharmacy to the prescribing physician’s office, or whether the patient collected and transported the vaccine (under cold storage transport condition) to their doctor, and whether patient would be willing to get the shingles shot at a pharmacy.

Cost as Access Barrier, Out-of-Pocket Responsibilities and Patient Willingness to Pay

Medicare beneficiary cost sharing responsibilities showed that average out-of-pocket expense by Medicare beneficiaries for the shingles vaccine was more than double the out-of-pocket expense that beneficiaries paid for the Td/Tdap vaccine (shingles vaccine out-of-pocket expense $57 versus Td/Tdap vaccine out-of-pocket expense $25). The out-of-pocket expense data for Part D beneficiaries is nearly double the estimate provided by physicians who reported that patients would be willing to spend no more than $29 for a shingles vaccination (Hurley, 2010).

Medicare Part D drug utilization data on out-of-pocket cost sharing by beneficiary does not provide an accurate measurement of a beneficiary’s willingness to pay, rather it provides a measurement of the amount the beneficiary was compelled to pay. Furthermore, Hurley reports physician-based estimates on patients’ willingness to pay for the shingles vaccine, which is subject to over or under estimates. The shingles survey addresses this deficiency and obtains measurements on patients’ willingness to pay for the shingles vaccine, which provides more valid measurements on out-of-pocket cost sharing than is currently available with Part D drug utilization data or with physician-based estimates on how much patients would pay.
**Vaccine Reimbursement**

GAO reports that less than 5% of Medicare beneficiaries received the shingles vaccine under Part D (reimbursement figure include beneficiaries in the donut hole). The shingles survey includes questions on how much of the cost was not covered by medical insurance, whether the respondent filed a medical insurance claim to be reimbursed for the shingles shot, gathers data on who filed the medical insurance claim, and whether one’s medical insurance company reimbursed them for the shingles vaccine.

**Improving Access to Prevention by Harmonizing Adult Vaccination Coverage**

Categorization of the shingles vaccination under Medicare Part D is a policy problem that has been raised by many stakeholders. One widely agreed upon recommendation is to harmonize all routinely recommended adult vaccinations under Medicare Part B, which covers the influenza, pneumococcal, and under certain conditions, the Td/Tdap vaccinations. Marrufo et al. (2011) discuss the gains and efficiencies of consolidating Part D covered vaccines within Medicare’s Part B coverage. The authors specifically state that if the herpes zoster vaccine were consolidated under Part B it would improve access, lower costs for beneficiaries and decrease the chances of beneficiaries reaching their Part D coverage gap. In order to partially test this theory, there is a need for empirical research with beneficiaries on whether making the vaccine available for free (practical implication of Part B coverage) would make a difference to shingles vaccination uptake. The shingles survey gathers data on whether Medicare Part D beneficiaries prefer to have the shingles vaccination covered under Medicare Part B, like influenza and pneumonia which enjoy higher vaccination coverage because these vaccinations are received with no associated out-of-pocket costs.
Although this survey does not explicitly ask if respondents would be more inclined to receive the shingles vaccine if it were covered by Medicare Part B, the survey does ask about the impact of free vaccination, and the impact of out-of-pocket costs, and whether the respondent’s insurance plan covers the shot, thereby, providing empirical evidence on the public’s perception of insurance coverage with fewer out-of-pocket cost policies. Data on the willingness (or not) to obtain the shingles vaccination if the vaccine were free (the equivalent of Part B coverage) will provide important patient reported data on the feasibility of these proposals and would compel law and policymakers to act on the Medicare Part D to B consolidation proposal.
CHAPTER 4: GOALS, OBJECTIVES, ASSUMPTIONS AND HYPOTHESES

Part A  Goals

A primary goal of this research is to identify barriers inhibiting access to shingles vaccination by exploring reasons why individuals over the age of 50 receive the vaccination, or not. This research examines whether shingles vaccination behavior is attributed to knowledge of the disease and its pathophysiologic sequelae, perceptions of vaccine safety and effectiveness, ownership over one’s health, provider recommendation or other social network effects, and level barriers, such as insurance coverage, co-payments/reimbursement, and whether convenience and access factors influence vaccination. Demographic characteristics of individuals that elect to be vaccinated/not vaccinated and other determinants are also analyzed for correlations. Finally, inferential statistics predict which consumers are likely to elect vaccination and which are not.

This research can inform a range of impacted stakeholders (specifically law and policymakers, health care practitioners, state boards of health, employers, payers, patients and other interested stakeholders) of the research findings in order to shape policies that incentivize shingles vaccination. The research findings may be useful for (1) reforming reimbursement and cost sharing policy, (2) changing vaccination policy, e.g. revising immunization practice recommendations and hierarchical vaccination priority systems, realigning of HP2020 zoster vaccination goals, (3) improving monitoring of zoster vaccination prevalence, and (4) targeting communication messages for at risk groups and ethnic minorities.
A secondary goal of this research considers that consumer behavior influencing shingles vaccination uptake has been measured only in Massachusetts, therefore, another goal is to present this study’s findings to other states as a turn-key instrument for collecting population-based vaccination data.

**Part B  Objectives**

A main objective of the shingles survey is to collect new and complementary patient-provided data about shingles vaccine use. To study consumer decision-making behavior with regard to utilization of the shingles vaccination, data were collected in Massachusetts using focus groups and telephone surveys. This research is timely for several reasons. Notably, the shingles vaccine is a relatively new vaccine (US licensure since 2006; ACIP recommendation in 2008) that is indicated for an older cohort (ACIP, 2013). While numerous studies have demonstrated its safety and effectiveness (ACIP, 2008, Tseng, 2011, Langan, 2013, Tseng, 2015) there is a dearth of contemporary research on consumer decision-making, little data exist as to why uptake of the shingles vaccination is low, and the role that physicians play in influencing vaccine acceptance by patient (PCORI, 2012).

Considering that policy change leverages empirical data (Breslow, 1998; Stone, 2002), an imperative arises to study population-based, vaccination decision-making behaviors to understand if vaccination uptake is rooted in social perceptions (which may lend itself to public education and awareness campaigns via social networks) or whether vaccine use/non-use are rooted in policy generated system level barriers (which may lead to changes in cost and access variables). This information may enable policymakers and other stakeholders to develop ways to incentivize use of this vaccine (National Vaccine Advisory Committee (NVAC), 2009).
Healthy People 2020 provides the shingles immunization goal. Surveillance monitoring of population-based vaccination prevalence provides measurements and charts progress toward this goal. The present research which studies consumer decision-making behavior with regard to utilization of the shingles vaccination may be useful in refining vaccination policy, programs, and outreach strategies to attain and possibly surpass the Healthy People 2020 destination goal. The resultant framework — charting progress towards the goal while studying consumer behavior to better understand vaccination prevalence — has the potential to be an enhanced model of using public dollars to achieve public health goals, such as adult vaccination coverage of the shingles vaccination.

Two prevailing arguments in vaccination policy are viewed through a series of sociological lenses that contrast government interest toward the common good with individual rights and self-determination (Sandel, 2009). Theoretical frameworks of Hardin’s “tragedy of the commons,” Bentham’s maximization utilitarianism concept, and Rawl’s redistributive justice are at the core of government vaccination policy motivations, while Nozick’s libertarianism, negative rights, and Samuelson’s theory of revealed preferences, which repudiates Bentham’s subjective utilitarianism concept, are at the core of consumer choice and decision-making. Finally, health belief theory and theory of planned behavior guide the response model and research hypotheses of the survey.

Part C Assumptions

Assumption 1-Disease Knowledge, Comprehension, Prevention and Awareness Source

It is assumed that the decision to vaccinate with the shingles vaccine is influenced by disease awareness, perceptions of developing shingles, knowing specific symptoms of shingles, and
awareness of the vaccine. The decision to vaccinate is also influenced by the personal motivation to prevent disease and take care of one’s health. It is also assumed that the decision to vaccinate with the shingles vaccine is influenced by the type of awareness sources. Conversely, it is assumed that lack of concern about shingles (thinking won’t get shingles), fearing the vaccine, or being afraid of needles influences the decision not to vaccinate with the shingles vaccine.

A consumer’s decision to vaccinate is predictably influenced, in part, by awareness, defined herein as cognitive knowledge of health information about disease and its prevention. Awareness is obtained from health care provider recommendation, social networks, or media (Mbah, 2012). It is assumed that the social-cognitive factors of awareness influence decision-making and reveals purchasing preferences (behavior) (Baars, 2008; Samuelson, 1938). The shingles survey operationalized the construct of knowledge, comprehension, prevention and awareness by asking whether respondents were aware of shingles, their comprehension of shingles symptoms, awareness of the shingles vaccine, and if respondents wanted to prevent shingles and take care of one’s health.

**Assumption 2- Theories of Influence, Provider Recommendation and Social Networks**

It is assumed that the decision to vaccinate with the shingles vaccine is influenced by health providers (talking about and receiving a recommendation for the shingles vaccine from one’s health care provider/doctor, or receiving specific advisement against the shingles vaccination). The motivation for vaccination might also be from people’s family and social networks. Constructs of Social Cognitive Theory (SCT) assume that health care provider recommendation and one’s social network overwhelmingly influence patient vaccination
behavior. The shingles survey operationalized the SCT construct of provider and peer influences by asking whether health care providers brought up the topic of shingles and whether they recommended (or not) the vaccine or whether the doctor recommended the vaccine but the patient refused it. The shingles survey also asks whether the decision to vaccinate was influenced by friends or family.

**Assumption 3- Perceptions about Vaccine's Safety and Efficacy and Trust**

It is assumed that the decision to vaccinate with the shingles vaccine is influenced by perceptions of vaccine safety, efficacy, the general trust of the vaccine and not fearing the live virus formulation of the shingle vaccine. Conversely, it is also assumed that perceptions of lack of vaccine safety and efficacy, fear of the live virus formulation, and not trusting the shingles vaccine influence the decision not to vaccinate with the shingles vaccine. These patient-centered determinants may play a greater role in affecting zoster vaccination programs and immunization coverage more so than the impact of system level determinants (Jones, 2004). There are many cultural variables that go into decision-making (gossip, internet, etc.) that give people distorted ideas. For example, people may believe that they will contract the disease if they get the shingles shot. This misconception is generally associated with the influenza vaccination and may have carried over to a misconception regarding the shingles vaccination, especially since it is a live vaccine. People may also simply be afraid of the vaccine or needles. These concepts are operationalized in the shingles survey by asking respondents how safe and efficacious the shingles vaccination is perceived to be and if respondents know that the shingles vaccine is a live virus vaccine. The units of analysis are false beliefs about vaccine's safety and efficacy, concerns about the vaccines’ side effects, or belief that the vaccine does not work.
**Assumption 4- Messaging Effectiveness**

It is assumed that the decision to vaccinate with the shingles vaccine is influenced by effective public health outreach tactics, which has its roots in *community influence theory*. The CDC’s Health Communication Office’s efforts on creating specific shingles outreach tactics, such as web-based messages on adult vaccination, shingles features on the CDC’s website, Facebook webpages, and word of mouth promotion or other formal outreach tactics (Facebook, Shingles, 2012) predictably influence vaccination awareness and are expected to increase vaccination coverage. To test CDC’s messaging effectiveness, the shingles survey asks (1) if the respondent heard about the vaccine from Facebook, CDC website, television shows, billboards, or in store advertisements, and (2) if family and friends influenced one in getting the shingles shot.

**Assumption 5- Convenience, Cost, and Supply Barriers**

It is assumed that the decision to vaccinate with the shingles vaccine is influenced by increased convenience and lack of supply barriers. The conceptual construct of *convenience* refers to ease of obtaining the shingles vaccination, and payment or reimbursement for the vaccine. Conversely, inconvenience influences the decision not to vaccinate with the shingles vaccine. It is also assumed that the decision to vaccinate with the shingle vaccine is influenced by out of pocket cost liabilities associated with the vaccination. The shingles survey questionnaire operationalizes this convenience concept by asking respondents if they had to go to the pharmacy to pick up the vaccine and then “brown bag” the vaccine to their doctor’s office for administration and the amount of time it took for the pharmacy to doctor’s office transport.

It is also assumed that pricing the vaccine as free or inexpensive would lead to the moral hazard of overuse. Since ideally everyone in the target population should get the vaccine, it is unclear
that such hazard would exist. This research study evaluates how varying out of pocket costs drive society’s perceptions and demand for obtaining the shingles vaccination. This conceptual construct is operationalized by asking whether the respondent would have received the vaccine if it were provided for free (Medicare Part B), how reimbursement for the vaccine was obtained, and their willingness to pay for the vaccine. The convenience variable as operationalized in this research is conceptually separate from sufficient vaccine supply which refers to adequate/inadequate vaccine inventory which is also measured in this research (did that location have the vaccine for you?). The conceptual construct of convenience however, may be open to mis-categorization and reporting bias since one’s inability to source vaccine may be perceived as an inconvenience.

Convenience may not be the main factor predicting vaccination decision-making behavior. The decision to vaccinate precedes the actual action to obtain the vaccine. In other words, before the individual presents at the doctor or pharmacy to obtain the vaccination, they have already made a decision to receive the vaccination. Therefore, the questions about how convenient it was to obtain the shingles vaccination are details of the vaccination experience that have little to do with the initial vaccination decision. If time and cost tradeoffs predict vaccination behavior, then there is support for the argument that people make health care decisions based on convenience.

**Assumption 6-Trust in Pharmacists as Providers of Shingles Vaccination**

It is assumed that the decision to vaccinate with the shingles vaccine is influenced by the type of health care provider administering the shot (physician or pharmacist). Historic restrictions on community pharmacist’s practice may have been grounded in professional rivalries among doctors, nurses, and pharmacists. Such restrictions may have effectuated barriers of access that
safeguarded other health care professions (a likely intended effect of interested political stakeholder parties), and may have created a perceived (and misplaced) externality in conveying to the public that pharmacists were not qualified to provide vaccinations as other health care providers, e.g. doctors or nurses.

Pharmacists are integral health care providers to meeting the nation’s vaccination demands (Fontenasi, 2009) and patients view them as viable providers of influenza vaccination (Machado, 2004). Furthermore, state policies permitting community pharmacists to administer influenza vaccine contribute to increasing vaccination coverage (Steyer, 2004; Fontenasi, 2009; Macado, 2004). The 2012 expanded Massachusetts policy allowing community pharmacists to administer a range of vaccinations rests on the factual premise that, as health care practitioners, pharmacists are adequately trained and qualified to administer vaccines, and on normative assumptions that pharmacy clientele (patients) ought to and want to receive vaccinations from a pharmacist.

This research provides insight into patient perceptions of pharmacists administering herpes zoster vaccination by asking if respondents would have the pharmacist administer the shingles vaccine. If empirical data show that respondents would have the pharmacist administer the vaccine, it would suggest that the historic restriction on community pharmacy practice had no effect on the professional reputation of pharmacists. On the other hand, if data shows that patients would not have the pharmacist administer the zoster vaccine, this may suggest a lack of trust in pharmacists to administer non-influenza vaccines or a distortion of time since the MA policy expanding pharmacists’ ability to vaccinate was expanded in 2012 and the MA BRFSS shingles survey was performed in 2012. If data supports the latter assumption, this may prove
challenging for Massachusetts pharmacy organizations in implementing the expanded vaccination provision.

**Assumption 7-Familiarity and Acceptance with the Zoster Vaccination**

It is assumed that the decision to vaccinate with the shingles vaccine is influenced by vaccination with other adult vaccines, e.g. influenza, tetanus, and pneumococcal. Societal acceptance of herpes zoster vaccination may differ from that of the aforementioned vaccines because those have been around longer and the influenza vaccination, for example, has inherently different characteristics. The herpes zoster and influenza vaccines are preventative vaccinations, e.g. HZ vaccine prevents shingles and influenza vaccine prevents incidence of influenza. Both are vaccines that the CDC’s ACIP routinely recommends for adults, but the two vaccines differ with regard to administration frequency (zoster vaccine is recommended just once for people over 60 years old, whereas influenza vaccine is recommended on an annual basis), and length of time on the market. The latency of the much newer zoster vaccine is also a likely determinant in zoster vaccine update. The shingles vaccine has only been recommended for use since 2008, whereas influenza vaccine has been used for over 40 years (Suddath, 2008). The different administration frequencies of zoster and influenza vaccines may contribute to greater social familiarity and acceptance of the influenza vaccine, higher general uptake, and a greater acceptance of pharmacist administration of influenza vaccine versus the shingles vaccine.

The shingles survey tests social familiarity and acceptance of the influenza vaccine by asking respondents if they received the influenza, tetanus and pneumococcal vaccine. The measurement of whether respondents utilize all preventative vaccines, or if they were utilizing the more familiar and accepted vaccinations over the shingles vaccination provides insight into whether
patients are as likely to get the one-time zoster vaccine as patients are likely to get other adult vaccines.

**Assumption 8-Game Theory Influences**

It is assumed that it is a social good not to have people in pain. Theories of influence also suggest that if society understands that the cost of developing shingles is pain and suffering and lost wages then society will want to invest in efforts to vaccinate (positive rights). If the benefit minimizing lost wages—and many people aged 60 and older are not employed although some are choosing to stay in the workforce longer (50-65 year-olds are assumed to be employed)—then the benefits are relatively limited to treatment costs since the disease is not contagious. The shingles survey asked respondents what symptoms they wanted to avoid by getting the shingles vaccination and if the reason they were vaccinated was because they did not want to miss work or lose pay.
Part D Hypotheses

This research examines influences on shingles vaccination awareness and decision-making behavior. The hypothesized decision making influences are (1) knowledge of the disease and of the vaccination, (2) recommendation to receive the vaccine by health care provider and/or social networks (family, friends or peers), (3) perceptions about the shingles vaccine’s safety and efficacy, (4) messaging effectiveness, (5) convenience, cost, and supply barriers, and (6) willingness for pharmacist to administer the vaccination, (7) societal acceptance of herpes zoster vaccination, (8) decreased costs and the moral hazard of overuse, and (9) game theoretic influences over vaccination.

The following pages present hypotheses for vaccination decision-making influences, hypotheses for vaccinating, and hypotheses for non-vaccinating. The null hypotheses use the more conservative 2-sided statistics.
1. **Awareness of HZ and Vaccination**

Hypothesis: Vaccinated respondents are aware of shingles disease and its associated pain and non-vaccinated respondents are not aware of the shingles disease and its associated pain. The alternate hypothesis is that there is no difference between the two groups.

2. **Awareness Source**

Hypothesis: Vaccinated respondents are influenced by high-prestige sources such as health care providers and non-vaccinated respondents are influenced by other sources, e.g. television show or radio. The alternate hypothesis is that there is no difference between the two groups.

3. **Knowing Others with Shingles**

Hypothesis: Vaccinated respondents know others who have had shingles and non-vaccinated respondents do not know someone who has had shingles. The alternate hypothesis is that there is no difference between the two groups.

4. **Perceptions of Pain**

Hypothesis: Vaccinated respondents perceive shingles to be more painful than non-vaccinated respondents. The alternate hypothesis is that there is no difference between the two groups.

5. **Developing Shingles**

Hypothesis: Vaccinated respondents perceive increased chances of developing shingles and non-vaccinated respondents perceive lower chances of developing shingles. The alternate hypothesis is that there is no difference between the two groups.
6. **Primary Symptom of Shingles**

Hypothesis: Vaccinated respondents are more knowledgeable about shingles symptoms and non-vaccinated respondents are less knowledgeable of shingles symptoms. The alternate hypothesis is that there is no difference between the two groups.

7. **Influenza Vaccination**

Hypothesis: Influenza vaccinated respondents received the recommended shingles vaccination and influenza non-vaccinated respondents did not receive the recommended shingles vaccination. The alternate hypothesis is that there is no difference between the two groups.

8. **Tetanus Shot**

Hypothesis: Tetanus booster vaccinated respondents received the recommended shingles vaccination and tetanus booster non-vaccinated respondents did not receive the recommended shingles vaccine. The alternate hypothesis is that there is no difference between the two groups.

9. **Pneumococcal Vaccination**

Hypothesis: Pneumococcal vaccinated respondents received the recommended shingles vaccine and pneumococcal non-vaccinated respondents did not receive the recommended shingles vaccine. The alternate hypothesis is that there is no difference between the two groups.

10. **Talk with Doctor**

Hypothesis: Patients whose providers talk about shingles vaccine are more likely to get vaccinated and patients whose providers do not talk about shingles vaccine are less likely to get vaccinated. The alternate hypothesis is that there is no difference between health care providers/doctors taking about the shingles vaccination and vaccination decision-making.
11. Doctor Recommendation

Hypothesis: Patients whose providers recommend the shingles vaccine are more likely to get vaccinated and patients whose providers do not recommend the shingles vaccine are less likely to get vaccinated. The alternate hypothesis is that there is no difference between health care providers/doctors recommendation of the shingles vaccination and vaccination decision-making.

12. Doctor Advise Against Shingles Vaccination

Hypothesis: Patients whose providers advise against the shingles vaccine are less likely to get vaccinated and patients whose providers do not advise against the shingles vaccine are more likely to get vaccinated. The alternate hypothesis is that there is no difference between health care providers/doctors advising against the shingles vaccination and vaccination decision-making.

13. Willingness of Pharmacist to Administer Shingles Vaccination

Hypothesis: Vaccinated respondents are more willing to have a pharmacist administered the shingles vaccine than non-vaccinated. The alternate hypothesis is that there is no difference between the two groups.

14. Willingness to Pay

Hypothesis: Vaccinated respondents are willing to pay more in out of pocket costs for shingles vaccinate than non-vaccinated respondents. The alternate hypothesis is that there is no difference between the two groups.
Hypotheses for Vaccinating

15. Importance of Prevention
Hypothesis: female vaccinated respondents place a greater importance of preventing shingles than male vaccinated respondents. The alternate hypothesis is that there is no difference between the two groups.

16. Family or Friends with Shingles
Hypothesis: vaccinated respondents are influenced more by family members who have been sick with shingles than friends who have been sick with shingles. The alternate hypothesis is that there is no difference between the two groups.

17. Take Care of Health
Hypothesis: females place a greater importance on wanting to take care of one’s healthy than males. The alternate hypothesis is that there is no difference between the two groups.

18. Miss Work or Lose Pay
Hypothesis: Vaccinated respondents are more likely to consider economic motivators than non-vaccinated respondents. The alternate hypothesis is that there is no difference in the effect of the economic motivation.

19. Perceptions of Shingles Vaccine
Hypothesis: Vaccinated respondents have higher perceptions that the shingles vaccine is safe than non-vaccinated respondents. The alternate hypothesis is that there is no difference in the effect of vaccine safety perceptions.
20. Vaccination Live Virus

Hypothesis: Vaccinated respondents had less concern that the vaccine was live than non-vaccinated respondents. The alternate hypothesis is that the formulation has an effect on motivating individuals to vaccinate with the shingles vaccine.

Hypotheses for Not Vaccinating

21. Primary Reason for Not Getting Shingles Vaccination

Hypothesis: Non-vaccinated individuals have less concern about shingles, fear the vaccine or are afraid of needles which affects non-vaccination decision-making. The alternate hypothesis is that there is no difference in the effect of the influences on non-vaccination behavior and people simply do not want the vaccine.

22. Do Not Trust Vaccine

Hypothesis: Non-vaccinated individuals do not trust the vaccine which affects non-vaccination decision making. The alternate hypothesis is that not trusting the vaccine has no effect on non-vaccination behavior.

23. Might Get Sick

Hypothesis: Non-vaccinated individuals perceive getting sick with shingles after vaccination which affects non-vaccination decision-making. The alternate hypothesis is that safety perceptions have no effect non-vaccination behavior.
24. Vaccine Not Effective

Hypothesis: Non-vaccinated individuals perceive the shingles vaccine as ineffective which affects non-vaccination decision making. The alternate hypothesis is efficacy perceptions have no effect on non-vaccination behavior.

25. Inconvenience

Hypothesis: Non-vaccinated individuals are influenced by inconvenience factors which effect non-vaccination behavior. The alternate hypothesis is that inconvenience factors have no effect on non-vaccination behavior.

26. Live Virus

Hypothesis: Non-vaccinated individuals are influenced by the live nature of the vaccine formulation which has an effect on vaccination behavior. The alternate hypothesis is that the formulation has no effect on non-vaccination behavior.

27. Cost

Hypothesis: Non-vaccinated individuals are influenced by out of pocket cost liabilities which have an effect on non-vaccination behavior. The alternate hypothesis is that out of pocket cost liabilities have no effect on non-vaccination behavior.
**Modeling**

This study determines which factors influence whether a person is aware of the shingles vaccination and which factors influence whether a person chooses to vaccinate with the shingles vaccination.

Hypothesized predictor variables for shingles awareness are:

<table>
<thead>
<tr>
<th>1. knowing others with shingles</th>
<th>2. how painful think shingles is,</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. chances of developing shingles during lifetime,</td>
<td>4. knowing symptoms of shingles</td>
</tr>
<tr>
<td>5. exposure to ads.</td>
<td></td>
</tr>
</tbody>
</table>

Hypothesized predictor variables for shingles vaccination include:

<table>
<thead>
<tr>
<th>1. knowing others with shingles,</th>
<th>2. perceptions of pain,</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. chances of developing shingles during lifetime</td>
<td>4. frequency of influenza vaccination</td>
</tr>
<tr>
<td>5. tetanus booster</td>
<td>6. pneumococcal vaccination</td>
</tr>
<tr>
<td>7. talking about shingles vaccination with doctor</td>
<td>8. doctor/HCP recommendation for vaccination</td>
</tr>
<tr>
<td>9. perception of effectiveness of shingles shot at preventing shingles</td>
<td>10. willingness for pharmacist to administer shot,</td>
</tr>
<tr>
<td>11. how much paid/willing to pay for vaccination</td>
<td>12. source of knowledge of the vaccination.</td>
</tr>
</tbody>
</table>

Other demographic variables may also influence vaccination behavior and include one’s health status, health care coverage, financial barriers to access, as well as demographics such as age, gender, race, marital status, education, employment, and income. Taken together, these multi-factorial variables were measured in the shingles survey and tested for vaccination decision-making behavior.
CHAPTER 5: RESEARCH METHODS

This dissertation uses a dual frame research method approach: qualitative method using focus
groups, and quantitative method based on the analysis of a Massachusetts shingles telephone
survey. Subpart A summarizes the focus group research study that explored people’s knowledge
and understanding of the shingles disease and people’s experiences with the shingles vaccine.
Data gathered in this research was used to generate question stems and/or multiple-choice
distractors (answer leads) for a portion of the 2012 Massachusetts BRFSS Shingles Survey (MA
BRFSS). Additional consideration from the underlying theoretical perspectives and literature
review gaps were used to inform the content of the shingles survey (presented in Chapter5,
Subpart B, Shingles Telephone Survey Development). Subpart C presents the research methods
for the Massachusetts shingles BRFSS telephone survey.

Part A Qualitative Research (Focus Groups)

Focus groups sessions were conducted in 2011 at three Massachusetts area senior centers to
generate the question stems and multiple-choice distractors of the Awareness Module of the
shingles survey. The focus group population consisted of older adults attending senior centers
(age range less than 64 to 85 years-old). The primary goals were to explore people’s knowledge
and understanding of shingles disease, and discover their experiences with the shingles vaccine
(Morgan and Krueger, 1998). The need for this information made the format of the focus groups
an appropriate qualitative research method for the larger research goal of the shingles survey. To
foster an optimal group discussion, groups were homogenous with regard to demographic
attributes (age, race/ethnicity, income, education) and conducted in senior centers in two
suburban Massachusetts towns and an inner-city north of Boston with differing demographic and
socio economic make up. Such participant “segmentation” coupled with effective focus group moderating produced “a comfortable group dynamic” (Krueger and Casey, 2000). The collected data identified common response themes and generated frequency distributions. The focus group individual results were also used to compare and contrast the data output among focus groups based on the demographic characteristics of each group.

Introduction

Three focus group sessions were conducted at area senior centers in various Massachusetts locations with various levels of socio-economic status (Danvers, MA, [n=9 participants]; Wellesley, MA, [n=10 participants]; and Lynn, MA, [n=8 participants]). The focus group sessions were advertised in fliers by center staff and participants voluntarily signed up and agreed to participate in a shingles focus group. There was no additional inclusion or exclusion criteria other than the population was taken from senior centers. No financial incentives were used. The focus groups in Danvers and Wellesley were conducted November 15, 2011 and the focus group in Lynn was conducted November 30, 2011. Each focus group took about an hour to administer and were led by M. Draper using approved questions. All sessions were audiotaped and later transcribed.

Northeastern University’s Office of Human Subject Protection (OHSP) approved the focus group research study (IRB# 11-10-03). Protocol updates, focus group recruitment materials, and welcome letters from participating focus group sites were provided to OHSP. Audio recordings and written transcripts from each group session are available (data on file). Verbal informed consent was obtained from participants.
During the session, the researcher provided internet resource information to participants who wished to learn more about shingles disease (NCBI PubMed Health Singles and MedicineNet.com Shingles). One participant in the second focus group had on hand the CDC’s Shingles Vaccine Information Sheet (VIS, Shingles Vaccine (9/11/06), Vaccine Information Statement (Interim)). The VIS was photocopied and provided to other participants for further information. The researcher also provided contact information to the Massachusetts Department of Public Health’s Immunization Program for those participants needing help in obtaining the herpes zoster vaccine.

**Focus Group Questions**

The focus groups have a high degree of structure to the discussion about awareness and perceptions of the shingles disease and its preventative measures. The shingles focus group questions are open-ended questions that are grouped into opening, introductory, transition, key and ending and have a functional flow and sequential progression. The questions are direct, uni-dimensional, non-ambiguous, and appropriate for a lay audience, e.g. no scientific jargon is used (Morgan and Krueger, 1998).

While it is not the primary goal of this research to ask whether participants have received a shingles vaccination (the primary goal is to assess peoples’ awareness of shingles disease and shingles prevention), the question sequence does ask if participants have received the shingles shot. The reason for including this question is that it is logical progression after posing the questions such as “**how do you think shingles can be prevented?**, ” which is a direct reference to the shingles vaccine, and “**do you know that there is a vaccine to prevent shingles?**” Not asking if participants have had a shingles shot would make the question cascade incomplete with some
participants even volunteering this information if this question was not asked. The questions were developed in advance of each focus group and were pre-screened and approved by the Northeastern University dissertation committee guiding the shingles research. The same questions were asked in the same order in each of the three focus groups (see Appendix B).

**Participant Descriptive Characteristics**

**Focus Group 1- Danvers, MA**

Focus group #1 was conducted at the Danvers Senior Center (Danvers Council on Aging 25 Stone Street Danvers, MA 01923) on 15 November 2011. Danvers, MA is predominantly white, middle-class suburban town 20 miles north of Boston, MA. The group consisted of nine participants. Demographic forms were collected from eight participants. One participant was unable to complete the demographic form due to reported poor vision problems. Scanned copies of the source forms are available upon request.

Descriptive characteristics of the Danvers focus group participants are summarized in Table 3. All participants were female, all were white, with variability in age group representation.
Table 3: Participant Descriptive Characteristics Focus Group 1 (n=9*)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Response Data</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Less than 64 years old</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>65-70 years old</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>71-75 years old</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>76-85 years old</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Greater than 85 years old</td>
<td>1</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>9 Female</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Black/African American</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hispanic or Latino</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Asian</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>9 White</td>
</tr>
</tbody>
</table>

a. Age information was not collected for one participant.
Focus Group 2 - Wellesley, MA

Focus group #2 was conducted at the Wellesley Community Center (219 Washington Street, Wellesley, MA 02481) on 15 November 2011. Wellesley, MA is predominantly white, upper-class suburban town 16 miles west of Boston, MA. The group consisted of ten participants. Demographic forms were collected from nine participants. Scanned copies of the source forms are available upon request.

Descriptive characteristics of the Wellesley focus group participants are summarized in Table 4. A majority of participants in Wellesley’s focus group were female and one attendee was male. All participants were white. Participants in this group tended to be older than participants in the other two focus groups.

Table 4: Participant Descriptive Characteristics Focus Group 2 (n=10*)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Response Data</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>Less than 64 years old</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>65-70 years old</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>71-75 years old</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>76-85 years old</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Greater than 85 years old</td>
<td>2</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>Male</td>
<td>1 Male</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>9 Female</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td>White</td>
<td>10 White</td>
</tr>
<tr>
<td></td>
<td>Black/African American</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hispanic or Latino</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Asian</td>
<td></td>
</tr>
</tbody>
</table>

a. Demographics not collected for one participant.
Focus Group 3 - Lynn, MA

Focus group #3 was conducted at the Lynn Community Center (Lynn, MA) on 30 November 2011. Lynn, MA is a racially mixed, inner city 10 miles north of Boston, MA. The group consisted of eight participants. Demographic forms were collected from all. Scanned copies of the source forms are available upon request.

Descriptive characteristics of the Lynn focus group participants are summarized in Table 5. Participants in Lynn’s focus group were of mixed age groups. All participants were white and were of mixed gender composition.

<table>
<thead>
<tr>
<th>Table 5: Participant Descriptive Characteristics Focus Group 3 (n=8)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variables</strong></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td><strong>Age</strong></td>
</tr>
<tr>
<td>Less than 64 years old</td>
</tr>
<tr>
<td>65-70 years old</td>
</tr>
<tr>
<td>71-75 years old</td>
</tr>
<tr>
<td>76-85 years old</td>
</tr>
<tr>
<td>Greater than 85 years old</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
</tr>
<tr>
<td>White</td>
</tr>
<tr>
<td>Black/African American</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
</tr>
<tr>
<td>Asian</td>
</tr>
</tbody>
</table>
Focus Group Data Analysis

**Behavioral Dimensions and Determinants**

Framework analysis drives the theme identification, categorization, and comparison of responses within and between groups (Rabiee, 2004). Data management and analysis followed the long-table procedure where participants’ response quotes were cut out, quotes that said similar things were grouped together, themes identified and categorized and frequencies tabulated (Kruger and Cassey, 2000).

Awareness responses concerning shingles disease and the shingles vaccine were categorized into factors that influence behavior dimensions (domains), and then grouped and coded into sub-categories (determinants) within each domain.

The shingles focus group data analysis categorized the data into behavioral dimensions as described in previously focus group health research analyses (Cassou et al, Cooper Robbins et al (2011), McGee et al (2008), and UT Medical Center (2011)). Participant responses from the shingles focus groups were analyzed and categorized into behavioral dimensions [(1) knowledge, (2) risk appraisal, (3) perceptions, and (4) access]. Each dimension encompasses more specific behavioral determinant categories, which explain health related behaviors. Figure 1 lists the behavioral dimensions and identifies the behavioral determinants within each dimension with the code schema.
**Figure 1: Summary of Behavioral Dimensions and Determinants**

<table>
<thead>
<tr>
<th>Behavioral Dimension</th>
<th>Description</th>
<th>Behavioral Determinants and Relationship to Shingles</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Disease Prevention</td>
<td>Awareness of general disease prevention via immunizations</td>
<td>KN_prevention_vaccines</td>
</tr>
<tr>
<td></td>
<td>HZ Awareness</td>
<td>Basic awareness of shingles disease</td>
<td>KN_HZdisease_awareness</td>
</tr>
<tr>
<td></td>
<td>Awareness Source</td>
<td>Source of shingles awareness/ knowledge of people who have had shingles</td>
<td>KN_HZawarenesssource</td>
</tr>
<tr>
<td></td>
<td>Clinical Symptoms</td>
<td>Knowledge of shingles disease symptoms</td>
<td>KN_symptoms</td>
</tr>
<tr>
<td></td>
<td>HZ Physical Handicap</td>
<td>Description of the physical handicaps caused after infection with HZ</td>
<td>KN_HZhandicap</td>
</tr>
<tr>
<td></td>
<td>HZ Epidemiology/ Risk</td>
<td>Knowledge about who’s at risk and how shingles is contracted</td>
<td>KN_HZ_epi/risk</td>
</tr>
<tr>
<td></td>
<td>Vaccine Awareness</td>
<td>Knowledge of shingles prevention via immunization</td>
<td>KN_HZvaccine</td>
</tr>
<tr>
<td></td>
<td>Vaccine Awareness Source</td>
<td>Source of shingles vaccine awareness</td>
<td>KN_HZvaccine_awareness</td>
</tr>
<tr>
<td></td>
<td>HCP Recommendation</td>
<td>Recommendation by provider to obtain/or abstain from HZ vaccine</td>
<td>KN_HCPrecommend</td>
</tr>
<tr>
<td></td>
<td>HZ Vaccinees</td>
<td>Knowledge of people who have had shingles vaccine</td>
<td>KN_HZvaccinees</td>
</tr>
<tr>
<td></td>
<td>Use of Rx drugs to Tx HZ</td>
<td>Knowing that shingles can be managed by drug therapy</td>
<td>KN_drugtherapy</td>
</tr>
<tr>
<td></td>
<td>Non prescription Tx</td>
<td>Knowing/belief that HZ can be treated with OTC/homeopathic remedies</td>
<td>KN_homeopathic</td>
</tr>
<tr>
<td></td>
<td>Susceptibility</td>
<td>Belief that person is or is not susceptible to shingles</td>
<td>RA-susceptibility</td>
</tr>
<tr>
<td></td>
<td>Perceived Severity</td>
<td>Perceived severity is the notion that shingles is/ not severe disease</td>
<td>RA-perceivedseverity</td>
</tr>
<tr>
<td></td>
<td>Immunity</td>
<td>Belief of invulnerability is the notion that person is immune to risk</td>
<td>RA-immunity</td>
</tr>
<tr>
<td></td>
<td>Fatalism</td>
<td>Sense of fatalism is notion that there is nothing one can do to avoid shingles</td>
<td>RA-fatalism</td>
</tr>
<tr>
<td></td>
<td>Misconception</td>
<td>False beliefs about what shingles is, how it is contracted or spread.</td>
<td>RA_misconception</td>
</tr>
<tr>
<td></td>
<td>Problem Hierarchy</td>
<td>Deal with more pressing health issues rather than about shingles prevention</td>
<td>RA-problem hierarchy</td>
</tr>
<tr>
<td>Behavioral Dimensions</td>
<td>Description</td>
<td>Behavioral Determinants and Relationship to Shingles</td>
<td>CODE</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------------------------------------</td>
<td>-----------------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Perceptions</td>
<td>Self-efficacy</td>
<td>Ownership/responsibility over one’s health</td>
<td>PR_selfefficacy</td>
</tr>
<tr>
<td>Vaccines as beneficial</td>
<td>Belief that Vaccines are beneficial</td>
<td></td>
<td>PR_vaccbeneficial</td>
</tr>
<tr>
<td>Vaccine Safety Concerns</td>
<td>Fear related to vaccine because of perceptions that they are unsafe/side effects</td>
<td></td>
<td>PR_fearvaccine</td>
</tr>
<tr>
<td>Vaccine Efficacy Concerns</td>
<td>Perceptions that vaccine is not effective</td>
<td></td>
<td>PR_ineffectvac</td>
</tr>
<tr>
<td>Lack of trust</td>
<td>Lack of trust in vaccines</td>
<td></td>
<td>PR_lacktrustvacc</td>
</tr>
<tr>
<td>Access to health care</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access Health Care System</td>
<td>Ability to Access health care system, e.g. see doctor</td>
<td></td>
<td>ACC_HCPAccess</td>
</tr>
<tr>
<td>Vaccine Access Attempt</td>
<td>Attempt to access HZ vaccine</td>
<td></td>
<td>ACC_vaccine</td>
</tr>
<tr>
<td>Vaccine Supply Barriers</td>
<td>Supply barriers in accessing HZ vaccine</td>
<td></td>
<td>ACC_supply_barrier</td>
</tr>
<tr>
<td>Vaccine Cost Barriers</td>
<td>Cost barriers in accessing HZ vaccine</td>
<td></td>
<td>ACC_Cost_barriers</td>
</tr>
<tr>
<td>Frozen Requirement</td>
<td>Frozen requirement for vaccine as a barrier</td>
<td></td>
<td>ACC_frozen_barrier</td>
</tr>
<tr>
<td>Positive experiences</td>
<td>Positive health care experiences</td>
<td></td>
<td>ACC_posHCExperience</td>
</tr>
</tbody>
</table>
Summary Results

The shingles focus groups were well attended (n=9 participants in Danvers, n=10 participants in Wellesley, and n=8 participants in Lynn). All participants were interested in the topic and everybody was engaged. One hundred percent (100%) of participants in the Danvers, Wellesley, and Lynn focus groups reported knowing about the shingles disease.

Most participants knew about the clinical pathology, epidemiology, and risk factors of shingles, and reported knowing of the associated pain and discomfort. Participants conveyed the severity of symptoms either through first hand personal experience with shingles, or through friends and family members who had the shingles disease. Some participants (male and female) reported having had shingles, were currently having shingles, and one participant reported that she was currently suffering from post herpetic neuralgia (PHN).

The panel of participants was not representative. There was no probability based sampling used in identifying participants based on specific strata, as was done with the telephone survey. Rather all participants self-selected, and this selection bias may be a reason why participants were so knowledgeable about shingles.

Participants in each group posed questions about herpes zoster pathology, epidemiology, and risk factors. The investigator provided internet resources to participants on additional information about shingles disease and contact information to MDPH’s Immunization Program for further guidance on obtaining vaccine. This was well received by all groups.
Not everybody reported knowing about the shingles vaccine. All participants in the Danvers and Wellesley groups reported knowing about the shingles vaccine, but not all participants in Lynn’s focus group knew about the vaccine. Most participants reported not having received the vaccine, although a few reported that they did receive the shingles vaccine. One participant reported that she partook in a clinical study to test shingles vaccine. The participant explained that even though she was randomized into the placebo arm, she was given the option to receive the shingles vaccine and that she was vaccinated. Another participant reported receiving the shingle vaccination at the Veterans Affairs (VA) center and that his practitioner told him that he was getting a “wonderful vaccine”. Another participant reported that someone they knew got the shingles vaccination and “they considered it was well worth it”.

Some participants reported hesitancy about the zoster vaccination primarily because of safety concerns, e.g. live vaccine. Other reasons for vaccination avoidance behavior are efficacy concerns, e.g. there is not sufficient data to support getting the vaccination, lack of provider recommendation (although there were a number of participants that reported that their provider recommended the vaccine), cost issues, and difficulty accessing the vaccine.

Only some participants were aware that the shingles vaccine is a live virus vaccine. After the moderator clarified that the shingles vaccine was a live virus vaccine, this attribute seemed to concern some participants.

The live vaccine formulation gave participants the most hesitancy about the shingles vaccine relative to all other vaccination concerns ranging from the vaccine’s high cost or reduced
supplies or lack of provider recommendation. Because this point received a lot of attention and
discussion from the group, it warranted that a question on the live nature of the vaccine be
included in shingles survey to obtain empirical data from patients about whether this is a
perceived barrier for shingles vaccination.

The participant with PHN reported that her physician did not advise vaccination with the zoster
vaccine, because he/she was not sure that shingles would recur in this patient. Nevertheless, the
participant reported that she urged her own husband to receive the zoster vaccine (which he did)
and encouraged others in the group to get their shingles shot.

Out of those who reported getting their shingles vaccine, all participants discussed their
experiences with, and had questions about insurance coverage and co-payment for the zoster
vaccine.

Some participants in Lynn seemed to have the most misconceptions about transmission of
shingles and whether the disease was contagious. Some knew correctly that shingles is generally
not contagious but that the blisters may be contagious during the shedding phase, however others
(mostly males in the group) did not know about this exception. Other groups all seemed to know
that shingles was not contagious during this period.

Some participants in Lynn reported having shingles, though they were curious to see what
shingles looked like so that they could be aware of its clinical manifestations. The expressed
interest to see shingles pictures was categorized into the domain of perception and its associated
behavioral determinant of self-efficacy. No other focus group site asked to see pictures of shingles. The focus group sessions provided insight into many issues related to shingles vaccination—shingles awareness and awareness sources, perceptions of developing shingles, provider recommendation for vaccination, the live formulation of the shingles vaccine and the requirement for frozen storage, trust in pharmacists and supply barriers—all of these findings were used to generate the question stems and/or multiple-choice distracters (answer leads) of the MA BRFSS Shingles Survey (MABSS) (see Chapter 5, Part B, Shingles Telephone Survey Development).

Tabulated summary frequency distributions, including row and column totals, of behavioral domains are summarized in Appendix C, Shingles Focus Group Raw Results and Tabulated Frequencies.

**Part B  Shingles Telephone Survey Development**

The shingles telephone survey was informed and developed by (1) findings from the shingles focus groups, (2) elements of individual and interpersonal influence stream theories (Health Belief Model, Theory of Planned Behavior, and Social Cognitive Theory), and (3) opportunities for research previously discussed in the literature review chapter (Chapter 3, Part D, Gap in Literature and Opportunities for Further Research). Discussion of each survey input stream is given below. A tabular summary of the input streams, their observation, and specific survey questions is given in Appendix D, Inputs into Survey Development.
Shingles Focus Group Findings

All focus group participants reported awareness of herpes zoster disease. Measuring disease awareness levels in the greater Massachusetts population would provide empirical data that is generalizable to the greater Massachusetts population. A number of focus group participants reported learning about shingles from friends or family members who had experienced shingles. Measuring shingles awareness, specifically whether respondents’ decision to vaccinate was influenced by family or friends having been sick with shingles will provide empirical data on the effects of social networks.

Focus group participants generally did not think that their chances of developing shingles were high. This observation merits asking the greater Massachusetts population about their perceived chances of developing shingles. Some focus group participants reported that physicians recommended the shingles vaccine, and that physicians, in general, “are pushing” this vaccine, whereas other participants reported that their doctor either did not tell them about shingles/shingles vaccine or recommended that they avoid the shingles vaccine. Provider recommendation overwhelmingly influences vaccination behavior, therefore, the mixed focus groups reactions merit including questions to the shingles survey (both vaccinated and non vaccinated arms) to ask whether health care providers brought up the topic of shingles and whether they recommended (or not) the vaccine or whether the doctor recommended the vaccine but the patient refused it.

The live vaccine formulation gave participants the most hesitancy about the shingles vaccine. This warrants a question to the larger Massachusetts population to understand if the live nature
of the vaccine poses a hesitancy to vaccination. In addition, focus group participants cited a lack
of trust in pharmacists to administer the shingles shot on multiple occasions and this also merits
inclusion of a question in the shingles survey to obtain empirical patient provided data about
whether lack of trust in pharmacist is a barrier to receiving the shingles vaccination in a
pharmacy.

Since focus group participants reported difficulty in obtaining the vaccine as it was not readily
available and cited waiting delays, this observation merits a question in the shingles survey to
obtain empirical data from the larger Massachusetts population about whether the lack of vaccine
supply is a barrier to accessing the shingles vaccination. Focus group participants also reported
that that they had to transport the vaccine on ice to their provider’s office from the pharmacy,
and also merits a question in the shingles survey pertaining to “brown bagging” practices of
whether the vaccine had to be transported to a doctor for administration, how that transport was
completed, and the length of time (Endnote 15). Lastly, focus group participants who got the
shingles shot reported variable out-of-pocket costs and variability in health insurance coverage.
This observation merits including a question in the shingles survey to obtain empirical data from
the larger Massachusetts population about the cost and insurance coverage aspects to obtaining
the shingles vaccination.

**Individual and Interpersonal Influence Stream Theories**

The Health Belief Model (HBM) explores patient reported perceptions of the threat, e.g.
shingles, and tests vaccination decision influences (Theory at a Glance, 2005). The HBM is
operationalized in the shingles survey with questions about perceptions of likelihood of getting
shingles (perceived susceptibility), the pathophysiological effects of shingles, and safety and
efficacy perceptions of the vaccination (perceived severity), awareness of the vaccine (perceived benefits), recommendations for vaccination (cue to action), measurement of taking action, e.g. getting vaccinated with influenza and pneumococcal vaccines, and the reason for getting vaccinated with shingles (self-efficacy).

The Theory of Planned Behavior (TPB) explores patients’ vaccination intentions and personal behavior attitudes (Theory at a Glance, 2005). The TPB is operationalized in the shingles survey with questions about how painful shingles is perceived, the primary reason that people got vaccinated/what symptom patients were most concerned with avoiding (behavioral intention), the importance of preventing shingles, and whether respondents would have received the vaccine if they knew that the vaccine was a live virus vaccine (behavioral control).

TPB also tests the concept of subjective norm by asking if respondents were concerned with missing work or losing pay as the reason for getting vaccinated, whether cost or convenience considerations influenced the vaccination decision, and whether respondents would have received vaccine if it were free or administered by a pharmacist.

Social Cognitive Theory (SCT) explores influences from social network interactions, specifically the influence of friends/peers, health care providers and communication messages on vaccination behavior (observational learning and reciprocal determinism) (Theory at a Glance, 2005). The MA BRFSS Shingles Survey operationalizes SCT influences with questions of how one heard about the shingles vaccination, if know anyone who was sick with shingles, and other questions that test individual vaccination behavior influenced by peer social networks and the
effectiveness of outreach instruments and communication tools, e.g. CDC website, Facebook, television show (Drs. Oz/Phil or Oprah), magazine or billboard advertisement, pharmacy/store advertisement-intercom or poster, or television advertisements.

**Gap in Literature and Opportunities for Further Research**

Studies from the Netherlands, Denmark, and Canada looked at non-compliance determinants with herpes zoster vaccination from the perspectives of patients and providers, however, the findings are not generalizable to the US population. Opstelten (2009) is a KABB study but one that is limited to >65 years old Dutch participants and does not capture US perceptions from 50 years through 64. Mortensen’s (2011) focus group data are useful, but only used a Danish population to assess disease knowledge and perceptions of shingles vaccination. MacDougall et al (2015) looked at vaccination hesitancy for a range of adult vaccines from the perspectives of the public and health providers. The shingles survey is an extension of Opstelten (2009), Mortensen (2011), and MacDougall et al. (2015), but is conducted in the United States (in Massachusetts) and measures the public’s perspectives and decision-making behavior on herpes zoster immunization. The age range included in the shingles study sample frame is >50 years old.

Mbah et al. (2012) discuss social network theory and imitative decision making on vaccination coverage. Research on individual motivations to vaccinate or not with the shingles vaccine and whether the decision is influenced by social networks or vaccine safety and efficacy misconceptions provide empirical support for Mbah’s social network theory. The shingles survey extends Mbah’s work and looks at the implications of social network imitation theory in the space of herpes zoster vaccination decision making.
Hurley (2010) and GAO (2011) performed surveys with physicians and pharmacists on shingles vaccination declination reasons and report that few Medicare beneficiaries received the shingles vaccine due to: physicians not stocking or recommending the vaccine, physicians’ unwillingness to shoulder the high cost of the vaccine, and billing complexities from the vaccine covered by Medicare Part D rather than Part B. While this data provide evidence to the administrative challenges of Part D enrollment verification and reimbursement, and physician and pharmacist experiences with vaccines, they are not inclusive of patient perceptions and should not be relied upon as the sole source of patient decision-making relative to obtaining the herpes zoster vaccination. The shingles survey builds upon the existing body of research with physicians and pharmacists to collect data from the Massachusetts public on their propensity of receiving the shingles vaccine if physicians recommended it and how much people would be willing to pay for the shingles vaccine (GAO, 2011; Hurley, 2010).

Wherever possible, the method used in the shingles survey mirrors the barrier classification method that GAO used in its surveys with providers so that the shingles survey results are comparable to GAO results, in so far as vaccine safety and efficacy and misperceptions are concerned. The shingles survey asks respondents to classify different reasons for not obtaining the shingles shot as a major reason, a minor reason, or not a reason. This question formulation is similar to GAO survey which asked providers to classify factors as either major or minor or not a reason.

In terms of vaccination coverage, GAO (2011) reports that 11% and 53% of Medicare beneficiaries obtained the shingles and Td/Tdap vaccines, respectively. While this aggregate statistic is useful, it does not inform researchers whether those who are electing to vaccinate for
shingles are also electing to vaccinate with flu, Td/Tdap, and pneumonia. The shingles survey asked respondents about receiving the influenza, Td/Tdap and pneumococcal vaccines and collected concurrent vaccination coverage status on shingles, influenza, tetanus/pertussis, pneumonia. This can answer the question of whether patients who are getting (or not getting) the flu, Td/Tdap, and pneumonia vaccines are also getting (or not getting) the shingles vaccination.

In terms of vaccine transport, pharmacist role, and patient convenience, the shingles vaccination was declined because of the inconvenience and difficulty with obtaining the vaccine (Hurley, 2010, GAO, 2011). Physicians reported that the vaccine transport from pharmacy to physician’s office was a barrier to stocking, administering, or recommending the shingles vaccine, however, GAO’s surveys with pharmacists did not gather information on how the vaccine was transported from the pharmacy to physician’s office. The shingles survey questioned vaccinated patients about where they received the shingles vaccine and if there was difficulty in obtaining the vaccine at that location. If received at the pharmacy, a question was asked about the manner in which the vaccine was transported, e.g. whether the vaccine was shipped by the pharmacy to the prescribing physician’s office, or whether the patient collected and transported the vaccine (under cold storage transport condition) to their doctor.

In terms of cost, out-of-pocket responsibilities and willingness to pay, GAO (2011) reports that the average out-of-pocket expense by Medicare beneficiaries for the shingles vaccine was more than double the out-of-pocket expense that beneficiaries paid for the Td/Tdap vaccine (shingles vaccine out-of-pocket expense $57 versus Td/Tdap vaccine out-of-pocket expense $25), and is more that double the estimate provided by physicians who reported that patients would be
willing to spend no more than $29 for a shingles vaccination. Rather than relying on Part D drug utilization data which shows how much patients were compelled to pay or physician-based estimates on how much patients would pay, the shingles survey obtains measurements directly from the public on how much they actually paid and asks those non-vaccinated respondents their willingness to pay for the shingles vaccine. This provides more valid and reliable measurements on out-of-pocket cost sharing than is currently available from GAO’s study.

In terms of reimbursement and insurance coverage, GAO (2011) reports that less than 5% of Medicare beneficiaries received the shingles vaccine under Part D (reimbursement figure includes beneficiaries in the donut hole), and Marrufo et al. (2011) discuss the gains and efficiencies of consolidating Part D covered vaccines within Medicare’s Part B coverage, and suggest that if the herpes zoster vaccine were consolidated under Part B it would improve access, lower costs for beneficiaries and decrease the chances of beneficiaries reaching their Part D coverage gap. The shingles survey includes questions on how much of the cost was not covered by medical insurance, whether the respondent filed a medical insurance claim to be reimbursed for the shingles shot, gathers data on who filed the medical insurance claim, and whether one’s medical insurance company reimbursed them for the shingles vaccine. To partially test Marrufo’s theory, the shingles survey collected data on consumers’ willingness to obtain the shingles vaccination if the vaccine were free (the equivalent of Part B coverage) and whether the respondent’s insurance plan covers the shot, thereby, providing empirical evidence on perceptions of insurance coverage with fewer out-of-pocket cost policies and important patient reported data on the feasibility of Marrufo’s (2011) proposal.
In terms of cost-utility influences on provider vaccination practices, Rothberg (2007) and Le’s (2015) cost-utility models concluded that the vaccination—at its current price ($187.89)—is not a good value for all patients at the generally accepted willingness-to-pay-threshold of $100,000 per QALY. That the vaccine is not cost-effective for all carries significant weight in influencing provider vaccination practices and insurance coverage decisions. The shingles study builds upon Rothberg and Le’s findings that the shingles vaccine does not represent a good value for all patients and tests provider recommendation practices and insurance coverage considerations. The shingles survey asks respondents if their doctor recommended the vaccine, whether their doctor advised against the vaccine, and also asks how much the public is willing to pay for the vaccine.

Since 2012 Massachusetts’ regulations [105 CMR 700.004(B)(6)] have allowed community pharmacists to administer vaccination beyond influenza and include the shingles vaccine, among other vaccinations. The shingles study provides empirical data on the feasibility of Massachusetts 2012 policy that expanded community pharmacist’s ability to administer the shingles vaccination. This survey asked the public if they would have been willing to get the shingles shot at a pharmacy (question asked of vaccinated and non-vaccinated respondents).
Additional Considerations in Survey Development

Shingles Survey Question Cascades and Panel Comparisons

The shingles survey is divided into two sections:

Section I (subsections 1 through 6): Developed for the vaccinated panel, e.g. respondents who previously reported receiving a shingles vaccination in the 2012 BRFSS Shingles Module, (shvac variable YES) and whose vaccination status is confirmed in the shingles survey (VACSTAT variable, filter questions S.9/S.10);

Section II (subsections 7 through 12): Developed for the unvaccinated panel, e.g. respondents who reported not receiving a shingles vaccination in the 2012 BRFSS Shingles Module 20, (shvac variable NO) and whose vaccination status is confirmed in the shingles survey (VACSTAT variable, filter question S.9/S.10).

Depending on the response provided to the shingles vaccination question in the 2012 MA BRFSS and the shingles survey screening section, eligible shingles survey respondents were categorized into either the vaccinated arm or into the non-vaccinated arm. Each arm representing a panel of respondents with similar experiences, e.g. shingles vaccination status.

Each section of the shingle survey consists of six modules that measure respondents’ (1) knowledge of the shingles disease and awareness of the vaccine, (2) self-motivational attitudes over health behavior, (3) whether providers inform about the shingles vaccination, or (4) whether knowledge is gained through social networks, (5) perceptions of vaccine safety and efficacy, and (6) questions over convenience, access, and vaccine reimbursement.
Some sections consist of cascading questions that are used to screen respondents’ answers and filter the respondent sample within each arm (vaccinated and non-vaccinated). The purpose of filtering the respondent sample is to create a sub sample with measured characteristics that are the focus of this research such that the filtered sub sample can answer successive survey questions, provide more reliable measurement of the outcome variables (awareness of shingles disease and the shingles vaccine, and (non) vaccination), and lastly, assist with data analysis about factors associated with herpes zoster vaccination uptake.

Side-by-side comparisons of the panel questions (organized by domain) are provided in Figures 2 through 7.
Figure 2: Question Comparisons by Panels (Awareness of Shingles and Shingles Vaccine)

<table>
<thead>
<tr>
<th>Vaccinated Panel</th>
<th>Unvaccinated Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>When you decided to get the shingles vaccination, how important was it for you to prevent getting shingles? Was it:</td>
</tr>
<tr>
<td></td>
<td>7.1</td>
</tr>
<tr>
<td>1</td>
<td>Not at all important</td>
</tr>
<tr>
<td>2</td>
<td>A little important</td>
</tr>
<tr>
<td>3</td>
<td>Somewhat important</td>
</tr>
<tr>
<td>4</td>
<td>Extremely important</td>
</tr>
</tbody>
</table>

| 1.2 | How did you heard about the shingles vaccine? |
| 1 | CDC website |
| 2 | Facebook |
| 3 | Television Show (Dr. Oz/ Oprah) |
| 4 | Magazine/ Billboard Advertisement |
| 5 | Pharmacy/Store Ad—intercom/poster |
| 6 | Doctor Recommendation |
| 7 | Other (Please specify) |

| 7.2 | How did you heard about the shingles vaccine? |
| 1 | CDC website |
| 2 | Facebook |
| 3 | Television Show (Dr. Oz/ Oprah) |
| 4 | Magazine/ Billboard Advertisement |
| 5 | Pharmacy/Store Ad—intercom/poster |
| 6 | Doctor Recommendation |
| 7 | Other (Please specify) |

| 1.2A | Do you know anyone that was sick with shingles? |
| 1 | Yes |
| 2 | No |

| 7.2A | Do you know anyone that was sick with shingles? |
| 1 | Yes |
| 2 | No |

| 1.3 | When you decided to get the shingles vaccine, how important was it that someone in your family or among your friends had already been sick with shingles? |
| 1 | Not at all important |
| 2 | A little important |
| 3 | Somewhat important |
| 4 | Extremely important |

| 1.4 | When you decided to get the shingles vaccine, how important was hearing from your friends that you should get the shingles shot? Was it: |
| 1 | Not at all important |
| 2 | A little important |
| 3 | Somewhat important |
| 4 | Extremely important |
### Figure 2: Shingles Survey Questions Comparisons by Panels (Awareness of Shingles and Shingles Vaccine) (cont.)

<table>
<thead>
<tr>
<th>Vaccinated Panel</th>
<th>Unvaccinated Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.5</strong> When you decided to get the shingles vaccine, how important was hearing from your family that you should get the shingles shot? Was it:</td>
<td></td>
</tr>
<tr>
<td>1 Not at all important</td>
<td>3 Somewhat important</td>
</tr>
<tr>
<td>2 A little important</td>
<td>4 Extremely important</td>
</tr>
<tr>
<td><strong>1.5A</strong> What would you say is the primary symptom of shingles?</td>
<td></td>
</tr>
<tr>
<td><strong>1.6</strong> How painful do you think shingles is? Do you think it:</td>
<td></td>
</tr>
<tr>
<td>1 Not at all painful</td>
<td>3 Moderately painful</td>
</tr>
<tr>
<td>2 Somewhat painful</td>
<td>4 Very painful</td>
</tr>
<tr>
<td><strong>1.7</strong> Before you were vaccinated with the shingles vaccine, what did you think your chances were of getting shingles during your lifetime? Would you say that it is:</td>
<td></td>
</tr>
<tr>
<td>1 10% chance (very low)</td>
<td>3 50% chance (moderate)</td>
</tr>
<tr>
<td>2 30% chance (low)</td>
<td>4 80% chance (high)</td>
</tr>
<tr>
<td><strong>1.8</strong> Now that you got the shingles shot, what do you think your chances are of getting shingles during your lifetime? Would you say that it is:</td>
<td></td>
</tr>
<tr>
<td>1 10% chance</td>
<td>3 ≥50% chance</td>
</tr>
<tr>
<td>2 30% chance</td>
<td>4 80% chance</td>
</tr>
<tr>
<td><strong>7.2B</strong> What would you say is the primary symptom of shingles?</td>
<td></td>
</tr>
<tr>
<td><strong>7.3</strong> How painful do you think shingles is? Do you think it:</td>
<td></td>
</tr>
<tr>
<td>1 Not at all painful</td>
<td>3 Moderately painful</td>
</tr>
<tr>
<td>2 Somewhat painful</td>
<td>4 Very painful</td>
</tr>
<tr>
<td><strong>7.4</strong> What do you think your chances are of getting shingles during your lifetime? Would you say that it is:</td>
<td></td>
</tr>
<tr>
<td>1 10% chance (very low)</td>
<td>3 50% chance (moderate)</td>
</tr>
<tr>
<td>2 30% chance (low)</td>
<td>4 80% chance (high)</td>
</tr>
</tbody>
</table>
**Figure 3: Question Comparisons by Panels (Self-Motivation/Responsibility)**

<table>
<thead>
<tr>
<th>Vaccinated Panel</th>
<th>Unvaccinated Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.1</strong> Was one reason why you got the shingles shot because you wanted to take care of your health and be healthy?</td>
<td></td>
</tr>
<tr>
<td>1 Yes</td>
<td>2 No</td>
</tr>
<tr>
<td><strong>2.2.A</strong> What part of the shingles disease were you hoping to avoid by getting vaccinated?</td>
<td></td>
</tr>
<tr>
<td>1 Rash/Itchiness on face/body</td>
<td></td>
</tr>
<tr>
<td>2 Blisters</td>
<td></td>
</tr>
<tr>
<td>3 Pain/Tingling of skin</td>
<td></td>
</tr>
<tr>
<td>4 Blindness/Sight Complications</td>
<td></td>
</tr>
<tr>
<td>5 Other (specify)</td>
<td></td>
</tr>
<tr>
<td><strong>2.3</strong> Was one reason why you got the shingles shot because you didn’t want to miss work or lose pay?</td>
<td></td>
</tr>
<tr>
<td>1 Yes</td>
<td>2 No</td>
</tr>
<tr>
<td><strong>2.4</strong> How often do you get the influenza vaccination? Is it:</td>
<td></td>
</tr>
<tr>
<td>1 Every year</td>
<td>2 Most years</td>
</tr>
<tr>
<td>3 Rarely</td>
<td>4 Have only gotten it once</td>
</tr>
<tr>
<td>5 Never</td>
<td></td>
</tr>
<tr>
<td><strong>2.5</strong> Within the past 10 years, did you get a tetanus shot?</td>
<td></td>
</tr>
<tr>
<td>1 Yes</td>
<td>2 No</td>
</tr>
<tr>
<td><strong>2.6</strong> Within the past 5 years, did you get the pneumococcal vaccination?</td>
<td></td>
</tr>
<tr>
<td>(only ask for ≥65. For &lt;65 do not ask.)</td>
<td></td>
</tr>
<tr>
<td>1 Yes</td>
<td>2 No</td>
</tr>
<tr>
<td><strong>8.1</strong> What was the primary reason that you did not get the shingles vaccine? (open ended question; Categorize into below)</td>
<td></td>
</tr>
<tr>
<td>1 Cost was too much</td>
<td></td>
</tr>
<tr>
<td>2 Fear of vaccine/safety concerns</td>
<td></td>
</tr>
<tr>
<td>3 I am not at risk of shingles</td>
<td></td>
</tr>
<tr>
<td>4 Vaccine not recommended</td>
<td></td>
</tr>
<tr>
<td>5 Vaccine would not help me</td>
<td></td>
</tr>
<tr>
<td>6 Other (specify)</td>
<td></td>
</tr>
<tr>
<td><strong>8.2</strong> How often do you get the influenza vaccination? Is it:</td>
<td></td>
</tr>
<tr>
<td>1 Every year</td>
<td>2 Most years</td>
</tr>
<tr>
<td>3 Rarely</td>
<td>4 Have only gotten it once</td>
</tr>
<tr>
<td>5 Never</td>
<td></td>
</tr>
<tr>
<td><strong>8.3</strong> Within the past 10 years, did you get a tetanus shot?</td>
<td></td>
</tr>
<tr>
<td>1 Yes</td>
<td>2 No</td>
</tr>
<tr>
<td><strong>8.4</strong> Within the past 5 years, did you get the pneumococcal vaccination? (only ask for ≥65. For &lt;65 do not ask.)</td>
<td></td>
</tr>
<tr>
<td>1 Yes</td>
<td>2 No</td>
</tr>
</tbody>
</table>
Figure 4: Question Comparisons by Panels (Doctor Recommendation)

<table>
<thead>
<tr>
<th>Vaccinated Panel</th>
<th>Unvaccinated Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3.1</strong> In the past 5 years, did you and your doctor talk about shingles vaccine?</td>
<td><strong>9.1</strong> In the past 5 years, did you and your doctor talk about shingles vaccine?</td>
</tr>
<tr>
<td>1 Yes 2 No</td>
<td>1 Yes 2 No</td>
</tr>
</tbody>
</table>

| **3.2** Did your doctor or healthcare professional bring up the topic of getting the shingles shot, or did you? |  |
| 1 You brought up the topic 2 Your doctor brought up the topic |  |

| **3.3** Did your doctor or healthcare professional recommend that you get the shingles vaccine? | **9.2** Did your doctor or healthcare professional recommend that you get the shingles vaccine? |
| 1 Yes [If code 1=Yes, do not ask Q 3.4 and 3.5] 2 No [If code 2=No, ask Q 3.4 and 3.5] | 1 Yes 2 No |

| **3.4** Did your doctor or healthcare professional advise against you getting the shingles vaccine? | **9.3** Did your doctor or healthcare professional advise against you getting the shingles vaccine? |
| 1 Yes 2 No [If No, ask Q 3.5] | 1 Yes 2 No |

| **3.5** You stated that your doctor advised against you getting the shingles vaccination, yet you still got the shingles vaccine? | **9.4** Was one reason why you were not vaccinated for shingles, because you refused the shot even though your doctor recommended it? |
| 1 Yes 2 No | 1 Yes 2 No |
Figure 5: Question Comparisons by Panel (Vaccine Safety and Efficacy)

<table>
<thead>
<tr>
<th>Vaccinated Panel</th>
<th>Unvaccinated Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>10.1</td>
</tr>
<tr>
<td></td>
<td>How safe do you think the shingles vaccine is? Would you say it is:</td>
</tr>
<tr>
<td></td>
<td>1 Not at all safe 2 A little safe 3 Somewhat safe 4 Very safe</td>
</tr>
<tr>
<td></td>
<td>“I do not trust the shingles vaccine.” Was not trusting the shingles vaccine a _[insert response options below] in your decision not to get the shingles shot:</td>
</tr>
<tr>
<td></td>
<td>1 Major reason 2 Minor reason 3 Not a reason</td>
</tr>
<tr>
<td></td>
<td>“I do not like needles.” Was not liking needles a _[insert response options below] in your decision not to get the shingles shot?</td>
</tr>
<tr>
<td></td>
<td>1 Major reason 2 Minor reason 3 Not a reason</td>
</tr>
<tr>
<td></td>
<td>“I thought I might get sick from the shingles vaccine.” Was thinking you might get sick from the shot a _[insert response options below] in your decision not to get the shingles shot:</td>
</tr>
<tr>
<td></td>
<td>1 Major reason 2 Minor reason 3 Not a reason</td>
</tr>
<tr>
<td></td>
<td>“I do not think the shingles vaccine is effective at preventing shingles.” Was thinking that the vaccine is not effective a _[insert response options below] in your decision not to get the shingles shot?:</td>
</tr>
<tr>
<td></td>
<td>1 Major reason 2 Minor reason 3 Not a reason</td>
</tr>
<tr>
<td></td>
<td>The shingles vaccine is a live virus vaccine. How important was this to your decision not to get the shingles shot?</td>
</tr>
<tr>
<td></td>
<td>1 Very important 2 Somewhat important 3 Not at all important</td>
</tr>
<tr>
<td>4.2</td>
<td>10.8</td>
</tr>
<tr>
<td></td>
<td>Before you got vaccinated, did you know that the shingles vaccination is a live virus vaccine?</td>
</tr>
<tr>
<td></td>
<td>1 Yes 2 No</td>
</tr>
<tr>
<td></td>
<td>How effective do you think the shingles shot is at preventing shingles? Do you think it is _[read all]:</td>
</tr>
<tr>
<td></td>
<td>1 Not at all effective 2 Only a little effective 3 Somewhat effective 4 Very effective</td>
</tr>
<tr>
<td></td>
<td>How effective do you think the shingles shot is at preventing shingles? Do you think it is _[read all]:</td>
</tr>
<tr>
<td></td>
<td>1 Not at all effective 2 Only a little effective 3 Somewhat effective 4 Very effective</td>
</tr>
</tbody>
</table>
Figure 6: Question Comparisons by Panels (Vaccine Supply and Convenience)

<table>
<thead>
<tr>
<th>Vaccinated Panel</th>
<th>Unvaccinated Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5.1</strong> How convenient was it to get the shingles shot?</td>
<td><strong>10.6</strong> Was inconvenience a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?</td>
</tr>
<tr>
<td>1 Not at all convenient</td>
<td>1 Major reason</td>
</tr>
<tr>
<td>2 A little convenient</td>
<td>2 Minor reason</td>
</tr>
<tr>
<td>3 Somewhat convenient</td>
<td>3 Not a reason</td>
</tr>
<tr>
<td>4 Very convenient</td>
<td></td>
</tr>
</tbody>
</table>

| **5.2** Where did you get the shingles shot? Was it at the: | **11.1** Was one reason why you did not get the shingles shot because the vaccine was not available at your doctor’s office? |
| 1 Doctor’s office | 1 Yes |
| 2 Pharmacy/retail stores | 2 No |
| 3 Vaccination clinics | 4 Health Department/public clinic |
| 5 VA | 6 Senior centers/assisted settings |
| 7 Hospital |

| **5.3** Did that location have the shingles vaccine available for you right away? | **11.2** Was one reason why you did not get the shingles shot because the vaccine was not available at your pharmacy? |
| 1 Vaccine available right away | 1 Yes |
| 2 Had to order it | 2 No |

| **5.4** Did the pharmacist administer the shot at the pharmacy or did you pick the vaccine up at the pharmacy and bring it to your doctor’s office so the vaccine was not available at any of the local health centers/clinics where your doctor could give you the shot? | **11.3** Was one reason why you did not get the shingles shot because the vaccine was not available at any of the local health centers/clinics where you normally get care? |
| 1 Vaccine administered by Pharmacist in Pharmacy | 1 Yes |
| 2 Picked up vaccine in pharmacy and brought to doctor’s office for them | 2 No |

<p>| <strong>5.5.A</strong> Did the Pharmacy transport the vaccine to the doctor’s office? | |
| 1 Yes | 2 No |</p>
<table>
<thead>
<tr>
<th>5.5.B</th>
<th>Did the pharmacy give you a package with ice for the vaccine so you could take it back to your doctor?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.5.C</th>
<th>Did you come to the pharmacy with your own icepack for the vaccine?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.5D</th>
<th>Did you transport the vaccine to doctor’s office without ice?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.6</th>
<th>About how long did it take to go from the pharmacy to your doctor’s office so you could get your shingles shot?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Less then 30 minutes</td>
</tr>
<tr>
<td>2</td>
<td>30 mins to under 1 hour</td>
</tr>
<tr>
<td>3</td>
<td>1 hour to just under 2 hours</td>
</tr>
<tr>
<td>4</td>
<td>Over 2 hours</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.7</th>
<th>Would you have been willing to have the pharmacist administer the shingles vaccine in a pharmacy instead of getting the shot in a doctor’s office?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11.4</th>
<th>If you were to get the shingles vaccine, would you be willing to have the pharmacist administer the shingles vaccine in a pharmacy instead of getting the shot in a doctor’s office?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
</tr>
</tbody>
</table>
### Figure 7: Question Comparisons by Panels (Vaccine Cost)

<table>
<thead>
<tr>
<th>Vaccinated Panel</th>
<th>Unvaccinated Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6.1</strong> How much did you pay to receive the vaccine? Please include any co-payments or co-insurance fees. Was it:</td>
<td><strong>12.6</strong> What is the most you would be willing to spend on the shingles vaccination?</td>
</tr>
<tr>
<td>1 0 to less than $25  2 $25 to less than $50  3 $50 to less than $100  4 $100 to less than $200  5 $200 plus</td>
<td>1 0 to less than $25  2 $25 to less than $50  3 $50 to less than $100  4 $100 to less than $200  5 $200 plus</td>
</tr>
</tbody>
</table>

| **6.2** Did you have to file a medical insurance claim to your insurance company to be reimbursed for the shingles shot? | **10.5** Was the cost of the vaccine a major reason, a minor reason, or not a reason in your decision not to get the shingles shot? |
| 1 Yes  2 No | 1 Major reason  2 Minor reason  3 Not a reason |

| **6.3** Who filed the medical insurance claim for you? Was it the: | **12.1** Was one reason for not receiving the shingles shot because the shingles vaccine is not recommended for your age group? |
| 1 Physician or office staff  2 Pharmacy  3 Patient (you)  4 Spouse/caregiver  5 Someone else (please specify) | 1 Yes  2 No |

| **6.4** Did your medical insurance company reimburse you for the shingles vaccine? | **12.2** Was one reason why you did not get the shingles shot because your medical insurance would not pay for the shot? |
| 1 Yes  2 No | 1 Yes  2 No |

| **6.5** As part of your Medicare insurance, do you have a prescription drug plan, also known as Part D? | **12.3** Would you get a shingles shot if your medical insurance plan paid the full cost of the vaccine? |
| 1 Yes  2 No | 1 Yes  2 No |

| **12.4** Was one reason why you did not get the shingles shot because your cost was too much? | **12.5** As part of your Medicare insurance, do you have a prescription drug plan, also known as Part D? |
| 1 Yes  2 No | 1 Yes  2 No |

| **12.7** Would you get vaccinated if the shingles shot were free? |  |
**Survey Vendor/Contractor**

The organization that performed the data collection activities (Abt SRBI) was a qualified vendor of MDPH that was selected through a competitive bidding process following broadcast of a Request For Responses on the Commonwealth Procurement Access and Solicitation System. Abt SRBI fielded the MA BRFSS survey, programmed the shingles survey, coded answers/data collection, and provided data output files for Northeastern University to analyze. All of the funds from the shingles special project grant (5H23IP122540-10) were used to pay Abt SRBI for their services.

**Northeastern University Law and Public Policy Program**

Marina Draper from Northeastern University’s Law and Public Policy Program conducted the shingles focus groups, developed a shingles survey addition to the MA BRFSS, analyzed the resulting data set, and synthesized public policy recommendations from the data.

**Survey Pretest**

A penultimate version of the survey, approved by the dissertation committee, was delivered to Abt SRBI for a pretest. The sample for the pretest was comprised of respondents interviewed in the January and February 2012 MA BRFSS Survey. After the call-back permission question and additional panel filter questions to confirm inclusion and validate vaccination status, 40 respondents answered the shingles survey (24 respondents vaccinated; 16 respondents not vaccinated). A summary pretest report was issued containing Abt SRBI’s observations and comments when administering the pretest, interviewee’s verbatim responses to questions, and response frequencies to the survey questions (26 April 2012 pretest report is located in Appendix E, Shingles Survey Pretest Report).
The pre-test was small (n=40), overall pretest questionnaire feedback was positive, however, several questions and/or multiple choice distractors were identified as having comprehension problems, or respondents’ answers suggested that the question was not collecting the anticipated information. Based on the pretest, some survey questions were modified. Changes included addition of new filter questions, and, where needed, rephrasing of problematic questions and/or multiple-choice distractors. These changes required updates to conditional instructions/skip patterns. The modifications to the survey only addressed the comprehension issues noted in the pretest. The inherent nature and purpose of the survey questions as well as the associated research hypotheses remain unchanged.

The finalized survey was provided to Abt SRBI to resume interviewing. A soft re-boot, similar to the pretest, was performed to make sure the revised questions work as intended and Abt SRBI began the interviews (target n=1,000 completes [based on the study design and availability of funds].

**Data Monitoring**

After the survey went live (May 2012), two remote monitoring sessions were conducted (August 9, 2012 and August 14, 2012) to observe Abt SRBI’s administration of interviews. The first monitoring session consisted of 5 interviews conducted by two different interviewers. The second monitoring session consisted of 4 interviews conducted by the same two Abt SRBI interviewers. Interview Monitoring Evaluation Forms are located in Appendix F.

Remote interview monitoring was performed with Abt SRBI’s Fort Myers, FL call center via telephone and WebEx, which allowed for live listening of the phone survey and viewing of data
collection via CATI and Sample Management System (SMS). The remote monitor allowed for live observations of interview with actual respondents as they took place. The monitoring sessions were informative tools to evaluate Abt SRBI’s performance. Overall assessment of interview administration and data collection was good, however, response rates could have been improved by improved interviewing techniques.

Based on the monitoring sessions, clarification notes and minor modifications were made to the survey data coding instructions. Some questions were re-programmed to accept multiple responses from the observation that some respondents provided more than one answer to a question. For example, when respondents told interviewers that they heard about the vaccine from all of the sources, all coded responses can be recorded. In order to highlight this for the benefit of the interviews and respondents, Abt SRBI added on-screen clarification that such questions are “multiple record” questions and can be data coded to accept multiple responses. In addition, some respondents provided answers that could not be allocated into the pre-coded multiple-choice distractors. As a result of this, the multiple-choice distractors for those specific questions were revised to include additional response options. The shingles call back survey is provided in Appendix G, MA BRFSS Shingles Survey.
Part C  Quantitative Research (Telephone Survey)

Massachusetts BRFSS and the Massachusetts Shingles Study

This research uses an explanatory study design, which is appropriate given that the goal is to identify determinants for shingles vaccination and test hypotheses about how shingles vaccination coverage varies in responses to changes of these determinants. The selection of a survey as a research method is appropriate as it is a popular research method that allows data to be collected on a broad range of social research topics and from a range of individuals. The benefits of using a telephone survey are versatility, efficiency, quickness, cost-effectiveness, and generalizability to the wider Massachusetts population (not easily generalizable beyond Massachusetts).

This research developed a call-back shingles survey to 2012 MA BRFSS telephone health survey. The call-back survey instrument includes questions associated with this research’s underlying theoretical perspectives to measure variables of interest and to test research hypotheses examining determinants/predictors for vaccination engagement behavior. The shingles survey was developed with input from focus groups, theoretical perspectives and gaps in literature review, and assistance from CDC and Massachusetts DPH experts on shingles disease and vaccination. Questions on the shingles survey were designed to be closed-ended with yes or no answer choice, and several Likert scale answer possibilities, although a few open-ended questions are used. The interview process used a computer assisted telephone instrument (CATI). In some instances, a skip pattern was used to pose questions depending on earlier qualifying responses, e.g. if respondent is over 65 years-old, then ask tetanus vaccination question; if the vaccine was administered by the pharmacist then ask questions in subsection 6; etc.
Why Massachusetts?

Massachusetts was selected as the site of this study based on the fact that: (1) the state is at the forefront of increasing access to vaccination and is among the best vaccinating states in the country (MA shingles vaccination coverage for ≥60 years has surpassed the national vaccination goal (38%) versus national estimates (24.2%) (2014 MA BRFSS), (2) the state has a strong physician infrastructure (Health, 2010), (3) strong immunization programs (MDPH, 2009), (4) small population, (5) more doctors per population, and (6) has utilized the optional BRFSS module to measure population-based estimates of shingles vaccination coverage and prevalence of shingles disease since 2010. These considerations make Massachusetts the focus state to study consumer behavior and reasons for the increased shingles vaccination coverage trend. However, Massachusetts is not representative of the nation, therefore, results from the shingles survey are not generalizable to national policy.

Sampling MA BRFSS Respondents for Shingles Call-Back Survey Participation

The 2012 MA BRFSS telephone survey was an ongoing survey conducted in the 2012 calendar year with a quota of 16,800 interviews (≥18 years-old contacted on land-line telephones by random digit dialing). The survey asked the state optional shingles module (Section 23: Module 20: Shingles) which consists of one question about whether respondents have ever had the shingles vaccination (shvac variable) of all adults age ≥50 (n=10,822). The Massachusetts shingles survey study population was drawn from Massachusetts residents aged ≥50 years-old who were asked the shingles module question.
All respondents over age 50, who reported being vaccinated with shingles were invited to participate in a future telephone survey (the shingles survey) to answer additional questions on shingles vaccination with the shingles survey call-back permission question. Unvaccinated respondents were invited to participate using a mixed method sampling strategy (see Sample Selection Strategy). The call-back permission question to participate in the shingles call back survey asked: “Finally, would you be willing to be contacted at some time in the future to participate in a follow-up survey?” The call-back permission question was not asked of respondents who provided ‘Do not know’ and ‘Refused’ answers on shingles vaccination status. Respondents’ consent was recorded in the 2012 BRFSS call-back permission script and confirmed again in the 2012 shingles survey. If the respondent did not wish to participate in the shingles survey, the participant could refuse and they were not re-contacted.

The MA BRFSS is roughly 26 minutes in length and the shingles survey is an additional ~10 minutes. The shingles survey was conducted in English and in Spanish (1.1% of interviews conducted in Spanish).

**Identification of Shingles Survey Participants**

While the initial BRFSS sample was derived from random probability sampling, the shingles survey was administered to a panel of respondents who self-selected and agreed to be re-contacted from the pool of State BRFSS respondents via the shingles call-back permission question, therefore, selection bias may have played a role in the respondent sample in the shingles call back survey. Six thousand eight hundred and seventy-three (n=6,873) respondents provided consent to participate in the shingles call-back survey. Abt SRBI contacted only those respondents who provided consent to participate in the shingles call back survey. Two thousand
five hundred and twenty-eight (n=2,528) respondents were selected in the shingles survey subsample using a mixed method, stratified probability design sampling method (see description in Sample Selection Strategy). The shingles survey subsample (n=2,528) accounts for anticipated attrition losses associated with refusal to participate in the shingles survey upon re-contact, and additional losses from eligibility criteria in the panel filter segment of the shingle survey including vaccination status validation question. A total of 1,000 interviews were completed which reflects the number of respondents that were budgeted for the shingles survey.

**Dual Panel Survey**

The shingles survey is designed as a dual panel survey that classifies vaccinated respondents into one panel, and non-vaccinated respondents into another panel. Each panel is asked a series of questions that are pertinent to the vaccinated (or non-vaccinated) group experiences.

**Panel Filter Segment**

A panel filter segment is asked that is comprised of four questions. The panel filter segment serves to screen respondents by confirming awareness of the shingles vaccination (inclusion criteria into survey) and classify respondents into the appropriate survey panel. The order of the filter segment followed a logical progression by first asking about awareness and validating the respondent's vaccination status.

The first two panel filter questions of the shingles survey measure the respondent’s awareness of the shingles disease and the vaccine. If respondents reported lack of awareness of the shingles disease they were allowed to participate in the shingles survey, however, if respondents reported lack of awareness of the shingles vaccine they were excluded from participating in the shingles survey (interview was terminated). Additional filter questions validated the vaccination status.
response previously recorded in the 2012 State BRFSS (Shingles Module 20). Respondents who may change their vaccination status, e.g. the respondent reports being vaccinated with the shingle vaccine in the call back shingles survey, but in the State BRFSS the respondent reports not having been vaccinated, were asked to re-confirm their vaccination status with an additional filter question. The intent is to obtain valid vaccination status before assigning respondents to respective panels.

**Verification of Shingles Vaccination Coverage**

The shingles contact survey is designed to verify vaccination coverage and account for respondents who may change vaccination status between the MA BRFSS and shingles survey interviews. Since vaccinated respondents represent a rarer population in terms of prevalence, the vaccination status confirmation question serves to identify recently vaccinated respondents and ensures that such respondents were properly categorized into the vaccinated panel (Figure 8).
Figure 8: MA Shingles Survey Participant Selection

2012 MA Landline BRFSS Sample >50 years old (n=10,822)

Shingles Call-Back Survey
Permission Question
“Finally, would you be willing to be contacted at some time in the future to participate in a follow-up survey”

Refused to Follow-up Survey (n=3,949)

Agreed to Follow-up Survey (n=6,873)

Shingles Survey Subsample (n=2,528)

Vaccinated Adults
Non-Vaccinated Adults

White Males 50-64 (n=88)
White Males 65+ (n=252)
White Females 50-64 (n=147)
White Females 65+ (n=29)
Non-White Adults 50+ (n=67)

White Males 50-64 (n=253)
White Males 65+ (n=204)
White Females 50-64 (n=178)
White Females 65+ (n=206)
Non-White Males 50+ (n=279)
Non-White Females 50-64 (n=337)
Non-White Females 65+ (n=222)
Figure 8: Pictorial of Shingles Survey Participant Selection (cont.)

Panel Filter Segment

Yes (Proceed to S8)

S7. Do you know about a medical condition called shingles?

Yes (Participant is eligible to proceed with

S8. Are you aware that there is a vaccine to prevent shingles?

Yes

S9. Have you had the shingles vaccination?

Yes

Validate S9 ‘Yes’ response with 2012 BRFSS shingles vaccination coverage question

If response is validated, assign participant to survey sections 1-7

If response is NOT validated, ask S10

VACCINATED PANEL (n=529)

S10. Previously when you were interviewed, you said that you had NOT had the shingles vaccination but just now you said that you HAVE HAD the shingles vaccination. Have you had the shingles vaccination since your interview?

No

TERMINATE INTERVIEW

Yes

Validate S9 ‘No’ response with 2012 BRFSS shingles vaccination coverage question

If response is NOT validated, terminate interview

If response is validated, assign participant to survey sections 7-12

NON-VACCINATED PANEL (n=471)

No (Participant is ineligible to proceed with survey and the interview is terminated)

No (Proceed to S8)

Yes (Proceed to S8)
Sample Selection Strategy

Respondents who reported knowledge of the shingles vaccine in the screening filter portion of the survey (inclusion criteria for participation) were eligible to participate in the shingles survey. Further, the stratification separated participants based on shingles vaccination status (vaccinated/non-vaccinated), gender (male/female), race (white/non-white), and age (50-64 and 65+ years). Note that since there are too few racial minorities, it was not feasible to stratify the sample with Black and Hispanic populations, therefore, the racial stratification for the shingles survey sample classifies the sample as White or Non White strata.

The shingles survey included as many participants in the vaccinated panel as possible in order to increase the statistical power and confidence for inferential statistics. All respondents who reported receiving the zoster vaccine in the 2012 State BRFSS, Shingles Module 20 were asked to participate in the shingles call back survey. Therefore, the method for identifying respondents did not sample, rather the entire populations that consented to participate in the survey were re-contacted [see further discussion in Modification to Survey Sampling Protocol; final vaccinated n=529]. Sampling methods for unvaccinated adults employed a mixed method, stratified probability design that considers the availability of populations in each gender/race/age strata cell. Since unvaccinated non-white women over 65-years-old and unvaccinated non-white men of both age brackets make up a rare population, all respondents in both age strata were asked to participate in the shingles survey. The sample selection strategy for the remainder of the unvaccinated strata employed a skip interval pattern (also referred to as a variable algorithm or sampling fraction) that is specific to each demographic. Sampling of unvaccinated white females of both age groups, unvaccinated non-white females aged 50-64, and unvaccinated white males
of both age groups employed different sampling fractions to generate a subsample of eligible interviews (final unvaccinated n=471).

The shingles survey began in May 2012, or as much as possible in real time, after respondents are identified from the 2012 BRFSS call-back permission, and continued through calendar year 2012 and into 2013 (concluded in March 2013) until 1,000 respondents completed the survey. The sampling strategy spread out interviews of the unvaccinated panel over the time it took to interview the vaccinated sample. The approach helped to avoid a long lag time between when respondents first provided their permission to be re-contacted to when they were actually contacted, and reduced the risk of losing respondents to follow-up because they changed their minds to participate (non response bias).

**Data Weighting**

Abt SRBI programmed weights to correct for oversampling and/or under-sampling of specific populations, and weighted the sample size in relationship to the Massachusetts ≥50 years old population. The weighting methods calculated: (1) design weights that factored weight corrections for the disproportionate respondent selection probability in the 2012 BRFSS survey sample, (2) propensity score adjustments to mitigate non-response bias of (a) BRFSS respondents agreeing for re-contact survey, and (b) re-contacted respondents completing the survey, (3) subsampling weights to adjust design weights for survey re-contact, and (4) sample stratification and ratio adjustments to match the Massachusetts population using the 2011 American Community Survey (ACS).
Modification to Survey Sampling Protocol

In Abt SRBI’s interim progress report provided (1 Oct 2012 memo), a total of 611 interviews were completed from May to September 2012. The interim report took stock of the number of completed interviews across cell strata, evaluated the original sampling protocol against the completed interviews, and was used in deciding whether any changes to the sampling protocol were warranted based on projected forecasts of how interviews would be allocated across strata.

The original sampling protocol was to take all vaccinated respondents who agreed to the follow-up, and different sampling fractions were used for each cell strata in the unvaccinated panel. Two-thirds of the way into the survey, it was apparent that the surveyed population consisted largely of white women with many more interviews with older white vaccinated women than with white men. Also, studying non-whites proved difficult since non-white respondents were hard to find given the Massachusetts sample frame, and studying non-vaccinated participants was difficult since many were not aware of the shingles vaccine (inclusion criteria for the study). Since there were many older white vaccinated women available for this survey, continuing to interview every available older white vaccinated woman (per the original sampling plan), would result in over 300 interviews in this stratum. This would translate into too many respondents in this one cell, would take away from allowable completes in all other cells, and create a skewed/unbalanced count of completes across both vaccinated and unvaccinated arms.

The decision options were to: (1) proceed with the sampling without any changes, which would result in an unbalanced interview forecast by vaccination status, e.g. more interviews with vaccinated adults, or, (2) modify sampling to balance the interview count by vaccination status.
The sampling method was modified to arrive at a more balanced count (50/50 by vaccinated/unvaccinated). This is closer to the ratio of respondents desired at the beginning of the survey anyway. Abt was informed of the modification to the sampling plan on 14 Oct 2012.

**Variables**

Variables collected in the shingles survey as well as a subset of additional variables collected in the 2012 BRFSS are presented in Figures 9 and 10, respectively.
### Figure 9: MA Shingles Survey Variables

<table>
<thead>
<tr>
<th>Variable Domains</th>
<th>Panel</th>
<th>Questions</th>
<th>Variable Type(s)/ Level of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccination Coverage</td>
<td>--</td>
<td>S.9/S.10</td>
<td>Categorical/Nominal Dichotomous</td>
</tr>
<tr>
<td>Shingles Awareness</td>
<td>---</td>
<td>S.7/S.8</td>
<td>Categorical/Nominal Dichotomous</td>
</tr>
<tr>
<td>Shingles and Pathophysiologic Sequelae Awareness</td>
<td>Vaccinated</td>
<td>1.1, 1.3-1.8</td>
<td>Attitude scale responses treated as interval (scales equally distributed)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2/a; 1.5a</td>
<td>Categorical/Nominal</td>
</tr>
<tr>
<td></td>
<td>Non-Vaccinated</td>
<td>7.1-7.2</td>
<td>Categorical/Nominal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.3-7.4</td>
<td>Categorical/Ordinal</td>
</tr>
<tr>
<td>Self-Motivation Taking Action</td>
<td>Vaccinated Panel</td>
<td>2.2/A, 2.3-2.6</td>
<td>Nominal Dichotomous/Categorical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8.1-8.4</td>
<td>Categorical/Ordinal</td>
</tr>
<tr>
<td>Doctor Recommendation</td>
<td>Vaccinated</td>
<td>3.1-3.5</td>
<td>Categorical/Dichotomous/Categorical</td>
</tr>
<tr>
<td></td>
<td>Non-Vaccinated</td>
<td>9.1-9.4</td>
<td>Categorical/Dichotomous/Categorical</td>
</tr>
<tr>
<td>Perception of Vaccine Safety/Efficacy</td>
<td>Vaccinated</td>
<td>4.1-4.4</td>
<td>Categorical/Dichotomous/Categorical</td>
</tr>
<tr>
<td></td>
<td>Non-Vaccinated</td>
<td>10.1-10.8 (excl 10.5/10.6)</td>
<td>Categorical/Ordinal</td>
</tr>
<tr>
<td>Adequate Vaccine Supply and Convenience</td>
<td>Vaccinated</td>
<td>5.1-5.7</td>
<td>Categorical/Dichotomous/Categorical</td>
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<td>10.6, 11.1-11.4</td>
<td>Categorical/Dichotomous/Categorical</td>
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<td>Defrayal of Vaccine Cost</td>
<td>Vaccinated</td>
<td>6.1-6.5</td>
<td>Interval and Nominal</td>
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<td></td>
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<td>Dichotomous/Categorical</td>
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<td>Non-Vaccinated</td>
<td>10.5, 12.1-12.5 and 12.7/12.6</td>
<td>Categorical/Ordinal</td>
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<td></td>
<td></td>
<td>Nominal</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Dichotomous/Categorical/Interval</td>
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Figure 10:  MA BRFSS Variables

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<th>Independent Predictor Variables</th>
<th>BRFSS Question</th>
<th>Variable Type(s)/ Level of Measurement</th>
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<td>Health Status</td>
<td>Hlth1 variable</td>
<td>Categorical/Ordinal</td>
</tr>
<tr>
<td>Age</td>
<td>age variable</td>
<td>Interval data; age coded in years</td>
</tr>
<tr>
<td>Race</td>
<td>Mrace variable</td>
<td>Nominal/Categorical</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Mrtl variable</td>
<td>Nominal/Categorical</td>
</tr>
<tr>
<td>Highest Grade Completed</td>
<td>Educ variable</td>
<td>Nominal/Categorical</td>
</tr>
<tr>
<td>Employment Status</td>
<td>Emp1 variable</td>
<td>Nominal/Categorical</td>
</tr>
<tr>
<td>Income</td>
<td>Incm variable</td>
<td>Interval level data measured in dollars per annum</td>
</tr>
<tr>
<td>Respondents Gender</td>
<td>gender variable</td>
<td>Categorical/Nominal Dichotomous</td>
</tr>
<tr>
<td>Have Any Health Care Coverage</td>
<td>HLTHPLAN variable</td>
<td>Categorical/Nominal Dichotomous</td>
</tr>
<tr>
<td></td>
<td>HINS7 (Has Medicare)</td>
<td></td>
</tr>
<tr>
<td>Was Cost a Determinant in Accessing Doctor?</td>
<td>Hins5 variable</td>
<td>Categorical/Nominal Dichotomous</td>
</tr>
</tbody>
</table>

Data Analytics

Data analysis was conducted using IBM® Statistical Package for the Social Sciences (SPSS®) (version 19; copyright 1989; 2010 SPSS), and StataCorp STATA/SE (copyright 1985-2011; Revision 23 Jan 2014).

Analysis Plan

Summary and raw data, descriptive statistics and multivariate analyses are provided. Bivariate analyses across vaccination panels are analyzed for survey question(s) that were asked in both panels. Intra-panel bivariate analyses are stratified by gender, age, and race. Additional bivariate analyses of shingles awareness, vaccination status, and cost are performed by demographic and access-to-care and other determinants of health variables. Relationships are assessed with statistical significance at $\alpha = 0.05$, chi square, measures of association analyses and/or correlation.
tests. In instances where there were three or more multiple choice distractors, responses may be collapsed into fewer categories for ease of review. “Do not know” (07) and “refused” (09) responses are excluded from analyses.

Lastly, inferential statistics are used to predict which consumers are likely to utilize the shingles vaccination. Multivariate logistic regression (with predicted marginal) is performed to account for varying odds of shingles vaccination. The relative strength of significant explanatory predictor variables is calculated in terms of magnifying or shrinking the prevalence (odds) of the outcome at $\alpha = 0.05$. The regression model only uses cases with non-missing values (for dependent and independent variables) in its analysis. Cases with missing values are not included in the model.

In addition to identifying the variables that give the best prediction of vaccination odds, the model also examines interaction (amplification) effects of some predictor variables by others using a general linear model analysis.
CHAPTER 6: SURVEY RESULTS

Propensity Predictors and Response Rates

The propensity of >50 years-old respondents to (1) agree to participate in and (2) complete the shingles survey was modeled by Abt SRBI by examining predictors from the MA BRFSS. Significant predictors in both BRFSS agreement and shingles survey completion were educational attainment, age, race/ethnicity, marital status, and shingles vaccination status. Significant predictors of shingles survey completion include gender and health coverage. Non-significant predictors affecting agreement and survey completion include inability to see a doctor because of cost, having doctor or health care provider, general health, and participation in physical activities in past month.

The shingles survey response (follow-up rate x agreement rate) rate is 47.4%. The overall response rate is 21.3%. This is calculated by the MA BRFSS response rate (internally calculated CDC rate) which is multiplied by the MA BRFSS rate times the shingle survey rate. The shingles survey response rate is lower than with other CDC surveillance systems (Shulman, 2006), yet within CDC’s established lower response rate limit of 40% (Schneider, 2012). The relative low overall response rate is influenced by the complex research design with dual eligibility criteria—the BRFSS eligibility criteria identified respondents >50 years old for the re-contact survey, however, when eligible respondents were re-contacted the shingles survey introduced additional eligibility criteria (awareness of shingles vaccine), hence upon re-contact, a number of initially eligible respondents, specifically non-white males and females, in both the young and older age groups, reported not being aware of the shingles vaccination and were subsequently excluded from the re-contact panel. This resulted in a lower response rate than if the research design
allowed for the sampled eligible respondents from the 2012 BRFSS to continue with the re-contact survey.

**Vaccination Verification Status Changes**

A total of 29 unvaccinated respondents who previously reported not receiving the shingles vaccine had reported a changed shingles vaccination status when interviewed for the shingles survey. In instances where participants in the 2012 BRFSS reported unvaccinated status (Shingles Module 11, [‘SHINGLE2’ variable], SHINGLE2=2 [No]), but in the shingles survey reported that a shingles shot was received (S.9/S/10=1 (Yes)), respondents were appropriately reassigned to the vaccinated arm panel of call back interview questions.

Refer to Appendix I for survey response propensity predictors, information on eligibility, re-contact, follow up, and refusal rates, and vaccination status changes. Appendix J presents the shingles survey raw data.

**Study Population**

Of the 1,000 surveyed individuals, there were more vaccinated than non-vaccinated participants [n=529 (53%) vaccinated and n=471 (47%) unvaccinated]. Across gender, participants were mostly female [n=584 (58%) versus n=416 (42%) males] and across age ≥65 years old (mean age: 67; range 50-99 years [CI 66.4-67.5]; n=413 (41%) 50-64 years old; n=587 (59%) ≥65 years old, p>0.05). Male respondents were comparably split by vaccination status [n=214 (51%) vaccinated, versus n=202 (49%) non-vaccinated], and were older [n=171 (41%) 50-64 years old; n=245 [59%] aged ≥65 years old, p>0.05]. Female respondents were not comparably split by vaccination status, with more vaccinated than non-vaccinated females (n=315 (54%) versus
n=269 (46%), respectively. Female respondents were older [n=342 (59%) ≥65 years old, p>0.05] (Table 6).

Table 6: Shingles Vaccination Status by Gender, Age and Vaccination Status Frequencies

<table>
<thead>
<tr>
<th>Gender</th>
<th>Vaccination Status</th>
<th>Age (group)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>50-64</td>
<td>65+</td>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>Vaccinated</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
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<tr>
<td></td>
<td></td>
<td>58</td>
<td>27</td>
<td>156</td>
<td>73</td>
<td>214</td>
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<tr>
<td></td>
<td>Non-Vaccinated</td>
<td>113</td>
<td>56</td>
<td>89</td>
<td>44</td>
<td>202</td>
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<tr>
<td></td>
<td>Sub Total Males</td>
<td>171</td>
<td>41</td>
<td>245</td>
<td>59</td>
<td>416</td>
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<tr>
<td>Female</td>
<td>Vaccinated</td>
<td>100</td>
<td>31</td>
<td>215</td>
<td>68</td>
<td>315</td>
</tr>
<tr>
<td></td>
<td>Non-Vaccinated</td>
<td>142</td>
<td>53</td>
<td>127</td>
<td>47</td>
<td>269</td>
</tr>
<tr>
<td></td>
<td>Sub Total Females</td>
<td>242</td>
<td>41</td>
<td>342</td>
<td>59</td>
<td>584</td>
</tr>
<tr>
<td></td>
<td>Sub Total Age (Both Genders)</td>
<td>413</td>
<td>41</td>
<td>587</td>
<td>59</td>
<td>1,000</td>
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</table>

Across race, respondents were generally white [n=836 (90%) white versus n=93 (10%) non-white] and older [549 (59%) aged ≥65 years, versus 380 (41%) aged 50-64 years]. White respondents were more likely to be vaccinated [n=503 (60%) versus n=333 (40%) non-vaccinated, respectively] and were older [n=505 (60%) ≥65 years old versus n=331 (40%) 50-64 years old, p<0.05]. Non-white respondents were more likely to be non-vaccinated [n=81 (87%) non-vaccinated versus n=12 (13%) vaccinated] and younger [n=49 (53%) aged 50-64 years old versus n=44 (47%) aged ≥65 years old, p<0.05]. Overall there were more vaccinated older whites than non-whites (n=352 versus n=9) (Table 7).
### Table 7: Shingles Vaccination Status by Race, Age and Vaccination Status Frequencies

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<th>Race</th>
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<th>Total</th>
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<td></td>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
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<td>White</td>
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<td>30</td>
<td>352</td>
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<tr>
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<td>Non-Vaccinated</td>
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<td>Sub Total Whites</td>
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<td></td>
<td>Non-Vaccinated</td>
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<td>57</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Sub Total Non-Whites</td>
<td>49</td>
<td>53</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>Sub Total Age (Both Races)</td>
<td>380</td>
<td>41</td>
<td>549</td>
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### Bivariate Analyses

#### Demographic Analyses

Analyses of demographic and access to care variables of herpes zoster awareness and vaccination are performed (Table 8). Chi-square, Fischer’s exact test or likelihood ratio used two-sided test to determine level of significance.
### Table 8: Sample Characteristics ≥50 years, Demographics and Access to Care Variables—Shingles Survey, 2012

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<th>HZ Aware</th>
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<th>HZ Not Aware</th>
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<th>Vaccinated</th>
<th></th>
<th>Non-vaccinated</th>
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<th>p</th>
<th>Chi Squared</th>
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<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
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<td>202</td>
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<td>5</td>
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<td>269</td>
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<td>71</td>
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<td>444</td>
<td>94</td>
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</table>
Inter/Intra-Panel Analyses

Inter-panel analyses of awareness responses, including data on shingles awareness sources are shown (Table 9 and Table 10). Across both vaccination panels respondents overwhelmingly reported being aware of shingles (n=989 [99], p >0.05). Inter-panel analyses for shingles awareness across similar survey questions show that the only statistically significant variable associated with shingles awareness is knowing others with shingles (p <0.001) and perceptions of developing shingles (p <0.05). Inter-panel analyses of vaccination status responses are shown in Table 11.
Table 9: Shingles Awareness, Shingles Survey, 2012

<table>
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<tr>
<th>Dimension</th>
<th>Shingles Awareness Status</th>
<th>Yes</th>
<th>No</th>
<th>p</th>
<th>Chi Squared</th>
<th>Phi</th>
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<td></td>
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<td>%</td>
<td>N</td>
<td>%</td>
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</tr>
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<td>2</td>
<td>0</td>
<td>0</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td></td>
<td>Moderately/Very</td>
<td>933</td>
<td>98</td>
<td>10</td>
<td>100</td>
<td>&gt;0.05</td>
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<td>Very Low- Low</td>
<td>406</td>
<td>45</td>
<td>8</td>
<td>73</td>
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<tr>
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<td>Rash/Itch on Face or Body</td>
<td>340</td>
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<td>38</td>
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<td>1</td>
<td>14</td>
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</tr>
<tr>
<td></td>
<td>Pain/Tingling Skin</td>
<td>503</td>
<td>57</td>
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a. Chi Square test reported as likelihood ratio.
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<td>Television Show or Radio</td>
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<tr>
<td>Newspaper/Magazine or Billboard Ad</td>
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<td>Pharmacy/Store Advertisement</td>
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<td>Doctor</td>
<td>244</td>
<td>45</td>
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<td>Friends or Family</td>
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<td>23</td>
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<tr>
<td>Work</td>
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<tr>
<td>Other</td>
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Table 11: Inter-Panel Comparisons, Vaccination Status, Shingles Survey, 2012

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<th>p</th>
<th>Chi Squared</th>
<th>Phi</th>
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<td>%</td>
<td>N</td>
<td>%</td>
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<td>Knowing Others with Shingles</td>
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<td></td>
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<td>&lt;0.001</td>
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</tr>
<tr>
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<td>1</td>
<td>0</td>
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<tr>
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<td>1</td>
<td>14</td>
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</tr>
<tr>
<td></td>
<td>Low</td>
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<td>21</td>
<td>112</td>
<td>26</td>
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<tr>
<td></td>
<td>Moderate</td>
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<td>45</td>
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<td>53</td>
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<td>How Painful Think Shingles Is</td>
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<td>---</td>
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<tr>
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<td>8</td>
<td>---</td>
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</tr>
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<tr>
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<td>3</td>
<td>34</td>
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</tr>
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<td></td>
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<td>37</td>
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<td>Most Years</td>
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<td>Rarely</td>
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<td>Never</td>
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Table 11: Inter-Panel Comparisons, Vaccination Status, Shingles Survey, 2012 (cont.)

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<td>N</td>
<td>%</td>
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<td>Doctor Advise Against Vaccination</td>
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<td>Effectiveness of Shot at Preventing Shingles</td>
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<td>121</td>
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<td>Very</td>
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<td>13</td>
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*a Chi Square test reported as likelihood ratio.
Intra-Panel Analyses

This section presents intra-panel analyses across sample strata (gender, age, and race). Table 12 presents intra-panel comparison data of survey questions posed to vaccinated respondents. Table 13 presents intra-panel comparison data of survey questions posed to unvaccinated respondents.
Table 14 presents intra-panel comparison data of survey questions posed to both un/vaccinated respondents. Note that for racial analyses, there were few cases of non-whites, which does not make for meaningful analysis.
Table 12: Shingles Vaccination Perceptions ≥50 years, by Gender, Age, and Race (Vaccinated)—Shingles Survey, 2012

<table>
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<th>Survey Questions</th>
<th>Gender</th>
<th>Age (Years)</th>
<th>Race</th>
<th>p</th>
</tr>
</thead>
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<td></td>
<td>Male</td>
<td>Female</td>
<td>50-64</td>
<td>65+</td>
</tr>
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<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Not important</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>A little important</td>
<td>6</td>
<td>3</td>
<td>8</td>
<td>3</td>
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<tr>
<td>Somewhat important</td>
<td>56</td>
<td>27</td>
<td>34</td>
<td>11</td>
</tr>
<tr>
<td>Extremely important</td>
<td>149</td>
<td>71</td>
<td>268</td>
<td>85</td>
</tr>
<tr>
<td>Importance of Family or Friends Sick</td>
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<td>%</td>
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<td></td>
</tr>
<tr>
<td>with Shingles</td>
<td>N</td>
<td>%</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Not important</td>
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<td>2</td>
<td>22</td>
<td>8</td>
</tr>
<tr>
<td>A little important</td>
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<td>Influence From Friends to Get Shingles Shot</td>
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<td>N</td>
<td>%</td>
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<td>Not important</td>
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<td>122</td>
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<tr>
<td>A little important</td>
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<tr>
<td>Somewhat important</td>
<td>47</td>
<td>3</td>
<td>64</td>
<td>1</td>
</tr>
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<td>Extremely important</td>
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</tr>
<tr>
<td>Influence From Family to Get Shingles Shot</td>
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<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Not important</td>
<td>95</td>
<td>5</td>
<td>144</td>
<td>8</td>
</tr>
<tr>
<td>A little important</td>
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<td>Age (Years)</td>
<td>Race</td>
<td>p</td>
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<td></td>
<td>Male</td>
<td>Female</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Take Care of Health</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>210 (98)</td>
<td>305 (7)</td>
<td>153 (97)</td>
<td>362 (98)</td>
</tr>
<tr>
<td>No</td>
<td>4 (2)</td>
<td>10 (3)</td>
<td>5 (3)</td>
<td>9 (2)</td>
</tr>
<tr>
<td>Didn’t Want Miss Work/Lose Pay</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>25 (32)</td>
<td>25 (27)</td>
<td>23 (28)</td>
<td>27 (30)</td>
</tr>
<tr>
<td>No</td>
<td>54 (68)</td>
<td>67 (72)</td>
<td>59 (71)</td>
<td>62 (70)</td>
</tr>
<tr>
<td>Which Symptoms Avoid by Vaccination</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rash/Itch on Face/Body</td>
<td>20 (11)</td>
<td>26 (9)</td>
<td>10 (7)</td>
<td>36 (1)</td>
</tr>
<tr>
<td>Blisters</td>
<td>1 (1)</td>
<td>5 (2)</td>
<td>3 (2)</td>
<td>3 (1)</td>
</tr>
<tr>
<td>Pain/Tingling of Skin</td>
<td>120 (66)</td>
<td>214 (74)</td>
<td>106 (75)</td>
<td>228 (70)</td>
</tr>
<tr>
<td>Blindness/Sight</td>
<td>2 (1)</td>
<td>4 (1)</td>
<td>2 (1)</td>
<td>4 (1)</td>
</tr>
<tr>
<td>Complications</td>
<td>39 (21)</td>
<td>39 (4)</td>
<td>21 (15)</td>
<td>57 (17)</td>
</tr>
<tr>
<td>How Safe Think Shingles Vaccine Is?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all safe</td>
<td>2 (1)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>2 (1)</td>
</tr>
<tr>
<td>A little safe</td>
<td>4 (2)</td>
<td>3 (1)</td>
<td>3 (2)</td>
<td>4 (1)</td>
</tr>
<tr>
<td>Somewhat safe</td>
<td>21 (10)</td>
<td>37 (12)</td>
<td>21 (14)</td>
<td>37 (10)</td>
</tr>
<tr>
<td>Very safe</td>
<td>179 (87)</td>
<td>263 (87)</td>
<td>130 (84)</td>
<td>312 (8)</td>
</tr>
<tr>
<td>Know Shingles Vaccination is Live Virus Vaccine?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>167 (82)</td>
<td>217 (74)</td>
<td>121 (81)</td>
<td>263 (76)</td>
</tr>
<tr>
<td>No</td>
<td>36 (18)</td>
<td>76 (26)</td>
<td>28 (19)</td>
<td>84 (26)</td>
</tr>
<tr>
<td>If Knew Live Virus, Would Vaccinate?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>32 (94)</td>
<td>66 (92)</td>
<td>24 (86)</td>
<td>74 (95)</td>
</tr>
<tr>
<td>No</td>
<td>2 (6)</td>
<td>6 (8)</td>
<td>4 (14)</td>
<td>4 (5)</td>
</tr>
<tr>
<td>File Medical Insurance Claim?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>22 (11)</td>
<td>29 (10)</td>
<td>14 (9)</td>
<td>37 (11)</td>
</tr>
<tr>
<td>No</td>
<td>182 (89)</td>
<td>268 (90)</td>
<td>142 (91)</td>
<td>308 (89)</td>
</tr>
</tbody>
</table>
Table 13: Shingles Vaccination Perceptions, ≥50 years, by Gender, Age, and Race (Non-vaccinated)—Shingles Survey, 2012

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Gender</th>
<th>Age (Years)</th>
<th>Race</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>N  %</td>
</tr>
<tr>
<td>Primary Reason for Not Getting Shingles Vaccine</td>
<td></td>
<td></td>
<td>p</td>
</tr>
<tr>
<td>Vaccine Cost too Much</td>
<td>14 7</td>
<td>16 6</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Inadequate vaccine supplies</td>
<td>5 3</td>
<td>3 1</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Recently found out about shingles vaccine</td>
<td>18 9</td>
<td>24 9</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Don’t have shingles/don’t think I will get</td>
<td>59 30</td>
<td>46 18</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>shingles/not concerned about shingles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Already had shingles and there would be no</td>
<td>10 5</td>
<td>26 10</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>point in getting shingles vaccine now</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor did not recommend vaccine</td>
<td>33 17</td>
<td>55 21</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Fear of vaccine or afraid of needles</td>
<td>17 9</td>
<td>29 11</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Vaccine would not help me/ efficacy concerns</td>
<td>5 3</td>
<td>7 3</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Other (specify)</td>
<td>39 20</td>
<td>57 22</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Do Not Think will Get Disease</td>
<td></td>
<td></td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Yes</td>
<td>65 35</td>
<td>57 22</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>No</td>
<td>121 65</td>
<td>198 78</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Do Not Trust Shingles Vaccine</td>
<td></td>
<td></td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Major</td>
<td>16 8</td>
<td>33 12</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Minor</td>
<td>33 16</td>
<td>32 12</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Not a Reason</td>
<td>152 76</td>
<td>201 76</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>
Table 13: Shingles Vaccination Perceptions, ≥50 years, by Gender, Age, and Race (Non-vaccinated)—Shingles Survey, 2012 (cont.)

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Gender</th>
<th>Age (Years)</th>
<th>Race</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>50-64</td>
<td>65+</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Do Not Like Needles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major</td>
<td>9</td>
<td>5</td>
<td>19</td>
</tr>
<tr>
<td>Minor</td>
<td>22</td>
<td>11</td>
<td>30</td>
</tr>
<tr>
<td>Not a Reason</td>
<td>171</td>
<td>85</td>
<td>220</td>
</tr>
<tr>
<td>I Might Get Sick From The Shingles Vaccine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major</td>
<td>16</td>
<td>8</td>
<td>37</td>
</tr>
<tr>
<td>Minor</td>
<td>32</td>
<td>16</td>
<td>42</td>
</tr>
<tr>
<td>Not a Reason</td>
<td>151</td>
<td>76</td>
<td>187</td>
</tr>
<tr>
<td>Do Not Think Vaccine is Effective at Preventing Shingles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major</td>
<td>9</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Minor</td>
<td>24</td>
<td>12</td>
<td>34</td>
</tr>
<tr>
<td>Not a Reason</td>
<td>160</td>
<td>83</td>
<td>196</td>
</tr>
<tr>
<td>Cost Reason to Not Vaccinate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major</td>
<td>18</td>
<td>9</td>
<td>31</td>
</tr>
<tr>
<td>Minor</td>
<td>19</td>
<td>10</td>
<td>19</td>
</tr>
<tr>
<td>Not a Reason</td>
<td>159</td>
<td>81</td>
<td>209</td>
</tr>
<tr>
<td>Inconvenience Reason in Decision to Not Vaccinate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major</td>
<td>3</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>Minor</td>
<td>29</td>
<td>14</td>
<td>30</td>
</tr>
<tr>
<td>Not a Reason</td>
<td>170</td>
<td>84</td>
<td>222</td>
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Table 13: Shingles Vaccination Perceptions, ≥50 years, by Gender, Age, and Race (Non-vaccinated)—Shingles Survey, 2012 (cont.)

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Gender</th>
<th></th>
<th>Age (Years)</th>
<th></th>
<th>Race</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>50-64 N</td>
<td>N</td>
<td>65+  N</td>
<td>N</td>
</tr>
<tr>
<td>Live Virus Vaccine a Reason in Decision to Not</td>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Vaccinate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very important</td>
<td>24</td>
<td>12</td>
<td>58</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat important</td>
<td>23</td>
<td>12</td>
<td>25</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little important</td>
<td>21</td>
<td>11</td>
<td>31</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all important</td>
<td>131</td>
<td>66</td>
<td>149</td>
<td>57</td>
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<td></td>
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</tbody>
</table>
Table 14: Shingles Vaccination Perceptions, ≥50 years, by Gender, Age, and Race (Both)—Shingles Survey, 2012

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Gender</th>
<th>Age (Years)</th>
<th>Race</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>50-64</td>
<td>65+</td>
</tr>
<tr>
<td>Know Anyone Sick with Shingles?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>166</td>
<td>79</td>
<td>277</td>
<td>8</td>
</tr>
<tr>
<td>No</td>
<td>44</td>
<td>21</td>
<td>38</td>
<td>12</td>
</tr>
<tr>
<td>Non-vaccinated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>134</td>
<td>13</td>
<td>212</td>
<td>79</td>
</tr>
<tr>
<td>No</td>
<td>68</td>
<td>34</td>
<td>57</td>
<td>21</td>
</tr>
<tr>
<td>How Painful is Shingles?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Somewhat</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Moderate</td>
<td>24</td>
<td>12</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Very</td>
<td>175</td>
<td>86</td>
<td>294</td>
<td>96</td>
</tr>
<tr>
<td>Not at all</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Somewhat</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Moderate</td>
<td>29</td>
<td>15</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Very</td>
<td>160</td>
<td>83</td>
<td>236</td>
<td>91</td>
</tr>
<tr>
<td>Chances of Getting Shingles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Vaccinated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very low</td>
<td>48</td>
<td>24</td>
<td>40</td>
<td>14</td>
</tr>
<tr>
<td>Low</td>
<td>53</td>
<td>26</td>
<td>49</td>
<td>17</td>
</tr>
<tr>
<td>Moderate</td>
<td>77</td>
<td>38</td>
<td>145</td>
<td>50</td>
</tr>
<tr>
<td>High</td>
<td>23</td>
<td>11</td>
<td>58</td>
<td>20</td>
</tr>
<tr>
<td>Very low</td>
<td>155</td>
<td>74</td>
<td>206</td>
<td>67</td>
</tr>
<tr>
<td>Low</td>
<td>39</td>
<td>19</td>
<td>65</td>
<td>21</td>
</tr>
<tr>
<td>Moderate</td>
<td>12</td>
<td>6</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>High</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Very low</td>
<td>63</td>
<td>34</td>
<td>49</td>
<td>20</td>
</tr>
<tr>
<td>Post-Vaccinated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very low</td>
<td>56</td>
<td>31</td>
<td>56</td>
<td>23</td>
</tr>
<tr>
<td>Low</td>
<td>46</td>
<td>25</td>
<td>102</td>
<td>42</td>
</tr>
<tr>
<td>Moderate</td>
<td>18</td>
<td>10</td>
<td>35</td>
<td>15</td>
</tr>
</tbody>
</table>
Panel Comparisons (Common Questions)

Awareness of HZ and Vaccination / Awareness Source/ Knowing Others with Shingles

Most respondents were aware of herpes zoster as a medical condition and all respondents are aware of the shingles vaccination (inclusion criteria). A variety of awareness sources were recorded, ranging from CDC website and Facebook, media, advertisements, providers, and social networks. The most frequently cited sources of awareness for vaccinated respondents include doctor (45%, n=244) versus 14% for non-vaccinated respondents (n=82). Television show or radio were a common source of awareness for the non-vaccinated respondents (32%, n=190) versus 7% (n=37) for the vaccinated respondents. Social networks of friends or family were more frequently cited awareness sources by vaccinated respondents (23%, n=126) versus non-vaccinated respondents at 15% (n=89). A majority of vaccinated respondents (84%, n=443) reported knowing others with shingles versus non-vaccinated (74%, n=346) (p<0.001).

Perceptions of Pain/ Developing Shingles/ Primary Symptom of Shingles

Large majorities from each group perceive shingles to be very painful. Perceptions of developing shingles vary by vaccination status, with 61% of vaccinated (n=303) versus 48% non-vaccinated respondents (n=201) perceived moderate to high chances of developing shingles and 39% of vaccinated (n=190) versus 52% non-vaccinated respondents (n=224) perceiving very low to low chances of developing shingles (p<0.001).

Comparing pre and post vaccinated states, respondents believed they had a moderate to high change of developing shingles prior to vaccination, however, after vaccination risk perceptions decreased post vaccination, demonstrating that vaccinated respondents believe that the vaccine
works—61% and 39% of pre-vaccinated respondents reported a moderate to high chance and very low to low, chance of developing shingles, respectively. Post vaccination, 10% and 90% of vaccinated respondents (post vaccination) reported a moderate to high to very low to low and chance of developing shingles, respectively (p<0.001).

Vaccinated male perceptions of developing shingles are lower than the perceived risk reported by females for all risk surveyed categories (p<0.05). Moreover, the data also shows that while both male and female’s perceptions of shingles development post vaccination declined, female perceptions of shingles development did not decline as much as male suggesting that males are more optimistic about the protection affects of the vaccination post vaccination (p>0.05). Perceptions of lifetime risk of shingles by age shows comparable perceptions across groups but highlights that in both age groups there was a moderate perception of (p>0.05).

The unvaccinated panel’s perceptions of lifetime risk of shingles show that males generally perceive lower chances of developing shingles than females (p<0.001).

When non-vaccinated respondents were asked if they believed that they would not develop shingles, almost three quarters of respondents (72%) reported No (n=319), suggesting that the non-vaccinated respondents understand their risk of developing shingles. This was especially relevant across gender (p<0.001). Vaccinated respondents tend to perceive the shingles vaccine as more effective than unvaccinated respondents, whereas non-vaccinated respondents report lower perceptions of effectiveness (p<0.001).
Symptom recognition was more or less evenly distributed between groups, with pain and tingling of skin named as the most frequently cited response, rash and itchiness of skin as the second most frequently cited response, and blisters as the third more frequently cited response.

**Influenza Vaccination, Tetanus Shot, and Pneumococcal Vaccination**

Survey data shows that respondents who received the shingles vaccination versus those who did not differed by flu vaccination status, \( \chi^2(1, N=997) = 69, p<0.001 \), with a moderate correlation between the two variables, \( r(995)=0.30, p<0.001 \). Shingles vaccination status also differed by tetanus vaccination status, \( \chi^2(1, N=927) = 10, p<0.05 \), with a small correlation between the two variables, \( r(925)=-0.10, p<0.05 \), and by pneumococcal vaccination, \( \chi^2(1, N=545) = 27, p<0.001 \), with a moderate correlation between the two variables, \( r(543)=0.20, p<0.001 \). This suggests that those who got the shingles vaccination were more likely to have had other vaccinations.

**Talk with Doctor / Doctor Recommend /Doctor Advise Against Shingles Vaccination**

A majority of vaccinated respondents spoke with their doctors and their doctors recommended the shingles vaccination, whereas a third of non-vaccinated respondents spoke with their doctors and reported that their doctor did not recommend the shingles vaccination (\( p<0.001 \)). Respondents who received the shingles vaccination versus those that did not differed by physician recommendation, \( \chi^2(1, N=997) = 451, p<0.001 \), with a high correlation between the two variables, \( r(975)=0.68, p<0.001 \). Physicians also overwhelmingly recommend shingles vaccination to the older age group—62% of 65+ years olds report having received recommendation for vaccination versus 40% of 50-64 years old report doctor recommendation for vaccination, \( \chi^2(1, N=977) = 46, p<0.001 \), with a moderate correlation between the two variables, \( r(975)=0.22, p<0.001 \). A large percentage of vaccinated and non-vaccinated
respondents reported that they were not specifically advised against the vaccination by their doctor.

**Willingness of Pharmacist to Administer Shingles Vaccination/ Willingness to Pay**

Vaccinated respondents indicated a willingness to have a pharmacist administer the shingles vaccination, although this question was posed to a few respondents due to survey skipping pattern thus the result should be interpreted with caution (89%, n=8) (p<0.05). The entire non-vaccinated panel was asked this question and there was a less dramatic skew of the data of whether the pharmacist would administer the shot —55% of respondents (n=246) indicating a willingness, and 45% indicating an unwillingness (n=204).

Across vaccination panels, a majority of respondents (83%, n=730) paid, or would be willing to pay no more than $50 for the shingles vaccination. Seventy-one percent (71%) of vaccinated respondents (n=328) paid less than $25, and an additional 9% (n=41) paid less than $50 for the vaccination. When out of pocket cost data are compared to the hypothetical question posed to the non-vaccinated cohort on willingness to pay, 60% of the non-vaccinated cohort (n=250) indicated willingness to pay not more than $25, with an additional 27% (n=111) indicating a willingness to pay less than $50 for the vaccination. These data suggest that non-vaccinated respondents may be willing to pay more than the vaccinated cohort actually paid for the vaccination (p<0.001).
**Reasons for Vaccinating (Vaccinated Panel)**

**Importance of Prevention/ Family or Friends with Shingles/Influence of Family or Friends to Vaccinate**

A majority of vaccinated respondents reported that vaccinating was ‘extremely important’ to preventing shingles. A greater percentage of females (85%, n=268) place emphasis on preventing shingles (‘extremely important’) than males (71%, n=149). Males nevertheless believe in the importance of preventing shingles with more males (27%, n=56) than females (11%, n=34) responding that vaccinating to prevent shingles was ‘somewhat important’ (p<0.001).

When asked how important it was that someone in one’s family or among one’s friends had already been sick with shingles, close to 65% of vaccinated respondents (n=279) answered that having family or friends sick with shingles was extremely important to getting a shingles vaccination. Females (71%, n=191) tend to place greater emphasis on preventing shingles based on history of family or friends having had shingles than males (54%, n=88), although at the ‘somewhat important’ response level, a greater percentage of males (30% n=49) versus 18% of females (n=48) reported the importance of getting a shingles vaccination based on family or friends experience (p<0.005).

Responses regarding whether family or friends influenced the decision to vaccinate with shingles are comparably split. When asked the importance of one’s family influencing the decision to vaccinate, just 43% (n=217) reported that it was ‘extremely’ to ‘somewhat important’, whereas 44% (n=222) reported that it was ‘extremely’ to ‘somewhat important’ that their friends influenced the decision to vaccinate. Comparison of shingles vaccination influence by friends or
family shows that neither friends or family more strongly influence shingles vaccination decisions than the other (p<0.001).

**Take Care of Health/Symptoms Avoided by Vaccinating/Miss Work or Lose Pay**

Almost all vaccinated respondents wanted to take care of their health and indicated being healthy as a reason for vaccinating. When asked what specific symptom of the shingles disease vaccinated respondents wished to avoid by getting vaccinated, almost three quarters of respondents wanted to avoid pain/tingling of the skin. Missing work or losing pay was not a motivator to vaccinate with the shingles vaccine for a majority of respondents (p>0.05).

**Safety Perceptions of Shingles Vaccine/ Vaccination Live Virus**

An overwhelming majority of vaccinated respondents answered that the shingles vaccine is very safe. Nearly 80% of vaccinated respondents reported that knowing that the shingles vaccination was a live virus vaccine. That the shingles vaccine was a live virus vaccine was known by more males (p<0.05). Respondents who did not know that the vaccination was a live virus vaccine were asked if they would still have received the vaccine if knew that the vaccination is a live virus and 93% responded yes (n=106). This suggests that the vaccinated cohort is not hesitant with the live formulation of the vaccine and are determined to vaccinate against shingles.
Needing to File Medical Insurance Claim for Reimbursement

A majority of vaccinated respondents did not have to file a medical insurance claim for reimbursement of the shingles vaccine (p>0.05).

Reasons for Not Vaccinating (Non-Vaccinated Panel)

Primary Reason for Not Getting Shingles Vaccination/Think Won't Get Shingles

Non-vaccinated respondents provided varied answers when asked what the primary reason was that they did not get the shingles vaccination— from perceptions that respondents don’t think they will get shingles/not concerned about shingles, that their doctor did not recommend vaccine (patient either too young or doctor felt vaccine not necessary), fear of vaccine (safety/allergic reaction concerns) or afraid of needles, recently found out about shingles vaccine /haven’t gotten vaccine yet. Other responses stated that they already had shingles and there would be no point in getting shingles vaccine now, cited the high vaccine cost, and inadequate vaccine supplies. The greatest difference in reasons was by age (p<0.05). Males and non-white respondents believed that they would not get shingles (p<0.05).

Verbatim responses to this question include the following: “I'm afraid I’ll get shingles if I get the shot,” “I’ve never had the chicken pox,” “because a friend contracted shingles after getting the live virus vaccine and died from it, never got better,” “Because of family history - no one in family got it,” “Because she was spending time with someone who was pregnant, and it was not until she was actually in the Dr.'s office to get the shot and filling out the questionnaire that she found out that the vaccine is a live virus, and she should not get it if she is spending time with children, or pregnant women,” “doesn’t know where to go to get the shot,” “doctor did not have
it,” “felt that I was too young,” and “forgets to bring it up to doctor, doctor hasn’t mentioned it when she was there,” “have to find out who will pay for it,” “Heard not recommended for people under 60 - too young,” “I don’t believe in vaccines I think its a government thing,” “insurance company wouldn’t pay for shingles shot unless administered the shot from the office,” “don’t trust vaccines,” “have not discussed with doctor,” “didn’t know I had to get it”.

**Do Not Trust Vaccine/ Do Not Like Needles/ Might Get Sick/ Vaccine Not Effective**

More that three quarters of respondents reported that their decision to not get the shingles vaccine was not because the respondents did not trust the vaccine. Results for major and minor reasons for not trusting the vaccine were comparable, although more females reported not trusting the vaccine as a major reason as well as have more of an aversion to needles (p>0.05). When compared by race, the results show that whites lacked trust in the vaccine more than non-whites (p<0.05). White respondents had more of a fear of needles than non-whites (p<0.001).

For almost three quarters of respondents, the perception of getting sick from shingle vaccination was not a reason not to vaccinate, however, the perception of getting sick from shingle vaccination influenced white respondents’ behavior versus non-white respondents (<0.05).

A majority of non-vaccinated respondents reported that not getting the shingles vaccine was not because of a belief the shingles vaccine is ineffective, however, white respondents reported the belief that the shingles vaccination is ineffective as a major reason for not vaccinating, more so than non-white respondents (p<0.05).
Inconvenience/ Live Virus/ Cost

A majority of respondents reported that not getting the shingles vaccine was not because of inconvenience factors, however more females categorized inconvenience was a major reason for non-vaccinating and more young respondents cited inconvenience as a reason for their vaccination behavior (p<0.05).

The influence of the shingles vaccination as a live virus vaccine on non-vaccinated respondents was apparent across gender (very important for females), age (very important for the older cohort) and race (very important for white respondents) (p<0.05). A majority of respondents stated that cost was not a reason to not obtain the shingles vaccination, however, cost mattered more to the older cohort who answered that cost was a major reason for non-vaccinating (p<0.05).

Multivariate Analysis

Missing Cases and Low Variability Analyses

Seven predictor variables (MA shingles survey and MA BRFSS) have significant numbers of missing cases that reduce the denominator below an acceptable number of cases for meaningful statistical analysis. Missing cases are noted in instances where respondents reported not knowing the answer to the question or when a question used a customized skip pattern. Variables missing more that 10% data were excluded from regression analysis. Five questions from the MA shingles survey [ (1) pneumococcal vaccination, (2) Did Doctor Advise Against Vaccination, (3) effectiveness of shingles shot, (4) willingness of pharmacist to administer vaccination, (5) payment, and four questions from MA BRFSS [ (6) income, (7) health insurance, (8) Medicare, (9) medical cost were excluded. In addition, two variables with low
variability were removed from statistical analysis (health insurance and medical cost; >95% of respondents reported having health coverage and that medical cost was not an issue in obtaining health care) (see Appendix I, Missing Cases and Low Variability).

**Multi-Collinearity/Redundancy**

Variable redundancy (co linearity of one or more predictor variables) was assessed via tolerance and variance inflation factor (VIF) analysis. All tolerance and VIF values were above 0.5 and below 2, respectively, indicating that no predictor variables are correlated with other variables.

A cross tabulation analysis of age and employment status variables showed that the percentage of employed/unemployed respondents differed by age, $\chi^2(1, N=999) = 178, p= 0.000$, with a moderate correlation between the two variables, $r(997)=0.42, p<0.001$. Also, a majority of older respondents (65+ yrs old) are Not Employed, e.g. retired ($n=402$). For this reason, the employment variable was removed from of the regression model.
**Interaction Analysis**

Analysis using the General Linear Model for between subject effects tests (main effects and two way interactions; custom model) was performed for shingles vaccination (DV) for the following significant predictors in the logistic regression model: (1) Perceptions of Developing Shingles During Lifetime, (2) Doctor Recommend Shingles Vaccination, (3) Flu Vaccination status, (4) Gender, (5) Age, (6) Marital Status, (7) College Education, and (8) Employment Status. Significant interactions (p<0.05) were obtained for perceptions of getting shingles during lifetime by age, doctor recommendation for shingles vaccination by age, doctor recommendation for shingles vaccination by flu vaccination, doctor recommendation for shingles vaccination by gender, age by employment status, and gender by age. Age interacted significantly in the preliminary analysis and suggests it to be an effect modifier because its presence in the model modifies the impact of shingles perceptions, doctor recommendation, employment status, and gender. Due to the multiplicative effects of age, age-specific logistic regression models were run to account for the 4 interaction variables, rather than model all the interaction terms.

**Logistic Regression and Predictive Marginal Modeling**

A logistic regression model was fit to the 2012 MA BRFSS shingles survey data set to explain the predicted odds of receiving a shingles vaccination. The model used the following main effects variables to predict the odds of shingles vaccination: (1) perception of developing shingles, (2) influenza vaccination, (3) doctor recommendation for shingles vaccination, (4) gender, (5) age, (6) marital status), and (7) education (Figure 11). Interpretation of the three regression models relative to the covariates that influence vaccination odds (p<0.05) is provided in the following pages. Data on odds ratios, probabilities (p) of the Wald statistics, predictive marginal and predicted probabilities, number of cases included in analysis, pseudo $R^2$, and
overall classification on the percentage of correctly predicted cases are summarized in Table 15 through Table 17.

**Figure 11: Binary Logistic Regression Model: Explanatory and Fixed Factor Variables, 2012 MA Shingles Survey**

<table>
<thead>
<tr>
<th>Co-Variables</th>
<th>Variable Type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Explanatory Variables</strong></td>
<td></td>
</tr>
<tr>
<td>Perceptions of developing shingles</td>
<td>Ordinal&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Influenza vaccination</td>
<td>Dichotomous&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Doctor recommendation</td>
<td>Dichotomous</td>
</tr>
<tr>
<td><strong>Fixed Factors</strong></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Dichotomous</td>
</tr>
<tr>
<td>Age</td>
<td>Dichotomous&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Marital status</td>
<td>Dichotomous&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Education</td>
<td>Dichotomous&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> Ordinal variable treated as interval level data in logistic regression analysis.
<sup>b</sup> Influenza vaccination frequency recorded as ordinal in 2012 shingles survey; variable recoded into dichotomous variable (Yes Flu/No Flu vaccination).
<sup>c</sup> Age recoded as interval variable (coded in years) in 2012 MA BRFSS; variable recoded into two age groups (50-64 yrs and 65+ yrs) in 2012 shingles survey.
<sup>d</sup> Marital status recorded as nominal/categorical variable in 2012 MA BRFSS; variable recoded into two groups (married and unmarried) in 2012 shingles survey.
<sup>e</sup> Education recorded as ordinal variable in 2012 MA BRFSS; variable recoded into two groups (college and no college) in 2012 shingles survey.

**Main Multivariate Regression Model 1**

In the main multivariable analysis model, characteristics independently associated with an increased likelihood of shingles vaccination include influenza vaccination and doctor recommendation (p<0.05). Age was independently associated with a decreased likelihood of shingles vaccination (p<0.05).

The main regression model confirms that the above independent predictors have an effect on the propensity to receive the shingles vaccination, c2(7, N= 890)=502, p=000). The overall percent of cases correctly predicted by the model is 84%. The covariates account for 58% (Nagelkerke R<sup>2</sup> = 0.58) of the explanation for why individuals elect to receive the shingles vaccination.
**Age-Specific Multivariate Regression Model 2 (50-64 Year-Old)**

In the 50-64 years-old multivariable analysis model, characteristics independently associated with an increased likelihood of shingles vaccination were influenza vaccination and doctor recommendation to receive the shingles vaccine (p<0.05). Gender was independently associated with a decreased likelihood of shingles vaccination (p<0.05).

This age specific regression model confirms that the independent predictors have an effect on the propensity to receive the shingles vaccination for the 50-64 year old cohort, $\chi^2(6,N= 377)=227 , p=000)$. The overall percent of cases correctly predicted by this model is 87%. The covariates account for 61% (Nagelkerke $R^2 = 0.61$) of the explanation for why younger individuals elect to receive the shingles vaccination.

**Age-Specific Multivariate Logistic Regression Model 3 (65+ Years Old)**

In the 65+ year-old multivariable analysis model, the characteristics found to independently increase the likelihood of shingles vaccination include perceptions of developing shingles, influenza vaccination, and doctor recommendation (p<0.05).

This model shows that that the independent predictors have an effect on the propensity to receive the shingles vaccination, $\chi^2(6,N= 513)=236 , p=000)$. The overall percent of cases correctly predicted by the full model is 83%. The covariates account for 51% (Nagelkerke $R^2 =0.51$) of the explanation for why individuals elect to receive the shingles vaccination.
Table 15: Characteristics Independently Associated with HZ Vaccination: Main Logistic Regression Model

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Odds Ratio</th>
<th>p</th>
<th>Predictive Marginal&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50-64 Years Old</td>
<td>0.5</td>
<td>0.000</td>
<td>Referent</td>
<td>0.02</td>
</tr>
<tr>
<td>65+ Years Old</td>
<td>0.58</td>
<td>0.02</td>
<td></td>
<td>0.02</td>
</tr>
<tr>
<td><strong>Perceptions of developing shingles</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Low</td>
<td>1.1</td>
<td>0.204</td>
<td>Referent</td>
<td>0.03</td>
</tr>
<tr>
<td>Low</td>
<td>0.53</td>
<td>0.03</td>
<td></td>
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<tr>
<td>Moderate</td>
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<td>0.02</td>
<td></td>
<td></td>
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<tr>
<td>High</td>
<td>0.56</td>
<td>0.03</td>
<td></td>
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</tr>
<tr>
<td><strong>Influenza vaccination</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>4.5</td>
<td>0.000</td>
<td>Referent</td>
<td>0.04</td>
</tr>
<tr>
<td>Yes</td>
<td>0.56</td>
<td>0.01</td>
<td></td>
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</tr>
<tr>
<td><strong>Doctor Recommendation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>24.3</td>
<td>0.000</td>
<td>Referent</td>
<td>0.02</td>
</tr>
<tr>
<td>Yes</td>
<td>0.82</td>
<td>0.02</td>
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</tr>
<tr>
<td><strong>Gender</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0.9</td>
<td>0.540</td>
<td>Referent</td>
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</tr>
<tr>
<td>Female</td>
<td>0.55</td>
<td>0.02</td>
<td></td>
<td></td>
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<tr>
<td><strong>Marital status</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Not Married</td>
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<td>0.062</td>
<td>Referent</td>
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<tr>
<td>Married</td>
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<td>0.02</td>
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<tr>
<td><strong>Education</strong></td>
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<tr>
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</tr>
<tr>
<td>College</td>
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<td>0.01</td>
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</tr>
</tbody>
</table>

Cases Included (N) 890
Cases Rejected (N) 110
Pseudo R<sup>2</sup> 0.58
Overall Classification (%) 84

<sup>a</sup> All predicted margins are many times greater than their standard errors and thus are all statistically significant at the 0.001 level.
Table 16: Characteristics Independently Associated with HZ Vaccination: Age Specific (50-64 Years Old) Logistic Regression Model

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Odds Ratio</th>
<th>p</th>
<th>Predictive Margin(^a)</th>
<th>Standard Error</th>
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</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50-64 Years Old</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>65+ Years Old</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td><strong>Perceptions of Developing Shingles</strong></td>
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<td></td>
</tr>
<tr>
<td>Very Low</td>
<td>0.8</td>
<td>0.4</td>
<td>Referent</td>
<td>0.04</td>
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<tr>
<td>Low</td>
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<tr>
<td><strong>Influenza vaccination</strong></td>
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<td></td>
</tr>
<tr>
<td>No</td>
<td>3.0</td>
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<td>Referent</td>
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<tr>
<td>Yes</td>
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<td>0.02</td>
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<td><strong>Doctor Recommendation</strong></td>
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<tr>
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<td>44.8</td>
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<td>Referent</td>
<td>0.02</td>
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<td>Yes</td>
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<td><strong>Gender</strong></td>
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<tr>
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<td>0.4</td>
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<td>College</td>
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<td><strong>Cases Included (N)</strong></td>
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<tr>
<td><strong>Cases Rejected (N)</strong></td>
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<tr>
<td><strong>Pseudo R(^2)</strong></td>
<td>0.61</td>
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<tr>
<td><strong>Overall Classification (%)</strong></td>
<td>87</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) All predicted margins are many times greater than their standard errors and thus are all statistically significant at the 0.001 level.
Table 17: Characteristics Independently Associated with HZ Vaccination: Age Specific (65+ Years Old) Logistic Regression Model

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Odds Ratio</th>
<th>p</th>
<th>Predictive Margins</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50-64 Years Old</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>65+ Years Old</td>
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<td></td>
</tr>
<tr>
<td><strong>Perceptions of Developing Shingles</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Low</td>
<td>1.3</td>
<td>0.030</td>
<td>Referent</td>
<td>0.04</td>
</tr>
<tr>
<td>Low</td>
<td>0.61</td>
<td>0.03</td>
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<td>Moderate</td>
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<td>High</td>
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<td><strong>Influenza Vaccination</strong></td>
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<td>Referent</td>
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<td>0.67</td>
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<td><strong>Doctor Recommendation</strong></td>
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<td>19.6</td>
<td>0.000</td>
<td>Referent</td>
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<td></td>
<td>0.86</td>
<td>0.02</td>
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<tr>
<td><strong>Gender</strong></td>
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<tr>
<td><strong>Overall Classification (%)</strong></td>
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\(^b\) All predicted margins are many times greater than their standard errors and thus are all statistically significant at the 0.001 level.
CHAPTER 7: DISCUSSION, POLICY IMPLICATIONS AND FURTHER RESEARCH

Part A Discussion

While Massachusetts may be among the best vaccinating states in the country— with a strong immunization program, increased access to vaccination, a strong physician infrastructure, a small and largely white population — the shingles survey shows that even Massachusetts has a way to go in reaching health parity for all its citizens. Since respondents were required to be aware of the shingles vaccination (per the survey sampling criteria), the fact that 100% of respondents were aware of the shingles vaccine is an artificial manifestation of awareness and is not representative of the state population’s true awareness. In fact, the survey sampling phase found that non-vaccinated adults (whites and non-whites) overwhelmingly reported a lack of knowledge about the shingles vaccine, and were therefore deemed ineligible from participating in the survey. Specifically, 60% of white and 82% of non-white, non-vaccinated males (both age groups), 50% of white and 80% of non-white, non-vaccinated young females, and 58% of white and 74% of non-white, non-vaccinated older females reported lack of awareness of the shingles vaccine.

It would be wrong to assume that a public relations campaign is not required to increase shingles vaccine awareness by simply looking at the fact that all shingles survey participants were aware of the shingles vaccine. The aforementioned groups have no idea that there is an available shingles vaccine and the shingles survey is silent on these people’s perceptions of the topic. It is therefore not possible to estimate the true percentage of the state population that is aware versus
not aware of the vaccination, their demographics nor access to care variables, and also not possible to test for the revealed preferences phenomenon to understand whether there is an association between HZ awareness (and lack of it) and vaccination decision-making. There is clearly a need to increase outreach in these specific subgroups. However, simply informing the public is not enough, because as this survey shows, even when the population is aware of the vaccine some still avoid the vaccination.

The Massachusetts shingles survey examined reasons behind population based vaccination prevalence to understand the thought processes and decision-making that influence vaccination behavior. The general findings are that knowledge and system level barriers affect vaccination decision-making, and that the greatest promise of disseminating information rests with high prestige, influential people (health providers) and social network channels (peer to peer, patient networks, or insurer to beneficiary). The study findings expand literature in the following ways and propose public policy recommendations (see Subpart B, Public Policy Recommendations):

Almost all survey respondents were aware of shingles, understood the magnitude of pain associated with the disease, and were able to identify specific symptoms of shingles. Review of commonly cited sources of awareness for the shingles vaccination provides evidence that vaccinated respondents learned about the vaccine mostly from their doctors whereas non-vaccinated respondents learned about the vaccination mostly from television shows or radio, newspaper/magazine or billboard, or pharmacy/store advertisement (CDC’s website and shingles features did not register many recalls in terms of awareness sources). Vaccinated respondents generally believed that the shingles vaccine was safe, and strongly believed that the vaccination
works, as evidenced by the belief that their chances of developing shingles significantly decreased post vaccination. Almost all vaccinated respondents placed “wanting to be healthy” in their decision to vaccinate and prevent shingles. Respondents who obtained the shingles vaccine were also vaccinated for influenza, tetanus, and pneumococcus. Shingles vaccination is also strongly associated with physician recommendation and willingness of having a pharmacist administer the shot. Vaccination decision-making demonstrates that friends and family with shingles influence shingles vaccination. Factors independently associated with shingles vaccination include doctor recommendation, influenza vaccination, and perceptions of risk in terms of developing shingles.

Overall, the resistance on the part of the non-vaccinated cohort was that respondents generally (1) underestimated their chances of developing shingles, (2) reported concern about the live virus nature of the vaccination, (3) believed that the shingles vaccination was not very effective, although generally safe, and (4) had general resistance to adult vaccinations (flu and pneumococcal vaccinations). Fear of needles was not an influential reason to not vaccinate, but some reported mistrust with the shingles vaccine as a reason. Inconvenience was generally not a reason to not obtain the shingles vaccination. Vaccine cost was generally not a reason not to obtain the shingles vaccination, although a few reported cost as a reason for their decision. Overall, respondents paid, or would be willing to pay, no more than $50 for the shingles vaccination. Some respondents indicated that they did not want pharmacists to administer the vaccination, however, this might be a distortion of time since the MDPH policy allowing pharmacists to administer expanded vaccinations (other than flu) was adopted in 2012 and the
This study also provides some evidence of misperceptions and fears about the shingles vaccine both of which drive the public’s acceptance of the vaccination. Review of reasons by the non-vaccinated group shows that there is evidence of misperceptions and fears:

*I’m a “healthy person” and don’t need it*  
*“Because a friend contracted shingles after getting the live virus vaccine and died from it, never got better”*  
*“Because of family history - no one in family got it.”*  
*“Had a stroke and doesn’t leave much, not concerned about exposure or contamination”*  
*“Had the german measles vaccination”*

There is also some evidence that the public understands (or believes it understands) the etiology of the disease and is making a rational choice to avoid the shingles vaccine which provides support for hypothesis there is no risk of people wanting it on a lark (moral hazard).

*“Never had the chicken pox”*  
*“I already had chickenpox when I was a child.”*

There is also evidence that people are scared of this vaccine and simply don’t want it so there is no risk of people overusing it:

*“I’m afraid I’ll get shingles if I get the shot”*  
*“I don’t like vaccinations”*  
*“I don't like to get vaccinations as they have metals/chemicals in them.”*  
*“I don’t believe in vaccines I think its a government thing”*  
*“You do not believe in a lot of preventive shots”*

For example, there is evidence from the shingles focus groups and survey that the public wants the vaccine and that health care providers positively influence shingles vaccination behavior by recommending it:
“I think it’s out there and I think there’s a possibility that I may get the shingles, then I want the shot.”
“I thought when I retired it would be a good idea to get the shot...”
“They tell me what is good and I accept it.”
“[M]y doctor told me [to get the shingles shot].”
“...so I’m in between trying to figure out if I want to get the vaccine.”
“...they do recommend that you should have it and I think that the doctors are pushing it now. My doctor is pushing it
“The shingles---my doctor had offered it to me...”
“And they’re just catching on to it, starting to push it.”
“And a lot of them may be pushing it...”
“he’s talking I should get it because he said you can get shingles again”.
“...That’s why he’s pushing the shot.”
“Now the doctors recommend it. I mean they tell you about it.”
“My doctor told me anybody you know that’s over 65, I advise to tell them to get the shingles [shot].”
“[the VA] offered to give me the shot.”

At the same time, there is also evidence that not everyone wants the vaccine and that doctors are not universally recommending the vaccine to their patients.

“forgets to bring it up to doctor, doctor hasn’t mentioned it when she was there”
“Didn't feel that I needed to get it yet”
“Didn’t want to”
“Didn’t get around to it and I have other health conditions”
“I decided I wasn't going to get the vaccination right now.”
“Don’t think I need it”
“don't think in getting disease”
“Haven't given it that much thought”
“I don’t want it.”
“No, not if it’s live.”

Information about and identification of these perceptions are useful not only for government but also to the vaccine marketer. CDC's or MDPH’s Health Communication Office’s can ramp up communication channels to reach target groups and distribute information that specifically addresses the public’s resistances and hesitancies. Publically financed campaigns should stress pain and suffering and stay away from message points that this vaccine is a live vaccine since that seems to frighten people and does not give people any useful information. The current
marketer of the vaccine structures outreach messages to curb the misperceptions of the non-vaccinated public about shingles vaccine. The follow on marketer of the next shingles vaccine, which is expected as an attenuated vaccine (not live virus) with a significantly higher and longer duration of efficacy should do the same. Pharma’s outreach tactics—performed via direct to consumer (drug) ad (DTCA) advertising which includes printed ads in, e.g. AARP and Better Homes and Gardens, as well as commercial advertisements on television shows, e.g. sports and news — may or may not have limited reach, nor be tailored with specific information to address concerns of the groups that are not accepting the vaccine.

A key strength of the DTCA communication strategy is that it is capable of reaching males (vaccination coverage in this group is lower than with females), however, DTCA channels may not be effective. Consider that the most common source of awareness reported by non-vaccinated respondents was television and radio, suggesting that DTCA channels are effective only at increasing awareness and are not as effective at mobilizing vaccination behavior. Therefore, ramping up DTCA channels may only increase awareness and may not translate into vaccination uptake.

This raises the question of just how much the government should invest in disseminating information, addressing misconceptions, and reaching those that most need to be reached to make the vaccine more widely available. The answer to that depends on the dominant theory of society, human rights and public health ethics driving the decision-making. CDC’s paradigm for the shingles vaccine has been classic utilitarian at best—while routinely recommending the vaccine for adults aged ≥60 years CDC has not expanded its recommendation to include the
younger cohort (≥50 years), like other governments have done, thereby continuing to recommend the vaccine for a limited pool of recipients (Hales et al., 2014). CDC’s analyses conclude that vaccinating a 50 year-old costs the most per QALY saved ($287,000 per QALY saved) and to vaccinate at 70 year-old costs the least cost per QALY saved is ($37,000 per QALY saved).

Not only is the established vaccination goal too low relative to goals for other adult vaccines (flu and pneumococcal) and too narrow (≥60 years old), it is guided by incomplete cost-utility analyses that undervalue the hedonic damages that one’s life can be hurt and the societal gains of reducing pain. Simply put the cost-effectiveness estimates do not factor in how much people would be willing to pay to be pain free. Why would being pain free be valued any differently by a 50-year-old versus a 70-year-old? It would not—an active adult of any age would place great value in a vaccine that could avoid the debilitating pain of shingles. However, hedonic considerations of willingness to pay are likely to encounter different receptions across socio economic status, e.g. affluent patients would be willing to pay more more than less affluent to obtain the vaccine.

Moreover, since shingles manifests differently across gender and the vaccine efficacy declines, the lens assigns a favorable cost-utility ratio only for older females and unfavorable one for males (Rothberg, 2007). Because cost utility considerations directly influence provider recommendations, the result of the unbalanced utility creates skewed provider recommendations and in turn vaccine rationing. Accessing medicine in such a fragmented manner violates the ethical guidelines of protecting individuals and does not satisfy Rawl’s difference principle (does
not make males better off than females and does not make the ≥60 years-old group better off than the 50-59 years-old group) (Lee, 2015) (Endnote 16). To be fair, CDC says that it is monitoring data in order to re-evaluate the age for vaccination, including the possibility of boosters with the current vaccine to address the issue of waning vaccine efficacy.

There is also evidence that younger (50-64 year-old) non-vaccinated respondents (23%) were not vaccinated because the vaccine was not recommended for their age group, and 86% reported that they would get the shingles vaccine if their medical insurance paid for it. This suggests that an increasing number of younger adults (>50 years old) are interested in getting this vaccination (likely a result of shingles awareness campaigns that encourage vaccination), but are encountering recommendation and system level access and cost barriers. From a Rawlsian point of view, the fact that people outside the recommended target group want the shingles vaccination but are unable to get it is a problem. These individuals are motivated to get the shingles vaccine because they value the benefit of reduced pain but are shut out of accessing it because of CDC’s normative cost-efficacy assumptions that do not take hedonic perspectives into consideration. CDC’s cost effectiveness estimates may be underestimating/undervaluing the shingle vaccine and the evidence from this study that younger individuals want the vaccine further supports that CDC have simply done its assessments wrong. It is noteworthy that a majority of pharmaco-economic studies (European and Canadian) concluded that the shingle vaccine is cost-effective at the £30,000 and €30,000 cut off for societal and/or payer perspectives (Kawai et al., 2014). These determinations likely played a role in influencing some European governments with positive rights paradigms to include the vaccine in immunization programs and make more of an
“equitable offer for this important preventative tool” in offering the shingles vaccine for free to specific age groups (Paganino, 2015, Summary Section, Last sentence).

In addition, other organizations within the U.S. government have taken limited steps to make the vaccine more equitably available. This specifically refers to the out of pocket costs that persist within Medicare, which covers nearly 54 million beneficiaries, 41 million of whom receive prescription drug benefits from Medicare Part D and the issue with the Part D coverage gap (Fast Facts About Medicare, 2016). This in contrast to PPACA's policy of not imposing any out-of-pocket costs in the private insurance market for preventative care, including vaccinations, if they carry a Preventative Task Force A/B rating.

A Rawlsian social justice framework seeks to increase shingles vaccination access and coverage to all through the lens of a just society and the principles of fairness of opportunity, respect for persons, beneficence, and non-maleficence. A just society that respects its citizens requires that the government make a real effort to educate people, disseminate information about shingles and the vaccine, and dispel misconceptions so that the public can make an informed decision about vaccination. It argues that the government should make every effort to reduce society’s burden of shingles pain (PHN).

This principal-based method and the clinical obligation to do no harm dictate that the government must provide equitable access to the vaccine so that more people (not just the ones that are worthy of it economically) are given the opportunity to benefit from less PHN (beneficence)— after all, it is a social good that people, and the community at large, are free of
pain. A Rawlsian paradigm states that it is moral that individuals benefit from cooperative schemes that increase society’s wellbeing and supports the use of public financing to achieve these means. If CDC embraced more of a Rawlsian point of view, then the cost of preventing shingles would be economical in all people. This principle-based approach provides fairness of opportunity for all, embraces respect for persons and personal choice, but stops short of imposing compulsion on the public but at a cost that must be shared by all.

The libertarian ideological persuasion also espouses freedom of choice and, above all else, liberty but is less concerned that there is variability in vaccination acceptance behavior and low uptake across age, economic and racial strata. The ideology advances the argument that people—as autonomous decision makers through their own acumen and pursuit of happiness—have enough information to make a choice—even if an unwise choice, and frowns on using tax payer dollars to advance public health goals as imposition on liberty. Individuals that accept vaccination do so of their own volition, and those that refuse it, also do so by their own choosing. Since shingles is generally not contagious (except if in direct contact with open, shedding blisters) refusing the shingles vaccination poses no harm to others. Libertarian ideology alienates society from Rawls’ principles of fairness of opportunity, respect for persons, beneficence, and non-maleficence.

Misperceptions and fears about the vaccine inhibit the public from making the informed choices that are so espoused by libertarianism, hence, libertarian ideology should welcome a helping hand from the government’s outreach efforts that dispel misconceptions and present the facts, and applaud provider recommendations to vaccinate. The intended effects of such efforts are a
better-informed public and restored autonomous decision making that allows for a genuinely informed choice about the shingles vaccine.

Each of the concepts advanced in this dissertation—(1) that increased awareness influences decision-making and reveals purchasing preferences, (2) that the greatest influence over shingles vaccination lies with high prestige people, e.g. health providers/physicians, (3) that motivation for vaccination comes from people’s social networks, (4) that increasing convenience, removing cost and supply barriers increases uptake—but present empirical problems. While each is capable of increasing vaccination behavior they also may lead to moral hazard where more of a good is taken than is needed and overused. The Rawlsian perspective sees each of these strategies as moral and equitable in that they increase society’s happiness, whereas the libertarian perspective sees publically financed attempts to influence vaccination perceptions as an imposition on liberty. In the case of shingles vaccination, moral hazard may not be as significant of an issue since CDC recommends the vaccine for all persons >60 years old, however, it is not inconceivable that when communication channels are optimally ramped up, e.g. airwaves are saturated then everyone sees the ads and starts to want the vaccine, it may lead to too many of the wrong people for whom it is not recommended wanting the vaccine.
Part B  Public Policy Recommendations (Survey Data)

Mandatory Physician/Provider Recommendation  

Respondents who received the shingles vaccination versus those that did not receive the vaccination differed by physician recommendation (p<0.001). This supports previous findings that physician recommendation is a formidable predictor in influencing patient vaccination decision-making (Kester, 2013; CDC, 1999). Physicians also overwhelmingly recommend shingles vaccination to the older age group (p<0.001). Overall, patients who received a physician vaccination recommendation are 25 to 49 times more likely to be vaccinated, depending on age than those who did not receive a physician recommendation. This split in recommendation practice and subsequent effect on vaccination decision is not remarkable given that burden of shingles is more profound on the elderly. However, almost 40% of older adults in this study reported that physicians did not recommend the shingles vaccination. For such a significant portion of the at-risk age group to lack a physician recommendation is discouraging since physician recommendation is the single most influential predictor of shingles vaccination decision making. This suggests that some education of practitioners may be required.

Improved provider recommendation practices so that all patients >60 years-old—barring medical contraindications—be informed of and receive a shingles vaccine recommendation should be the gold standard. This policy has the greatest odds of increasing patient vaccination. As a matter of federal law, the 1987 National Vaccine Childhood Injury Act (NCVIA) requires that all providers distribute written vaccination information materials to patients prior to vaccine administration, and supplement this information with a presentation or explanation (42 U.S.C. § 300aa-26). As a matter of state law, Massachusetts General Law requires that providers
disseminate information to patients about certain medical procedures (M.G.L.c 111L s.4). Taken together there are federal and state legal precedents that obligate providers to distribute medical information so that patients can make informed decisions about their care and health. It is therefore reasonable to extend this policy to all-age specific vaccination recommendations, including shingles, and require providers to inform patients about the shingles vaccine (as well as other vaccines for adults). This strategy would force adult vaccination as a standing topic on provider’s agendas and would address not only the issue of trailing adult vaccination coverage, but leverage behavioral social science research that highlight that patients generally trust their doctors (Guffey and Yang, 2012), and trust is central to patients following through with provider recommendation (Hall, 2002; Thom, 2004).

Compelling providers to recommend vaccination can be tied in with game theory incentive-based pay for performance initiatives (P4P) (Kautter et al, 2007). These impose performance metrics to improve the quality of care and contain cost across the spectrum of health care utilization for beneficiaries of Medicare and other insurance programs. Projects such as these are capable of coordinating care, encouraging administrative and delivery efficiencies, and re-structuring physician reimbursement with a hybrid Fee for Service (FFS) and capitation payment system that maintains the FFS payment structure, but pays additional incentives contingent on patient health improvement and the realized savings that this creates for the Medicare program (Kautter et al, 2007). The innovation of P4P programs may be interesting to practitioners who want to improve and manage patient care, and affords physicians the opportunity to “earn additional performance payments for providing high quality and cost efficient care” (Kautter et al, 2007, p. 27, Discussion, 2nd sentence).
Flu Vaccinations — Opportunity for Added Vaccination

Survey data shows that respondents who received the shingles vaccination, versus those that did not, differed by flu vaccination status (p<0.001). Given that flu vaccination is associated with shingles vaccination, annual flu vaccination clinics, at either retail pharmacy locations, provider offices, or employer sponsored flu clinics should be expanded to provide a more complete complement of adult vaccines. Retail pharmacy settings as providers of vaccinations are in the best position to use a “pat on the back,” carrot stick “reward” tactic to encourage use of the complete complement of adult vaccines by offering discounts on pharmacy products. This tactic is already in play by CVS Pharmacy which offers customers its 20% Off CVS/pharmacy Shopping Pass and/or ExtraBucks Rewards for getting their flu shot and should be expanded.

Guiding Consumer Decision-Making Use of Social Networks

Since adult immunization involves a relatively unusual audience that needs to be reached in very different ways, a question arises of how to distribute information given that there is limited knowledge, specialized groups (outreach strategies for an active 50-year-old are different than for an 80-year-old in a nursing home; there are significant racial disparities), and it is not known if the typical channels of information dissemination used by the pharmaceutical industry (direct to consumer (DTCA) advertising are optimally used. As previously discussed, the central findings of this study are that (i) non-vaccinated, non-white adults (and to a lesser extent white adults) overwhelmingly reported a lack of knowledge about the shingles vaccine, (ii) that friends and family who have had shingles are strong predictors of shingles vaccination decision, and that (iii) these individuals believed in the efficacy of the vaccine (as evidenced by decreased
perceptions of developing shingles post vaccination. Based on this evidence, the power of
social networks should be leveraged for vaccinated individuals to (i) spread the word about the
pain and suffering of shingles and ways to prevent it and (ii) motivate others to get vaccinated.

Tactical opportunities to increase awareness and influence shingles vaccination behavior could
leverage the fact that minorities are big church-goers in the U.S. and use ministers and the
vaccinated public to talk about shingles and encourage vaccination. Venues of sports clubs with
members ≥50 years-old, high school reunions, or work places can be explored (utilitarian
certainty consideration). Celebrity thought leaders such as Oprah, and Drs. Phil and Oz and
the former NFL player Terry Bradshaw, who had shingles and has been informing the public
about shingles can be mobilized to leverage the significant viewership of these shows and
following. Alternatively, building a coalition with AARP to leverage its significant penetration
with the ≥50 years old demographic and creating language specific messaging tactics to reach
non English-speakers and address the racial and ethnic disparities among the older cohort (2009
NHIS) should be tried.

Part C  Further Policy Recommendations

In addition to the above public policy recommendations, this dissertation raises unanswered
questions that are beyond the scope of this study but that stakeholders need to consider, such as
(1) whether ACIP recommendations need to be revised, (2) whether national health goals need to
be refined, (3) how to reduce vaccine costs, reform reimbursement policy, and cost sharing
responsibilities, (4) what the appropriate game theory, liberal paternalist inducements should be
utilized to influence decision-making, (5) whether wellness programs and adult vaccination clinics can be optimized, and (6) whether access and convenience can be optimized.

Revised ACIP Recommendations

ACIP could expand its recommendation to align with the FDA’s expanded label use, and recommend this vaccine for adults aged 50 years and older. This would not only remove the dichotomy and confusion between the FDA approved prescribing information and ACIP’s vaccination recommendations, but would also move shingles vaccination policy a step closer — towards a positive rights theoretical framework where the public has a right to, and the government has an obligation to, ensure that the public is healthy, e.g. shingles complications PHN free.

There are several practical benefits of widening the recommended age: individuals could get vaccinated earlier and avoid disease complications later, however, the issues with waning vaccine efficacy would need to be addressed to determine if a booster is required. This would also allow immunization when people are not on Medicare, shifting some of the costs from the federal government. Because PPACA requires private health plans to cover all clinical preventative services without cost sharing, the beneficiary would not incur any out-of-pocket costs but the insurer and employer would incur the cost (GOA, 2011) (Reimbursement Policy, Cost Sharing). Expanding the age recommendation for the shingles vaccine would remove the rationing and inequality with the current limited recommendation, compel medical insurance to cover the zoster vaccine for the younger cohort, and allow the private sector to use game theory, liberal paternalist inducements to encourage vaccination.
Vaccination recommendations informed by incomplete cost utility considerations are characterized by negative externalities, insofar as priorities for vaccine availability and financing are concerned. In either case the result is rationing and/or inequality at the central level when advisory bodies account for economic utility in vaccination recommendations, which limits supply and availability of the vaccine to the public. At a decentralized level this pushes the burden of prioritizing vaccination financing to local bodies and leads to inconsistent, cross state priorities over publicly provided vaccinations and differences with the private sector (Davis, 2005). The ACIP should, therefore, reconsider its assumptions behind the current cost-effectiveness models that would allow ACIP to conclude that the vaccination is cost beneficial for all subgroups (versus current conclusions that it is less so for some age groups). Lastly, to rebalance the cost-effectiveness calculus, the ACIP could respond to controlling a key parameter in published cost-effectiveness and utility models, e.g. waning vaccine efficacy, and consider recommending routine boosters for the current vaccine. The added dose recommendation should prompt a decrease in vaccine price based increasing the number of doses, which would flatten the cost effectiveness ratios and reduce the QALY for vaccinating a younger cohort (Rothberg, 2007, Le, 2015). Consider that the varicella vaccine, which is recommended at two doses, has a decreased price per dose of $107.67 private sector cost/ dose and $83.77 CDC cost/ dose, or that the measles, mumps and rubella (MMR) vaccine which is also recommended at two doses also has a decreased price per dose at $62.79 (private sector cost/ dose) and $19.90 CDC cost/ dose.

These efforts would go a long way to encouraging more widespread use. There is also the option of waiting until a second generation shingles vaccine is available with longer duration of efficacy and one-time use.
Refining National Health Goals

The National Health Objectives (Healthy People 2020 goals) for zoster vaccination coverage (Objective IID-14) could increase the baseline target from the current 30% and consider bringing it closer to Healthy People 2020 vaccination coverage goals for influenza and pneumonia. It could also establish a hierarchical vaccination priority system of higher coverage goals for high-risk individuals that takes into account the increased incidence and complications of zoster in individuals by gender and age (≥70 years) and in the immune compromised.

The current target goal of 30% is unlike other vaccination goals for flu and pneumococcal vaccine, which are set at 90% for over 65-year high-risk age group. In contrast, the shingles vaccination goal of 30% is conservative, and does not stratify by age, or high-risk groups. The initial national target goal for shingles vaccination coverage may have been influenced by insufficient vaccine supply (now largely resolved) but this supposition remains an unanswered question, especially when considering that the vaccination goal for varicella vaccine, which is also manufactured by the same supplier and which uses the same antigen, is at a considerably higher target (≥90%; albeit chicken pox is highly contagious) (HP2020 Goals IID-7.6, IID-10.5, and IID-11.2).

Analysis of Healthy People 2020 goals for the varicella vaccination in children and young adults shows significantly higher vaccination goals: 90% coverage for children (19 to 35 months); 95% of kindergarten children; 90% of two doses of varicella vaccine are recommended in children (13 to 15 years). The wide discrepancy between the varicella and zoster vaccination goals cannot be attributed to past supply constraints, or the fact that the zoster vaccination is manufactured by
one supplier. Other reasons, such as contagion, may explain the more aspirational varicella coverage goals for children (chicken pox is contagious) and more conservative goals for shingles coverage in adults. There are also recommended booster shots for the chickenpox vaccination, which may affect the higher targets, whereas the adult shingles vaccine is a one-time recommended vaccine.

Other reasons that might explain the high coverage targets for flu and pneumococcal vaccines is that they already enjoy high coverage levels and have different contagion factors. Pneumococcal vaccination coverage was 60% among adults ≥ 65 years (MMWR, 2012), and influenza coverage was 64% of ≥65 year in 2010 (National Flu Survey, 2011-12 Influenza Season). This is contrasted to 2012 vaccination coverage level for shingles at 20.1% and thus, may be why DHHS set incremental coverage goals for shingles (Williams, et al., 2014).
Reducing Costs/Reimbursement Policy/Cost Sharing

Vaccine Cost

Zostavax® is the costliest adult vaccine on the market today—$187.89 /dose [private sector] and $117.12 /dose [CDC manufacturer contract] (Adult Vaccine Price List, 2016). The vaccination is deemed to be largely not cost-effective (cost-effective only for >70 years) and is many times more what patients, especially those who want the vaccine but who are outside the vaccination recommendations, are willing to pay. The high cost of the shingles vaccine is among the most significant barriers to vaccination practice recommendations and consumer uptake. At either price point the vaccination is not cost-effective at the unofficial cut-off ceiling of $100,000 per QALY (Rothberg, 2007; Le, 2015). At such a high price the utilitarian perspective argues that it is difficult to justify public investment or wider recommendation of this vaccine. The cost-effectiveness calculus can be rebalanced when the vaccine price is lowered, market competition is increased when a new, improved vaccine is on the market (Lal, 2015), and/or private and public forces impose significant cost controls or reimbursement changes. This will be central to increasing demand for the vaccine while lowering the price. If cost-effectiveness assumptions are not updated to factor in the public’s willingness to pay to avoid pain and the vaccine cost remains high, Zostavax® will remain a low value therapy.

Meanwhile, while PPACA’s framework is somewhat capable of addressing the high cost of this vaccination by enabling states to leverage federal purchasing power for vaccines, as well as increasing federal funding for CDC’s Immunization Grant Program (Section 317) (PPACA, 2010, Title IV, Subtitle C, Sec. 4204.), the law simply does not decrease the cost of this vaccination enough to make it cost-effective. Even if states purchase the vaccination at CDC’s
current negotiated price, which does not take into account vaccine purchased in the private market, the cost per dose is still more than double the price that would make the shingles vaccination cost-effective (ranging from $46 per dose for ≥60 year-old cohort [Rothberg, 2007] to $80 per dose for the 50-59 year-old cohort [Le and Rothberg, 2015]) [Endnote 17].

The PPACA has the ability to influence the price consumers pay since the law embraces an egalitarian theory of justice and prescribes redistributive policies, that according to John Rawl’s difference principle, make high-income earners pay not only for their own health care, but also for other reforms in the health care law that benefit the less well off (Sandel, 2009). Taxes are increased in order to raise funds to carry out certain provisions of the law, such as increasing and expanding the Medical Hospital Insurance Tax by levying higher taxes on investment (non earned) income and on earned wages for high-income earners ($200,000 (individuals) or $250,000 (married couples), and imposing a 40% non-deductible excise tax on high-value health plans, the so called Cadillac Health Plans (plans that cost $10,200/annum and $27,500/annum for individuals and family, respectively) (Morgan Stanley Smith Barney, 2011). Perhaps monies raised via these provisions can be used to further bring down the cost of the shingles vaccination.

**Cost Sharing**

Removing the cost sharing requirement, e.g making health agents free and/or subsidizing them (Baicker, 2013), or decreasing the cost sharing requirements for vaccination (Fendrick, 2010) is a pragmatic policy to increase utilization. The Patient Protection and Affordable Care Act did just that when it created a blueprint for reforming the national prevention strategy. Effective September 2010, PPACA required that all clinical preventative services, graded A or B in a cost-
effectiveness rating by the US Preventative Service Task Force (USPSTF), be available without any cost sharing to the beneficiary (Health Policy Brief, 2010). This requirement extends to all ACIP recommended vaccinations (including the shingles vaccine) among other clinical preventative services.

There are strengths and weaknesses to this cost sharing reform. The strength is that the moral hazard of waste and inefficiency that would inevitably ensue by the over-consumption of a free good was hedged by including only AB rated preventative services in the methodology (Baicker, 2013). The cost sharing reform, however, only applies to private insurance policies and to some types of Medicaid programs, but not for Medicare. The herpes zoster vaccination, and other clinical preventative services are available, de facto for free to those in the affected insurance settings. The preventative services reform however, did not remove the cost sharing requirement for the shingles vaccination in Medicare, a Federal program structured with numerous cost sharing, “behavioral hazard” (Baicker, 2013) policies, even though PPACA requires first-dollar coverage (no copays or deductibles) of all ACIP recommended vaccines. These still remain in effect, further magnifying the effect of this barrier to access, especially when considering that a rising number of Americans ≥65 rely on Medicare and an increasing cohort become eligible for the shingles immunization on a daily basis.

Congress should embrace meaningful dialogue around drug pricing and correct CMS’s inability to consider cost-effectiveness variables in coverage decisions. Doing so would remove the agency’s blindness to costs and allow CMS to re-examine coverage of therapies like Zostavax® and usher in an era of reference pricing and reimbursement thresholds. A move towards a cost-
effective, or value-based reimbursement system, as proposed by Bagley et al. (2015) would transfer a portion of the cost (above a certain established cost-effective QALY threshold) onto patients, and in this way, test society’s willingness to pay. The initial result would be counter productive, as it would constrain utilization, however, the supply and demand curves would be adjusted when industry is signaled that the price is not in line with what the market is willing to bear (Bagley, 2015).

To reduce Medicare cost sharing PPACA created the Medicare Coverage Gap Discount Program (P.L. 111-148, §3301) to phase out the Medicare Part D doughnut hole to start in 2014/2015 and be phased out by 2020. While an incremental step in the right direction in reducing cost liabilities, this policy does nothing to reduce the cost of the vaccine, the Part D billing complexities for vaccines, nor improve access to increase adherence rates to vaccination.

Nearly 60% of non-vaccinated respondents in the shingles survey answered that they would be willing to get the shingles shot if it were free. As part of the move towards a value-based system, Medicare should streamline its reimbursement policy and consolidate Part D/B vaccine coverage. While the Medicare Part D gap in prescription drug coverage is set to be completely phased out by 2020, it remains in effect for the next four years, and prolongs problems with drug coverage lapses. Policymakers can go a step further and consolidate Part D covered vaccines (shingles and tetanus and diphtheria) under Medicare Part B. Doing so would reconcile the reimbursement and cost sharing dichotomies between Medicare Part B and Part D programs (P.L. 108-173) and make drug coverage more generous. This would remove the financial burden with out of pocket liabilities for beneficiaries, allow beneficiaries to receive the vaccination in their doctor’s office,
increase access and compliance with provider recommendations (particularly in states where pharmacists are not permitted to administer the vaccine), and reduce provider billing burdens. Even in states where community pharmacists administer the shingles vaccination, Part B coverage of the shingles vaccine is preferred over Part D (Marrufo, 2011; McWilliams, 2011).

Incentives and Inducement

Instead of compulsion, the preferred policy strategies to increase vaccination could use a mix of game theory, liberal paternalist inducements, or marketplace-initiated “efforts [that] offset decision balance and customer reluctance” to maximize the desired behavior and use of preventative vaccinations (McLellan, 2014, 6th paragraph, 4th sentence). Inducement strategies that tie the desired outcome, e.g. vaccination, to decreases in insurance premiums, or that provide financial incentives to reward the behavior could be explored to increase vaccination (Weaver, 2014). Examples of game theory and/or libertarian paternalist strategies to incentivize (or nudge) vaccination include mandating that insurance companies publicize treatments (Thaler and Sunstein, 2008), structuring premiums (for Medicare and other insurance) such that the premium is lowered if the beneficiary adheres to vaccination recommendations, or providing fixed or escalating value payment schemes for the high-risk vaccination cohort to incentivize vaccination.

Wellness Programs and Adult Vaccination Clinics

Employers bear a large part of employee health care premiums and risk seeing premiums rise through increased utilization, hence, a valuable incentive to employers is healthier employees and lower insurance premiums (Baicker, 2010). Employers therefore, are important stakeholders to use game theory incentives to promote healthy behavior that encourage vaccination for its workforce. The popular employer-sponsored flu clinics and wellness programs (the latter provides employers with tax incentives) could be expanded to offer a full range of vaccines to
employees, allowing employers to benefit from a healthier workforce and increased tax credit/deductions, and employees could, in turn, benefit from the utilitarian tactic and get their full complement of vaccinations at work (convenience) and possibly have their insurance premium lowered.

Employers’ decisions to cover the shingle vaccination need to consider the age of the workforce. Assumptions that employee populations are younger than 65 years old may not be realistic in the current economic climate where people are delaying retirement and staying in the workforce longer (Towers Watson Retirement Attitudes Survey, 2010). If individuals continue employment and receive employer provided health care coverage, employers would want to pay for the shingles vaccine despite the fact that Medicare covers Americans ≥65 years old and the shingles vaccination. This is especially true if the vaccine recommendations stay where they are (>60 years old), in which case employers with an aging workforce would want to pay for and provide the shingles vaccine to its employees. If ACIP recommendations were lowered to cover the >50-year-old segment then this is all the more relevant that employers introduce shingles into wellness vaccination clinics.

In order for the expanded employer sponsored adult vaccination clinics to work optimally, the clinics need to affect a large enough share of the employee workforce to be cost-effective. For this to happen, (1) the price of the vaccination needs to come down, (2) the ACIP has to expand the recommended age window of the shingles vaccine to ≥50 years so that a larger share of the workforce can be eligible to vaccinate, and medical insurance would pay for younger vaccinees.
Expanded Access and Convenience

Pharmacists are in a unique position to engage with patients about health practices, to influence the awareness aspect, and to offer the vaccine during office visits/pharmacy settings. This is especially relevant because there is evidence that pharmacies are a good way to reach the public, especially the non-vaccinated public.

State Boards of Pharmacies in all 50 states have passed legislation and changed policy to expand the authority of community pharmacists to administer the vaccination, however, not all pharmacists administer it (APhA, 2013, IAC, 2013). More community pharmacists could be encouraged to have the training and certification to administer the vaccination as this is another avenue of increasing access and convenience to the shingles vaccination. This would yield “a dramatic increase in vaccinations administered to high-risk patients for … herpes zoster” and help reach Healthy People 2020 vaccination goals (Taitel, 2013, Discussion, 3rd paragraph, 1st sentence).
Part D  Study Design Limitations

Limitations of the Shingles Focus Groups

Several weaknesses of the shingles focus group study design include that the focus groups were conducted in suburban and one inner-city communities, with no presence in either urban or rural Massachusetts communities. In addition, there was no racial diversity (all participants were white) and there was little diversity in gender (most participants were female).

Furthermore, while the focus group research sought to compare data across focus groups, the shingles focus group research data did not permit for any meaningful generalizable conclusions due to (1) the small sample size (less than 40 participants), (2) the sample selection method, i.e. intercept strategy, and (3) the non-representative participant sample that this method produces.

Moreover, monetary incentives were not provided to focus group participants. The lack of monetary incentive may have discouraged some from participating in the discussion. It is worthwhile to mention that no monetary incentives were provided to participants in the shingles survey either, however, the lack of monetary incentive for survey participants is weighed differently than the lack of monetary incentive for the focus group participants since focus group participants have to actually travel and be physically present for the group session while the telephone survey participants did not.
Limitations of the Shingles Telephone Survey

The telephone study has several limitations. The first is that the population in the shingles survey is representative only of Massachusetts residents—the conclusions are not generalizable to states outside of Massachusetts, nor to national policy as a whole. Another limitation of this study is that it cannot report on what percent of the state’s population are not aware of the shingles vaccine due to the inclusion criteria required all participants to be aware.

From the perspective of sample selection, the 2012 State BRFSS sample has no systemic selection bias since the survey sample was derived from random probability sampling. However, the shingles survey may be subject to sample selection, recall, and response bias issues. Selection bias may have played a role in affecting the respondent sample in the shingles call back survey. The shingles survey is not a RDD survey (like the State BRFSS), rather, it is a re-contact survey of a panel of respondents who have self-selected and agreed to be re-contacted from the pool of State BRFSS respondents. The panel of respondents participating in the shingles survey may have been more engaged, having participated in the State BRFSS and subsequently consented to participate in the shingles survey. The respondents may be more patient and provide thoughtful responses. It is also possible that respondents who did not receive the shingle vaccination may not have agreed to participate in the shingles call-back survey at an increased rate resulting in a follow-up survey panel that is skewed to vaccinated respondents.

Yet, another way in which the shingles survey may be biased, is that the research method used a single sample frame (land line telephones only). A dual sample frame consisting of cellular and land line phones, which the State BRFSS survey uses, was not utilized in the shingles survey due
to limited funds. This is, nevertheless, noted as a study limitation since the proportion of older adults with cellular phones is increasing (Pew Research Center, 2014), therefore, future research using this study population should use a dual frame research.

In order to remove potential bias against English only speakers, the survey was conducted in English and Spanish, however, additional language speakers were not surveyed. Additional response and recall bias may persist since answers to vaccination status, location of vaccine receipt, and answers about cold chain transport are self-reported (not verified by medical records). Non-response bias may also be a factor.

Another study limitation was that the sampling protocol was modified two-thirds of the way into the survey. The modification stopped sampling older white women, thereby introducing an inherent sampling fraction for this subgroup, and changed the skip pattern in the unvaccinated panel to balance and increase the total tally to approximately 500 completes. While the decision was being taken to modify the protocol, interviews were stopped for several weeks. This meant that the survey was not conducted in one continuous, uninterrupted time frame. Converting the shingles survey into a non-continuous survey was not expected to present significant downside since this survey was still conducted in one calendar year, however, this may have influenced the responses.

Yet another study limitation deals with the fact that there were few non-white males, therefore for data analysis to have meaning, the non-white male subgroup combined the two age groups into one subgroup of non-white males >50 years old. Lastly, since there were so few completes
in some subgroups there were a number of statistically insignificant findings that should be interpreted with caution.

**Part E  Opportunities for Future Research**

*Diffusion of Innovations: Mobilizing Shared Community Interests*

To date, only a handful of states have looked at shingles vaccination coverage (prevalence). In addition, the Commonwealth of Massachusetts went one step further and pioneered the shingles survey to study reasons behind this prevalence and the considerations that people take to obtain the vaccination. The shingles survey, however, represents viewpoints from Massachusetts’ consumers only, therefore results are not generalizable to the US population. While Massachusetts has surpassed the Health People 2020 Goal of 30% shingles vaccination coverage (2014 MA BRFSS vaccination coverage level of 38.4%), the *Healthy People 2020* goal is a *national* health goal, and one that remains unmet although there have been modest improvements towards this goal (CDC MMWR, 2012). An opportunity for further research is for other states to consider initiating similar surveillance of shingles vaccination decision-making behaviors and barriers to use, especially where there is trailing vaccination coverage, and the shingles survey can be used as a turn-key instrument.

If additional shingle research is performed, this should be in states with a more diverse racial makeup that is living with different social realities than Massachusetts. Also, future research should have appropriate sample size for meaningful statistical interpretation (non-whites and Asians), with a particular emphasis in recruiting vaccinated, older non-white respondents as this was the cell with the least number of participants. Future research could also include younger vaccinated males and females in its sample.
Even in Massachusetts there was a significant proportion of the sampled population who were not aware of the shingles vaccination. If, as this dissertation recommends, awareness campaigns are ramped up to increase awareness, a future study in the Commonwealth could measure the percentage of respondents that are aware and not aware. Future research could also remove this survey’s inclusion criterium for shingles vaccination awareness as well as test for revealed preferences phenomenon to see which respondents progressed from awareness to vaccination. This would require a sample with variability in the awareness measurement.

Future research could also re-test the public’s perceptions on willingness for pharmacists to administer the shingles. Respondents in the shingles study indicated that they did not want pharmacists to administer the vaccination, however, this might be a distortion of time since the MDPH policy allowing pharmacists to administer expanded vaccinations (other than flu) was adopted in 2012 and the shingles survey was fielded in 2012/13 during the time community pharmacies were not widely known to administer the shot. It might be that the public’s comfort level with pharmacists will increase as more pharmacies provide vaccinations.
Part F  Conclusions

The currently available zoster vaccine on the US market has two major drawbacks that influence provider vaccination practices and contribute to variable vaccination coverage—(1) the vaccine’s established market price, and (2) waning efficacy and one-dose regimen. The vaccine price and its lack of durable effectiveness make the vaccine impractical for the younger age group (50-60 year olds) and cost ineffective for the significant segment of even the older demographic that could receive this vaccination.

There is another shingles vaccine on the horizon from Glaxo Smith Kline (GSK) expected on the market in 2017. Unlike Zostavax®, GSK’s vaccine is not a live virus vaccine, is reported to have higher efficacy in preventing HZ, and is more durable across age groups. The last attribute is especially relevant since the ACIP has stressed the importance that a shingles vaccine demonstrates durable effectiveness especially as patients reach ≥60 years of age to account for the significant increases of HZ incidence. Any contemplated revisions to the ACIP recommendations and/or HP2020 coverage goals with respect to the shingles vaccine should probably anticipate GSK’s vaccine on the market, the recommended dosing regimen, and the unveiling of the vaccine’s price point. This will allow groups like Institute for Clinical and Economic Review (ICER) to make a value based assessment of the price and evaluate the budgetary impact on the health care system.

With regard to the current marketed shingles vaccine, this survey showed that there is a significant segment of the public that are unaware that there is a vaccine for shingles. Meanwhile, the government has a Rawlsian obligation to help all and should distribute more
information about the pain complications that accompany shingles to enable a more informed and empowered public, and advocate for more equitable provision of the vaccine. Since non-vaccinated adults overwhelmingly reported a lack of knowledge about the shingles vaccine, opportunities to increase awareness and influence shingles vaccination behavior in these groups should be prioritized.

The policy that has the greatest odds of increasing vaccination coverage is provider recommendation, therefore, standard practice should include adding shingles to flu vaccine recommendations in >60 year patients and flu vaccination clinics should be expanded to provide a more complete complement of adult vaccines. Also, the power of social networks should be leveraged to spread the word about shingles and influence others in the community.
APPENDICES

Appendix A  Human Subject Research Protection

This research was approved by Northeastern University’s (NU) Human Subject Research Protection Office (HSRP) and complies with applicable Federal, State and University statutes and regulations governing the protection of human subjects.

BRFSS research protocols are exempted from IRB review as this research activity falls under a categorical exemption from human subject protection by Federal regulations (45 CFR 101(b)(2)). Furthermore, the Massachusetts Department of Public Health’s Research and Data Access Review (RaDAR) Committee has exempted the shingles survey from MDPH IRB oversight.
Figure 1: DHHS IRB Exemptions

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Centers for Disease Control
and Prevention (CDC)

Memorandum

DATE: September 21, 2007
FROM: Lead IRB Administrator
Human Research Protection Office
Office of Scientific Regulatory Services
Office of the Chief Science Officer

SUBJECT: 2988: Continuation of Exempt Status
TO: Lina Balluz, M.P.H., Sc.D.
NCCDPHP/DACH

I have reviewed the request for continuation of the exempt status of CDC protocol #2988, "Behavioral Risk Factor Surveillance System." I find that this research activity continues to be exempt under 45 CFR 46.101(b)(2).

Please note that the continuation of this exemption determination will be valid for an additional three years, rather than one year, as has been the procedure in the past. You will be asked no later than 10/20/2010 to confirm that no changes have occurred in the protocol or the related science that would affect the ethical appropriateness of the research or this exemption. However, we strongly encourage investigators to close out exempt protocols as soon as CDC staff are no longer engaged in the research activity, rather than waiting for a reminder of the three-year expiration date.

Also, please be aware that changes to this protocol may not be implemented until they are reviewed by HRPO and determined to be consistent with the exemption categories. You will be reminded in three years (if the study has not been completed and closed) to submit another request for continuation and to confirm that no changes have been made to the protocol or the related science that would affect the ethical appropriateness of the research or this exemption determination.

Please also be advised that investigators remain responsible for the ethical conduct of this study and for ensuring appropriate human research protections even for research that is exempt from the regulations governing the protection of human subjects in research.

If you have questions, please contact your Division Associate Director for Science, your National Center Human Subjects Contact, or HRPO at Human Subjects Review — OD on the CDC global address list, huma@cdc.gov, or by telephone at 404-639-4721.

Pamela K. Galusha

cc: Joan Redmond-Leonard
Date: September 28, 2010

From: Barbara R. DeCausey, MPH, MBA
Acting Chief, Human Research Protection Office

Subject: HRPO Approval of Continuation of Protocol #2988.0, "Behavioral Risk Factor Surveillance System (BRFSS)"

To: Lina Balluz, Sc.D
OSELS/DBS

The CDC Human Research Protection Office has received your submission for continuing review of exempt protocol #2988.0, "Behavioral Risk Factor Surveillance System (BRFSS)."

I find that this research activity remains exempt under 45 CFR 46.101(b)(2). Changes to this protocol may not be implemented until they are reviewed and determined to be consistent with the exemption categories. You will be asked in three years at 10/20/2013 to confirm that no changes have occurred in the protocol or the related science that would affect the ethical appropriateness of the research or this exemption. Please be advised that the investigators remain responsible for appropriate human research protections even for research that is exempt from regulations for protecting human subjects.

If you have any questions, please contact your National Center Human Subjects Contact or the CDC Human Research Protection Office at (404) 639-4721 (or by e-mail at Human Subjects Review - OD on the global CDC global address list or at humas@cdc.gov).

cc: Joan Redmond Leonard
January 6, 2012

Marina Draper, M.S.
Ph.D. candidate
Law and Public Policy
Northeastern University
Boston, MA 02115

Re: Survey proposal review

Dear Ms. Draper:

Thank you for submitting the proposal for adding a shingles survey component to the MDPH Behavioral Risk Factor Surveillance System for 2012. The MDPH Research and Data Access Review (RaDAR) Committee, an MDPH IRB, has assessed the information provided and has determined that no MDPH IRB oversight is required to field the survey at this time; it will be conducted as MDPH surveillance and not as human subject research.

When the survey data collection is complete, you will need to apply for access to the data for your study. The RaDAR Committee will review your research project at that time.

If you have any questions, please contact the office at DPH.IRB@state.ma.us.

Sincerely,

Alice Moszczyk
RaDAR IRB Administrator
Confidential Data Officer

CC: Helen Hawk, PhD
Director, Health Survey Program
Figure 3: MDPH Research and Data Access Review (RaDAR) Shingles Survey Data Clearance

**The Commonwealth of Massachusetts**
Executive Office of Health and Human Services
Department of Public Health
250 Washington Street, Boston, Massachusetts 02108-4619
Institutional Review Board and Data Access

**FWA**
00000786

**MDPH IRB**
00000701

**DATE:**
August 14, 2013

**TO:**
Marina Draper, Ph.D (c)
Northeastern University

**FROM:**
Massachusetts Department of Public Health

**PROJECT TITLE:**
[446815-1] Massachusetts BRFSS Shingles Survey

**SUBMISSION TYPE:**
New Project

**REVIEW:**
Administrative

**ACTION:**
ACKNOWLEDGED

**EFFECTIVE DATE:**
August 14, 2013

Thank you for submitting revised materials for this project. After reviewing your final merged data list as submitted on July 29, 2013, it has been determined that the specific extract requested from the Shingles Call-Back Survey combined with specific elements from the BRFSS can be considered fully de-identified, and approval is not required. No further action is required at this time, however, if you should require any additional data, you must submit an amendment request for review and approval in order to ensure that the assessed level of de-identification is still appropriate.

If you have any questions, please contact the office at DPH.IRB@state.ma.us. Please include your project title and reference number in all correspondence with this office.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within the Massachusetts Department of Public Health's records.
### Appendix B  Focus Group Questions

#### Shingles Focus Group Questions

<table>
<thead>
<tr>
<th>Shingles Disease and Vaccine Awareness Focus Group Questions</th>
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<tbody>
<tr>
<td><strong>Opening Question</strong></td>
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<tr>
<td>How is everyone doing today?</td>
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<tr>
<td><strong>Introductory Question</strong></td>
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<tr>
<td>When you think about vaccinations that adults get to prevent diseases, what shots come to mind?</td>
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<tr>
<td><strong>Transition Question</strong></td>
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<tr>
<td>What do you know about a disease called shingles?</td>
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<tr>
<td><strong>Key Questions</strong></td>
</tr>
<tr>
<td>How would you describe the medical condition, shingles?</td>
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<tr>
<td>How did you become aware of shingles?</td>
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<tr>
<td>Who do you know that has had shingles?</td>
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<tr>
<td>How did having shingles affect them?</td>
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<tr>
<td>Which people are at risk of getting shingles?</td>
</tr>
<tr>
<td>What do you think your chances are of getting shingles?</td>
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<tr>
<td>How do you think shingles can be prevented?</td>
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<tr>
<td>Are you aware that there is a shot to prevent shingles?</td>
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<tr>
<td>How did you hear about the shingles shot?</td>
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<tr>
<td>How safe to you think the shingles shot is?</td>
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<tr>
<td>How effective do you think the shingles shot is at preventing shingles?</td>
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<tr>
<th><strong>Ending Questions</strong></th>
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<tbody>
<tr>
<td>Have you tried getting the shingles shot?</td>
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<tr>
<td>What was that experience like?</td>
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<tr>
<td>What were the barriers that hindered getting the vaccine?</td>
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<tr>
<td>Who do you know that has gotten the shingles shot?</td>
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</tbody>
</table>
Appendix C  Shingles Focus Group Raw Results and Tabulated

Frequencies

Focus Group 1

Participant responses from focus group 1 are categorized into each behavioral dimension.

Knowledge

I. Disease Prevention (KN_prevention_vaccines) Frequencies in Subcategory: 7

1. “Flu. Pneumonia”
2. “Tetanus”
3. “Well, because you get the shots when you’re younger”
4. “you want to protect them anyhow, so you make sure that they get the shots.”
5. “When I had the small pox vaccination when I was a kid, I’ve had six of them since then.
6. They never took, but I’ve had six of them, so I was wondering if this is something that is continuing that you have to have boosters.”
7. “…when you’re a child you’re getting all of these preventative medications to prevent you know, whopping cough and all of the other things… you want to protect them anyhow, so you make sure that they get the shots.”

II. HZ Awareness (KN_HZdisease awareness) Frequencies in Subcategory: 9

1. “They had also told me to go see my primary care doctor the next day which I did and they took one look at it and saw that it was shingles”
2. “[I went to the] dermatologist. That looks like shingles and sure enough that’s what it was.”
3. “…I figured I had shingles.”
4. “I do not have an awful lot of knowledge about shingles.”
5. “…ever since I had it years ago and my ears perk up when I overhear conversations…”
6. “I haven’t had much experience with shingles, so I’m learning a lot right now.”
7. “You don’t hear that much about it.”
8. “You really don’t on the whole, but when you do hear it...”
9. “But he said I could get it again.”

III. Awareness Source (KN_HZawarenesssource) Frequencies in Subcategory: 6

1. “There’s a man that comes here. He had shingles quite a few years ago…”
2. “I got them.”
3. “They showed up.”
4. “Just you and me. Three of us.”
5. “Brother and son had it.”
6. “And then … my friend … got it…”

IV. Clinical Symptoms (KN_symptoms) Frequencies in Subcategory: 24
1. “I had pain and no itching and the rash didn’t come out until the next day. So I wasn’t itchy at all. It just hurt really bad.”
2. “…painful…discomfort for about four or five days and then it was itchy…”
3. “A few years ago, I was getting ready to go to the beach and I used some hair remover under my arms and this arm here started burning right away. It was terrible and I washed it right off and the other arm was fine and it kept bothering me for two or three days so I went to the doctor and he said, I think you have shingles, cause it was burning like crazy.”
4. “There were five little dots on the inner part of arm one morning when I got up and I thought I wonder what those are and they didn’t hurt, but I touched it, it was very burning and very tender…”
5. “He said it was extremely itchy and it hurt and they said it was on nerve endings and my brother had it in almost the exact same spot when he was fourteen.”
6. “…how painful it is and mine was just that discomfort for about four or five days and then it was itchy…”
7. “I broke out with a rash right up here and I went hmm, and it was itchy…”
8. “It was just too painful because it was all under here.”
9. “I got under my arm and then the itching.”
10. “When my mom had them, she had from the middle here to the middle part of her back and it blistered and she had a lot of pain and it itched very badly at times…”
11. “I think it starts with a rash, doesn’t it?”
12. “[My friend] had really bad, bad pain…”
13. “Mine blistered a little bit, but then I got some salve to put on it, but my hands still lumpy. It’s not a rash or anything. It’s like a - -”
14. “It left marks on my son and my brother. Same spot about this big and it’s still like a rash, but it doesn’t itch and it’s a little bit red.”
15. “Sometimes it is a real bad pain…”
16. “sometimes it’s …a blotching…”
17. “the ring thing is evidently the way they can really tell you have it”
18. “The next morning, I had a little rash in my hand here, a dot here and a dot here”
19. “…nothing appeared immediately and the rash never changed or spread or anything, but I got it very severely on my hand and I was very sick for about
a month, month and a half with it.”
20. “it was very painful. I didn’t have any itching or anything and my hand still bothers me. I have good days. I can use it alright, but I couldn’t even use my hand. It was so swollen.”
21. “…my had swelled up so bad…”
22. “I was in so much pain.”
23. “They thought it was a pinched nerve in my neck.”
24. “I know that it can often be a circular kind of thing. It comes around the body because my chiropractor the time that he saw the bumps, he said, oh that looks just like shingles and he immediately pulled up my shirt and I thought what’s he looking for and he says I’m looking for rings around and there was no sign of anything around the body.”

V.HZ Physical Impact/ Handicap (KN_HZhandicap) Frequencies in Subcategory: 12
1. “and then quite a while after they disappeared, she still had the itchiness.”
2. “I feel fine.”
3. “It bothers me sometimes, like opening a jar or something like that. I knit and crochet, so I’m able to use my hand, but it’s lumpy. You can feel my hand isn’t like the other hand, but it works.”
4. “bad pain all around the area to the point that she didn’t quit her job, but she only worked part time because it was so painful that she had to go home and take a nap and she couldn’t wear a bra.”
5. “There’s a man that comes here. He had shingles quite a few years ago and he’s in constant pain from it and there’s nothing they can do for him. He’s been to all kinds of doctors and tried pain medication. It doesn’t help.”
6. “He has to lay down a good part of the day some days it’s so bad.”
7. “I was in tears and I’d be like, I’m so sorry. I can’t help it. It was bad.”
8. “I had to sleep on the couch and I used - - one thing that helped was you know those little things you buy or they can be handmade with the beans in them and you put them in the microwave and I’d wrap my hand in it. So that was really nice. That was soothing. I don’t think it helped solve the problem or anything, but it felt good.”
9. “On the back and it still doesn’t tan for my son. He’s very Portuguese looking so he has very dark skin and that’s the only place on his body that really doesn’t tan.”
10. “…but my hands still lumpy.”
11. “Yeah, it’s lumpy. Under my hand there’s little lumps, but it’s not a rash, though. It’s just from the nerve damage.”
12. “Like the nerve endings? Maybe there’s some residual effects from - -“
VI. Epidemiology and Risk of HZ (KN_HZ_epi/risk) Frequencies in Subcategory: 17
1. “So I don’t know. I’ve never had shingles and I would anticipate that I wouldn’t have shingles”
2. “And I remember saying to him [the doctor], oh, my mother said I had chicken pox when I was younger and he said, well, that’s why you have it because it stays in your body apparently and it comes later on in life.”
3. “he said you can get shingles again…”
4. “…I think if there’s a possibility that I may get the shingles…”
5. “I did have stress in my life at the time cause my daughter was going through a horror show divorce and I think as a mother, a parent, I was absorbing her stress …I guess you absorb things and you don’t even realize you’re doing it…”
6. “…but they do suggest that you do have it as you get older especially because if you had, somebody had mentioned, chicken pox, it stays hidden on your body and it can show up and it often shows up in your lower back and your groin area and around your stomach, places that’s covered…”
7. “I think years ago I remember hearing some kind of relationship between chicken pox and shingles and this was when I was maybe even a teenage. I’m not sure. That there was some relation to the virus - - a similar virus, not exactly the same, but very similar and that’s when I first heard of it and then I just totally forgot about it.”
8. “The claim that if you come into contact with someone that has the chicken pox you can come down with the shingles after. I read that.”
9. “Yeah, it’s a childhood disease and they’ve been wanting to call it - - I think they just call it shingles because we’re adults when get it, when it comes back.”
10. “People don’t get chicken pox very much anymore, do they?”
12. “It is the same virus. It’s basically the organism that causes chicken pox that comes back later, so if you’ve had chicken pox as a child, you can contract it.”
13. “Yeah, and I did have a very severe case of the chicken pox.”
14. “People who have had chicken pox.”
15. “Well, now we hear about a 14 year old.”
16. “People that are having babies.”
17. “And as the years go by and as you get older now I guess. Its seniors.”
VII. HZ Vaccine Awareness (KN_HZvaccine) Frequencies in Subcategory: 11
1. “Shingles” [referring to being aware of the shingles vaccine]
2. “And recently shingles” [referring to being aware of the shingles vaccine]
3. “Yeah. We all know that one.” [referring to being aware that there is a vaccine to prevent shingles]
4. “…so I’m in between trying to figure out if I want to get the vaccine.”
5. “And if you’ve already had a very light case, you might not have to worry about having the shot.”
6. “…and what you said may well be true, that if you have had a serious case, maybe you don’t need the shot.”
7. “I thought when I retired it would be a good idea to get the shot…”
8. “…but they also said that if you have this shot and you have had shingles, that if it returns and it could, shingles does have a tendency to come back, that it lessens. It’s not as severe if it does come back and you have had the shot.”
9. “I think it’s out there and I think I there’s a possibility that I may get the shingles, then I want the shot.”
10. “Once you get the vaccination, you don’t have to get it again? It’s not like the flu shot.”
11. “No, it’s a one time.”

VIII. Vaccine Awareness Source (KN_HZvaccine_awareness) Frequencies in Subcategory: 4
1. “I was just approached. I used to go to the Peabody Council on Aging and one of the social workers and I were friends and this program was coming to the center and they were looking for volunteers and she asked if I wouldn’t be a guinea pig, so I signed up for it [reference made to participate in study to test HZ vaccine]. That’s how I heard about it [reference made to HZ vaccine].”
2. “A friend of mine just had it last Thursday. I heard it from her. I didn’t even know that there was a shot available until she mentioned it.”
3. “I had asked him [reference to doctor] about the vaccine…”
4. “I heard about it from my doctor…”

IX. HCP Recommendation (KN_HCPrecommend) Frequencies in Subcategory: 12
1. “My doctor offered it…”
2. “when he [referring to the doctor] brought it [referring to the vaccine] up again”
3. “…they do recommend that you should have it and I think that the doctors are pushing it now. My doctor is pushing it, but I did, because I participated, I received a shot free.”
4. “The shingles---my doctor had offered it to me…”
5. “And they’re just catching on to it, starting to push it.”
6. “My doctor isn’t pushing it. She’s not pushing it and my chiropractor said he didn’t think it would help me at all and I have a friend whose doctor said not
to have it, so I don’t think they’re all pushing it. Some maybe pushing it and some maybe not.”
7. “Well, I know my doctor has, but she had forgotten that I had gotten the shot.”
8. “And a lot of them may be pushing it…”
9. “I had asked him about the vaccine and he said, when did you have the shingles and I said, oh, last year. He said, no, it’s too soon. And then I asked him one other time and he said, it’s still too soon. Now, he’s talking I should get it because he said you can get shingles again”.
10. “…That’s why he’s pushing the shot.”
11. “…so I asked about my doctor about it and thought he didn’t seem terribly enthusiastic at the time…”
12. “he [referring to doctor] felt that it [referring to shingles vaccine] wouldn’t necessarily help me in any way or not and I already did have shingles”

X.HZ Vaccinees (KN_HZvaccinees) Frequencies in Subcategory: 2
1. “A friend of mine just had it last Thursday.”
2. “I have had the shot…”

XI.Drug Use to Treat HZ (KN_drugtherapy) Frequencies in Subcategory: 5
1. “Yeah, I went to the dermatologist and he immediately put me on five days of - - I don’t even remember what the drug was, but whatever it was, it was very effective and it immediately - - actually by the next day, there was no discomfort if you even touched it…”
2. “And he said, well, okay, we’ll treat it as acute dermatitis and he gave some cream.”
3. “Well, a couple days later, I broke out with a rash right up here and I went hmm, and it was itchy, so I went back to him and he said, now, that’s shingles. So, I don’t know what he gave me. I can’t remember.”
4. “They put me on five days of medication and it just wiped it right out immediately and I’ve never had it return.”
5. “One of the medications they put me on…”

XII.Non-prescription Treatment Beliefs (KN_homeopathic) Frequencies in Subcategory: 6
1. “Yeah, because one of the things in one of the books Chicken Soup for whatever and one of the folk remedies is to use Epsom salt or baking soda and make a paste of it and put it on the little--”
2. “It’s interesting in that book Chicken Soup and all the other folk remedies, one of the things they said is if you have a blender to make celery juice and drink I forget how much each day and within about a week it’s supposed to take care of a lot of what’s happening and I’ve wondered if there’s something to that or not. I thought that was kind of interesting. But I had a
feeling that it is something that would possibly cleanse it and get it out of your body. It’s a virus, so something that would remove that from your body would be a good thing and there may be natural ways to do it. I often rely on a lot of old remedies because I find they work for me.”

3. “If there’s some other way to do it, I will do it and it so often works and I don’t know whether that’s mind over matter or if it’s really happening. It might be just that I think that it’s going to work and that’s what why it works.”

4. “And then another one I had never heard of before was making tea of buck leaf - - I think it’s something that grows in the south. Have you ever heard of buck leaf? And it grows in the south of this country and then it’s on some kind of thorny bush and that’s supposed to be something that helps cure it. Some man did this and he went to work within a week whereas he’d been very uncomfortable and it’s interesting these certain things that you might read about.

5. “What they need to do is they need to really do some studies on these herbs and alternate treatments”

6. “That’s right and that’s exactly what it is.”

Risk Appraisal

I. Susceptibility (RA-susceptibility) Frequencies in Subcategory: 5

1. “I don’t feel that I’ll necessarily get them again…”

2. “It might be a good idea to think about the possibilities that maybe we’ll get them as we get older”

3. “I took care of my mom when she had them and I never got them.”

4. “My father is 87 and he still hasn’t had them.”

5. “My parents passed away the past couple of ears, both of them. They were 95 and 98 and neither of them ever had them [referring to shingles] and I’m 71 and I haven’t so far.”

II. Perceived Severity (RA-percdseverity) Frequencies in Subcategory: 9

1. “…it’s often a very severe case”

2. “…it just amazes me what a spectrum there seems to be. I don’t know whether if that’s true or not, but from everything I’ve heard, there seems to be such a wide range of cases and ways it manifests and I guess everybody at least has a couple of little dots from what I’ve heard. I don’t think I’ve ever heard anything different from that, but the ring thing is evidently the way they can really tell you have it, but not everybody has had that.”

3. “…I hear so many different kinds of situations and some of them as so simple and some of them as so difficult.”

4. “…think I had a very mild case.”

5. “…I had the very mildest case you could ever imagine.”
6. “I had a mild case like [participant’s name given but not transcribed herein].”

7. “I thought I was having a heart attack. I thought I was done. I really did. So having this [referring to having shingles] over the heart attack I was like, oh, I can deal with this.”

8. “I’m very fortunate, It could have been a lot worse, like you said, face and --.”

9. “I’m wondering why she [my doctor] hasn’t…mentioned it…I’m thinking maybe they don’t—my doctor doesn’t think it’s as prevalent as the flu.”

III. Immunity (RA-immunity) Frequencies in Subcategory: 9

1. “I wonder if the salt water did something for it because - -“

2. “I always think salt water does good stuff for your body.”

3. “Well, we lived on a boat. And so I’m thinking that just hanging in the salt water - -“

4. “Well, we lived on a boat and he was always in the salt water.”

5. “And that’s very healthy for the body to do that.”

6. “The kids never had the flu. They very seldom had colds.”

7. “I grew up swimming in the ocean was very healthy.”

8. “They were hardly every sick when they were small.”

9. “I bet that got rid of it quick.”

IV. Fatalism (RA-fatalism) Frequencies in Subcategory: 2

1. “Every time you walk out you could catch something.”

2. “You were going to get sick anyway”

V. Misconception (RA_misconcept) Frequencies in Subcategory: 2

1. “I had this initial feeling I should wash my hands after I touched it…”

2. “I heard people of having it in their eyes and you wonder if maybe they’ve even spread it. I don’t know, but I know you said you are not a doctor, so you can’t answer that one.”

VI. Problem Hierarchy (RA_prblmhierchy) Frequencies in Subcategory: 0

None recorded in focus group.
Perceptions

I. Self-efficacy (PR_selfefficacy) Frequencies in Subcategory: 13
1. “…and if I do [get them], I’m going to deal with it immediately.”
2. “I think you should go ahead and have the shot.”
3. “You should go ahead and prevent whatever. I know you don’t like shots, but—”
4. “People have to take control of their own bodies and I think that’s good. If you choose to take it, that’s very good.”
5. “Life is full of choices and options.”
7. “And drink a lot of tomato juice every day. At least one glass. It’s better for your teeth than orange juice because it doesn’t have as much sugar in it and I do the low sodium because of the salt. So I tried it - - it’s not always easy when you see French fries in front of you that are very good.”
8. “Well, more than anything, they keep saying to eat well, eat a Mediterranean diet and you avoid a lot of physical ails that way, if you tend to eat that way and basically live a pretty normal lifestyle as best you can and not give up the good things either I mean that you think are gluttonous, so that’s all I can think of.”
9. “But from my way of thinking it’s more like if you keep yourself reasonably healthy, a lot of these things aren’t going to necessarily affect you and if they do, you have to deal with them.”
10. “my feeling is if you keep aware of what’s happening on your body, if I see it again, I would just go immediately and deal with it.”
11. “I’ve been taking vitamin C pills for 30 years. I had a urinary tract infection and that’s what they told me, to take those so I wouldn’t get another one and I take them two times a day, one in the morning and one at night and I very seldom - - I might have a cold for two or three days. Everybody else is sick for three weeks, but I also go outside a lot. I’m outside walking and I think that helps kill any germs that are out there. And I eat well too. Well I try. It’s not always easy.”
12. “I’m a fan of vitamin C too.”
13. “I went online to look it up…”

II. Vaccines are beneficial (PR_vaccbeneficial) Frequencies in Subcategory: 3
1. “I’ve had a flu shot every year since they started offering it where I work and I’ve never got sick from it…”
2. “Because a flu shot’s a dead virus. A dead virus can’t make you sick. They say it’s a coincidence if you get sick.”
3. “you want to protect them anyhow, so you make sure that they get the shots.”
III. Vaccine Safety Concern (PR_fear_vaccines) Frequencies in Subcategory: 19
1. “And what kinds of side effects does - - “
2. “Did you get any side effects?
3. “I had no side effects [f]rom my shot…
4. “A shot is a live virus that they put in your body, so I don’t think I would”
5. “It’s like the flu shot. You don’t know what you’re getting…”
6. “Just the fact that it is a live virus turns me off”
7. “…I’m very sensitive to drug reactions and things and I just really I do better.”
8. “…and get off the drugs that cause side effects. Every single of them. You take a drug, you get a side effect.”
9. “For years I had allergies injections cause I couldn’t take the medication. It made me too drowsy, so I wanted to drive, so I had desensitization.”
10. “And my husband got sick from it too. He won’t get them.
11. “I wouldn’t have it.”
12. “If it’s only been out five years, you don’t know.”
13. “The vaccine is so new. It’s only been out a couple of years.”
14. “It’s like buying a car. I wouldn’t buy a car when they first come out either until they come out for three or four years.”
15. “Has there been a study of people that have had the shots and have they had any problems from having the shots?”
16. “I think that’s what this thing that I was involved in and it was a year-long thing, I think this is what they were doing behind the scenes. I don’t know what the other side. I never saw, but after the time was over, they passed it. They handed it out, so it couldn’t have been too bad.”
17. “I haven’t seen any research on it, but I wouldn’t do anything until I see something on it.”
18. “Written, whether what the side effects are and does it guarantee it or get it bad or will it give it to you.”
19. “I guess that drug hasn’t been on the market long enough for them to have done that, has it?”

IV. Vaccine Efficacy Concerns (PR_ineffectvac) Frequencies in Subcategory: 5
1. “I don’t necessarily think it is [effective]. It’s 50-50.”
2. “There’s no guarantee.”
3. “Nobody really knows.”
4. “Unless you’re going to get it within five years anyway. You have no guarantee.”
5. “But there’s no guarantee with anything. With the flu, you can still get the flu.”
V. Lack of trust (PR_lacktrustvacc) Frequencies in Subcategory: 8
1. “Honestly, I haven’t had a shingles shot and I’m really nervous about it because I won’t get a flu shot. Years back, on two different occasions I got the flu shot and I got very sick from the flu shot, so I won’t get a flu shot and because of that, my primary care doctor said it’s entirely up to me whether I get a shingles shot or not…”
2. “…and also there’s no guarantee that it will come back again and so as of yet, I have had not a shingles shot and I was toying with that idea and I had shingles just a year ago, so it was just a year ago. I’m nervous about it because of how I reacted to the flu shot.”
3. “…I don’t take any pills. I don’t take drugs. I might take an Aleve or something once in a while.”
4. “I just don’t like how I feel when I’m on a medication. I don’t like how it makes me feel, so I’m nervous about it.”
5. “I’d like to know a lot more about it before I subject myself to anything like that.”
6. “So, cause I have mixed feelings about inoculations.”
7. “It’s not that I won’t have them, but I had my flu shot, but I waited until I was into my 70s to do that. And all those years before I never got not one.”
8. “There are mixed feelings about that one…I didn’t want it.”

Access
I. Ability to Access health care system, e.g. see doctor (ACC_HCPAccess)
Frequencies in Subcategory: 25
1. “My doctor offered it…”
2. “I had talked to my chiropractor…”
3. “I was going to an adjustment [with the chiropractor] that day”
4. “…go to your dermatologist”
5. “…so I went to the doctor”
6. “so I went back to him…”
7. “Now he’s [referring to doctor] talking…”
8. “…by the time I got him to a dermatologist, it was gone.”
9. “I have to go to the hospital.”
10. “So we went to the hospital. They took me right away.”
11. “They had also told me to go see my primary care doctor the next day which I did…”
12. “but one of things the doctor asked me…”
13. “I had been involved oh, maybe about five, six years ago in a [clinical trial] group… and you had to call once a month and tell whoever it was - - the nurse - - at the other end - - it came from Boston, one of the Boston hospitals…”
14. “I know my doctor has…”
15. “My doctor isn’t pushing it”
16. “[doctor] said I could get it again…”
17. “my chiropractor … said, oh that looks just like shingles”
18. “so I asked about my doctor about it…”
19. “He’s been to all kinds of doctors and tried pain medication”
20. “I heard about it from my doctor”
21. approached by “one of the social workers”
22. “my doctor”
23. “my primary care doctor said…”
24. “I had asked my doctor about it”
25. “…that’s what they told me at Costco.”

II. Attempt to access HZ vaccine (ACC-vaccine) Frequencies in Subcategory: 4
1. “No”
2. “No”
3. “Not yet”
4. “I’m the only one here?”

III. Supply barriers in accessing HZ vaccine (ACCsupply_barrier) Frequencies in Subcategory: 2
1. “You have to order it and then when you get it…”
2. [Costco] didn’t have it in, but they get it every so often.

IV. Cost barriers in accessing HZ vaccine (ACC-Cost_barrier) Frequencies in Subcategory: 11
1. “It was too expensive and not covered by insurance.”
2. “At the time it wasn’t, but now my insurance will cover a portion.”
3. “Did you say it’s not covered by Medicare?”
4. “Well, whether it is now since they have changed things, but it wasn’t when I asked.”
5. “It was something like $75 I think for the shot and most insurances don’t pay for it. Medicare. I don’t know what the rule is now that the rule is now since things have been changing, but it didn’t before.”
6. “When he first told me about it a few years back, it was like I had to pay for it, $200. Now my insurance will cover everything but $33, so it has.”
7. “I called my insurance company and my co-payment would be $33 so it has come down and they are I guess accepting it now and paying more for it.”
8. “I’ve been turned off by the price and it not being covered.”
9. “…in the beginning, it was quite expensive. It was like a couple hundred dollars.”
10. “I thought it was $300.”
11. “I think it may have changed to Medicaid. Could be. I’m not positive.”
V. Frozen requirement for vaccine as a barrier (ACC_frozen_barrier) Frequencies in Subcategory: 3
   1. “And there’s also, I guess it comes frozen…”
   2. “…you have to go and pick it up with them…”
   3. “She said call and when you come out, bring your cooler and then go immediately to the doctor.”

VI. Positive health care experiences (ACC-posHCexperience) Frequencies in Subcategory: 2
   1. “They took me right away.”
   2. “…go see my primary care doctor the next day which I did”

Focus Group 2

Participant responses from focus group 2 are categorized into each behavioral dimension.

Knowledge
I. Disease Prevention (KN_prevention_vaccines) Frequencies in Subcategory: 12
   1. “Flu shots.”
   2. “Pneumonia.”
   3. “Polio.”
   5. “Hepatitis.
   6. “Hepatitis, hepatitis B.”
   7. “diphtheria and something else”
   8. “Babies get that.”
   9. “small pox vaccinations”
   10. “We had small pox.”
   11. “Was that before you could leave to go to Europe? You had to have, that wasn’t chicken pox. It was small pox. I guess that’s what it was.”
   12. “I think so.”
II. HZ Awareness (KN_HZdisease awareness) Frequencies in Subcategory: 12
1. “Chicken pox is shingles.”
2. “It’s something to do with chicken pox too.
3. “I haven’t had it...[but ]I’m aware of it.”
4. “I think you have shingles...”
5. “It’s supposed to be a disease of your nervous system but it makes you very nervous once you get it.”
6. “Somehow amazingly enough it knows when to stop.”
7. “Well obviously I have [postherpetic neuralgia] and it’s really frustrating.”
8. “How long ago were you diagnosed with shingles?”
9. “April”
10. “I’ve heard a couple of years some people have it.
11. “...twenty percent of people get this...”
12. Two days later, shingle..”

III. Awareness Source (KN_HZawarenesssource) Frequencies in Subcategory: 13
1. “Literature”
2. “I was not aware at all until I got the disease. It just was not on my radar screen.”
3. “Yeah, somebody in your family that’s had it and you’re aware of it.”
4. “And if patients have it and you’re treating them.”
5. “Knowing people who were suffering from shingles.”
6. “My daughter got it when she was in her twenties I think.”
7. “My wife.”
8. “Myself.”
9. “My mother and my daughter both had it and I had it.”
10. “In my church a member had it.”
11. “I have gone through the shingles and the postherpetic neuralgia...”
12. “just knew nothing about it.”
13. “My brother had it when he was in his sixties.”

IV. Clinical Symptoms (KN_symptoms) Frequencies in Subcategory: 42
1. “It’s unilateral. That’s one of the ways they know right away.”
2. “…because it’s all once sided.”
3. “The pain... was just awful.”
4. “It’s painful, it’s very painful.”
5. “It’s painful.”
6. “Yeah and this neuralgia...”
7. “post herpetic neuralgia...”
8. “It attacks one side of the body where ever it attacks.”
9. It used to be a superstition that if it got to the other side then you were doomed.”
10. “It begins with a rash usually”
11. “…a traditional description of the shingles people have…[are blisters]”
12. “Painful.”
13. “You break out.”
14. “First you start with blisters, sometimes, usually and then it heals over and gets scabby and peeling…”
15. “painful and the pain can last after the skin is all cleared up.
16. “And it’s preceded by pain”
17. “…they can’t diagnose the disease until they actually see the blisters break”
18. “…horrific pain”
19. “…blisters break out.”
20. “Or even welts. That’s how mine was diagnosed.”
21. “I had terrific pain…”
22. “… and I had red welts.”
23. “You mean pain before you were diagnosed?
26. “It could be around your waist…”
27. “…I had it on my face, around my eyes and apparently it got into my eye and left a scar on my eyeball, a tiny little one. So that’s another effect of it, I don’t know.”
28. “…most painful in that area and lasts longer…”
30. ”…and having it fall on your scalp.”
31. “…she had it around her waist. It’s like a nervous system”.
32. “It’s the nerves.”
33. “Yeah.”
34. “Even walking here today it’s a little bit windy today, I can feel it on my face.
35. “Cause you had it on your face.”
36. “I had it all through here. Has anybody else had it down here then or am I the only one in this group?
37. “Is that type of thing itchy or that type of thing or is it pain?”
38. “It’s pain if you put anything like a bra or.”
39. “Anything that touches it.”
40. It’s your nerve endings right in the surface of your skin so anything that touches.”
41. “…you’ll forget about the pain…”
42. “…one day all of a sudden I had pain in my head, what is this?
V.HZ Physical Impact/ Handicap (KN_HZhandicap) Frequencies in Subcategory:
1. “this pain theoretically it can last up to a year and I was joking with the neurologist at that point I was two months into it. I said oh, I’ve only got ten more months to go and she was just like shrugging her shoulders and was like don’t count on it. It might be less but.”

2. “For three weeks I was a zombie…”

3. “It’s very uncomfortable.”

4. “Horrible.”

5. “Very undesirable.”

6. “… she was miserable for a long, long time”

7. “I had about a weekend of discomfort”

8. “I know people have had it there have really suffered.”

9. “It gets so sensitive that you can’t imagine getting in a shower”


11. “She was also very painfully affected by it.”

12. “I know people have had it there but I feel sympathy for you because you can’t wear clothing.”

13. “You can’t bear having anything touch this.

14. “That’s why I got my hair cut really short. Just one piece of hair on my face, you jump out of your skin so I am very empathetic to people who have it on their torso.

15. “I understand that it’s much worse on the area than down here so I wondered where it has quite a rash down here if it was an itchy type thing as well as painful.

16. “Oh yes.”

17. “I didn’t drive for five months”

VI. Epidemiology and Risk of HZ (KN_HZ_epi/risk) Frequencies in Subcategory:

45

1. “… you’ve had chicken pox….”

2. “It attacks older people.”

3. “If you’ve had chicken pox you can get it but if you haven’t ever had chicken pox you don’t get shingles?”

4. “I think that’s the way it goes”.

5. “If you get it once supposedly you won’t get it again.”

6. “But not always”.

7. “I thought you could get it again.”

8. “It lingers in your body your whole life.

9. “…you probably won’t get it again.

10. “…it’s in your body and could crop up any time.”

11. “I think you can get it any age.”
12. “Yeah, that’s right.
13. “Does it affect men and women?”
14. “Yes, it does but from what I understand it overwhelmingly tends to affect women but it does affect both.”
15. “My understanding is that when it’s in the head mostly above the eyebrow and so on…. I don’t know whether that’s because it’s near the central nervous system or what. I have no idea.”
16. “Older ones.”
17. “If you’ve had chicken pox.
18. “Chicken pox, yeah that’s right.
20. “You have to get chicken pox or the chicken pox vaccine…”
21. “It’s more prevalent in older people but it’s not limited to older people.”
22. “Right.”
23. “Because you wouldn’t have what’s dormant in your spine.”
24. “Yeah, that’s right. Maybe if you had a vaccination versus chicken pox you would never get shingles.”
25. “It puts that virus in your body when you get the vaccine so it makes you vulnerable I guess.
26. “Oh that’s true”
27. [Chances of developing shingles are]“[v]ery good.”
29. “Yeah.”
30. “I know two men that have had it.”
31. “Oh, well it’s [referring to chicken pox] in your system?”
32. “Yeah.”
33. “Nasty business staying in your system all that time.”
34. “Is it stress related at all?”
35. Yes, that’s what I had heard.”
36. “Yes, I have definitely heard that. There are many different types of stress.”
37. “It often happens just before something big is happening in your life.”
38. When we went to dinner with a neighbor in Wellesley who had a cook, she got the shingles and I remember at the time there was concern that because she handled the food in the family that there might be the dangers that others would get shingles and so she was more or less isolated for a period of time.
39. “My understanding is that you are contagious when you have the blisters and I’m kind of concerned because one person had a friend she said had it on their torso so it wasn’t visible.”
40. “…for you would be very serious because you haven’t had it or a person who has an immune deficiency can be somehow impacted very negatively…
41. “… so it’s important for people who have shingles while they’re in the blister stage to isolate themselves…
42. “…not everyone does that because they don’t want to stay home from work or whatever...
43. “…that could be very dangerous for a lot of other people or for children who have never had chicken pox they could get chicken pox because of that.
44. “I should think you’d have to have direct contact with somebody.”
45. “I don’t know what the direct contact is, what’s involved, I don’t know but my understanding is you need to isolate yourself while you have the blisters.”

VII. HZ Vaccine Awareness (KN_HZvaccine) Frequencies in Subcategory: 23
1. “the shot… many people cannot take… because of immune system disorders”
2. “Your doctor shouldn’t give it to you if you have immune - -“
4. “Yeah.”
5. Oh, disorders and also you shouldn’t have it if you’re currently having shingles.
6. “Oh no, it’s preventive”.
7. “It’s preventive but I mean if you want to prevent a future attack you should wait until you get rid of the present one.”
8. “I didn’t know about it.”
9. “With the [shingles] shot you don’t get it [reference made to shingles], right?
10. “No, my understanding is if you get the shot you can still get it [reference made to shingles] but it will be less painful.”
11. “Yeah.”
12. [Shingles can be prevented b’]’y getting vaccinated”.
13. “But it will make it less horrific.
14. “I’ll never get it again and I’ll never get shingles again because I’ve had a shingles shot?”
15. “if you do get it, it decreases the severity of it.”
16. “I didn’t [hear about the shingles shot]”.
17. “Isn’t it a fairly recent development”?
18. “I’ve also suffered damage to my immune system, which they [reference made to physician] know and they may have made a judgment [not to recommend the vaccine] on that basis.”
19. “Yeah cause I had the same situation and that’s why they didn’t mention it. They’re not supposed to give it to you if you have any sort of an immune system problem.
20. “It was never mentioned to me.
21. “Did you get the vaccine after you already had shingles?
22. “I think it’s too late by that time to get the vaccine.”
23. “You might be able to keep it from coming back.”

VIII. Vaccine Awareness Source (KN_HZvaccine_awareness) Frequencies in Subcategory: 4
1. “heard it from the doctor’s office…”
2. “Newspaper”
3. “the literature I think says now you can get it as early as age fifty.”
4. “when I was in California a lot of the supermarkets that had the signs for flu vaccine also had signs saying shingles vaccine…”

IX. HCP Recommendation (KN_HCPrecommend) Frequencies in Subcategory: 6
1. “My doctor didn’t tell me about it…My doctor never mentioned it.”
2. “I noticed in the doctor’s office.”
3. “Now the doctors recommend it. I mean they tell you about it.”
4. “My doctor has never mentioned to me… the shingles vaccine and obviously have never suggested that I consider taking the vaccine so I wouldn’t”.
5. “…my neurologist is saying I don’t know if you should have the shot because there’s not enough data who had gotten the shot and whether it was effective or not so I don’t know.”
6. “so even though it’s available to people age fifty his doctor wasn’t sure he should get it quite yet.”

X. HZ Vaccinées (KN_HZvaccinees) Frequencies in Subcategory: 6
1. “husband”
2. “My husband got the vaccine.”
3. “One of my brothers got the vaccine almost immediately”
4. “I don’t discuss that sort of thing with people ordinarily.”
5. “I know [reference to person’s name not reproduced herein] has had a shot because she’s indicated to me that she got the shot but I don’t know”.
6. “My sister and my brother-in-law both got the shingles vaccine…”

XI. Prescription Drug Use to Treat HZ (KN_drugtherapy) Frequencies in Subcategory: 32
1. “…if you have that pill, I didn’t have blisters…”
2. “Right so the sooner you get the medication the better.”
3. “Yeah.”
4. “You mean Valtrex?”
5. “Yes.”
6. “…the medication is different from the shot.”
7. “Yes.”
8. “Oh yeah.”
9. “Yes, the medication is to deal with [shingles].”
10. “After you get it, right?”
11. “I think that… if you get the medication soon enough it really stops”
12. “…gave me the medication soon enough…”
13. “Was that Valtrex medication? Was it Valtrex?”
15. “This medication that you have to take it just has a lot of side effects so that it’s almost like.”
17. “Neurontin is what you take for a lot of things.”
18. “So I’ve been taking it for over five months now.
19. “So that’s one piece that obviously people that have it want to know how do you treat it.
20. “…when I initially went and got the Valacyclovir…”
21. “…they should have also given me a steroid for the pain”
22. “…instead they gave me narcotics which were so devastating.
23. “…and I kept asking for more because I was in such pain and she said that does nothing for that kind of pain and she was just amazed that they hadn’t given me the steroid.
24. So is it not common knowledge for physicians that’s how you treat it or how does that knowledge get through to these people?
25. “When did you start Neurontin? You said instead of Valtrex I assume?
26. “I started Neurontin - -”
27. “Yeah, you said you were taking Valtrex and you weren’t taking those at the same time?”
28. “No, I don’t think so. I think the Valacyclovir you take for a week.”
29. “They stop you and then they start you on Neurontin and you’re still taking it?
30. “I probably would be taking more medication except for I said to her I need to start driving again.”
31. “Do you take it every seven or eight hours?”
32. “I take it three times a day.”

XII. Non-prescription Treatment Beliefs (KN_homeopathic) Frequencies in Subcategory: 17
1. “I tried a whole bunch of different things. Some naturopathic types, I’m taking that but you still have the pain”
2. “…just trying to find things to cope.”
3. “…I was doing apple cider vinegar…”
4. “…there’s Capsaicin.
5. “Capsaicin, how is that?”
6. “When I put that on I just about jumped out of my skin.”
7. “That’s hot pepper. They put it in a cream and use it for arthritis.
8. “I jumped out of my skin.”
9. “You put it on your face?”
10. “Yes, I put it on my face and now that’s not working.”
11. “Aloe Vera was what helped me.”
12. “Aloe Vera is the only thing that helped me through. The Aloe Vera helped a lot even though it was just surface.”
13. “Is that Valtrex?”
14. “No, it’s just an over the counter. It’s what they put for sunburn and burns and all kinds of stuff.”
15. “What do you call it?”
16. “Aloe Vera, it’s from the aloe vera plant. It’s very soothing.”
17. “Anything with vitamin E they say, any creams, something like that, that’s helped me a lot.”

Risk Appraisal
I.Susceptibility (RA-susceptibility) Frequencies in Subcategory: 2
1. “so you can’t escape.”
2. “so younger kids are getting the vaccine now so that virus is alive in their systems so they’re vulnerable also.”

II.Perceived Severity (RA-percdseverity) Frequencies in Subcategory: 7
1. “I had what I guess was a mild case…”
2. “You’re lucky.”
3. “I wonder if you get a mild case if you would maybe not notice that it is shingles and not get diagnosed.”
4. “There’s no such thing as a mild case.”
5. “I honestly don’t know.”
6. “Some people get it worst.”
7. “Some people have very mild cases but I would have been out of work for six weeks and I still have the pain after six months.”

III.Immunity (RA-immunity) Frequencies in Subcategory: 0
None documented in group.

IV.Fatalism (RA-fatalism) Frequencies in Subcategory: 1
1. “There’s no way out.”
V. Misconception (RA_misconcept) Frequencies in Subcategory: 11
2. “I mean if you’ve had chicken pox shot does that mean you’re less apt to get shingles or more apt to? I don’t know.”
3. “Is it a fact that if you haven’t ever had chicken pox you don’t get shingles? I don’t know about that.”
4. “Does it just affect females?”
5. “No.”
6. “Men do [get shingles]?”
7. “Avoid chicken pox.”
8. “You know if it’s related to chickenpox why wouldn’t there be more men getting it [reference made to shingles]? Before the vaccination boys got chicken pox as well as girls but they don’t seem to be affected by it [reference made to shingles].
9. “It’s probably something about their hormones that we don’t know about you know that protects them.”
10. “Flu is of course very contagious and does anybody know? From my reading I don’t gather shingles is contagious.”
11. My understanding is you don’t pass out shingles but you can pass person and I don’t know what the interaction needs to be but you can cause someone to get chicken pox
12. “I honestly don’t know if men have it.”

VI. Problem Hierarchy (RA_prblmhierchy) Frequencies in Subcategory: 3
1. “I certainly don’t creep up to people and offer some kind of question like that as a socially desirable comment.”
2. “But you do ask somebody have you had your flu shot. That’s a very common question to one another.
3. But you never say have you had your shingles shot.”

Perceptions
I. Self-efficacy (PR_selfefficacy) Frequencies in Subcategory: 2
1. “Now that I’ve had it when I look at lists of things that one should do at a certain age is getting the shingles vaccine is in there but I didn’t know about it.”
2. “I don’t even keep a good record of the vaccinations that I’ve had personally”

II. Vaccines are beneficial (PR_vaccbeneficial) Frequencies in Subcategory: 3
1. “They got it… they considered it was well worth it.”
2. “I talk to everybody that I know. Do they know about shingles? Do they know about getting the vaccine because I don’t want anybody to go through what I went through and I’m still going through.”
3. “I would get it in a heartbeat”
III. Vaccine Safety Concern (PR_fear_vaccines) Frequencies in Subcategory: 7
1. “Time will tell [referring perception of how safe the shingles shot is].
2. “Good answer.”
3. “I just said like everything else, all the medications.”
4. “I know. I don’t want anything put in my body that my body is fine the way it is.”
5. “And you don’t know that yet.”
6. “We really don’t know [how safe the shingles shot is].”
7. “I don’t think anybody knows [how safe the shingles shot is].”

IV. Vaccine Efficacy Concerns (PR_ineffectvac) Frequencies in Subcategory: 20
1. “And there’s some question about that. My neurologist said there’s just not enough evidence out there to say whether you should get it or not because there’s not enough people who have had shingles and then gotten the vaccine to see if it’s affective.”
2. “But you just said it. You said a shot to prevent shingles but apparently it doesn’t prevent it.”
3. “But you just said you might get it [reference made to shingles] even though you’re vaccinated.”
4. “So let’s not say that it prevents shingles.”
5. “Some people it does.”
6. “It’s like the flu vaccine I think. Some it prevents people from getting it but also some people still get it.”
7. “Well I had the shot and I haven’t gotten the shingles.
8. “Yeah, I do [think it’s effective].
9. “How long ago did you have the shot?
10. “Five, six, seven years.
11. “I don’t know what the statistics are I mean. If my doctor says get it I get it but how effective it is based on how many shots are given and how many people then got it I mean we’d have to know some data I would think about it to answer the question how affective do you think the shingles vaccine is..”
12. “The test says it’s affective on her if she hasn’t got it. Same for me but I would have no way of knowing how affective.”
13. “It might be that we’d all have it and four of us would still come down with it.”
14. “And when did you judge? After seven years? After ten years? After fifteen years?”
15. “Well they must have some records already. Even one year of giving the shot.”
16. “I think the vaccine came out in 2006 so they’ve had a number of years now with it.”
17. “And you’re doing a study I presume to get some data up.”
18. ”You still have to be sure that it doesn’t cause, you can get it again.”
19. “…because they’re not sure how long the vaccine lasts”
20. “…can anyone get a booster shot or anything like that…”

V. Lack of trust (PR_lacktrustvacc) Frequencies in Subcategory: 9
1. “Is it a live vaccine or not?” [response given that the shingles vaccine is a live vaccine]
2. “I don’t want it.”
3. “No, not if it’s live.”
4. Well flu is a live vaccine. Flu shots are live vaccine too.”
5. “Yeah and I don’t like those either.”
6. “Did you get one?”
7. “Not this year. Last year I got it.”
8. “I’ve never gotten the flu shot.”
9. “Because it’s a live vaccine.”

Access
I. Access health care system (ACC_HCPAccess) Frequencies in Subcategory: 9
1. “She may have not gone to the doctor soon enough.”
2. “I think she probably did. She’s a nurse…”
3. “I’ll talk to my neurologist”
4. “A neurologist that I talked to said…”
5. “I was joking with the neurologist…”
6. “She diagnosed me over the phone.”
7. “You have to go to the emergency room…”
8. The dermatologist said…”
9. [The Vaccine Information Sheet that one of the participants had with her stated that] “[i]t was in the Mayo Clinic Report probably”.

II. Attempt to access HZ vaccine (ACC-vaccine) Frequencies in Subcategory: 16
1. “I wouldn’t”
2. “it was not easy to get.”
3. “Right… I got the shot”
4. “So are you going to get it [reference to shingles vaccine]?“
5. “I don’t know. When the time comes I’ll talk to my neurologist and see what she says at that point. I just don’t know.”
6. Obviously I haven’t [tried getting the shingles vaccine] because I have shingle…
7. “…but my husband wanted to get it…”
8. “Yeah” [referring to knowing anybody that’s gotten the shingles shot]
9. “They got it…”
10. “Another one of my brothers is younger so his doctor said I’m not sure if we should give it to you yet…”
11. “Do they find out whether they’ve had chicken pox”?
12. “Oh yeah and if they don’t know like my husband wasn’t sure they can do a blood test and find out so then they know whether they can give you the vaccine.”
13. “No, they won’t give you the shot until way after you’re finished.”
14. “I had been given the same answer. You certainly can’t have it until it’s over.”
15. “Way over. It has to be a long time. I don’t know what the time period is but it’s not two months. It’s like a long time after.”
16. “Mine was two months, two and a half months.”

III. Supply barriers in accessing HZ vaccine (ACC_supply_barrier) Frequencies in Subcategory: 6
1. “he was originally told… we won’t be getting any vaccine in until June”
2. “…my impression is it can be difficult to get…”
3. “…then some way they got a supply in … and gave it to him.”
4. “Some frustration at first that he was going to have to wait that long but then when it showed up it was there.”
5. “I have talked to a lot of people who said they had to really chase it down to get it.”
6. “A friend went into Boston to get it. This was a couple of years ago but people have had a hard time.”
7. “It’s not just I want it, here it is. There’s some planning that needs to happen I guess.”
8. “Yes” [referring to some planning, some difficulty required to obtain the vaccine]

IV. Cost barriers in accessing HZ vaccine (ACC-Cost_barrier) Frequencies in Subcategory: 7
1. “I had to pay thirty dollars even though I’m on an HMO. I understand it’s now covered if you have it at your HMO doctor.”
2. “I heard that is very recently.”
3. “some insurance companies don’t cover it.”
4. “That’s true.”
5. “Well I’ve been with the same health plan for over thirty years and mine does cover it.”
6. “They got it before the insurance company paid for it…”
7. “My sister and my brother-in-law both got the shingles vaccine when it was not covered by insurance.”
V. Frozen requirement for vaccine as a barrier (ACC_frozen_barrier) Frequencies in Subcategory: 0 None documented in group.

VI. Positive health care experiences (ACC-posHCexperience) Frequencies in Subcategory: 0 None documented in group.
Focus Group 3

Participant responses from focus group 3 are categorized into each behavioral dimension.

Knowledge

I. Disease Prevention (KN_prevention_vaccines) Frequencies in Subcategory: 14

1. “I got the flu shot”
2. “Smallpox.”
3. “Flu shot…”
4. “…pneumonia shot.”
5. “Tetanus.”
6. “Insulin”.
7. “Did we say pneumonia?”
8. “Yeah, I have shots.”
9. “I got all kinds of shots when I was in the military, and I didn’t even know what the hell they were for.”
11. “Oh, they got all kinds of ‘em like that.”
12. “Diphtheria, I think they have one for diphtheria, don’t they?..”
13. “Malaria.”
14. “Oh, yeah, malaria.”
II. HZ Awareness (KN_HZdisease awareness) Frequencies in Subcategory: 20
1. “I have no idea what it looks like. Do you?”
2. “Have you seen them, what they look like?”
3. “Mine were not like that.”
4. “Have you seen the rash and what it looks like?”
5. “Like a big rash.”
6. “You guys, I’m serious. They know it was shingles…”
7. “What’s that, shingles? Oh, definitely.”
8. “…I’ve never heard of the shingles until I came to this place.”
9. “I have no idea what it would even look like.”
10. “I know nothing about it [reference made to shingles disease].”
11. “I have no idea [how to describe the medical condition shingles”
12. “…and I said what the hell is that?”
13. “I’d never even heard of shingles.”
14. “It’s affiliated with chicken pox.”
15. “It’s related to chicken pox.”
16. “I was going to say the same thing she did.”
17. “Chicken pox.”
18. “Chicken pox in disguise.”
19. “And [the doctor] say you have shingles.”
20. “[I] know about shingles”

III. Awareness Source (KN_HZawarenesssource) Frequencies in Subcategory: 26
18. “When I was nursing, people had them, you know.”
19. “My daughter had it”
20. “The lady that had it in the nursing home”
21. “I had them two years ago.”
22. “I had them two years ago, no three.”
23. “[I] had shingles”
24. “I asked my doctor what it was… and he [said]…it’s [shingles]…”
25. “The first time I heard it was when my doctor said I’m giving you a shot for shingles…”
26. “I had it [reference made to shingles disease]…”
27. “[doctor] explained everything about shingles”
28. “…heard about it from the VA.”
29. “I don’t know [where heard about shingles].”
30. I worked in the nursing home, so we – I knew about it from that, when the lady had it.”
31. “I didn’t know anything about it till I heard it.”
32. “A friend of mine had it.”
33. “my friend, 30 years ago.”
34. “My grandmother’s sister [had them].”
35. “I’ve never known anyone to have them.”
36. “Me either.”
37. “I did have them, yes.”
38. Right, I am.
39. “I just went through it two years ago, with the shingles.”
40. “I don’t know. He got ‘em, I got ‘em.”
41. “I’ve never known anybody that’s ever had it, the virus. I’ve never known –
   the virus, right?
42. “Honestly, this friend of mine, she had them over 30 years ago, and she had
   shingles.”
43. “But I know she had shingles. I mean I know.”

IV. Clinical Symptoms (KN_symptoms) Frequencies in Subcategory: 20
1. “It didn’t spread, it stopped quick”
2. “…had it in her eye.”
3. “…had it on her hip. She had it on her hip.”
4. “Somebody said pimples; they look like that.”
5. [They are itchy]… almost like chicken pox.”
6. “but they’re itchy, like I said.”
7. “It’s very painful.”
8. “Itchy.”
9. “Painful.”
10. “Painful.”
12. “Your skin flakes.”
13. “Very painful.”
14. “Also called pimples, too.”
15. “Very painful.”
16. “Sometimes it’s painful; they have to hospitalize them.”
17. [I had] “those little pimples I’ve been talking about…”
18. “We get skin flakes, something like that.”
19. “But other than that, I don’t know what else it does.”
20. “he got rash or little pimples”

V. HZ Physical Impact/Handicap (KN_HZhandicap) Frequencies in Subcategory: 8
1. “They’re awful.”
2. “You stay away from them.”
3. “My great aunt didn’t want to travel any more.”
4. “That’s right.”
5. “She did a lot of traveling and she decided it was time to stay home.”
6. “No, he [reference made to doctor] didn’t tell me to stay home”
7. “she had ‘em for years…[a]nd it never went away”
8. “[She had them for] several years”

VI. Epidemiology and Risk of HZ (KN_HZ_epi/risk) Frequencies in Subcategory: 22
1. “…it’s a disease that, you know, the elderly [can normally] pick up.”
2. “It’s a reoccurrence of the chicken pox.
3. “It leads you to it.”
4. “Sickly people” [are at risk of developing shingles].
5. “Older people” [are at risk of developing shingles].
6. “Of course. 65 and over.”
7. “-- history of chicken pox”
8. “…but they can spread most…”
10. Only if it’s a baby a year or two years old, yes.
11. “If you had the chicken pox or whatever.
12. “- it can do harm.
13. “I also heard it can cause from stress.”
14. Ah, that’s another thing.”
15. “…seniors [are at risk of shingles].”
16. “People who work in the health field.”
17. “Older people.”
18. “That’s what my doctor said, older people, seniors.”
19. “People who work in nursing homes and stuff…can [catch it from] patients and the workers.”
20. “At our age.”
21. “Anybody get shingles, one out of a million.”
22. “Sixty-five years and old, over”

VII. HZ Vaccine Awareness (KN_HZvaccine) Frequencies in Subcategory: 29
1. “but I don’t know if there was any shot.”
2. “I’d never heard of the shot before, up until when I got it from my doctor’s last time.
3. “I didn’t know until today when you told me.”
4. “Didn’t know about it.”
5. “Shingles” [referring to shingles vaccine].
6. “[Prevent shingles b]y the shot.”
7. “I think [the shingles vaccine is] the only way you can prevent [shingles].”
8. “Is that shot new?”
9. “I didn’t know till today [that there is a shot to prevent shingles].”
10. “I didn’t know until he said it.”
11. “I didn’t [know about the shingles shot] either.”
12. “I didn’t know about it until I got it.”
13. “I [knew about it] thirty years ago…Well not 30, but quite a while.”
14. “For a while [I had known about it].”
15. “Mmm-hmm [meaning yes that respondent knew about shingles shot].”
16. “I heard that they had all kinds of new vaccines for different ailments, and that was one of them.”
17. “once you have the shingles shot, you never have to have them again.
18. “That’s right. I was told that, one shot.”
19. “Yeah, that’s what he told me, too, it’s a lifetime.”
20. “Yeah.”
21. “They told me a pneumonia shot was good for five years and they ended up giving me another one, even though they give me one last year.”
22. “After you have the shot.”
23. “after you get the shot, your chances of developing shingles are one in a million.
24. “Millions, or maybe never.”
25. “From 65 years old and now we supposed to get it, supposed to get the shingles shots.”
26. “Yeah, when you hit 65, then they start giving you ever shot, no matter if you had it or not. They just start saying you’re a senior, you’re getting the shots.”
27. “In other words, my daughter’s 42; she don’t have to [take it].”
28. Well, I think the shot’s new.
29. “About the vaccine, I mean shot, maybe it wasn’t out at those years. I don’t know.”

VIII. Vaccine Awareness Source (KN_HZvaccine_awareness) Frequencies in Subcategory: 7
1. “Yeah, the VA told me about it”
2. “[Heard about the shingles shot f]rom my doctor.
3. “My insurance actually insisted on my shot, because I didn’t know I was gonna even get it, receive the shot. And I’m asking why I’m getting it and they’re there, because the insurance insists that you have this shot. So I said okay, whatever.
4. “Of course!”
5. “I read about it.”
6. “In the doctor’s office, in one of the medical journals that they leave on the table.”
7. “I know from my daughter, too, because she’s a medical.”

IX. HCP Recommendation (KN_HCPrecommend) Frequencies in Subcategory: 8
1. “[the VA] offered to give me the shot..”
2. “[the VA] offered me the shot”
3. “They tell me what is good and I accept it.”
4. “[M]y doctor told me [to get the shingles shot].”
5. “Never mentioned it to me.”
6. “My doctor told me anybody you know that’s over 65, I advise to tell them to get shingles.”
7. “No. She didn’t discuss it with me.
8. “Me neither.”

X.HZ Vaccinees (KN_HZvaccinees) Frequencies in Subcategory: 2
1. “Cause I got the shot last month…”
2. “I had mine at the Veteran’s so.”

XI.Prescription Drug Use to Treat HZ (KN_drugtherapy) Frequencies in Subcategory: 13
1. “Well, didn’t you say they also gave you a cream, [participant name, not reproduced herein]?”
2. “Yeah, my doctor does.
3. “Maybe they used the cream back at that time.”
4. “No, this was a –“
5. “That’s what I’m saying, maybe back then they used the cream, if they didn’t have the shot.”
6. “This was two years ago, not even two years ago.”
7. “They must’ve had something.”
8. “He give me some lotion some –“
9. “Calamine lotion?”
10. “Come on. No, it wasn’t calamine. No, that’s for poison ivy.”
11. “We’re talking about shingles.”
12. “…so with the medicine that he give me, and lotion, I used them three time a day, it took care of it pretty quick.”
13. “Yeah. He also give me some pills, too.”

XII.Non-prescription Treatment Beliefs (KN_homeopathic) Frequencies in Subcategory: 0
None documented in group.

Risk Appraisal
I.Susceptibility (RA-susceptibility) Frequencies in Subcategory: 15
1. “If you’ve had chicken pox along the way, you’re more susceptible”.
2. “You’re more, yeah, you’re more susceptible.”
3. “Very slim [changes of getting shingles].”
4. “I would say small.”
5. “Around the senior center I’d say it’s probably a very high-risk.”
6. “Around here, I’d say it’s a very high-risk.”
7. “A high-risk in a senior center setting?
8. “Mmm-hmm [meaning yes] [to a senior center setting presenting a high-risk setting for shingles].”
9. “Very small percentage [of getting shingles].”
10. “Very small [chances of getting shingles].”
11. “Probably hospitals because I have to have open heart surgery and that’s one of the reasons they gave it to me.”
12. “That’s what they gave me all these shots for [because of the upcoming open heart surgery].”
13. “Yeah, hospitals, that would be [a setting where you can contract them]— “
14. “I don’t know if I ever had the chicken pox; I can’t remember. I don’t remember.”
15. “Excuse me. Let’s say you have a daughter home, a son, six months, a year old. What my doctor told me, you cannot stay around your baby if you got shingles. That’s right, because she can catch them.”
II. Perceived Severity (RA-perceivedseverity) Frequencies in Subcategory: 13
   1. “Not as bad [as chicken pox].”
   2. “People get ‘em different.”
   3. “Oh, wow!”
   4. “Oh, my God!”
   5. “That’s horrible.”
   6. “That’s gonna stop me from eating pizza.”
   7. “It looks like pizza.”
   8. “Oh, my God!”
   9. “That’s more like a rash.”
  10. “It looks so sore.”
  11. “That looks like a disease.”
  12. “It looks painful.”
  13. “Oh, my God!”

III. Immunity (RA-immunity) Frequencies in Subcategory: 2
   1. “If you have the chicken pox, are you immune to it?
   2. “No.”

IV. Fatalism (RA-fatalism) Frequencies in Subcategory: 0
   None documented in group.
V. Misconception (RA_misconcept) Frequencies in Subcategory: 53
1. “Is [shingles] transmittable?
2. “You can –“
3. “No.”
4. “Yes!”
5. “Is it? I didn’t think –“
6. “No, it’s no catch.”
7. “Yes it is! When I worked in the nursing home, they sent the lady right home.”
8. “My doctor told me it wasn’t.”
9. “[They said it wasn’t]”
10. “They sent the lady home. When they knew she had shingles, one of the workers, she was sent home.”
11. “You don’t [catch it].”
12. “Yeah, you do.”
13. “Well, my doctor’s stupid, then.”
14. “You do. The person in the nursing home –“
15. “It’s an airborne –“.
16. “Is it airborne?”
17. “It doesn’t real catchy – that’s what my doctor told me. I don’t know how people think that it’s catchy; it isn’t.”
18. “Okay, I just remember, if you had chicken pox and I had shingles, and I’m around you and you had chicken pox, you can get them. You won’t get it.”
19. “Well, they would have to be contagious if it spreads on your body. It would have to be contagious.”
20. “I know.”
21. “Do you have to touch the person, or is it airborne? That’s what I’m trying to find out.”
22. “It’s gotta be touched.”
23. “Why did they send the lady home from work?”
24. “It’s got to be physical contact.”
25. “I don’t think so.”
26. “We had the chicken pox, okay.”
27. “I don’t think it’s airborne because that would have to be a virus if it was airborne.”
28. “It would be like the mumps and the chicken pox.
29. “It is a virus?”
30. “It is a virus, yeah.”
31. “They sent the lady right home from work when she had them.”
32. “They sent her home.”
33. “Then it could be airborne.”
34. “And maybe perhaps the airborne I don’t know about it…”
35. “…if the rash sheds, if you could touch something, you could potentially contaminate something or somebody else.”
36. Now you see why I wouldn’t let you touch my lunch place?
37. “You don’t know offhand though, really, if it’s contagious – if it’s airborne or if you have to touch the person?”
38. “Yeah! It’s like conjunctivitis. You can catch that from somebody. There’s someone in here right now with it, and it can spread.”
39. “It’s a funny thing.”
40. “Is it more of a female or a male virus?”
41. “Either or.”
42. Shingles. First I thought, not to be funny, but are we are talking about shingles from the house?
43. I’ve got it, it’s the other way around than I was thinking.”
44. “You just said a minute ago that they weren’t transmittable.”
45. “You said an hour, or 15, 20 minutes ago that they weren’t catchy. Because I’m the one that said they were.
46. “They’re not.”
47. “They are catchy.”
48. “I’m talking about baby, a year old.”
49. “Well, if they’re transmittable to a baby, they’re transmittable to anyone.”
50. “They can be transferred to anyone.”
51. “No.”
52. “Yes.
53. “No, it’s a baby.”

VI. Problem Hierarchy (RA_prblmhierch) Frequencies in Subcategory: 0
None documented in group.
Perceptions
I. Self-efficacy (PR_selfeffficacy) Frequencies in Subcategory: 11
1. “[I took care of them] right away, so it wasn’t [bad] – it all depends.”
2. “But I took care of ‘em right away.”
3. “I would have it. If I could have it, I’d have it.”
4. “Yeah, I would advise anyone to take it if the shingles are out there and there’s something to prevent it…”
5. “I got every part of my body – my tonsils, my appendix, everything.
6. “Why do you think I wash my hands in alcohol 50 times a day?”
7. “Me neither.”
8. “I’ve never had surgery. And I’m 67 years old and I told ‘em that I have to have open heart now to have my aortic valve replaced. And I’m there,
you’re not doing it until I at least hit 67.”
9. “And they said that the vaccine for the flu was tainted, so that the health department required them to notify everybody. But I got the vaccine for the shingles shot the same time. Now I’ve got to call them and ask them, was that tainted.”
10. “Could you show us a picture so we have an idea of what they would look like?”
11. “Do you have pictures of it or anything, what shingles look like?”

II. Vaccines are beneficial (PR_vaccbeneficial) Frequencies in Subcategory: 4
1. “You have nothing to lose.”
2. “In other words, it’s good to have it.”
3. “The nurse that administered the shot said to me you are very fortunate. I said why? She said you’re getting a wonderful vaccine.”
4. “…take the shot”

III. Vaccine Safety Concern (PR_fear_vaccines) Frequencies in Subcategory: 32
1. “That would scare me.”
2. “What are the side effects?”
3. “Ask George over there, he’s already got it. Any side effects, George?”
4. “Not yet.”
5. “I didn’t got no side effect…”
6. “I have no idea [how safe the shingles shot is].”
7. “I have no idea.”
8. I know they gave me a flu shot and I got the flu.”
9. “I didn’t either [have any reaction to the shingles shot].”
10. “No, it was fine.”
11. “And you know what, they made me sit there. That’s right, after they gave me the shot, I had to sit there for 10 minutes. And I had asked them, because they gave me four different shots and I asked them why I had to sit there…”
12. “…in case you have a reaction. And I said well how would I know what I’m having a reaction to; you gave me four shorts.”
13. “And they’re it would be the shingles shot and we’d know right away.”
14. “The reaction would show right away.”
15. “The shingles shot you could get side effects, yes.”
16. “Yeah, it’ll develop a rash they said, right away.”
17. “You could get it.”
18. “Get side effects. I didn’t get it, but you can.
19. “My doctor told me, it’s been for years.
20. “When they give you the shot, they make you sit there for a few minutes because if you’re gonna have a reaction, it’ll be right away.”
22. “I had mine at the Veteran’s so.
23. “It doesn’t matter where you have it; if you’re gonna have a reaction, it’s gonna be right away.
24. “Zoom, I left. That was it.”
25. “Good.
26. “I have no idea [how safe the shot is],
27. “I’d say safe.”
28. “I would say it’s safe.”
29. “I’ve never had anything that was negative or had a reaction.”
30. “Knock on wood, too, I’ve never had a reaction to any kind of shot.
31. “Neither have I.”
32. “…they called me the next day and told me the flu shot was tainted, because they lost their power.”

IV. Vaccine Efficacy Concerns (PR_ineffectvac) Frequencies in Subcategory: 10

1. “I hope so; that’s what they gave me a shot for, so I hope it does something.”
2. “The way the doc described it to me is if you get shingles shot, probably – - you don’t get shingles.”
3. “That you might never get shingles.”
4. “Yeah, one out of a million.”
5. “Well, I haven’t gotten shingles yet, so I’m happy.”
6. “Well, I haven’t come down with them since I had the shot, so maybe I’m safe.
7. “I only had mine about three months ago; so far I’m fine. I mean it’s a short time.”
8. “I’d say 96 percent [effective].”
9. “[I got the flu shot and]” then I came down a week later with the flu.”
10. “And I got the shingles shot that day and I came down with the flu.”

V. Lack of trust (PR_lacktrustvacc) Frequencies in Subcategory: 3

1. “No, private doctor.
2. “I can go to the VA but I don’t.”
3. "I don’t trust the VA.”

Access

I. Access health care system (ACC_HCPAccess) Frequencies in Subcategory: 5

1. “I asked my doctor what it was for…”
2. “I went to see my doctor right away…”
3. “My doctor told me…”
4. “The VA has been taking care of me since 1947.”
5. “gonna have to call my doctor”

II. Attempt to access HZ vaccine (ACC-vaccine) Frequencies in Subcategory: 5
6. “I took [the shot].”
7. “I just got it”
8. “I had the shot”
9. “I only had mine about three months ago”
10. “I got the vaccine for the shingles”

III. Supply barriers in accessing HZ vaccine (ACC_supply_barrier) Frequencies in Subcategory: 10
1. “Is there a shortage on the vaccine?”
2. “I’m going to my doctor next week; I don’t know if they’ll give me it.”
3. “Do all hospitals have it?”
4. “Shingles shots?”
5. “The serum, whatever you call it.”
6. “What do you call the stuff they put in it?”
7. “Vaccine.”
8. “Vaccine, the medicine. Is it available everywhere, like health clinics?”
9. “Maybe there’s a shortage, cause they only recommend it to seniors.”
10. “Do all doctors have it in hand?”

IV. Cost barriers in accessing HZ vaccine (ACC-Cost_barrier) Frequencies in Subcategory: 15
1. “And [the nurse] said if you went to your own doctor, had this done privately, it would cost you a minimum of $200.”
2. “$220.”
3. “For the shingles shot? Wow.”
4. “$220, but I got it through the VA, thank God.”
5. “Yes. VA, VA.”
6. “$220.”
8. “Yeah, I’m a wounded veteran and this I get free.”
10. “But they told me it would be very expensive.”
11. “No, my insurance covered it.”
12. “Yeah, I had a $35 co-pay.”
13. “No, that was two months I had to do that. I think it was 15 or something like that.”
14. “Yeah, I did have a co-pay.”
15. “…I have a co-pay every time to go to the doctor.”

V. Frozen requirement for vaccine as a barrier (ACC_frozen_barrier) Frequencies in Subcategory: 2
“...She also said this vaccine has to come to us in a cooler…”
“…it has to be kept at a very low temperature.”

VI. Positive health care experiences (ACC-posHCexperience) Frequencies in Subcategory: 1

9. “I’m very pleased with the choices they have made. I don’t argue with them.”
**Frequency Distributions**

**Row Totals**

Frequency row totals across all three focus groups, dimensions, and behavioral determinants are discussed below.

**Knowledge Dimension Row Sub-Totals**

The cumulative row frequency in the *knowledge dimension* across all focus groups is 513 counts. Wellesley’s focus group (10 participants) returned the greatest cumulative frequency in the knowledge dimension (n= 229), followed by Lynn (8 participants, n= 169) and Danvers’ focus group (9 participants, n=115).

**Risk Appraisal Dimension Row Sub-Totals**

The cumulative row frequency in the *risk appraisal dimension* across all focus groups is 134 counts. Lynn's focus group returned the highest cumulative frequency in the risk appraisal dimension (n=83), followed by Danvers (n=27) and Wellesley's focus group (n=24).

**Perception Dimension Row Sub-totals**

The cumulative row frequency in the *perception dimension* across all focus groups is 149 counts. Lynn's focus group returned the highest cumulative frequency in the perception dimension (n=60), followed by Danvers (n= 48) and Wellesley’s focus group (n= 41).
**Access Dimension Row Sub-totals**

The cumulative row frequency in the *access dimension* across all focus groups is 125 counts. Danvers focus group returned the highest cumulative frequencies in the access dimension (n=47), followed by Wellesley (n=40), and Lynn’s focus group (n=38).

**Row Total Summaries**

Behavioral dimensions and determinants with the five highest row frequencies across focus group sites include:

- Knowledge of Herpes Zoster (HZ) clinical symptoms (KN_symptoms, row total 86),
- *HZ epidemiology/risk* (KN_HZ_epi/risk, row total 84),
- *Misconception* (RA_misconcept, row total 66),
- *Vaccine awareness* (KN_HZvaccine, row total 63), and
- *Vaccine safety concerns* (PR_fearvaccine, row total 58).

Behavioral dimensions and determinants with the second highest row frequencies across focus group sites include:

- Knowledge of the use of Rx drugs to treat shingles (KN_drugtherapy, n=50),
- *HZ awareness* (KN_HZdisease awareness, n=41),
- *HZ awareness source* (KN_HZawarenesssource, n=45), and
- Knowledge of HZ physical handicap (KN_HZhandicap, n=37).
Column Totals

Frequency column totals within each focus group across all dimensions and behavioral determinants are discussed below.

Danvers Focus Group

Danvers’ focus group recorded the least number of cumulative comments across all behavioral dimensions and determinants (Danvers Focus Group Cumulative Column Total 237). The fewer number of response frequencies can be attributed to the group’s conservative nature, e.g. participants tended not to repeat answers that were previously provided by others. Column total summaries by all dimensions and behavioral determinants for Danvers are presented below.

Knowledge Dimension Column Sub-Totals

The Danvers focus group returned the greatest cumulative column frequency in the knowledge dimension (Column Sub-Total 115). Participants in this focus group returned increased frequencies in knowledge of clinical symptoms (KN_symptoms, 24 comments), HZ Epidemiology/ Risk (KN_HZ_epi/risk, n=17), knowledge of HZ Physical Handicap (KN_HZhandicap, 12 comments), health care practitioner recommendation of the shingles vaccine (KN_HCPrerecommend, n=12), as well as vaccine awareness (KN_HZvaccine, n=11).

Risk Appraisal Dimension Column Sub-Totals

The Danvers focus group returned the lowest cumulative column frequency in the risk appraisal dimension (Column Sub-Total 27). Behavioral determinants within this dimension returned increased frequencies in perceived severity (RA_percdseverity, n=9) and immunity (RA_immunity, n=9), and a moderate frequency in susceptibility (RA_susceptibility, n=5).
Perception Dimension Column Sub-Totals

The Danvers focus group returned the second highest cumulative column frequency in the perception dimension (Column Sub-Total n=48). Behavioral determinants within this dimension categorized the greatest number of responses into vaccine safety concerns (PR_fearvaccine, n=19) and self-efficacy cell (PR_selfefficacy, n=13).

Access Dimension Column Sub-Totals

The Danvers focus group returned the second lowest cumulative column frequency in the access of health care system dimension (Column Sub-Total; n=47). Behavioral determinants within this dimension categorized the greatest number of responses into ability to access health care system (ACC_HCPAccess, n=25) and vaccine cost barriers (ACC_cost_barrier, n=11).

Wellesley Focus Group

Wellesley’s group, which had the higher number of participants (n=10), recorded second to highest cumulative column frequencies across all behavioral dimensions and determinants (Wellesley Focus Group Cumulative Column Total 334). Column total summaries by analyzed dimensions and behavioral determinants for Wellesley are presented below.

Knowledge Dimension Column Sub-totals

The Wellesley focus group recorded the highest cumulative column frequencies the knowledge dimension (Column Sub-total, n=229). Within the knowledge dimension, high frequencies were recorded in describing HZ epidemiology and risk (KN_HZ_epi/risk, n=45), HZ symptoms (KN_symptoms, n=42), use of prescription drugs to treat HZ (KN_drugtherapy, n=32), and vaccine awareness (KN_HZ vaccine, n=23).
**Risk Appraisal Dimension Column Sub-totals**

The Wellesley focus group returned the lowest cumulative frequencies in the *risk appraisal* dimension (*Column Sub-Total, n=24*). Within this domain, the highest frequencies belonged to the determinants of *misconception* (RA_misconcept, n=11) and *perceived severity* (RA_percedseverity, n=7).

**Perception Dimension Column Sub-totals**

The Wellesley focus group returned the second highest cumulative column frequency in the *perception dimension* (*Column Sub-Total, n=41*). Within this dimension, behavioral determinants with the highest frequencies were *vaccine efficacy* concerns (PR_ineffectivevac, n=20) and *lack of vaccine trust* (PR_lacktrustvacc, n=9), followed by *vaccine safety concerns* (PR_fearvaccine, n=7).

**Access Dimension Column Sub-totals**

The Wellesley focus group returned the second lowest cumulative column frequency in the *access to health care system* (*Column Sub-Total, n=40*). Within this dimension, the highest relative frequencies pertained to the *vaccine access attempt* category (ACC_vaccine, n=16).

**Lynn Focus Group**

Lynn’s focus group recorded the most comments across all dimensions and behavioral determinants (*Cumulative Column Total 350*). The large number of comments recorded in Lynn cannot be attributed to the size of the group because Lynn had the least number of participants in the group (n=8). Reasons for the high frequency count is attributed to the high number of comments recorded in the behavioral determinant of *misconception* relative to how shingles disease is transmitted (RA_misconcept, n=53) as well as to some participants repeating
themselves which contributed to the increased frequency counts. Column total summaries by analyzed dimensions and behavioral determinants for Lynn are presented below.

**Knowledge Dimension Column Sub-Totals**

The Lynn focus group returned the greatest cumulative column frequency in the *knowledge dimension* (*Column Sub-Total, n=169*). Within this dimension, the highest frequency was recorded for *vaccine awareness* (*KN_HZvaccine, n=29*), *herpes zoster awareness source* (*KN_HZawarenesssource, n=26*), and *herpes zoster epidemiology and risk* (*KN_HZ_epi/risk, n=22*).

**Risk Appraisal Dimension Column Sub-totals**

Lynn’s focus group returned the second highest cumulative column frequency in the *risk appraisal dimension* (*Column Sub-Total, n=83*). Within this dimension, the highest frequency belonged to the behavioral determinant of *misconception* (*RA_misconcept, n=53*), followed by *susceptibility* (*RA_susceptibility, n=15*), and *perceived severity* (*RA_percdseverity, n=13*).

**Perception Dimension Column Sub-totals**

The Lynn focus group returned the second to lowest cumulative column frequency in the *perception dimension* (*Column Sub-Total, n=60*). Within this dimension, the highest recorded frequency belonged to the behavioral determinant of *vaccine safety concerns* (*PR_fearvaccine, n=32*), followed by *self-efficacy* (*PR_selfefficacy, n=11*), and *vaccine efficacy concerns* (*PR_ineffectvac, n=10*).

**Access Dimension Column Sub-totals**
Lynn’s focus group returned the least cumulative column frequency in the *access* dimension (*Column Sub-total, n=38*). Within this dimension, Lynn's participants recorded the highest frequency in *vaccine cost barriers* (*ACC_cost_barriers, n=15*) and *vaccine supply barriers* (*ACC_supply_barrier, n=10*).
## Tabulated Frequencies

### Summary Frequency Distributions

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Summary Frequency Distributions (cont.)

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## Appendix D Inputs into Survey Development

<table>
<thead>
<tr>
<th>Telephone Survey Inputs</th>
<th>Observation</th>
<th>Observation Developed in Survey</th>
<th>Verbatim Survey Question</th>
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<tr>
<td><strong>Shingles Focus Groups Inputs</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>HZ Awareness</strong></td>
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<tr>
<td>All focus group participants reported awareness of herpes zoster disease. Measuring disease awareness levels in the greater Massachusetts population would provide empirical data that is generalizable to the greater Massachusetts population.</td>
<td>The shingles survey included a question about whether respondents are aware of shingles disease in both the vaccinated and non-vaccinated arms of the survey.</td>
<td>S.7 Do you know about a medical condition called shingles?</td>
<td></td>
</tr>
<tr>
<td><strong>HZ Awareness Source</strong></td>
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<td></td>
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</tr>
<tr>
<td>A number of focus group participants reported learning about shingles from friends or family members who had experienced shingles.</td>
<td>The shingles survey asked if respondents’ decision to vaccinate was influenced by someone in their family or their friends having been sick with shingles. Additional survey questions were added to measure if the decision to vaccinate with shingles was influenced by friends and family.</td>
<td>1.2A/7.2A Do you know anyone who was sick with shingles?</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.3 When you decided to get the shingles vaccination, how important was it that someone in your family or among your friends had already been sick with shingles?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.4 When you decided to get the shingles vaccination, how important was hearing from your friends that you should get the shingles shot?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.5 When you decided to get the shingles vaccination, how important was hearing from your family that you should get the shingles shot?</td>
</tr>
</tbody>
</table>

a. Questions designated with S are from the survey panel filter segment (S1-S4).
b. Questions designated with numbers 1-6 are from the vaccinated panel of the shingle survey.
c. Questions designated with numbers 7-12 are from the non-vaccinated panel of the shingle survey.
### Appendix D: Inputs into Shingles Telephone Survey Development (cont.)

<table>
<thead>
<tr>
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<tr>
<td><strong>Shingles Focus Groups Inputs (cont.)</strong></td>
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</tbody>
</table>
| **Chances of Developing Shingles** | Focus Group participants generally did not think that their chances of developing shingles were high. This observation merits asking the greater Massachusetts population their perceived chances of developing shingles. | The shingles survey asked what respondents believe their chances are of developing shingles during their lifetime (both vaccinated pre and post vaccination and non-vaccinated arms). This was coupled with another question that asked how important it was for the person not to develop shingles. | 1.1 When you decided to get the shingles vaccination, how important was it for you to prevent getting shingles?  
7.1 Was one reason why you did not get the shingles shot because you do not think you will get the disease?  
1.7/1.8/7.4 What do you think your chances are of getting sick with shingles during your lifetime? |
| **Health Care Provider Recommendation** | Some focus group participants reported that physicians recommended the shingles vaccine and that physicians, in general, “are pushing” this vaccine, whereas other participants reported that their doctor either did not tell them about shingles/shingles vaccine or recommended that they avoid the shingles vaccine. | Provider recommendation overwhelmingly influences vaccination behavior, therefore, the mixed focus groups reactions merit including questions to the shingles survey (both vaccinated and non-vaccinated arms) to ask whether health care providers brought up the topic of shingles and whether they recommended (or not) the vaccine or whether the doctor recommended the vaccine but the patient refused it. | 3.1/9.1 In the past 5 years, did you and your doctor talk about the shingles vaccine?  
3.2 Did your doctor or healthcare professional bring up the topic of getting the shingles shot, or did you?  
3.3/9.2 Did your doctor or health care professional recommend that you get the shingles vaccine?  
3.4/9.3 Did your doctor or health care professional advise against you getting the shingles vaccine? |
<table>
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<tbody>
<tr>
<td><strong>Shingles Focus Groups Inputs (cont.)</strong></td>
<td><strong>Live Vaccine</strong></td>
<td>The live vaccine formulation gave participants the most hesitancy about the shingles vaccine.</td>
<td>Since this point received a lot of attention and discussion, it warranted that a question on the live nature of the vaccine be included in shingles survey to obtain empirical data from patients about whether the live vaccine is a barrier for shingles vaccination.</td>
</tr>
<tr>
<td></td>
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<td>4.3 If you had known that the vaccination is a live virus, would you have still gotten the vaccine?</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>10.7 The shingles vaccine is a live virus vaccine. How important was this to your decision not to get the shingles shot?</td>
</tr>
<tr>
<td></td>
<td><strong>Trust in Pharmacists</strong></td>
<td>Focus group participants cited a lack of trust in pharmacists on multiple occasions.</td>
<td>This observation warrants inclusion of a question in the shingles survey to obtain empirical patient provided data about whether lack of trust in pharmacists is a barrier to receiving shingles vaccination in a pharmacy setting.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11.4 If you were to get the shingles vaccination, would you be willing to have the pharmacist administer the shingles vaccination in a pharmacy instead of getting the shot in a doctor’s office?</td>
</tr>
</tbody>
</table>
## Appendix D: Inputs into Shingles Telephone Survey Development (cont.)

<table>
<thead>
<tr>
<th>Telephone Survey Inputs</th>
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<th>Verbatim Survey Question</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shingles Focus Groups Inputs (cont.)</strong></td>
<td><strong>Supply Barriers</strong> Focus group participants stated that obtaining the vaccine was difficult because it is not readily available and cited waiting delays.</td>
<td>5.2 Where did you get the shingles shot?</td>
</tr>
<tr>
<td></td>
<td>This observation merits including a question in the shingles survey to obtain empirical data from patients about whether the lack of vaccine supply is a barrier for shingles vaccination. Survey questions asked where respondents received the shingles shot (at doctors’ office or at pharmacy or other health clinic) and whether patients encountered waiting lists because providers were out of stock of vaccine.</td>
<td>5.3 Did that location have the shingles vaccine available for you right away?</td>
</tr>
<tr>
<td></td>
<td>5.4 Did the pharmacist administer the shingles shot at the pharmacy or did you have to pick the vaccine up at the pharmacy and bring it to your doctor’s office so that your doctor could give you the shot?</td>
<td>5.5A Did the Pharmacy transport the vaccine to the doctor’s office?</td>
</tr>
<tr>
<td></td>
<td>5.5B Did the Pharmacy give you a package with ice for the vaccine so you could take it back to your doctor?</td>
<td>5.5C Did you come to the pharmacy with your own icepack for the vaccine?</td>
</tr>
<tr>
<td></td>
<td>5.5D Did you transport the vaccine to the doctor’s office without ice?</td>
<td>5.6 About how long did it take to go from the pharmacy to your doctor’s office so you could get your shingles shot?</td>
</tr>
<tr>
<td><strong>Frozen Requirement for Vaccine</strong></td>
<td>Focus group participants reported that that they had to transport the vaccine on ice to their provider office after receiving the shingles shot from the pharmacy.</td>
<td></td>
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<tr>
<td></td>
<td>This observation merits a question in the shingles survey pertaining to brown bagging practices of whether the shingles vaccine had to be transported to doctors for administration, how that transport was completed, and the length of time.</td>
<td></td>
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<tr>
<td>Telephone Survey Inputs</td>
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<td>Observation Developed in Survey</td>
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<tr>
<td>Shingles Focus Groups Inputs (cont.)</td>
<td>Vaccine Cost</td>
<td>Focus group participants who got the shingles shot reported variable out-of-pocket costs and variability in health insurance coverage.</td>
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<tr>
<td></td>
<td>Barriers</td>
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### Appendix D: Inputs into Shingles Telephone Survey Development (cont.)

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<td>Shingles Focus Groups Inputs (cont.)</td>
<td>Vaccine Cost</td>
<td>12.6 What is the most you would be willing to spend on the shingles vaccination?</td>
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<td>Barriers (cont.)</td>
<td>12.7 Would you get vaccinated if the shingles shot were free?</td>
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### Appendix D: Inputs into Shingles Telephone Survey Development (cont.)

<table>
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<tr>
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<td><strong>Theories</strong></td>
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<tr>
<td>Health Belief Model (HBM)</td>
<td>HBM explores patient reported perceptions of the threat, e.g. shingles, and tests vaccination decision influences (Theory at a Glance, 2005).</td>
<td>The HBM is operationalized in the MA shingles survey with questions about perceptions of likelihood of getting shingles (perceived susceptibility), the pathophysiological effects of shingles, and safety and efficacy perceptions of the vaccination (perceived severity), awareness of the vaccine (perceived benefits), recommendations for vaccination (cue to action), measurement of taking action, e.g. getting vaccinated with influenza and pneumococcal vaccines, and the reason for getting vaccinated with shingles (self-efficacy).</td>
<td>S.8 Are you aware that there is a vaccine to prevent shingles? 1.5A/7.2B What would you say is the primary symptom of shingles? 1.7/1.8/7.4 Before vaccination/Now that you got the shot, what do you think chances are of getting shingles? 2.2 Did you want to take care of your health and be healthy? 3.1/9.1 Did you and your doctor talk about the shingles vaccine? 3.2 Did your doctor or healthcare professional bring up the topic of getting the shingles shot, or did you? 3.3/9.2 Did your doctor or health care professional recommend that you get the shingles vaccination? 2.4/8.2 How often do you get the influenza vaccination? 2.5/8.3 Within the past 10 years, did you get a tetanus shot? 2.6/8.4 Since your 65th birthday, did you get the pneumococcal vaccination? 4.1 How safe do you think the shingles vaccination is? 4.4 How effective do you think the shingles shot is at preventing shingles?</td>
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### Appendix D: Inputs into Shingles Telephone Survey Development (cont.)

<table>
<thead>
<tr>
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<td>Theories (cont.)</td>
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<tr>
<td>Theory of Planned Behavior (TPB)</td>
<td>TPB explores patients' vaccination intentions and personal behavior attitudes (Theory at a Glance, 2005).</td>
<td>The TPB is operationalized in the shingles survey with questions about how painful shingles is perceived, the primary reason that people got vaccinated/what symptom patients were most concerned with avoiding (behavioral intention), the importance of preventing shingles, and whether respondents would have received the vaccine if they knew that the vaccine was a live virus vaccine (behavioral control).</td>
<td></td>
</tr>
<tr>
<td></td>
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<td>1.1 When you decided to get the shingles vaccination, how important was it for you to prevent getting shingles?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7.1 Was one reason why you did not get the shingles shot because you do not think you will get the disease?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.6/7.3 How painful do you think shingles is?</td>
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<tr>
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<td>8.1 What was the primary reason that you did not get the shingles vaccination?</td>
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<td>2.2A What part of the shingles disease were you hoping to avoid by getting vaccinated?</td>
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<td>2.3 Was one reason why you got the shingles vaccination because you didn’t want to miss work or lose pay?</td>
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<td>4.2 Before you got vaccinated, did you know that the shingles vaccination is a live virus vaccine?</td>
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<td></td>
<td>4.3 If you had known that the vaccination is a live virus, would you have still gotten the vaccine?</td>
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<td></td>
<td>10.7 The shingles vaccine is a live virus vaccine. How important was this to your decision not to get the shingles shot?</td>
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<tr>
<td></td>
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<td></td>
<td>5.1 How convenient was it to get the shingles shot?</td>
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## Appendix D: Inputs into Shingles Telephone Survey Development (cont.)

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<td><strong>Theories (cont.)</strong></td>
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<tr>
<td><em>Theory of Planned Behavior (TPB)</em> (cont.)</td>
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<tr>
<td>11.1 Was one reason why you did not get the shingles shot because the vaccine was not available at your doctor’s office?</td>
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<tr>
<td>12.7 Would you get vaccinated if the shingles shot were free?</td>
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<tr>
<td>5.7 Would you have been willing to have the pharmacist administer the shingles vaccine in a pharmacy instead of getting the shot in a doctor’s office?</td>
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<tr>
<td>11.4 If you were to get the shingles vaccination, would you be willing to have the pharmacist administer the shingles vaccination instead of getting the shot in a doctor’s office?</td>
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</table>
### Literature Gap Inputs (cont.)

#### Social Cognitive Theory (SCT)
SCT explores influences from social network interactions, specifically the influence of friends/peers, health care providers and communication messages on vaccination behavior (observational learning and reciprocal determinism) (Theory at a Glance, 2005).

<table>
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<tr>
<td>The Massachusetts BRFSS Shingles Survey operationalizes SCT influences with questions of how one heard about the shingles vaccination, if know anyone that was sick with shingles, and other questions that test individual vaccination behavior influenced by peer social networks and the effectiveness of outreach instruments and communication tools, e.g. CDC website, Facebook, television show (Drs. Oz/Phil or Oprah), magazine or billboard advertisement, pharmacy/store advertisement-intercom or poster.</td>
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<table>
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<tr>
<td>1.2/7.2 How did you hear about the shingles vaccination?&quot;</td>
<td></td>
</tr>
<tr>
<td>1.2A/7.2A Do you know anyone who was sick with shingles?&quot;</td>
<td></td>
</tr>
<tr>
<td>1.3 When you decided to get the shingles vaccination, how important was it that someone in your family or among your friends had already been sick with shingles?&quot;</td>
<td></td>
</tr>
<tr>
<td>1.4 How important was hearing from your friends that you should get the shingles shot?</td>
<td></td>
</tr>
<tr>
<td>1.5 How important was hearing from your family that you should get the shingles shot?&quot;</td>
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<tbody>
<tr>
<td>Literature Gap Inputs (cont.)</td>
<td>Non-compliance Determinants of Herpes Zoster Uptake</td>
<td>Studies from the Netherlands, Denmark, and Canada looked at non-compliance determinants with herpes zoster vaccination from the perspectives of patients and providers, however, the findings are not generalizable to the US population. Opstelten (2009) is a KABB study but one that is limited to &gt;65 years old Dutch participants and does not capture US perceptions from 50 years through 64. Mortensen's (2011) focus group data are useful, but only used a Danish population to assess disease knowledge and perceptions of shingles vaccination. MacDougal et al (2015) looked at vaccination hesitancy for a range of adult vaccines from the perspectives of the public and health providers.</td>
<td>The MA shingles BRFSS survey is an extension of Opstelten (2009), Mortensen (2011), and MacDougall et al (2015), but is conducted in the United States (Massachusetts) and measures the public's perspectives and decision-making behavior on herpes zoster immunization. The age range included in the shingles study sample frame is &gt;50 years old.</td>
</tr>
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<tr>
<td>Literature Gap Inputs (cont.)</td>
<td>Mbah et al (2012) discuss social network theory and imitative decision making on vaccination coverage. Research on individual motivations to vaccinate or not with the shingles vaccine and whether the decision is influenced by social networks or vaccine safety and efficacy misconceptions provide empirical support for Mbah’s social network theory.</td>
<td>The MA shingles study extends Mbah's work and looks at the implications of social network imitation theory in the space of herpes zoster vaccination decision making.</td>
<td>1.2A/7.2A Do you know anyone that was sick with shingles?</td>
</tr>
<tr>
<td>Social Network Theory and Imitative Decision Making</td>
<td></td>
<td></td>
<td>1.3 When you decided to get the shingles vaccination, how important was it that someone in your family or among your friends had already been sick with shingles?</td>
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<td></td>
<td></td>
<td></td>
<td>1.4 When you decided to get the shingles vaccination, how important was hearing from your friends that you should get the shingles shot?</td>
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<td></td>
<td></td>
<td>1.5 When you decided to get the shingles vaccination, how important was hearing from your family that you should get the shingles shot?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.1 How safe do you think the shingles vaccination is?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10.3 “I thought I might get sick from the shingles vaccine.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.4 How effective do you think the shingles shot is at preventing shingles?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10.4 “I do not think the shingles vaccine is effective at preventing shingles.”</td>
</tr>
</tbody>
</table>
Appendix D: Inputs into Shingles Telephone Survey Development (cont.)

<table>
<thead>
<tr>
<th>Telephone Survey Inputs</th>
<th>Observation</th>
<th>Observation Developed in Survey</th>
<th>Verbatim Survey Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literature Gap Inputs (cont.)</td>
<td>Hurley (2010) and GAO (2011) performed surveys with physicians and pharmacists on shingles vaccination declination reasons and report that few Medicare beneficiaries received the shingles vaccine due to: physicians not stocking or recommending the vaccine, physicians’ unwillingness to shoulder the high cost of the vaccine, and billing complexities from the vaccine covered by Medicare Part D rather than Part B. While this data provide evidence to the administrative challenges of Part D enrollment verification and reimbursement, and physician and pharmacist experiences with vaccines, they are not inclusive of patient perceptions and should not be relied upon as the sole source of patient decision-making relative to obtaining the herpes zoster vaccination.</td>
<td>The shingles survey builds upon the existing body of research with physicians and pharmacists to collect data from the Massachusetts public on their propensity of receiving the shingles vaccine if physicians recommended it and how much people would be willing to pay for the shingles vaccine (GAO, 2011; Hurley, 2010). Wherever possible, the method used in the shingles survey mirrors the barrier classification method that GAO used in its surveys with providers so that the shingles survey survey results are comparable to GAO results, in so far as vaccine safety and efficacy and misperceptions are concerned. The shingles survey asks respondents to classify different reasons for not obtaining the shingles shot as a major reason, a minor reason, or not a reason. This question formulation is similar to GAO survey which asked providers to classify factors as either major or minor or not a reason.</td>
<td>10.1 “I do not trust the shingles vaccine.” Was not trusting the shingles vaccine a major reason, a minor reason, or not a reason in your decision not to get the shingles shot? 10.2 “I do not like needles.” Was not liking needles a major reason, a minor reason, or not a reason in your decision not to get the shingles shot? 10.3 “I thought I might get sick from the shingles vaccine.” Was thinking you might get sick from the shot a major reason, a minor reason, or not a reason in your decision not to get the shingles shot? 10.4 “I do not think the shingles vaccine is effective at preventing shingles.” Was thinking that the vaccine is not effective a major reason, a minor reason, or not a reason in your decision not to get the shingles shot? 10.5 Was the cost of the vaccine a major reason, a minor reason, or not a reason in your decision not to get the shingles shot? 10.6 Was inconvenience a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?</td>
</tr>
<tr>
<td>Literature Gap Inputs (cont.)</td>
<td>Survey</td>
<td>Question</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------</td>
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<td></td>
</tr>
<tr>
<td><strong>Vaccination Coverage</strong></td>
<td>GAO (2011) reports that 11% and 53% of Medicare beneficiaries obtained the shingles and Td/Tdap vaccines, respectively. While this aggregate statistic is useful, it does not inform researchers whether those who are electing to vaccinate for shingles are also electing to vaccinate with flu, Td/Tdap, and pneumonia.</td>
<td>The shingles survey asked respondents about receiving the influenza, Td/Tdap and pneumococcal vaccines and collected concurrent vaccination coverage status on shingles, influenza, tetanus/pertussis, pneumonia. This can answer the question of whether patients who are getting (or not) the shingles vaccine are also getting (or not) vaccinations for other diseases (flu, Td/Tdap, and pneumonia).</td>
<td>2.4/8.2 How often do you get the influenza vaccination?</td>
</tr>
</tbody>
</table>
| **Vaccine Transport, Pharmacist Role, and Patient Convenience** | The shingles vaccine was declined because of the inconvenience and difficulty with obtaining the vaccine (Hurley, 2010, GAO, 2011). Physicians reported that the vaccine transport from pharmacy to physician’s office was a barrier to stocking, administering, or recommending the shingles vaccine, however, GAO’s surveys with pharmacists did not gather information on how the vaccine was transported from the pharmacy to physician’s office. | The shingles survey sampled vaccinated patients about where they received the shingles vaccine and if there was difficulty in obtaining the vaccine at that location. If received at the pharmacy, a question was asked about the manner in which the vaccine was transported, e.g. whether the vaccine was shipped by the pharmacy to the prescribing physician’s office, or whether the patient collected and transported the vaccine (under cold storage transport condition) to their doctor). | 2.5/8.3 Within the past 10 years, did you get a tetanus shot?  
2.6/8.4 Since your 65th birthday, did you get the pneumococcal vaccination?  
5.1 How convenient was it to get the shingles shot?  
5.2 Where did you get the shingles shot?  
5.3 Did that location have the shingles vaccine available for you right away?  
5.4 Did the pharmacist administer the shingles shot at the pharmacy or did you have to pick the vaccine up at the pharmacy and bring it to your doctor’s office so that your doctor could give you the shot?  
5.5A: Did the Pharmacy transport the vaccine to the doctor’s office?  
5.5B Did the Pharmacy give you a package with ice for the vaccine so you could take it back to your doctor?  
5.5C: Did you come to the pharmacy with your own icepack for the vaccine? |
Appendix D: Inputs into Shingles Telephone Survey Development (cont.)

<table>
<thead>
<tr>
<th>Telephone Survey Inputs</th>
<th>Observation</th>
<th>Observation Developed in Survey</th>
<th>Verbatim Survey Question</th>
</tr>
</thead>
</table>
| **Literature Gap Inputs (cont.)**  
*Vaccine Transport,*  
*Pharmacist Role,*  
*and Patient Convenience (cont.)* | | | |
| 5.5D: Did you transport the vaccine to the doctor’s office without ice? |
| 5.6 About how long did it take to go from the pharmacy to your doctor’s office so you could get your shingles shot? |
| 11.1 Was one reason why you did not get the shingles shot because the vaccine was not available at your doctor’s office? |
| 11.2 Was one reason why you did not get the shingles shot because the vaccine was not available at your pharmacy? |
| 11.3 Was one reason why you did not get the shingles shot because the vaccine was not available at any of the local health centers/clinics where you normally get care? |

**Cost as Access Barrier, Out-of-Pocket Responsibilities and Willingness to Pay**

*GAO (2011) reports that the average out-of-pocket expense by Medicare beneficiaries for the shingles vaccine was more than double the out-of-pocket expense that beneficiaries paid for the Td/Tdap vaccine (shingles vaccine out-of-pocket expense $57 versus Td/Tdap vaccine out-of-pocket expense $25), and is more than double the estimate provided by physicians who reported that patients would be willing to spend no more than $29 for a shingles vaccination.**

Rather than relying on Part D drug utilization data which shows how much patients were compelled to pay or physician-based estimates on how much patients would pay, the shingles survey obtains measurements directly from the public on how much they actually paid and asks those non vaccinated their willingness to pay for the shingles vaccine. This provides more valid and reliable measurements on out-of-pocket cost sharing than is currently available from GAO’s study.

6.2 How much did you pay to receive the vaccination?

12.6 What is the most you would be willing to spend on the shingles vaccination?
### Appendix D: Inputs into Shingles Telephone Survey Development (cont.)

<table>
<thead>
<tr>
<th>Literature Gap Inputs (cont.)</th>
<th>Observation</th>
<th>Observation Developed in Survey</th>
<th>Verbatim Survey Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccine</td>
<td>GAO (2011) reports that less than 5% of Medicare beneficiaries received the shingles vaccine under Part D (reimbursement figure include beneficiaries in the donut hole).</td>
<td>The shingles survey includes questions on how much of the cost was not covered by medical insurance, whether the respondent filed a medical insurance claim to be reimbursed for the shingles shot, gathers data on who filed the medical insurance claim, and whether one’s medical insurance company reimbursed them for the shingles vaccine.</td>
<td>6.1 How much did you pay to receive the vaccination?</td>
</tr>
<tr>
<td>Reimbursement and Insurance Coverage</td>
<td>Marrufo et al (2011) discuss the gains and efficiencies of consolidating Part D covered vaccines within Medicare’s Part B coverage, and suggest that if the herpes zoster vaccine were consolidated under Part B it would improve access, lower costs for beneficiaries and decrease the chances of beneficiaries reaching their Part D coverage gap.</td>
<td>To partially test Marrufo’s theory, the shingles survey collected data on whether consumers would be willing (or not) to obtain the shingles vaccination if the vaccine were free (the equivalent of Part B coverage), what the out-of-pocket costs were, and whether the respondent’s insurance plan covers the shot, thereby, providing empirical evidence on the public’s perception of insurance coverage with fewer out-of-pocket cost policies and important patient reported data on the feasibility of Marrufo’s (2011) proposal.</td>
<td>6.2 Did you have to file a medical insurance claim to your insurance company to be reimbursed for the shingles shot?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6.3 Who filed the medical insurance claim for you?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6.4 Did your medical insurance company reimburse you for the shingles vaccination?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6.5 As part of your Medicare insurance, do you have a prescription drug plan, also known as Part D?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12.2 Was one reason why you did not get the shingles shot because your medical insurance would not pay for the shot?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12.3 Would you get a shingles shot if your medical insurance plan paid the full cost of the vaccination?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12.4 Was one reason why you did not get the shingles shot because your cost was too much?</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>12.6 What is the most you would be willing to spend on the shingles vaccination?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12.7 Would you get vaccinated if the shingles shot were free?</td>
</tr>
</tbody>
</table>
Appendix D: Inputs into Shingles Telephone Survey Development (cont.)

<table>
<thead>
<tr>
<th>Telephone Survey Inputs</th>
<th>Observation</th>
<th>Observation Developed in Survey</th>
<th>Verbatim Survey Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost-utility Influences on Provider Vaccination Practices</td>
<td>Rothberg (2007) and Le's (2015) cost-utility models concluded that the vaccination— at its current price ($187.89)— is not a good value for all patients, at the generally accepted willingness-to-pay-threshold of $100,000 per QALY. That the vaccine is not cost-effective for all carries significant weight in influencing provider vaccination practices and insurance coverage decisions.</td>
<td>The shingles study builds upon Rothberg and Le's findings that the shingles vaccine does not represent a good value for all patients and tests provider recommendation practices and insurance coverage considerations. The shingles survey asks respondents if their doctor recommended the vaccine, whether their doctor advised against the vaccine, and also asks how much the public is willing to pay for the vaccine.</td>
<td>3.1/9.1 In the past 5 years, did you and your doctor talk about the shingles vaccine?</td>
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<td></td>
<td></td>
<td></td>
<td>3.2 Did your doctor or healthcare professional bring up the topic of getting the shingles shot, or did you?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.3/9.2 Did your doctor or health care professional recommend that you get the shingles vaccination?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.4/9.3 Did your doctor or health care professional advise against you getting the shingles vaccine?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.5 You stated that your doctor advised against you getting the shingles vaccination, yet you still got the shingles vaccine?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9.4 Was one reason why you were not vaccinated for shingles, because you refused the shot even though your doctor recommended it?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12.1 Was one reason for not receiving the shingles shot because the shingles vaccine is not recommended for your age group?</td>
</tr>
</tbody>
</table>
### Appendix D: Inputs into Shingles Telephone Survey Development (cont.)

<table>
<thead>
<tr>
<th>Telephone Survey Inputs</th>
<th>Observation</th>
<th>Observation Developed in Survey</th>
<th>Verbatim Survey Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literature Gap Inputs (cont.)</td>
<td>Since 2012 Massachusetts’ regulations [105 CMR 700.004(B)(6)] allow community pharmacists to administer vaccination beyond influenza and include the shingles vaccine, among other vaccinations.</td>
<td>The shingles study provides empirical data on the feasibility of Massachusetts 2012 policy that expanded community pharmacist’s ability to administer the shingles vaccination. They survey asked the public if they would have been willing to get the shingles shot at a pharmacy (asked of vaccinated and non-vaccinated respondents)</td>
<td>5.7 Would you have been willing to have the pharmacist administer the shingles vaccine in a pharmacy instead of getting the shot in a doctor’s office?</td>
</tr>
</tbody>
</table>
Appendix E  Massachusetts Shingles Survey Pretest Report

Authored by Abt SRBI 2012
Massachusetts BRFSS Shingles Callback Survey

Pretest Summary

REVIEW
Forty interviews were conducted for the Shingles Survey pretest. The sample was comprised of respondents interviewed in the January and February Massachusetts Landline BRFSS Survey. 116 records were dialed during the pretest; fifty-six (of the 116) indicated they received the shingles vaccine during the Massachusetts BRFSS interview, the other sixty stated they had not received the singles vaccine. The pretest sample was loaded in an evenly distributed manner to allow interviews to be conducted with both vaccinated and unvaccinated adults. Fifty-four respondents were re-screened (questions S.5-S.10):

<table>
<thead>
<tr>
<th></th>
<th>Total Screened</th>
<th>54</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.5. Refused Permission</td>
<td>1</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>S.6. Unaware of the shingles vaccine</td>
<td>11</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>S.9. Screen-Out (BRFSS Shingles vaccine=Yes, S.9=No)</td>
<td>1</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Screened, qualified callback</td>
<td>1</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Completed Interview</td>
<td>40</td>
<td>74%</td>
<td></td>
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</tbody>
</table>

The forty interviews averaged 9.8 minutes in length. Twenty-four respondents interviewed were vaccinated; the remaining sixteen respondents had not received the shingles vaccination. Given the very small size of the pretest sample and the short Field period, no conclusions can be drawn about the ratio of sample 1. When full interviewing begins and we are calling the sample in a manner similar to the Asthma Callback Survey, we will be able evaluate the proposed sample ratios.

Survey question response frequencies from the pretest interviews are included in this summary.

QUESTIONNAIRE FEEDBACK
Overall, respondents seemed to comprehend the survey questions. Based on monitoring and interviewer de-briefing, we are identifying a few questions where the pretest respondents had difficulty answering or the Abt SRBI found a question to be awkward.

Question 1.3

1.3 When you decided to get the shingles vaccination, how important was it that someone in your family or among your friends had already been sick with shingles? Was it:

Please read:
1 Not at all important
2 A little important
3 Somewhat important
4 Extremely important

Do not read:
7 Don’t know / Not sure

Comment [AE1]: Some respondents did not know anyone who had been sick with shingles and they had difficulty answering. During the interview, the question was re-read and with some additional thought, the respondents answered along the lines of: “well, I guess it would be ‘not at all important’.” Would it be appropriate to add a voluntary response “Does not know anyone who was sick with shingles”? Would you prefer an interviewer note about how to probe and/or code this situation?

1 See the March 23, 2012 memo “2012 Shingles Follow-Up Survey Forecast Sample Table” (a.k.a. “sample form”).
Questions 1.7, 1.8 and 7.4: several of the respondents seemed to focus on the percentages rather than the text after the number. If the respondent feels the chances are about 20% (or any number not specified), they may not answer the question correctly.

Please read:
1 10% chance, or very low
2 30% chance, or low
3 50% chance, or moderate
4 80% chance, or high

Question 2.1: This question does not seem to be collecting the information anticipated. Nearly all of the respondents answering the question provided a response that was categories with a “specify” verbatim (those responses have been inserted to appear in the topline). In some of the cases, the interviewer could have coded the response to one of the items in the response list, but for the purposes of the pretest, we are more comfortable collecting the additional information.

Generally speaking, the respondents tell us they were vaccinated in order to avoid getting shingles. Thus, the question text may need to request more specific information from the respondents.

Three other questions (Q1.2, 7.2, and 8.1) with an “Other (specify)” response also had some helpful verbatim responses, but those responses (also included in the topline) may assist with further development of the response lists. Again, with these three questions, some of the “other” responses would appropriately be coded to the existing response lists, either by the interviewer and if not, by our Coding department.

Questions 3.4 and 3.5: the question wording for 3.5, in regards to the Q3.4 response, is a little awkward. These questions were not frequently asked during the pretest, but this may become more of an issue when the survey begins.

3.4 Did your doctor or health care professional recommend that you not get the shingles vaccination?
1 Yes GO TO SUBSECTION 4
2 No ASK Q3.5

Do Not Read:
7 Don’t know / Not sure GO TO SUBSECTION 4
9 Refused GO TO SUBSECTION 4

3.5 You stated that your doctor did not recommend that you get the shingles vaccination, yet you still got the shingles vaccine?

Questions 5.5A-C

5.5 For each of the following, please say “yes” or “no”. How was the shingles vaccine kept cold between the pharmacy and your doctor’s office?
5.5A The Pharmacy gave you a package with ice for the vaccine so you could take it back to your doctor? Yes OR No
1 Yes
2 No
Do Not Read: 7 Don’t know / Not sure
9 Refused

5.5B: Did you come to the pharmacy with your own icepack for the vaccine? Yes OR No
1 Yes
2 No
Do Not Read: 7 Don’t know / Not sure
9 Refused

5.5C: Did the Pharmacy transport the vaccine to the doctor’s office? Yes OR No
1 Yes
2 No
Do Not Read: 7 Don’t know / Not sure
9 Refused

Question 6.1: this question is a companion question of the Non Vaccinated section question 12.6. The response list from 12.6 flows better during an interview.

6.1 How much did you pay to receive the vaccination? Please include any co-payments or co-insurance fees. Was it:
Please Read:
1 Less than $50
2 Between $50 to under $100
3 Between $100 to under $200
4 More than $200

Question 9.4: following questions 9.2 and 9.3, the wording of Q9.4 seems awkward and it may lead respondents to misinterpret the question. If you study questions 9.2 and 9.4, it IS clear they are not the same question – the placement of “not” in relation to “recommend” makes all of the difference. However, during the course of a telephone interview, the distinction between the two questions seems less clear.

9.2 Was one reason why you did not get the shingles shot because your doctor recommended that you not get the shot?
1 Yes
2 No
Do Not Read: 7 Don’t Know / Not Sure
9 Refused
9.4 Was one reason why you did not get the shingles shot because your doctor did not recommend the shingles shot to you?

1  Yes
2  No
Do Not Read: 7  Don't Know/Not Sure
9  Refused

That concludes the post pre-test review of the survey questionnaire.

PRE-TEST RESULTS
A topline frequency report for the survey pre-test responses are presented on the following pages.

Comment (AE7): Could 9.4 be reworded along the lines of: "Was one reason why you did not get the shingles shot because your doctor made no recommendation to you?"
#5560 Massachusetts BRFSS Shingles Callback Survey

Results of study 5560 at Wed Apr 25 11:50:54 2012

Question STATUS  Single-Coded. Answered by 40 out of 40

Type of complete

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<tr>
<td>1. Complete</td>
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<tr>
<td>2. Non-complete</td>
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<td>0.0</td>
</tr>
<tr>
<td>3. Over Quota Complete</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>4. Screen-outs / Contacts</td>
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Question DISPO  Single-Coded. Answered by 40 out of 40

Disposition of Interview

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<th></th>
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<tbody>
<tr>
<td>1. Proceed with interview/Completed Interview</td>
<td>40</td>
<td>100.0</td>
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Question XSHNGL2  Single-Coded. Answered by 40 out of 40

MA BRFSS SHINGLE FROM THE SAMPLE

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<tbody>
<tr>
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<td>24</td>
<td>60.0</td>
</tr>
<tr>
<td>2. No</td>
<td>16</td>
<td>40.0</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
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<td>0.0</td>
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### Massachusetts BRFSS Shingles Callback Survey

Question XHLTPLN  Single-Coded. Answered by 40 out of 40

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<tr>
<td>----------</td>
</tr>
<tr>
<td>1. Yes</td>
</tr>
<tr>
<td>2. No</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
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Question XHINS7  Single-Coded. Answered by 40 out of 40

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</tr>
<tr>
<td>1. Yes</td>
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<tr>
<td>2. No</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
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Question XEMPLOY  Single-Coded. Answered by 40 out of 40

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</tr>
<tr>
<td>1. Employed for wages</td>
</tr>
<tr>
<td>2. Self-employed</td>
</tr>
<tr>
<td>3. Out of work for more than 1 year</td>
</tr>
<tr>
<td>4. Out of work for less than 1 year</td>
</tr>
<tr>
<td>5. A homemaker</td>
</tr>
<tr>
<td>6. A student</td>
</tr>
<tr>
<td>7. Retired, Or</td>
</tr>
<tr>
<td>8. Unable to work</td>
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<tr>
<td>9. (VOL) Refused</td>
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#5560 Massachusetts BRFSS Shingles Callback Survey

Question XSEX Single-Coded. Answered by 40 out of 40

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<td>2. Female</td>
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Question XAGE Numeric. Answered by 40 out of 40

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Question S1 Single-Coded. Answered by 40 out of 40

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<td>2. No</td>
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</table>
Question S2  Single-Coded. Answered by 1 out of 40

S2. May I speak with &xsp;?n?

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<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
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</table>

Question S4  Single-Coded. Answered by 1 out of 40

S4. Am I speaking with &xsp;?n?

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<th>%/Resp</th>
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<tr>
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<td>0.0</td>
</tr>
</tbody>
</table>

Question S5  Single-Coded. Answered by 40 out of 40

S5. PERMISSION: Some of the information that you shared with us when we called you before could be useful in this study. May we combine your answers to this survey with your answers from the survey you did a few weeks ago? Everyone's answers will be combined to give us information about the health practices of people in this state.

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
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<tr>
<td>No</td>
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<tr>
<td>Refused</td>
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</tr>
</tbody>
</table>
#5560 Massachusetts BRFSS Shingles Callback Survey

Question S7  Single-Coded. Answered by 40 out of 40

S7. Do you know about a medical condition called shingles?

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<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Yes</td>
<td>40</td>
<td>100.0</td>
</tr>
<tr>
<td>2.</td>
<td>No</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>7.</td>
<td>(VOL) Don't know/Not sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9.</td>
<td>(VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Question S8  Single-Coded. Answered by 40 out of 40

S8. Are you aware that there is a vaccine to prevent shingles?

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Yes</td>
<td>40</td>
<td>100.0</td>
</tr>
<tr>
<td>2.</td>
<td>No</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>7.</td>
<td>(VOL) Don't know/Not sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9.</td>
<td>(VOL) Refused</td>
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Question S9  Single-Coded. Answered by 40 out of 40

S9. Have you had the shingles vaccination?

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Yes</td>
<td>24</td>
<td>60.0</td>
</tr>
<tr>
<td>2.</td>
<td>No</td>
<td>16</td>
<td>40.0</td>
</tr>
<tr>
<td>7.</td>
<td>(VOL) Don't know/Not sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9.</td>
<td>(VOL) Refused</td>
<td>0</td>
<td>0.0</td>
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</tbody>
</table>
**#5560 Massachusetts BRFSS Shingles Callback Survey**

**Question VACSTAT**  Single-Coded. Answered by 40 out of 40

Shingle vaccination status

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 1 - BRFSS=Yes, S9 confirmed</td>
<td>24</td>
<td>60.0</td>
<td>60.0</td>
</tr>
<tr>
<td>2. 2 - BRFSS=No, S9=Yes</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>3. 3 - BRFSS=No, S9 confirmed</td>
<td>16</td>
<td>40.0</td>
<td>40.0</td>
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<tr>
<td>4. 4 - BRFSS=Yes, S9=No</td>
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**Question VACSTAT2**  Single-Coded. Answered by 40 out of 40

Shingle vaccination status based on vacstat

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vaccinated</td>
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<td>60.0</td>
</tr>
<tr>
<td>2. Non Vaccinated</td>
<td>16</td>
<td>40.0</td>
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</table>

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**Question Q1Z1**  Single-Coded. Answered by 24 out of 40

Q1.1. When you decided to get the shingles vaccination, how important was it for you to prevent getting shingles? Was it:

(READ LIST)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Not at all important</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2. A little important</td>
<td>2</td>
<td>8.3</td>
<td>5.0</td>
</tr>
<tr>
<td>3. Somewhat important</td>
<td>4</td>
<td>16.7</td>
<td>10.0</td>
</tr>
<tr>
<td>4. Extremely important</td>
<td>18</td>
<td>75.0</td>
<td>45.0</td>
</tr>
<tr>
<td>7. (VOL) Don't know / Not sure</td>
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<tr>
<td>9. (VOL) Refused</td>
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</table>
#5560 Massachusetts BRFSS Shingles Callback Survey

Question Q122 Multi-coded. Answered by 24 out of 40

Q1.2. How did you hear about the shingles vaccination? Was it?
(READ LIST)

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<thead>
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<tbody>
<tr>
<td>Tot/Ans</td>
<td>%/Ans</td>
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<tr>
<td>1. CDC website</td>
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<tr>
<td>2. Facebook</td>
<td>0</td>
</tr>
<tr>
<td>3. Television Show (Dr. Oz or Oprah)</td>
<td>2</td>
</tr>
<tr>
<td>4. Magazine or Billboard Advertisement</td>
<td>2</td>
</tr>
<tr>
<td>5. Pharmacy/Store advertisement-intercom or poster, etc</td>
<td>0</td>
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<tr>
<td>6. Doctor Recommendation</td>
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</tr>
<tr>
<td>7. Other (Please specify)</td>
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</tr>
<tr>
<td>77. (VOL) Don't know / Not sure</td>
<td>2</td>
</tr>
<tr>
<td>99. (VOL) Refused</td>
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</table>

Q1.2 Other (specify) - VERBATIM RESPONSES
- "A FRIEND"
- "FRIEND OF MINE HAD THE SHINGLES AND THAT PUT ME IN LINE TO GET THE SHOT"
- "FRIEND OF MINES HAD SHINGLES AND TOLD ME YOU BETTER GET THE VACCINE BECAUSE YOU DONT WANT SHINGLES"
- "FRIEND OF MINES HAD THE SHINGLES AND TOLD ME I COULD GET THE SHOTS FOR IT."
- "MAGAZINE ARTICLE PUT OUT BY MY HEALTH CARE PROVIDER"
- "MY SISTER'S EXPERIENCE"
- "NEWSAPER FRIENDS WHOSE PARENTS HAD IT"
- "THROUGH MY JOB"

Question Q123 Single-Coded. Answered by 24 out of 40

Q1.3. When you decided to get the shingles vaccination, how important was it that someone in your family or among your friends had already been sick with shingles? Was it?
(READ LIST)

<table>
<thead>
<tr>
<th>24</th>
<th>40</th>
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<tbody>
<tr>
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<td>%/Ans</td>
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<td>7</td>
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<td>1</td>
</tr>
<tr>
<td>3. Somewhat important</td>
<td>1</td>
</tr>
<tr>
<td>4. Extremely important</td>
<td>15</td>
</tr>
<tr>
<td>7. (VOL) Don't know / Not sure</td>
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<td>9. (VOL) Refused</td>
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#5560 Massachusetts BRFSS Shingles Callback Survey

Question Q1Z4  Single-Coded. Answered by 24 out of 40

Q1.4. When you decided to get the shingles vaccination, how important was hearing from your friends that you should get the shingles shot? Was it: (READ LIST)

<table>
<thead>
<tr>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Not at all important</td>
<td>10</td>
<td>41.7</td>
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<tr>
<td>2. A little important</td>
<td>4</td>
<td>16.7</td>
</tr>
<tr>
<td>3. Somewhat important</td>
<td>6</td>
<td>25.0</td>
</tr>
<tr>
<td>4. Extremely important</td>
<td>4</td>
<td>16.7</td>
</tr>
<tr>
<td>7. (VOL) Don't know / Not sure</td>
<td>0</td>
<td>0.0</td>
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<tr>
<td>9. (VOL) Refused</td>
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Question Q1Z5  Single-Coded. Answered by 24 out of 40

Q1.5. When you decided to get the shingles vaccination, how important was hearing from your family that you should get the shingles shot? Was it: (READ LIST)

<table>
<thead>
<tr>
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<th>%/Resp</th>
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<td>2. A little important</td>
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<td>16.7</td>
</tr>
<tr>
<td>3. Somewhat important</td>
<td>5</td>
<td>20.8</td>
</tr>
<tr>
<td>4. Extremely important</td>
<td>3</td>
<td>12.5</td>
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<tr>
<td>7. (VOL) Don't know / Not sure</td>
<td>0</td>
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<tr>
<td>9. (VOL) Refused</td>
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Question Q1Z6  Single-Coded. Answered by 24 out of 40

Q1.6. How painful do you think shingles is? Do you think it is: (READ LIST)

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<tr>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Not at all painful</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>2. Somewhat painful</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>3. Moderately painful</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td>4. Very painful</td>
<td>22</td>
<td>91.7</td>
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<tr>
<td>7. (VOL) Don't know / Not sure</td>
<td>0</td>
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<tr>
<td>9. (VOL) Refused</td>
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</table>
# Massachusetts BRFSS Shingles Callback Survey

---

**Question Q1Z7** Single-Coded. Answered by 24 out of 40

Q1.7. Before you were vaccinated with the shingles vaccine, what did you think your chances were of getting sick with shingles during your lifetime? Would you say that it was:

(READ LIST)

<table>
<thead>
<tr>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 10% chance, or very low</td>
<td>4</td>
<td>16.7</td>
</tr>
<tr>
<td>2. 30% chance, or low</td>
<td>5</td>
<td>20.8</td>
</tr>
<tr>
<td>3. 50% chance, or moderate</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td>4. 80% chance, or high</td>
<td>8</td>
<td>33.3</td>
</tr>
<tr>
<td>7. (VOL) Don't know / Not sure</td>
<td>4</td>
<td>16.7</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
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</tbody>
</table>

---

**Question Q1Z8** Single-Coded. Answered by 24 out of 40

Q1.8. Now that you got the shingles shot, what do you think your chances are of getting sick with shingles during your lifetime? Would you say that it is:

(READ LIST)

<table>
<thead>
<tr>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 10% chance, or very low</td>
<td>20</td>
<td>83.3</td>
</tr>
<tr>
<td>2. 30% chance, or low</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td>3. 50% chance, or moderate</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>4. 80% chance, or high</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>7. (VOL) Don't know / Not sure</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
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</tbody>
</table>
#5560 Massachusetts BRFSS Shingles Callback Survey

Question Q221 Single-Coded. Answered by 24 out of 40

Q2.1 What was the primary reason that you got the shingles vaccination?
(Do NOT read list)

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<thead>
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<th>Reason</th>
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<th>40</th>
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</thead>
<tbody>
<tr>
<td>1. Avoid Rash/Itchiness on the face or body</td>
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</tr>
<tr>
<td>2. Avoid Blisters</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>3. Avoid Pain/Tingling of skin</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>4. Avoid Blindness/Sight Complications</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>5. Vaccine was recommended by doctor/health care provider</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td>6. Other (specify) ^c</td>
<td>21</td>
<td>87.5</td>
</tr>
<tr>
<td>7. (VOL) Don’t Know/Not Sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Q2.1 Other (specify) - VERBATIM RESPONSES

- “SO I DONT GET SHINGLES”
- “I’VE HAD SHINGLES IN THE PAST”
- “TO PREVENT SHINGLES”
- “BECAUSE IVE ALWAYS HAD THIS VIRUS”
- “FEAR OF GETTING SHINGLES”
- “I HAD HAD SHINGLES PREVIOUSLY AND IT WAS TO PREVENT MY HAVING ANOTHER OCCURRENCE”
- “BECAUSE I TOOK CARE OF PATIENTS THAT HAD IT AND I DID NOT WANT TO GET IT.”
- “I DIDNT WANT TO GET IT, I HAD A TEST TO FIND OUT IF I HAD THE CHICKENPOX.I FOUND OUT I DID HAVE THE CHICKEN POX WHEN I WAS A KID”
- “TO REDUCE THE LIKELIHOOD OF GETTING SHINGLES”
- “I HAD CHICKEN POX AS A KID AND I HEARD IT STAYS IN YOUR SYSTEM AND I HEARD HOW PAINFUL SHINGLES IS AND I DIDNT WANT TO GET IT”
- “MY DAUGHTER WAS PREGNANT AND I DIDNT WANT TO GET THE SHINGLES AND NOT BE ABLE TO HELP HER OUT”
- “BECAUSE I HAD HEARD HOW PAINFUL AND DIFFICULT IT WAS TO GET SHINGLES”
- “FEAR OF GETTING SHINGLES”
- “SO I DONT GET THE SHINGLES”
- “KNOWING THAT IT EXISTED. WHEN I HEARD ABOUT IT I SAID YES I’LL TAKE, I’VE KNOWN SEVERAL PEOPLE THAT WERE WIPED OUT BY IT”
- “MY WIFE TOLD ME TO GET IT”
- “TO PREVENT ME FROM GETTING SHINGLES AGAIN”
- “BECAUSE WE KNEW SOMEBODY WHO HAD SHINGLES”
- “BECAUSE A COUPLE OF FRIENDS OF MINE HAD SHINGLES AND IT WAS VERY UNCOMFORTABLE. AND ALSO I HAD CHICKENPOX AND IT WAS A VERY BAD CASE AS A CHILD AND I HEARD ITS THE SAME VIRUS AND I THOUGHT IT WAS A GOOD CHANCE IT MIGHT COME BACK”
- “A RELATIVE OF MINE HAD SUFFERED FROM IT QUITE RECENTLY AND IT REMINDED ME OF THE PAINFULNESS OF THE CONDITION AND THAT ONE COULD GET IT”

April 25, 2012
#5560 Massachusetts BRFSS Shingles Callback Survey

- "I AM A COLON CANCER PATIENT AND I DIDNT WANT ANY ADDITIONAL COMPLICATIONS TO THAT. SO I GOT THE SHINGLES VACCINATION TO AVOID ADDITIONAL MEDICAL ISSUES"

Question Q222 Single-Coded. Answered by 24 out of 40

Q2.2. Was one reason why you got the shingles vaccination because you wanted to take care of your health and be healthy?

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yes</td>
<td>24</td>
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<td>60.0</td>
</tr>
<tr>
<td>2. No</td>
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<td>0.0</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
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</tr>
</tbody>
</table>

Question Q223 Single-Coded. Answered by 10 out of 40

Q2.3. Was one reason why you got the shingles vaccination because you didn’t want to miss work or lose pay?

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yes</td>
<td>2</td>
<td>20.0</td>
<td>5.0</td>
</tr>
<tr>
<td>2. No</td>
<td>8</td>
<td>80.0</td>
<td>20.0</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
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<td>0.0</td>
</tr>
</tbody>
</table>
#5560 Massachusetts BRFSS Shingles Callback Survey

Question Q2Z4  Single-Coded. Answered by 24 out of 40

Q2.4. How often do you get the influenza vaccination? Is it:
(READ LIST. Read if necessary: The vaccine is either sprayed in the nose or injected in the arm.)

<table>
<thead>
<tr>
<th>Tot/Ans</th>
<th>24</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>%/Ans</td>
<td>%/Resp</td>
<td></td>
</tr>
<tr>
<td>1. Every year</td>
<td>19</td>
<td>79.2</td>
</tr>
<tr>
<td>2. Most years</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td>3. Rarely</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td>4. Have only gotten it once</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td>5. Never</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td>7. (VOL) Don't Know/Not Sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Question Q2Z5  Single-Coded. Answered by 24 out of 40

Q2.5. Within the past 10 years, did you get a tetanus shot?

<table>
<thead>
<tr>
<th>Tot/Ans</th>
<th>24</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>%/Ans</td>
<td>%/Resp</td>
<td></td>
</tr>
<tr>
<td>1. Yes</td>
<td>20</td>
<td>83.3</td>
</tr>
<tr>
<td>2. No</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Question Q2Z6  Single-Coded. Answered by 17 out of 40

Q2.6. Since your 65th birthday, did you get the pneumococcal vaccination?

<table>
<thead>
<tr>
<th>Tot/Ans</th>
<th>17</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>%/Ans</td>
<td>%/Resp</td>
<td></td>
</tr>
<tr>
<td>1. Yes</td>
<td>8</td>
<td>47.1</td>
</tr>
<tr>
<td>2. No</td>
<td>2</td>
<td>11.8</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>7</td>
<td>41.2</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Question Q3Z1  Single-Coded. Answered by 24 out of 40

Q3.1. In the past 5 years, did you and your doctor talk about the shingles vaccine?

<table>
<thead>
<tr>
<th></th>
<th>24</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tot/Ans %/Ans %/Resp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.    Yes</td>
<td>18</td>
<td>75.0</td>
</tr>
<tr>
<td>2.    No</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td>7.  (VOL) Don't know/Not sure</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td>9.  (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Question Q3Z2  Single-Coded. Answered by 18 out of 40

Q3.2. Did your doctor or healthcare professional bring up the topic of getting the shingles shot, or did you?

(READ LIST. Read only if necessary: By "healthcare professional" we mean a nurse practitioner, a physician's assistant, or some other licensed health professional, such as a nurse.)

<table>
<thead>
<tr>
<th></th>
<th>18</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tot/Ans %/Ans %/Resp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.    You brought up the topic</td>
<td>10</td>
<td>55.6</td>
</tr>
<tr>
<td>2.    Your doctor or health care professional brought up the topic</td>
<td>8</td>
<td>44.4</td>
</tr>
<tr>
<td>7.  (VOL) Don't know / Not sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9.  (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Question Q3Z3  Single-Coded. Answered by 24 out of 40

Q3.3. Did your doctor or health care professional recommend that you get the shingles vaccination?

<table>
<thead>
<tr>
<th></th>
<th>24</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tot/Ans %/Ans %/Resp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.    Yes</td>
<td>20</td>
<td>83.3</td>
</tr>
<tr>
<td>2.    No</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td>7.  (VOL) Don't know/Not sure</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td>9.  (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
### #5560 Massachusetts BRFSS Shingles Callback Survey

**Question Q3Z4 Single-Coded. Answered by 4 out of 40**

Q3.4. Did your doctor or health care professional recommend that you NOT get the shingles vaccination?

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yes</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2. No</td>
<td>4</td>
<td>100.0</td>
<td>10.0</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

---

**Question Q3Z5 Single-Coded. Answered by 4 out of 40**

Q3.5. You stated that your doctor did NOT recommend that you get the shingles vaccination, yet you still got the shingles vaccine?

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yes</td>
<td>4</td>
<td>100.0</td>
<td>10.0</td>
</tr>
<tr>
<td>2. No</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

---

**Question Q4Z1 Single-Coded. Answered by 24 out of 40**

Q4.1. How safe do you think the shingles vaccination is? Would you say it is:

(READ LIST)

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Not at all safe</td>
<td>1</td>
<td>4.2</td>
<td>2.5</td>
</tr>
<tr>
<td>2. A little safe</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>3. Somewhat safe</td>
<td>3</td>
<td>12.5</td>
<td>7.5</td>
</tr>
<tr>
<td>4. Very safe</td>
<td>20</td>
<td>83.3</td>
<td>50.0</td>
</tr>
<tr>
<td>7. (VOL) Don't Know/Not Sure</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
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</tbody>
</table>
#5560 Massachusetts BRFSS Shingles Callback Survey

**Question Q4Z2** Single-Coded. Answered by 24 out of 40

Q4.2. Before you got vaccinated, did you know that the shingles vaccination is a live virus vaccine?

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>15</td>
<td>62.5</td>
<td>37.5</td>
</tr>
<tr>
<td>No</td>
<td>9</td>
<td>37.5</td>
<td>22.5</td>
</tr>
<tr>
<td>(VOL) Don't know/Not sure</td>
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<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>(VOL) Refused</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Question Q4Z3** Single-Coded. Answered by 9 out of 40

Q4.3. If you had known that the vaccination is a live virus, would you have still gotten the vaccine?

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>8</td>
<td>88.9</td>
<td>20.0</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>(VOL) Don't know/Not sure</td>
<td>1</td>
<td>11.1</td>
<td>2.5</td>
</tr>
<tr>
<td>(VOL) Refused</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Question Q4Z4** Single-Coded. Answered by 24 out of 40

Q4.4. How effective do you think the shingles shot is at preventing shingles?

(READ LIST)

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all effective</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Only a little effective</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Somewhat effective</td>
<td>5</td>
<td>20.8</td>
<td>12.5</td>
</tr>
<tr>
<td>Very effective</td>
<td>16</td>
<td>66.7</td>
<td>40.0</td>
</tr>
<tr>
<td>(VOL) Don't know/Not sure</td>
<td>3</td>
<td>12.5</td>
<td>7.5</td>
</tr>
<tr>
<td>(VOL) Refused</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
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</tbody>
</table>
Question Q5Z1  Single-Coded. Answered by 24 out of 40

Q5.1. How convenient was it to get the shingles shot?
(READ LIST)

<table>
<thead>
<tr>
<th>24</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tot/Ans</td>
<td>%/Ans</td>
</tr>
<tr>
<td>1. Not at all convenient</td>
<td>3</td>
</tr>
<tr>
<td>2. A little convenient</td>
<td>1</td>
</tr>
<tr>
<td>3. Somewhat convenient</td>
<td>3</td>
</tr>
<tr>
<td>4. Very convenient</td>
<td>16</td>
</tr>
<tr>
<td>7. (VOL) Don't Know/Not Sure</td>
<td>1</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
</tr>
</tbody>
</table>

Question Q5Z2  Single-Coded. Answered by 24 out of 40

Q5.2 Where did you get the shingles shot? Was it at the:
(READ LIST)

<table>
<thead>
<tr>
<th>24</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tot/Ans</td>
<td>%/Ans</td>
</tr>
<tr>
<td>1. Doctor's office</td>
<td>20</td>
</tr>
<tr>
<td>2. Pharmacy/retail stores</td>
<td>2</td>
</tr>
<tr>
<td>3. Vaccination clinics</td>
<td>1</td>
</tr>
<tr>
<td>4. Health Department or other public clinic</td>
<td>0</td>
</tr>
<tr>
<td>5. Veteran's administration</td>
<td>0</td>
</tr>
<tr>
<td>6. Senior centers or assisted living settings</td>
<td>0</td>
</tr>
<tr>
<td>7. (VOL) Don't know / Not sure</td>
<td>1</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
</tr>
</tbody>
</table>

Question Q5Z3  Single-Coded. Answered by 24 out of 40

Q5.3. Did that location have the shingles vaccine available for you right away?
(READ LIST)

<table>
<thead>
<tr>
<th>24</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tot/Ans</td>
<td>%/Ans</td>
</tr>
<tr>
<td>1. Yes, the vaccine was available right away</td>
<td>14</td>
</tr>
<tr>
<td>2. No, the vaccine had to be ordered</td>
<td>8</td>
</tr>
<tr>
<td>7. (VOL) Don't know / Not sure</td>
<td>2</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
</tr>
</tbody>
</table>
#5560 Massachusetts BRFSS Shingles Callback Survey

Question Q5Z4  Single-Coded. Answered by 2 out of 40

Q5.4. Did the pharmacist administer the shot at the pharmacy or did you pick the vaccine up at the pharmacy and bring it to your doctor's office so that your doctor could give you the shot?

(READ LIST)

<table>
<thead>
<tr>
<th>2</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tot/Ans</td>
<td>%/Ans</td>
</tr>
<tr>
<td>1. The vaccine was administered by the pharmacist in the pharmacy</td>
<td>1</td>
</tr>
<tr>
<td>2. You picked up the vaccine in the pharmacy and brought it to a doctor's office for them to give it</td>
<td>1</td>
</tr>
<tr>
<td>7. (VOL) Don't know / Not sure</td>
<td>0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
</tr>
</tbody>
</table>

Question Q5Z5A  Single-Coded. Answered by 1 out of 40

5.5A. The Pharmacy gave you a package with ice for the vaccine so you could take it back to your doctor? Yes OR No

<table>
<thead>
<tr>
<th>1</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tot/Ans</td>
<td>%/Ans</td>
</tr>
<tr>
<td>1. Yes</td>
<td>0</td>
</tr>
<tr>
<td>2. No</td>
<td>1</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
</tr>
</tbody>
</table>

Question Q5Z5B  Single-Coded. Answered by 1 out of 40

5.5B. Did you come to the pharmacy with your own ice pack for the vaccine? YES OR NO

<table>
<thead>
<tr>
<th>1</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tot/Ans</td>
<td>%/Ans</td>
</tr>
<tr>
<td>1. Yes</td>
<td>1</td>
</tr>
<tr>
<td>2. No</td>
<td>0</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
</tr>
</tbody>
</table>
#5560 Massachusetts BRFSS Shingles Callback Survey

Question Q5Z5C  Single-Coded. Answered by 1 out of 40

5.5C. Did the Pharmacy transport the vaccine to the doctor's office? YES OR NO

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tot/Ans</td>
<td>%/Ans</td>
</tr>
<tr>
<td>1. Yes</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>2. No</td>
<td>1</td>
<td>100.0</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Question Q5Z6  Single-Coded. Answered by 1 out of 40

Q5.6. About how long did it take to go from the pharmacy to your doctor's office so you could get your shingles shot? (READ LIST)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tot/Ans</td>
<td>%/Ans</td>
</tr>
<tr>
<td>1. Less then 30 minutes</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>2. 30 minutes to just under 1 hour</td>
<td>1</td>
<td>100.0</td>
</tr>
<tr>
<td>3. 1 hour to just under 2 hours</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>4. Over 2 hours</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>7. (VOL) Don't know / Not sure</td>
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<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Question Q5Z7  Single-Coded. Answered by 1 out of 40

Q5.7. Would you have been willing to have the pharmacist administer the shingles vaccine in a pharmacy instead of getting the shot in a doctor's office?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tot/Ans</td>
<td>%/Ans</td>
</tr>
<tr>
<td>1. Yes</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>2. No</td>
<td>1</td>
<td>100.0</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
#5560 Massachusetts BRFSS Shingles Callback Survey

Question Q6Z1  Single-Coded. Answered by 24 out of 40

Q6.1. How much did you pay to receive the vaccination? Please include any co-payments or co-insurance fees. Was it:

<table>
<thead>
<tr>
<th></th>
<th>24</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tot/Ans</td>
<td>%/Ans</td>
</tr>
<tr>
<td>1. Less than $50</td>
<td>14</td>
<td>58.3</td>
</tr>
<tr>
<td>2. Between $50 to under $100</td>
<td>0</td>
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<tr>
<td>3. Between $100 to under $200</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td>4. More than $200</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td>7. (VOL) Don't know / Not sure</td>
<td>6</td>
<td>25.0</td>
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<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Question Q6Z2  Single-Coded. Answered by 24 out of 40

Q6.2. Did you have to file a medical insurance claim to your insurance company to be reimbursed for the shingles shot?

<table>
<thead>
<tr>
<th></th>
<th>24</th>
<th>40</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Tot/Ans</td>
<td>%/Ans</td>
</tr>
<tr>
<td>1. Yes</td>
<td>1</td>
<td>4.2</td>
</tr>
<tr>
<td>2. No</td>
<td>21</td>
<td>87.5</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Question Q6Z3  Single-Coded. Answered by 1 out of 40

Q6.3. Who filed the medical insurance claim for you? Was it the:

<table>
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<tr>
<th></th>
<th>1</th>
<th>40</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Tot/Ans</td>
<td>%/Ans</td>
</tr>
<tr>
<td>1. Physician or office staff</td>
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<td>0.0</td>
</tr>
<tr>
<td>2. Pharmacy</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>3. Patient (you)</td>
<td>1</td>
<td>100.0</td>
</tr>
<tr>
<td>4. Spouse/caregiver</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>5. Someone else (Please specify)^o</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>7. (VOL) Don't know / Not sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
# Massachusetts BRFSS Shingles Callback Survey

**Question Q6Z4** Single-Coded. Answered by 1 out of 40

Q6.4. Did your medical insurance company reimburse you for the shingles vaccination?

<table>
<thead>
<tr>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yes</td>
<td>1</td>
<td>100.0</td>
</tr>
<tr>
<td>2. No</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Question Q6Z5** Single-Coded. Answered by 1 out of 40

Q6.5. As part of your Medicare insurance, do you have a prescription drug plan, also known as Part D?

(READ LIST)

<table>
<thead>
<tr>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yes</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>2. No</td>
<td>1</td>
<td>100.0</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Question Q7Z1** Single-Coded. Answered by 16 out of 40

Q7.1. Was one reason why you did not get the shingles shot because you do not think you will get the disease?

<table>
<thead>
<tr>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yes</td>
<td>5</td>
<td>31.2</td>
</tr>
<tr>
<td>2. No</td>
<td>11</td>
<td>68.8</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
#5560 Massachusetts BRFSS Shingles Callback Survey

Question Q7Z2  Multi-coded. Answered by 16 out of 40

Q7.2. How did you hear about the shingles vaccination? Was it:

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CDC website</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2. Facebook</td>
<td>1</td>
<td>6.2</td>
<td>2.5</td>
</tr>
<tr>
<td>3. Television Show (Dr. Oz or Oprah)</td>
<td>6</td>
<td>37.5</td>
<td>15.0</td>
</tr>
<tr>
<td>4. Magazine or Billboard Advertisement</td>
<td>1</td>
<td>6.2</td>
<td>2.5</td>
</tr>
<tr>
<td>5. Pharmacy/Store advertisement-intercom or poster, etc</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>6. Doctor Recommendation</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>7. Other (Please specify)</td>
<td>9</td>
<td>56.2</td>
<td>22.5</td>
</tr>
<tr>
<td>77. (VOL) Don't know / Not sure</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>99. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Q7.2 Other: (specify) - VERBATIM RESPONSES

- "My father had it. (had what) Shingles. He's been dead for nine years. That's how long I've known about shingles"
- "From wife she's a nurse"
- "I had a conversation in regards to it at a doctor's appointment and physical then they were talking the shingles shot and that you had to be at certain age to get it"
- "I worked with a guy that had it and also did some research online about it and read some medical books about it"
- "Newspaper and radio"
- "Somebody mentioned it in passing and I don't even recall who. It was just brought up in conversation"
- "Thru my niece"
- "Website (which) don't remember"
- "Work as a home health aide and CNA so I've heard about it through there"

Question Q7Z3  Single-Coded. Answered by 16 out of 40

Q7.3. How painful do you think shingles is? Do you think it is:

(READ LIST)

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Not at all painful</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2. Somewhat painful</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>3. Moderately painful</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>4. Very painful</td>
<td>15</td>
<td>93.8</td>
<td>37.5</td>
</tr>
<tr>
<td>77. (VOL) Don't know / Not sure</td>
<td>1</td>
<td>6.2</td>
<td>2.5</td>
</tr>
<tr>
<td>99. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
**#5560 Massachusetts BRFSS Shingles Callback Survey**

Question Q724 Single-Coded. Answered by 16 out of 40

Q7.4. What do you think your chances are of getting sick with shingles during your lifetime? Do you think it is a:

<table>
<thead>
<tr>
<th></th>
<th>16</th>
<th></th>
<th>40</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tot/Ans</td>
<td>%/Ans</td>
<td>%/Resp</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>10% chance, or very low</td>
<td>4</td>
<td>25.0</td>
<td>10.0</td>
</tr>
<tr>
<td>2.</td>
<td>30% chance, or low</td>
<td>6</td>
<td>37.5</td>
<td>15.0</td>
</tr>
<tr>
<td>3.</td>
<td>50% chance, or moderate</td>
<td>3</td>
<td>18.8</td>
<td>7.5</td>
</tr>
<tr>
<td>4.</td>
<td>80% chance, or high</td>
<td>2</td>
<td>12.5</td>
<td>5.0</td>
</tr>
<tr>
<td>7.</td>
<td>(VOL) Don't Know/Not Sure</td>
<td>1</td>
<td>6.2</td>
<td>2.5</td>
</tr>
<tr>
<td>9.</td>
<td>(VOL) Refused</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
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</tbody>
</table>

Question Q821 Single-Coded. Answered by 16 out of 40

Q8.1. What was the primary reason that you did NOT get the shingles vaccination?

(Do Not Read List)

<table>
<thead>
<tr>
<th></th>
<th>16</th>
<th></th>
<th>40</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tot/Ans</td>
<td>%/Ans</td>
<td>%/Resp</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Vaccine Cost was too much</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2.</td>
<td>Vaccine not recommended to me</td>
<td>2</td>
<td>12.5</td>
<td>5.0</td>
</tr>
<tr>
<td>3.</td>
<td>Afraid of vaccine/safety concerns</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>4.</td>
<td>Vaccine would not help me/ efficacy concerns</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>5.</td>
<td>Didn't think I am at risk of getting shingles</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>6.</td>
<td>Other (specify)</td>
<td>14</td>
<td>87.5</td>
<td>35.0</td>
</tr>
<tr>
<td>7.</td>
<td>(VOL) Don't Know/Not Sure</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>8.</td>
<td>ADD LATER B</td>
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<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>9.</td>
<td>(VOL) Refused</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

---

Q8.1 Other (specify) - Verbatim Responses

- "I DONT HAVE SHINGLES AND NO REASON TO GET IT (ELSE) NO"
- "JUST HAVENT DONE IT YET. HAVEN'T HAD THE TIME"
- "BECAUSE I DIDNT THINK IT APPLIED TO ME. MY DOCTOR SAID IF I DIDNT HAVE CHICKEN POX THERE WAS VIRTUALLY NO CHANCE FOR ME TO GET THE SHINGLES. SO TO TAKE A SHOT FOR SOMETHING IM NOT AT RISK OF GETTING IS A RISK AS WELL. AND ALOT OF VACCINES I DONT BELIEVE IN BECAUSE OF WHAT'S IN THEM"
- "BECAUSE I JUST RECENTLY FOUND OUT ABOUT IT"
- "I THOUGHT IT WOULD ONLY HELP IF IT WAS TAKEN BEFORE GETTING THE SHINGLES OR SOMETHING RELATED TO SHINGLES LIKE HERPES."
- "I ASKED MY DOCTOR ABOUT IT AND HE SAID HE WOULD LOOK INTO IT...AND I MIGHT BE TOO YOUNG."
- "BECAUSE IT DID NOT SEEM TO BE IMPORTANT ENOUGH"
- "I DONT LIKE NEEDLES"
- "MY DOCTOR WAS CONCERNED BECAUSE OF POSSIBLE ALLERGIC REACTION"
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- “TALKED IT OVER WITH THE DOCTOR AND HE DID NOT THINK IT WAS NECESSARY. THIS WAS A LITTLE WHILE AGO. HE DIDN'T THINK IT WAS WORTH THE SHOT.”
- “IF MY DOCTOR OFFERED IT THEN I WOULD GET IT”
- “ITS NOT SOMETHING IVE TALKED WITH MY DOCTOR TO YET.”
- “I DON'T BELIEVE I HAD CHICKENPOX”
- “BECAUSE WHEN I WENT TO GET IT THEY WERE OUT”

Question Q822 Single-Coded. Answered by 16 out of 40

Q8.2. How often do you get the influenza vaccination? Is it:
(READ IF NECESSARY: THE FLU VACCINATION IS EITHER SPRAYED IN THE NOSE OR INJECTED IN THE ARM.)

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Every year</td>
<td>8</td>
<td>50.0</td>
<td>20.0</td>
</tr>
<tr>
<td>2. Most years</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>3. Rarely</td>
<td>2</td>
<td>12.5</td>
<td>5.0</td>
</tr>
<tr>
<td>4. Have only gotten it once</td>
<td>2</td>
<td>12.5</td>
<td>5.0</td>
</tr>
<tr>
<td>5. Never</td>
<td>4</td>
<td>25.0</td>
<td>10.0</td>
</tr>
<tr>
<td>7. (VOL) Don't Know/Not Sure</td>
<td>0</td>
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<td>0.0</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
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<td>0.0</td>
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</tbody>
</table>

Question Q823 Single-Coded. Answered by 16 out of 40

Q8.3. Within the past 10 years, did you get a tetanus shot?

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yes</td>
<td>9</td>
<td>56.2</td>
<td>22.5</td>
</tr>
<tr>
<td>2. No</td>
<td>4</td>
<td>25.0</td>
<td>10.0</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>3</td>
<td>18.8</td>
<td>7.5</td>
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<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
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</tbody>
</table>
**#5560 Massachusetts BRFSS Shingles Callback Survey**

### Question Q8Z4  Single-Coded. Answered by 6 out of 40

Q8.4. Since your 65th birthday, did you get the pneumococcal vaccination?

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
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<td>1. Yes</td>
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<td>50.0</td>
<td>7.5</td>
</tr>
<tr>
<td>2. No</td>
<td>2</td>
<td>33.3</td>
<td>5.0</td>
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<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>1</td>
<td>16.7</td>
<td>2.5</td>
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<tr>
<td>9. (VOL) Refused</td>
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</tbody>
</table>

### Question Q9Z1  Single-Coded. Answered by 16 out of 40

Q9.1. In the past 5 years, did you and your doctor talk about the shingles vaccine?

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yes</td>
<td>6</td>
<td>37.5</td>
<td>15.0</td>
</tr>
<tr>
<td>2. No</td>
<td>9</td>
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<td>22.5</td>
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<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>1</td>
<td>6.2</td>
<td>2.5</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
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</tbody>
</table>

### Question Q9Z2  Single-Coded. Answered by 16 out of 40

Q9.2. Was one reason why you did not get the shingles shot because your doctor recommended that you NOT get the shot?

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yes</td>
<td>3</td>
<td>18.8</td>
<td>7.5</td>
</tr>
<tr>
<td>2. No</td>
<td>13</td>
<td>81.2</td>
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<td>7. (VOL) Don't know/Not sure</td>
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<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
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</tbody>
</table>
#5560 Massachusetts BRFSS Shingles Callback Survey

**Question Q9Z3** Single-Coded. Answered by 16 out of 40

Q9.3. Was one reason why you did not get the shingles shot because your doctor recommended that you get the shingles shot but you refused the vaccination?

<table>
<thead>
<tr>
<th></th>
<th>16</th>
<th>40</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yes</td>
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<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2. No</td>
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<td>100.0</td>
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<td></td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
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<td>0.0</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
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<td>0.0</td>
<td></td>
</tr>
</tbody>
</table>

**Question Q9Z4** Single-Coded. Answered by 16 out of 40

Q9.4. Was one reason why you did not get the shingles shot because your doctor did NOT recommend the shingles shot to you?

<table>
<thead>
<tr>
<th></th>
<th>16</th>
<th>40</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yes</td>
<td>9</td>
<td>56.2</td>
<td>22.5</td>
<td></td>
</tr>
<tr>
<td>2. No</td>
<td>7</td>
<td>43.8</td>
<td>17.5</td>
<td></td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
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<td>0.0</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
<td></td>
</tr>
</tbody>
</table>

**Question Q10Z1** Single-Coded. Answered by 16 out of 40

Q10.1. "I DO NOT TRUST THE SHINGLES VACCINE." Was not trusting the shingles vaccine a major reason, a minor reason, or not a reason in your decision NOT to get the shingles shot?

<table>
<thead>
<tr>
<th></th>
<th>16</th>
<th>40</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Major reason</td>
<td>1</td>
<td>6.2</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>2. Minor reason</td>
<td>5</td>
<td>31.2</td>
<td>12.5</td>
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</tr>
<tr>
<td>3. Not a reason</td>
<td>10</td>
<td>62.5</td>
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<td>7. (VOL) Don't know / Not sure</td>
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</tbody>
</table>
**Question Q10Z2** Single-Coded. Answered by 16 out of 40

Q10.2. "I DO NOT LIKE NEEDLES." Was not liking needles a major reason, a minor reason, or not a reason in your decision NOT to get the shingles shot?

<table>
<thead>
<tr>
<th></th>
<th>16</th>
<th>40</th>
<th>%/Ans</th>
<th>%/Resp</th>
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<tr>
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<td>2</td>
<td>12.5</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>3.  Not a reason</td>
<td>13</td>
<td>81.2</td>
<td>32.5</td>
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<td>7.  (VOL) Don't know / Not sure</td>
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<tr>
<td>9.  (VOL) Refused</td>
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</tbody>
</table>

**Question Q10Z3** Single-Coded. Answered by 16 out of 40

Q10.3. "I THOUGHT I MIGHT GET SICK FROM THE SHINGLES VACCINE." Was thinking you might get sick from the shot a major reason, a minor reason, or not a reason in your decision NOT to get the shingles shot?

<table>
<thead>
<tr>
<th></th>
<th>16</th>
<th>40</th>
<th>%/Ans</th>
<th>%/Resp</th>
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<td>12.5</td>
<td>5.0</td>
<td></td>
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<td>2</td>
<td>12.5</td>
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</table>

**Question Q10Z4** Single-Coded. Answered by 16 out of 40

Q10.4. "I DO NOT THINK THE SHINGLES VACCINE IS EFFECTIVE AT PREVENTING SHINGLES." Was thinking that the vaccine is not effective a major reason, a minor reason, or not a reason in your decision NOT to get the shingles shot?

<table>
<thead>
<tr>
<th></th>
<th>16</th>
<th>40</th>
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<th>%/Resp</th>
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<td>2.  Minor reason</td>
<td>2</td>
<td>12.5</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>3.  Not a reason</td>
<td>14</td>
<td>87.5</td>
<td>35.0</td>
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</tr>
<tr>
<td>7.  (VOL) Don't know / Not sure</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>9.  (VOL) Refused</td>
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<td>0.0</td>
<td>0.0</td>
<td></td>
</tr>
</tbody>
</table>
#5560 Massachusetts BRFSS Shingles Callback Survey

Question Q10Z5  Single-Coded. Answered by 16 out of 40

Q10.5. Was the cost of the vaccine a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tot/Ans</td>
<td>%/Ans</td>
<td>%/Resp</td>
</tr>
<tr>
<td>1.</td>
<td>Major reason</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>2.</td>
<td>Minor reason</td>
<td>2</td>
<td>12.5</td>
</tr>
<tr>
<td>3.</td>
<td>Not a reason</td>
<td>14</td>
<td>87.5</td>
</tr>
<tr>
<td>7.</td>
<td>(VOL) Don't know / Not sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9.</td>
<td>(VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Question Q10Z6  Single-Coded. Answered by 16 out of 40

Q10.6. Was inconvenience a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

<table>
<thead>
<tr>
<th></th>
<th>16</th>
<th></th>
<th>40</th>
</tr>
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<tr>
<td></td>
<td>Tot/Ans</td>
<td>%/Ans</td>
<td>%/Resp</td>
</tr>
<tr>
<td>1.</td>
<td>Major reason</td>
<td>1</td>
<td>6.2</td>
</tr>
<tr>
<td>2.</td>
<td>Minor reason</td>
<td>2</td>
<td>12.5</td>
</tr>
<tr>
<td>3.</td>
<td>Not a reason</td>
<td>13</td>
<td>81.2</td>
</tr>
<tr>
<td>7.</td>
<td>(VOL) Don't know / Not sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9.</td>
<td>(VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Question Q10Z7  Single-Coded. Answered by 16 out of 40

Q10.7. The shingles vaccine is a live virus vaccine. How important was this to your decision not to get the shingles shot?

(READ LIST)

<table>
<thead>
<tr>
<th></th>
<th>16</th>
<th></th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tot/Ans</td>
<td>%/Ans</td>
<td>%/Resp</td>
</tr>
<tr>
<td>1.</td>
<td>Very important</td>
<td>2</td>
<td>12.5</td>
</tr>
<tr>
<td>2.</td>
<td>Somewhat important</td>
<td>1</td>
<td>6.2</td>
</tr>
<tr>
<td>3.</td>
<td>Only a little important</td>
<td>3</td>
<td>18.8</td>
</tr>
<tr>
<td>4.</td>
<td>Not at all important</td>
<td>10</td>
<td>62.5</td>
</tr>
<tr>
<td>7.</td>
<td>(VOL) Don't know / Not sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9.</td>
<td>(VOL) Refused</td>
<td>0</td>
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</tr>
</tbody>
</table>
# Massachusetts BRFSS Shingles Callback Survey

## Q10.8. How effective do you think the shingles shot is at preventing shingles? Do you think it is...

<table>
<thead>
<tr>
<th></th>
<th>16</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Not at all effective</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>2. Only a little effective</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>3. Somewhat effective</td>
<td>6</td>
<td>37.5</td>
</tr>
<tr>
<td>4. OR Very effective</td>
<td>5</td>
<td>31.2</td>
</tr>
<tr>
<td>7. (VOL) Don't know / Not sure</td>
<td>5</td>
<td>31.2</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
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## Q11.1. Was one reason why you did not get the shingles shot because the vaccine was not available at your doctor's office?

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</thead>
<tbody>
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<td>3</td>
<td>18.8</td>
</tr>
<tr>
<td>2. No</td>
<td>11</td>
<td>68.8</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
<td>2</td>
<td>12.5</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

## Q11.2. Was one reason why you did not get the shingles shot because the vaccine was not available at your pharmacy?

<table>
<thead>
<tr>
<th></th>
<th>13</th>
<th>40</th>
</tr>
</thead>
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<td>0.0</td>
</tr>
<tr>
<td>2. No</td>
<td>12</td>
<td>92.3</td>
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<td>1</td>
<td>7.7</td>
</tr>
<tr>
<td>9. (VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
#5560 Massachusetts BRFSS Shingles Callback Survey

Question Q11Z3  Single-Coded. Answered by 13 out of 40

Q11.3. Was one reason why you did not get the shingles shot because the vaccine was not available at any of the local health centers/clinics where you normally get care?

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>1</td>
<td>7.7</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>12</td>
<td>92.3</td>
</tr>
<tr>
<td>7</td>
<td>(VOL) Don't know/Not sure</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>9</td>
<td>(VOL) Refused</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Question Q11Z4  Single-Coded. Answered by 16 out of 40

Q11.4. If you were to get the shingles vaccination, would you be willing to have the pharmacist administer the shingles vaccination in a pharmacy instead of getting the shot in a doctor's office?

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
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<td>Yes</td>
<td>8</td>
<td>50.0</td>
</tr>
<tr>
<td>2</td>
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<td>6.2</td>
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<tr>
<td>9</td>
<td>(VOL) Refused</td>
<td>0</td>
<td>0.0</td>
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</table>

Question Q12Z1  Single-Coded. Answered by 16 out of 40

Q12.1. Was one reason for not receiving the shingles shot because the shingles vaccine is not recommended for your age group?

<table>
<thead>
<tr>
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<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
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<td>Yes</td>
<td>3</td>
<td>18.8</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>10</td>
<td>62.5</td>
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<tr>
<td>7</td>
<td>(VOL) Don't know/Not sure</td>
<td>3</td>
<td>18.8</td>
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<tr>
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Question Q12Z2  Single-Coded. Answered by 16 out of 40

Q12.2. Was one reason why you did not get the shingles shot because your medical insurance would not pay for the shot?

<table>
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<tr>
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<th>40</th>
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<th></th>
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<td>Tot/Ans</td>
<td>%/Ans</td>
<td>%/Resp</td>
<td></td>
<td></td>
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<td>2.</td>
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<td>87.5</td>
<td>35.0</td>
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<td>12.5</td>
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<tr>
<td>9.</td>
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Question Q12Z4  Single-Coded. Answered by 16 out of 40

Q12.4. Was one reason why you did not get the shingles shot because your cost was too much?

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<thead>
<tr>
<th></th>
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<td>Tot/Ans</td>
<td>%/Ans</td>
<td>%/Resp</td>
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<td>6.2</td>
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<td>(VOL) Refused</td>
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Question Q12Z6  Single-Coded. Answered by 16 out of 40

Q12.6. What is the most you would be willing to spend on the shingles vaccination?

(READ LIST)

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<tr>
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<th>16</th>
<th>40</th>
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<th></th>
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<td>%/Ans</td>
<td>%/Resp</td>
<td></td>
<td></td>
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<td>50.0</td>
<td>20.0</td>
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</tr>
<tr>
<td>2.</td>
<td>$25 to less than $50</td>
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<td>18.8</td>
<td>7.5</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>$50 to less than $100</td>
<td>3</td>
<td>18.8</td>
<td>7.5</td>
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</tr>
<tr>
<td>4.</td>
<td>$100 to less than $200</td>
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</tr>
<tr>
<td>5.</td>
<td>$200 plus</td>
<td>1</td>
<td>6.2</td>
<td>2.5</td>
<td></td>
</tr>
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<td>7.</td>
<td>(VOL) Don't know / Not sure</td>
<td>1</td>
<td>6.2</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>(VOL) Refused</td>
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<td></td>
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</tbody>
</table>
#5560 Massachusetts BRFSS Shingles Callback Survey

Question Q12Z7  Single-Coded. Answered by 16 out of 40

Q12.7. Would you get vaccinated if the shingles shot were free?

<table>
<thead>
<tr>
<th></th>
<th>Tot/Ans</th>
<th>%/Ans</th>
<th>%/Resp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yes</td>
<td>10</td>
<td>62.5</td>
<td>25.0</td>
</tr>
<tr>
<td>2. No</td>
<td>5</td>
<td>31.2</td>
<td>12.5</td>
</tr>
<tr>
<td>7. (VOL) Don't know/Not sure</td>
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</tr>
<tr>
<td>9. (VOL) Refused</td>
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----------------------------------------------------------------------------------------------
Appendix F    MA Shingles Survey Interview Monitoring Session Forms

August 9, 2012

2012 Interview Monitoring Evaluation Form
Call center being monitored: Fort Myers, FL
BRFSS staff monitor: Marina Draper
Date: 9 August 2012     Time: start 7:00 p.m.     end 8:30 p.m.

How many interviews did you listen to: 5 interviews

Overall Impressions:
Remote monitoring of Abt SRBI’s interview administration and data collection of the shingles survey was conducted on 9 August 2012. The monitoring session was well organized and served as an informative tool for evaluating Abt SRBI’s quality and project management performance.

Abt SRBI’s Fort Myers, Florida call center fielded the shingles call back survey. Abt SRBI’s Hadley, MA call center conducts the State BRFSS surveys, however, most follow-up surveys, e.g. asthma call back and the shingles call back are conducted from the Fort Myers, FL call center.

Andrew Evans (Abt SRBI) coordinated the remote monitoring session and provided advance communication regarding logistics, e.g. telephone dial-in and GoToMeeting log-in information.

In addition, client expectation was managed in advance of the monitoring session. Andrew communicated that even though a fresh sample of respondents would be loaded into the system, it was possible that few (if any) interviews may be heard due to the inherent nature of the call back survey, e.g. not RDD, a smaller panel sample, and fewer interviewers during calling shifts. However, the monitoring session was successful since a total of 5 live interviews were observed.

Andrew and Kristina (did not get last name, Abt SRBI call center Supervisor) were on the call during the entire monitoring session. Both described what information was presented on the screen (CATI and Sample Management System), updated me on the interview progress/status, and when a respondent was identified, connected the phone line to the live interview.

Andrew was attentive to each interviewee’s responses, and summarized the data collected after each session, observed the difficulty (if any) with question comprehension, and made suggestions for response codes, and interviewer notes to survey script.

After one interview de-brief, Andrew observed that it appeared that the respondent did not comprehend a question, although after further thought, it was determined that this respondent took longer to answer a particular question than other questions.

In another interview de-brief regarding question that asks how painful shingles is, Andrew observed that a respondent had a hard time providing a response. When given time to think about it, the respondent said that she did not know, thus her answer was coded as DN but, at the last second, the respondent ultimately did provide an answer that fit into one of the pre coded
responses. Andrew stated that Abt would a data clean for this case and record the correct response that the respondent provided.

Moreover, Andrew informed me that during a post-shift de-briefing, interviewer #2 (Christopher) mentioned that a vaccinated respondent (in an interview that we did not listen to) answered question 5.2 (where was the shingles vaccine obtained) by saying “hospital”, which was not a pre-coded response. Andrew observed that the response of “hospital” is the first reported occurrence and inquired if the response should be incorporated into the text of an existing code or if a new response code such as “Other” or specifically “Hospital” should be created.

I was pleased to observe that the CATI system was properly coded and that the panel filter segment functioned as expected. This was observed when interview #2 (male respondent) was screened out after the first few questions because this respondent provided conflicting vaccination status information (stated that he was vaccinated in the MA BRFSS, but in the call back survey respondent stated that he was not vaccinated). Based upon this, the interview was terminated, as per the protocol.

Lastly, Andrew invited me to observe additional interviews and offered to schedule another monitoring session. A second remove monitoring session is scheduled for 14 August 2012, 7-8 p.m.

**Rating:**

<table>
<thead>
<tr>
<th>QA: Andrew Evans</th>
<th>☒ Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewer 1: Erik Bechtel</td>
<td>☒ Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor</td>
</tr>
<tr>
<td>Interviewer 2: Christopher Illicet</td>
<td>☐ Excellent ☒ Very Good ☒ Good ☐ Fair ☐ Poor</td>
</tr>
<tr>
<td>Interviewer 3: N/A</td>
<td>☐ Excellent ☐ Very Good ☒ Good ☐ Fair ☐ Poor</td>
</tr>
</tbody>
</table>

**Any issues that came up?**

Two interviewers (Interviewer 1, Erik Bechtel and Interviewer 2, Christopher Illicet) conducted interviews.

Interviewer 1 (Eric Bechtel) had exceptional interview style. Eric Bechtel had a good pace in reading the questions, incorporated outstanding voice inflection, and communicated respect for survey participants. What especially resonated was that Eric was passionate about his work and I sensed that he enjoyed conducting the interviews. Listening to Erik administer the survey was a pleasure. Andrew told me that Eric has been with Abt SRBI for 15 years.

Interviewer 2 (Christopher Illicet) was professional, polite and courteous with all respondents, however, Christopher’s interview style was different. Specifically, his pace in reading the questions was noticeably faster, and overall, I sensed that his administration style was brisk. He did not seem to relate to respondents in the same manner as Eric did, and it seemed that he was more intent on getting through each question and getting data from respondents. In instances where responses were outside the pre coded options, Chris steered respondents by using the pre-coded answers as probes. This was good. I also observed a verbatim response being typed into
August 14, 2012

2012 Interview Monitoring Evaluation Form
Call center being monitored: Fort Myers, FL

BRFSS staff monitor: Marina Draper

Date: 14 August 2012 Time: start 7:00 p.m. end 8:30 p.m.

How many interviews did you listen to: 4 interviews

Overall Impressions:
A second remote monitoring of Abt SRBI’s interview administration and data collection of the shingles survey was conducted on 14 August 2012. The same two interviewers from Abt SRBI’s Fort Myers, Florida call center that conducted the 9 August 2012 interviews were on shift for the 14 August 2012 monitoring session.

Rating:
QA: Andrew Evans
- Excellent □ Very Good □ Good □ Fair □ Poor

Interviewer 1: Erik Bechtel
- Excellent □ Very Good □ Good □ Fair □ Poor

Interviewer 2: Christopher Illicet
- Excellent □ Very Good □ Good □ Fair □ Poor

Interviewer 3: N/A
- Excellent □ Very Good □ Good □ Fair □ Poor

Any issues that came up?
Similar to the first monitoring session, after completion of each interview, Andrew and Christina summarized the interview and made note of things that caused confusion for the interviewee, if any.

Were these issues addressed with the QA and how?
Andrew followed up in an e-mail summarizing the night’s monitoring session, stating that “[a]fter reviewing the survey’s CATI script and data last night, … questions 1.2 and 7.2 were programmed to accept multiple responses …[since there] have [been] respondents who have provided more than one answer to the questions. Thus, when respondent tells an interviewer he/she has heard about the vaccine from all of the sources, all eight coded responses can be recorded. In order to highlight this for the benefit of the interviews and respondents, we have added on-screen clarification that these two questions are “multiple record” questions. Also, response code 6 “(VOL) Will never get the shingles shot” has been added to question 12.6.”

Andrew also provided an updated count of interviews by quota cell classification. As of 15 August 2012 a total of 543 interviews were conducted.

What was the QA’s response?

Need follow up with the project manager?

Results of your follow up? N/A
Appendix G  Massachusetts Shingles Survey (2012)
2012

Massachusetts BRFSS Shingles Survey (MABSS)

Questionnaire

August 15, 2012

April 2012-March 2013
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Interviewer's Introductory Script

HELLO, my name is ____ (name) ____. I am calling from the Massachusetts Department of Public Health and the Centers for Disease Control and Prevention about a shingles study we are doing in your state.

During a recent phone interview, [provide person’s first name or initials as provided by consenting respondent in shingles call-back permission script] indicated {he/she} would be willing to participate in this study.

S.1 Are you [name / initials]?

1  Yes (go to informed consent section)
2  No (go to S.2)

S.2 May I speak with {sample person’s name}?

1  Yes (when sample person comes to phone go to S.4)
2  No (If respondent not available set time for return call in S.3)

S.3 CALLBACK CALENDAR

S.4 Am I speaking with [name / initials]?

1  Yes (read introduction below)
2  No (return to S.2)
3  Refused [THANK & END, HARD REFUSAL]

If respondent identifies as the person whom the interviewer is asking to speak with, then read the below introductory statement and proceed to informed consent section:

HELLO, my name is ____ (name) ____. I am calling from the Massachusetts Department of Public Health and the Centers for Disease Control and Prevention about a shingles study we are doing in your state.

During a recent phone interview you indicated that would be willing to participate in this study. You agreed to us calling you.

CONTINUE TO INFORMED CONSENT
Informed Consent

Before we continue, I’d like you to know that this survey is authorized by the U.S. Public Health Service Act.

You were selected to participate in this study about shingles because of your responses to questions in a prior survey.

In the next few questions, I would like to ask you about your experiences with the shingles shot. I will not ask for your last name, address, or other personal information that can identify you. You do not have to answer any question you do not want to, and you can end the interview at any time. Any information you give me will be confidential. If you have any questions about the survey, please call 877-286-6318.

This interview will last about 10 minutes.

S.5 PERMISSION: Some of the information that you shared with us when we called you before could be useful in this study. May we combine your answers to this survey with your answers from the survey you did a few weeks ago? Everyone’s answers will be combined to give us information about the health practices of people in this state.

1 YES [Skip to Panel filter segment, Questions S.7-S.9]
2 NO [GO TO S.6 TERMINATE]
7 DON’T KNOW [GO TO S.6 TERMINATE]
9 REFUSED [GO TO S.6 TERMINATE]

S.6 TERMINATE:
Upon survey termination, READ:

Those are all the questions I have. I’d like to thank you on behalf of the Massachusetts Department of Public Health and the Centers for Disease Control and Prevention for answering these questions. If you have any questions about this survey, you may call my supervisor toll-free at 877-286-6318. If you have questions about your rights as a survey participant, you may call the chairman of the Institutional Review Board at 888-772-4269. Thanks again. Goodbye.
PANEL FILTER SEGMENT

Shingles & Shingles Vaccine Awareness and Vaccination Validation

Interviewer Note: ask and record responses to Questions S.7 - S.9.

- The Survey sample will include the respondents’ answer to the 2012 CDC Module 11 “Shingles (Zostavax or ZOS)” question ‘SHINGLE2’. Respondents’ answers to the BRFSS Landline Survey shingles vaccination question will be compared to their response to the screener question S.9.

- For Question S.8, if =1 (Yes) the participant is eligible to proceed with remainder of survey.

- For Question S.8, if code= 2 (No), the participant is ineligible to proceed with remainder of survey and the call is ended (read S.6, terminate).

- Question S.9 validates the participant’s response provided in the 2012 BRFSS on shingles vaccination coverage (CDC Shingles Module 11, ‘SHINGLE2’ variable)). Based on the response to Question S.9, assign participant into vaccinated or non-vaccinated panel.

- If participant reported in the 2012 BRFSS Shingles Module 11, (‘SHINGLE2’ variable) that they did not have a shingles shot (SHINGLE2=2 (No)), but in Question S.9 report that they had a shingles shot (S.9=1 (Yes)), ask Question S.10. If Question S.10=1 (Yes), then assign participant into vaccinated arm panel and proceed with subsections.

- If participant reported in the 2012 BRFSS Shingles Module 11, (‘SHINGLE2’ variable) that they had a shingles shot (SHINGLE2=1 (Yes)), and in Question S.9 respondent reports that they did NOT receive a shingles shot (S.9=2 (No)), do NOT assign participant into non-vaccinated arm panel and terminate the call (read S.6, terminate).

S.7 Do you know about a medical condition called shingles?

1 Yes
2 No

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

S.8 Are you aware that there is a vaccine to prevent shingles?

1 Yes
2 No [GO TO S.6 TERMINATE]

Do Not Read:
7 Don’t Know/Not Sure [GO TO S.6 TERMINATE]
9 Refused [GO TO S.6 TERMINATE]
S.9   Have you had the shingles vaccination?

1   Yes
2   No

Do Not Read:
7   Don’t know / Not sure   [GO TO S.6 TERMINATE]
9   Refused  [GO TO S.6 TERMINATE]

CATI LOGIC, DUMMY VARIABLE VACCINATION STATUS

- S.9=1 (Yes) AND SAMPLE SHINGLE2=1 (Yes, received shingles vaccination), CODE VACSTAT=1 AND GO TO QUESTIONNAIRE SECTIONS 1-6.
- IF S.9=1 (Yes) AND SAMPLE SHINGLE2=2 (No, did not receive shingles vaccination), ASK S.10.
- IF S.9=2 (No, DK, Ref) AND SAMPLE SHINGLE2=2 (No, did not receive shingles vaccination), GO TO QUESTIONNAIRE SECTIONS 7-12.
- IF S.9=2, 7, 9 (No, ) AND SAMPLE SHINGLE2=1 (Yes, received shingles vaccination), GO TO S.6 TERMINATE.

VACSTAT Shingle vaccination status

1   BRFSS=Yes, S9 confirmed    [GO TO SUBSECTION 1]
2   BRFSS=No, S9=Yes           [ASK S.10]
3   BRFSS=No, S9 confirmed     [GO TO SUBSECTION 7]
4   BRFSS=Yes, S9=No           [GO TO S.6 TERMINATE]

S.10   Previously when you were interviewed, you said that you had NOT had the shingles vaccination but just now you said that you HAVE HAD the shingles vaccination. Have you had the shingles vaccination since your interview?

1   Yes   [GO TO SUBSECTION 1]
2   No    [GO TO S.6 TERMINATE]

Do Not Read:
7   Don’t Know/Not Sure   [GO TO S.6 TERMINATE]
9   Refused   [GO TO S.6 TERMINATE]
Section A: Shingles Call-Back Questions for Vaccinated Respondents

Subsection 1: Awareness of Shingles and Shingles Vaccine

NOTE: Subsections 1 through 6 are asked of respondents who responded “Yes” (code = 1) to CDC Optional Module 11: Shingles (shingles vaccine question) and whose response was validated by Questions S.8 and S.9.

1.1 When you decided to get the shingles vaccination, how important was it for you to prevent getting shingles? Was it:

    Please read:
    1 Not at all important
    2 A little important
    3 Somewhat important
    4 Extremely important

    Do not read:
    7 Don’t know / Not sure
    9 Refused

1.2 How did you hear about the shingles vaccination? Was it from:

    (READ LIST – MULTIPLE RECORD)
    1 CDC website
    2 Facebook
    3 Television Show (Dr. Oz or Oprah) or radio
    4 Newspaper/Magazine or Billboard Advertisement
    5 Pharmacy/Store advertisement—intercom or poster, etc
    6 Doctor
    7 Friends or family
    8 Work
    9 Other (Please specify) ________________________________

    Do not read:
    77 Don’t know / Not sure
    99 Refused
1.2A Do you know anyone who was sick with shingles?

1  Yes  GO TO Q1.4
2  No  GO TO Q1.4

Do not read:
7  Don’t know / Not sure  GO TO Q1.4
9  Refused  GO TO Q1.4

1.3 When you decided to get the shingles vaccination, how important was it that someone in your family or among your friends had already been sick with shingles? Was it:

Please read:
1  Not at all important
2  A little important
3  Somewhat important
4  Extremely important

Do not read:
7  Don’t know / Not sure
9  Refused

1.4 When you decided to get the shingles vaccination, how important was hearing from your friends that you should get the shingles shot? Was it:

Please read:
1  Not at all important
2  A little important
3  Somewhat important
4  Extremely important

Do not read:
7  Don’t know / Not sure
9  Refused

1.5 When you decided to get the shingles vaccination, how important was hearing from your family that you should get the shingles shot? Was it:

Please read:
1  Not at all important
2  A little important
3  Somewhat important
4  Extremely important

Do not read:
7  Don’t know / Not sure
9  Refused
1.5A What would you say is the primary symptom of shingles?

[DO NOT READ LIST]
1 Rash/Itchiness on the face or body
2 Blisters
3 Pain/Tingling of skin
4 Blindness/Sight Complications
5 Other (specify)
6 Don’t Know/Not Sure
7 Refused

1.6 How painful do you think shingles is? Do you think it is:

Please Read:
1 Not at all painful
2 Somewhat painful
3 Moderately painful
4 Very painful

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

1.7 Before you were vaccinated with the shingles vaccine, what did you think your chances were of getting sick with shingles during your lifetime? Would you say that it was:

Please read:
1 Very low, 0 to 29% chance
2 Low, 30 to 49% chance
3 Moderate, 50 to 79% chance
4 High, 80 to 100% chance

Do not read:
7 Don’t know / Not sure
9 Refused

1.8 Now that you got the shingles shot, what do you think your chances are of getting sick with shingles during your lifetime? Would you say that it is:

Please read:
1 Very low, 0 to 29% chance
2 Low, 30 to 49% chance
3 Moderate, 50 to 79% chance
4 High, 80 to 100% chance

Do not read:
7 Don’t know / Not sure
9 Refused
Subsection 2: Self Motivation/ Responsibility

2.2 Was one reason why you got the shingles vaccination because you wanted to take care of your health and be healthy?

1 Yes
2 No
Do not Read:
7 Don’t Know/Not Sure
9 Refused

2.2A What part of the shingles disease were you hoping to avoid by getting vaccinated?
[If need to probe, ask “what specific symptom of shingles were you hoping to avoid by getting vaccinated?”]

[DO NOT READ LIST]
1 Rash/Itchiness on the face or body
2 Blisters
3 Pain/Tingling of skin
4 Blindness/Sight Complications
5 Other (specify)
7 Don’t Know/Not Sure
9 Refused

ASK Q2.3 IF (MA BRFSS) EMPLOY=1 OR 2. ELSE GO TO 2.4

2.3 Was one reason why you got the shingles vaccination because you didn’t want to miss work or lose pay?

1 Yes
2 No
Do not Read:
7 Don’t Know/Not Sure
9 Refused
2.4 How often do you get the influenza vaccination? Is it:

[Read if necessary: We are referring to the flu shot. The flu vaccine is either sprayed in the nose or injected in the arm.]

**Please Read:**
1. Every year
2. Most years
3. Rarely
4. Have only gotten it once
5. Never

**Do Not Read:**
7. Don’t Know/Not Sure
9. Refused

2.5 Within the past 10 years, did you get a tetanus shot?

1. Yes
2. No

**Do not Read:**
7. Don’t Know/Not Sure
9. Refused

ASK Q2.6 IF (MA BRFSS) AGE>=65, ELSE GO TO SUBSECTION 3

2.6 Since your 65th birthday, did you get the pneumococcal vaccination?

[IF NECESSARY: We are referring to the pneumonia shot.]

1. Yes
2. No

**Do not Read:**
7. Don’t Know/Not Sure
9. Refused
Subsection 3: Doctor Recommendation

3.1 In the past 5 years, did you and your doctor talk about the shingles vaccine?

1 Yes
2 No  GO TO Q3.3

Do not Read:
7 Don’t Know/Not Sure  GO TO Q3.3
9 Refused  GO TO Q3.3

3.2 Did your doctor or healthcare professional bring up the topic of getting the shingles shot, or did you?

[Read only if necessary: By “healthcare professional” we mean a nurse practitioner, a physician’s assistant, or some other licensed health professional, such as a nurse.]

Please Read:
1 You brought up the topic
2 Your doctor or health care professional brought up the topic

Do Not Read:
7 Don’t know / Not sure
9 Refused

3.3 Did your doctor or health care professional recommend that you get the shingles vaccination?

1 Yes  GO TO SUBSECTION 4
2 No

Do Not Read:
7 Don’t know / Not sure
9 Refused

3.4 Did your doctor or health care professional advise against you getting the shingles vaccine?

1 Yes  ASK Q3.5
2 No  GO TO SUBSECTION 4

Do Not Read:
7 Don’t know / Not sure  GO TO SUBSECTION 4
9 Refused  GO TO SUBSECTION 4
3.5 You stated that your doctor advised against you getting the shingles vaccination, yet you still got the shingles vaccine?

1 Yes
2 No

Do Not Read:
7 Don’t know / Not sure
9 Refused

Subsection 4: Vaccine Safety and Efficacy

4.1 How safe do you think the shingles vaccination is? Would you say it is:

Please Read:
1 Not at all safe
2 A little safe
3 Somewhat safe
4 Very safe

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

4.2 Before you got vaccinated, did you know that the shingles vaccination is a live virus vaccine?

1 Yes  GO TO 4.4
2 No

Do Not Read:
7 Don’t know / Not sure  GO TO 4.4
9 Refused  GO TO 4.4

4.3 If you had known that the vaccination is a live virus, would you have still gotten the vaccine?

1 Yes
2 No

Do Not Read:
7 Don’t know / Not sure
9 Refused
4.4 How effective do you think the shingles shot is at preventing shingles?

Please Read:
1 Not at all effective
2 Only a little effective
3 Somewhat effective
4 Very effective

Do Not Read:
7 Don’t know / Not sure
9 Refused

Subsection 5: Vaccine Supply and Convenience

5.1 How convenient was it to get the shingles shot?

Please Read:
1 Not at all convenient
2 A little convenient
3 Somewhat convenient
4 Very convenient

Do Not Read:
7 Don’t know / Not sure
9 Refused

5.2 Where did you get the shingles shot? Was it at the:

Please Read:
1 Doctor’s office
2 Pharmacy/retail stores
3 Vaccination clinics
4 Health Department or other public clinic
5 Veteran’s administration
6 Senior centers or assisted living settings
8 Hospital

Do Not Read:
7 Don’t know / Not sure
9 Refused
5.3 Did that location have the shingles vaccine available for you right away?

Please Read:
1 Yes, the vaccine was available right away
2 No, the vaccine had to be ordered

Do Not Read:
7 Don’t know / Not sure
9 Refused

IF Q5.2=1, 3, 4, 5, 6, 7, or 9 GO TO SUBSECTION 6.
IF Q5.2=2, ASK Q5.4.

5.4 Did the pharmacist administer the shingles shot at the pharmacy or did you have to pick the vaccine up at the pharmacy and bring it to your doctor's office so that your doctor could give you the shot?

Please Read:
1 The vaccine was administered by the pharmacist in the pharmacy GO TO SUBSECTION 6
2 You picked up the vaccine in the pharmacy and brought it to a doctor's office for them to give it. ASK Q5.5 SERIES

Do Not Read:
7 Don’t know / Not sure GO TO SUBSECTION 6
9 Refused GO TO SUBSECTION 6

5.5 The next series of questions ask about how the shingles vaccine was kept cold between the pharmacy and your doctor’s office. For each of the following, please say “yes” or “no”.

5.5A: Did the Pharmacy transport the vaccine to the doctor’s office? Yes OR No

1 Yes GO TO Q5.6
2 No

Do Not Read:
7 Don’t know / Not sure
9 Refused

5.5B Did the Pharmacy give you a package with ice for the vaccine so you could take it back to your doctor? Yes OR No

1 Yes GO TO Q5.6
2 No

Do Not Read:
7 Don’t know / Not sure
9 Refused

5.5C: Did you come to the pharmacy with your own icepack for the vaccine? Yes OR No

1 Yes GO TO Q5.6
2 No

Do Not Read:
7 Don’t know / Not sure
9 Refused
5.5D: Did you transport the vaccine to the doctor’s office without ice?

1 Yes
2 No

Do Not Read:
7 Don’t know / Not sure
9 Refused

5.6 About how long did it take to go from the pharmacy to your doctor’s office so you could get your shingles shot?

Please Read:
1 Less than 30 minutes
2 30 minutes to just under 1 hour
3 1 hour to just under 2 hours
4 Over 2 hours

Do Not Read:
7 Don’t know / Not sure
9 Refused

5.7 Would you have been willing to have the pharmacist administer the shingles vaccine in a pharmacy instead of getting the shot in a doctor’s office?

1 Yes
2 No

Do Not Read:
7 Don’t know / Not sure
9 Refused

Subsection 6: Vaccine Cost

6.1 How much did you pay to receive the vaccination? Please include any co-payments or co-insurance fees. Was it:

Please Read:
1 0 to less than $25
2 $25 to less than $50
3 $50 to less than $100
4 $100 to less than $200
5 $200 plus

Do Not Read:
7 Don’t know / Not sure
9 Refused
6.2 Did you have to file a medical insurance claim to your insurance company to be reimbursed for the shingles shot?

**Please Read:**
1. Yes
2. No  
**GO TO Q6.5**

**Do Not Read:**
1. Don’t know / Not sure  
**GO TO CLOSING STATEMENT**
2. Refused  
**GO TO CLOSING STATEMENT**

6.3 Who filed the medical insurance claim for you? Was it the:

**Please Read:**
1. Physician or office staff
2. Pharmacy
3. Patient (you)
4. Spouse/caregiver
5. Someone else (Please specify) __________________

**Do Not Read:**
1. Don’t know / Not sure
2. Refused

6.4 Did your medical insurance company reimburse you for the shingles vaccination?

1. Yes
2. No

**Do Not Read:**
1. Don’t know / Not sure
2. Refused

*(MA BRFSS) AGE>=65 AND (MA BRFSS) HINS7=1 (Has Medicare)), ASK Q6.5. ELSE, SKIP TO CLOSING STATEMENT*

6.5 As part of your Medicare insurance, do you have a prescription drug plan, also known as Part D?

**Please Read:**
1. Yes
2. No

**Do Not Read:**
1. Don’t know / Not sure
2. Refused
Closing Statement for Vaccinated Arm

Please read:

That was my last question. I’d like to thank you on behalf of the Massachusetts Department of Public Health and the Centers for Disease Control and Prevention for answering these questions.

If you have any questions about this survey, you may call my supervisor toll-free at 877-286-6318.

If you have questions about your rights as a survey participant, you may call the chairman of the Institutional Review Board at 888-772-4269.

Thank you very much for your time and cooperation. Goodbye.
SECTION B: SHINGLES CALL-BACK QUESTIONS FOR NON VACCINATED RESPONDENTS

Subsection 7: Awareness of Shingles and Shingles Vaccine

NOTE: Subsections 7 through 12 are asked of respondents who responded “NO” (code = 2) to CDC Optional Module 11: Shingles (shingles vaccine question) and whose response was validated by Questions S.8 and S.9.

7.1 Was one reason why you did not get the shingles shot because you do not think you will get the disease?

1 Yes
2 No

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

7.2 How did you hear about the shingles vaccination? Was it from:

(READ LIST – MULTIPLE RECORD)
1 CDC website
2 Facebook
3 Television Show (Dr. Oz or Oprah) or radio
4 Newspaper/Magazine or Billboard Advertisement
5 Pharmacy/Store advertisement—intercom or poster, etc
6 Doctor
7 Friends or family
8 Work
9 Other (Please specify) ________________________________

Do not read:
77 Don’t know / Not sure
99 Refused
7.2A  Do you know anyone that was sick with shingles?

1  Yes
2  No

Do not read:
7  Don’t know / Not sure
9  Refused

7.2B  What would you say is the primary symptom of shingles?

[DO NOT READ LIST]
1  Rash/Itchiness on the face or body
2  Blisters
3  Pain/Tingling of skin
4  Blindness/Sight Complications
5  Other (specify)
7  Don’t Know/Not Sure
9  Refused

7.3  How painful do you think shingles is? Do you think it is:

Please Read:
1  Not at all painful
2  Somewhat painful
3  Moderately painful
4  Very painful

Do Not Read:
7  Don’t Know/Not Sure
9  Refused

7.4  What do you think your chances are of getting sick with shingles during your lifetime? Do you think it is a:

Please Read:
1  Very low, 0 to 29% chance
2  Low, 30 to 49% chance
3  Moderate, 50 to 79% chance
4  High, 80 to 100% chance

Do Not Read:
7  Don’t Know/Not Sure
9  Refused
Subsection 8: Self Motivation/ Responsibility

8.1 What was the primary reason that you did not get the shingles vaccination?

DO NOT READ LIST; CATEGORIZE GIVEN RESPONSES INTO:

1 Vaccine Cost was too much
2 Inadequate vaccine supplies (went to get vaccine but store did not have it)
3 Recently found out about shingles vaccine /haven’t gotten vaccine yet
4 I don’t have shingles/don’t think I will get shingles/not concerned about shingles
5 I already had shingles and there would be no point in getting shingles vaccine now
6 Doctor did not recommend vaccine (patient either too young or doctor felt vaccine not necessary)
7 Fear of vaccine (safety/allergic reaction concerns) or afraid of needles
8 Vaccine would not help me/ efficacy concerns
9 Other (specify)
77 Don’t Know/Not Sure
99 Refused

8.2 How often do you get the influenza vaccination? Is it:

[Read if necessary: We are referring to the flu shot. The flu vaccination is either sprayed in the nose or injected in the arm.]

Please Read:
1 Every year
2 Most years
3 Rarely
4 Have only gotten it once
5 Never

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

8.3 Within the past 10 years, did you get a tetanus shot?

1 Yes
2 No

Do not Read:
7 Don’t Know/Not Sure
9 Refused
ASK Q8.4 IF (MA BRFSS) AGE $\geq 65$, ELSE GO TO SUBSECTION 9

8.4 Since your 65th birthday, did you get the pneumococcal vaccination?

[IF NECESSARY: We are referring to the pneumonia shot.]

1 Yes
2 No

Do not Read:
7 Don’t Know/Not Sure
9 Refused

Subsection 9: Doctor Recommendation

9.1 In the past 5 years, did you and your doctor talk about the shingles vaccine?

1 Yes
2 No

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

N9.2 Did your doctor or health care professional recommend that you get the shingles vaccine?

1 Yes GO TO N9.4
2 No

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

N9.3 Did your doctor or health care professional advise against you getting the shingles vaccine?

1 Yes
2 No

Do Not Read:
7 Don’t Know/Not Sure
9 Refused
ASK N9.4 IF N9.2=YES. ELSE SKIP TO SUBSECTION 10.

N9.4 Was one reason why you were not vaccinated for shingles, because you refused the shot even though your doctor recommended it?

1 Yes
2 No
Do Not Read:
7 Don’t Know/Not Sure
9 Refused

Subsection 10: Vaccine Safety and Efficacy

Now I will read a list of reasons why some people decide not to get the shingles shot. For each reason, please tell me if that reason was a major reason, a minor reason, or not a reason in your decision to not get the shingles shot:

10.1 “I do not trust the shingles vaccine.” Was not trusting the shingles vaccine a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1 Major reason
2 Minor reason
3 Not a reason
Do Not Read:
7 Don’t know / Not sure
9 Refused

10.2 “I do not like needles.” Was not liking needles a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1 Major reason
2 Minor reason
3 Not a reason
Do Not Read:
7 Don’t know / Not sure
9 Refused

10.3 “I thought I might get sick from the shingles vaccine.” Was thinking you might get sick from the shot a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1 Major reason
2 Minor reason
3 Not a reason
Do Not Read:
7 Don’t know / Not sure
9 Refused
10.4 “I do not think the shingles vaccine is effective at preventing shingles.” Was thinking that the vaccine is not effective a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?:

1 Major reason  
2 Minor reason  
3 Not a reason  
Do Not Read:  
7 Don’t know / Not sure  
9 Refused

10.5 Was the cost of the vaccine a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1 Major reason  
2 Minor reason  
3 Not a reason  
Do Not Read:  
7 Don’t know / Not sure  
9 Refused

10.6 Was inconvenience a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1 Major reason  
2 Minor reason  
3 Not a reason  
Do Not Read:  
7 Don’t know / Not sure  
9 Refused

10.7 The shingles vaccine is a live virus vaccine. How important was this to your decision not to get the shingles shot?

Please Read:  
1 Very important  
2 Somewhat important  
3 Only a little important  
4 Not at all important  
Do Not Read:  
7 Don’t know / Not sure  
9 Refused
10.8 How effective do you think the shingles shot is at preventing shingles? Do you think it is

Please Read:
1 Not at all effective
2 Only a little effective
3 Somewhat effective
4 OR Very effective

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

Subsection 11: Vaccine Supply and Convenience

11.1 Was one reason why you did not get the shingles shot because the vaccine was not available at your doctor’s office?

1 Yes Go To Q11.4
2 No

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

11.2 Was one reason why you did not get the shingles shot because the vaccine was not available at your pharmacy?

1 Yes Go To Q11.4
2 No

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

11.3 Was one reason why you did not get the shingles shot because the vaccine was not available at any of the local health centers/clinics where you normally get care?

1 Yes
2 No

Do Not Read:
7 Don’t Know/Not Sure
9 Refused
11.4 If you were to get the shingles vaccination, would you be willing to have the pharmacist administer the shingles vaccination in a pharmacy instead of getting the shot in a doctor’s office?

1 Yes
2 No

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

Subsection 12: Vaccine Cost

12.1 Was one reason for not receiving the shingles shot because the shingles vaccine is not recommended for your age group?

1 Yes
2 No

Do not Read:
7 Don’t Know/Not Sure
9 Refused

ASK Q12.2 IF (MA BRFSS) HLTHPLAN=1 (Yes, has health care coverage), ELSE GO TO Q12.4.

12.2 Was one reason why you did not get the shingles shot because your medical insurance would not pay for the shot?

1 Yes
2 No  GO TO Q12.4

Do Not Read:
7 Don’t Know/Not Sure  GO TO Q12.4
9 Refused  GO TO Q12.4

12.3 Would you get a shingles shot if your medical insurance plan paid the full cost of the vaccination?

1 Yes
2 No

Do Not Read:
7 Don’t Know/Not Sure
9 Refused
12.4  Was one reason why you did not get the shingles shot because your cost was too much?

1  Yes
2  No
Do Not Read:
7  Don’t Know/Not Sure
9  Refused

(MA BRFSS) AGE>=65 AND (MA BRFSS) HINS7=1 (Has Medicare)), ASK Q12.5. ELSE, SKIP TO Q12.6

12.5  As part of your Medicare insurance, do you have a prescription drug plan, also known as Part D?

1  Yes
2  No
Do Not Read:
7  Don’t Know/Not Sure
9  Refused

12.6  What is the most you would be willing to spend on the shingles vaccination?

Please Read:
1  0 to less than $25
2  $25 to less than $50
3  $50 to less than $100
4  $100 to less than $200
5  $200 plus
6  (VOL) Will never get the shingles shot
7  (VOL) Don’t Know/Not Sure
9  (VOL) Refused

12.7  Would you get vaccinated if the shingles shot were free?

1  Yes
2  No
Do Not Read:
7  Don’t Know/Not Sure
9  Refused
Closing Statement for Non-Vaccinated Arm

Please read:

That was my last question. I’d like to thank you on behalf of the Massachusetts Department of Public Health and the Centers for Disease Control and Prevention for answering these questions.

If you have any questions about this survey, you may call my supervisor toll-free at 877-286-6318.

If you have questions about your rights as a survey participant, you may call the chairman of the Institutional Review Board at 888-772-4269.

Thank you very much for your time and cooperation. Goodbye.

MNSRVY CATI: SET VARIABLE VALUE TO ‘2’.

1. Pretest
2. Main Survey
Appendix H  Abt SRBI Methods Report Massachusetts Shingles Survey
2012 MASSACHUSETTS
BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM
SHINGLES FOLLOW-UP SURVEY
METHODOLOGY REPORT

Prepared by

Abt SRBI

8405 Colesville Road, Suite 300
Silver Spring, MD 20910

June 11, 2013
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I. Introduction

This report describes the survey implementation for the 2012 Massachusetts Behavioral Risk Factor Surveillance System Shingles Follow-Up Survey (MA BRFSS Shingles Follow-up Survey), conducted on behalf of the Massachusetts Department of Public Health (MDPH). The BRFSS Shingles Follow-up Survey is a telephone follow-up survey of 1,000 adults aged 50 years of age or older who agreed to be called back at some time in the future at the end of the 2012 Massachusetts BRFSS landline survey.

Zostavax®, the shingles vaccine, was licensed by the Food and Drug Administration (FDA) in 2006 for adults aged 60 and older, and in 2011, it was licensed for adults aged 50 and older. Shingles vaccination rates lag below the Healthy People 2020 goal of 30%¹ for many reasons, and the MDPH has taken a variety of steps to increase vaccination rates in Massachusetts. The MA BRFSS Shingles Follow-up Survey was designed to collect information from adults who were and were not vaccinated with the shingles vaccination to obtain information on: why adults do and do not get vaccinated against shingles; the barriers to getting vaccinated; adults’ knowledge, attitudes, and perceptions of the shingles disease; and the beliefs about the safety and effectiveness of the shingles vaccine.

The project began as a discussion between Abt SRBI, MDPH, CDC and Marina Draper, a PhD candidate at Northeastern University’s Law and Public Policy Program (Boston, MA) and principal investigator, at the 2011 Annual BRFSS Conference. This initial discussion was followed by emails and telephone discussions to clarify expectations and define the parameters of the study. Once the project was defined and the deliverables determined, a preliminary questionnaire was received. A final pretest questionnaire was prepared on March 30 2012. The questionnaire was programmed in English, a pretest was conducted, and after some additional questionnaire changes, data collection effort began on May 16, 2012. After the start of data collection, a Spanish translation of the survey questionnaire was prepared and fielded.

II. Sample Design and Eligibility Requirements

Population
The BRFSS Shingles Follow-up Survey sample included adults aged 50 years or older who spoke English or Spanish and agreed to participate in a follow-up survey at the end of the 2012 Massachusetts BRFSS landline survey.

FOLLOWUP Finally, would you be willing to be contacted at some time in the future to participate in a follow-up survey?

Eligible adults aged 50 years and older were separated into two groups:

1. Adults who had the shingles vaccination.
2. Adults who did not have the shingles vaccination.

Adults who stated “don’t know” or “refused” to whether or not they received the shingles vaccination were not eligible to participate in this study.

Sample
Prior to commencing the data collection, Abt SRBI looked at vaccination rates in the years prior to 2012 among the target groups to estimate the numbers of vaccinated and unvaccinated eligible respondents. From this analysis, it was clear that some groups would be overrepresented in the final sample if all eligible respondents were selected. As a result, sampling fractions were determined for some target groups. These fractions were revisited periodically as data collection progressed and modified as needed.

On an ongoing basis, Abt SRBI data processing staff generated the eligible follow-up cases, including any information that needed to be included from the MA BRFSS interview (i.e., age, gender, race/ethnicity, shingles vaccination status, name, health care coverage, and employment status). The MA BRFSS Shingles Follow-up Survey began on May 16, 2012, and therefore, all respondents from the January, February, March, and April MA BRFSS who were eligible were called in May). Thereafter, each month’s sample was drawn from the prior month of the MA BRFSS (i.e., the sample Field in June for the Shingles Follow-up Survey was drawn from eligibles in the May MA BRFSS sample). A halt in data collection occurred in September 2013 due to the need to clarify and obtain approval of the revised study objectives which affected the sample design. Eligible adults from the September and October sample of the MA BRFSS were called in November, 2012. Adequate sample was drawn each month in order to obtain 1,000 completed interviews.

The original sample design was based on the likelihood of obtaining an overall number of vaccinated and unvaccinated adult interviews based on previous years' shingles vaccination information. It appeared that we would obtain fewer interviews with vaccinated adults overall than with unvaccinated adults. Additionally, Ms. Draper wanted to target groups by age, gender and race. However, analysis of previous years of Massachusetts data indicated that very small numbers would be obtained in several target group categories (specifically vaccinated non-white
adults and unvaccinated non-white males). Based on the interviewed number of adults by sex, race and age from the 2011 data collection, an estimate of the total number of eligible persons and the likely number of interviews in 2012 was calculated. Based on this analysis, Abt SRBI initially designed the sample so that we reinterviewed every sixth unvaccinated white female aged 50 to 64, and every fifth unvaccinated respondent for white females aged 65 and over. For white males aged 50 to 64, every fourth unvaccinated respondent was reinterviewed, and for white males aged 65 and over, every third unvaccinated respondent was reinterviewed. For every other target group, all qualified persons were eligible for the callback. Eligible cases were identified and then Abt SRBI’s sampling staff loaded the cases for the Follow-Up Survey.

After examining the first 5 months of data collection, the number of vaccinated eligible respondents was greater than anticipated necessitating a sample plan revision (shingles vaccination rates had increased over the previous year). Contrary to the original sample design, it became apparent that we could obtain follow-up interviews with 500 vaccinated adults. Therefore, the final sample plan was to target half the interviews with vaccinated adults and the other half with non-vaccinated adults.

While Shingles Follow-up Survey interviews were being completed with 42% of sample records overall that were dialed, the completion rates varied greatly by age, gender, and race/ethnicity. For example, the completion rate for non-white vaccinated men aged 50-64 was at zero percent (due to so few in the sampled) and the completion rate for white vaccinated females aged 65 and older was at 65%. Abt SRBI found that vaccinated adults were qualifying for the Shingles Follow-up Survey at a significantly higher rate than non-vaccinated adults; 40% versus 11%. This large difference was due to the fact that non-vaccinated adults had a lack of knowledge about the shingles vaccine (MA BRFSS screening question S8) and they were less willing to agree to participate in a follow-up survey (MA BRFSS screening question S5).

Due to the greater numbers (and therefore interviews) with certain sub-groups, Abt SRBI and the principal investigator decided to cap some sub-groups while trying to obtain as many interviews as possible with others. For example, it was decided that we would stop adding sample for white vaccinated women aged 65 and older, and close the quota for this cohort at 192 completed interviews. At this point in data collection, it was determined that we would obtain 500 interviews with unvaccinated and vaccinated adults throughout the targeted groups. No other changes were made to the sample design during data collection.

A total sample of 2,528 respondents was drawn by the end of data collection, with 500 interviews with vaccinated adults and 500 interviews with non-vaccinated adults.
III. Questionnaire Design

After the questionnaire was received from the principal investigator, Abt SRBI reviewed the questionnaire, programmed it into CATI, and conducted a pretest of 40 interviews. Interviewers were trained on April 16, 2012 and pretest interviewing began that night and lasted eight days (through 4/23/12). After the pretest interviews were conducted, Abt SRBI analyzed the data, debriefed the interviewers, and wrote a report to the MDPH with its recommendations for question changes.

Pretest Questionnaire Changes

There were three questions that had an "other (specify)” response where pretest respondents gave responses that would be important to include in the list of response options read to respondents.

1.2 How did you hear about the shingles vaccination? Was it from:

Please read:
1  CDC website
2  Facebook
3  Television Show (Dr. Oz or Oprah) or radio
4  Newspaper/Magazine or Billboard Advertisement
5  Pharmacy/Store advertisement—intercom or poster, etc
6  Doctor Recommendation
7  Friends or family
8  Work
9  Other (Please specify) __________________________
77  Don't know / Not sure
99  Refused

7.2 How did you heard about the shingles vaccination? Was it from:

Please read:
1  CDC website
2  Facebook
3  Television Show (Dr. Oz or Oprah) or radio
4  Newspaper/Magazine or Billboard Advertisement
5  Pharmacy/Store advertisement—intercom or poster, etc
6  Doctor Recommendation
7  Friends or family
8  Work
9  Other (Please specify) __________________________
77  Don't know / Not sure
99  Refused
8.1 What was the primary reason that you did not get the shingles vaccination?

[Do Not Read List; Categorize Given Responses Into:]

1. Vaccine Cost was too much
2. Inadequate vaccine supplies (went to get vaccine but store did not have it)
3. Recently found out about shingles vaccine /haven't gotten vaccine yet
4. I don't have shingles/don't think I will get shingles/not concerned about shingles
5. I already had shingles and there would be no point in getting shingles vaccine now
6. Doctor did not recommend vaccine to me(patient either too young or doctor felt vaccine not necessary)
7. Afraid—Fear of vaccine (safety/allergic reaction concerns) or afraid of needles safety concerns
8. Vaccine would not help me/ efficacy concerns
9. Didn't think I am at risk of getting shingles
10. Other (if given response cannot be categorized into options 1-9; specify here)
11. Don't Know/Not Sure
12. Refused

Some respondents did not know anyone who had been sick with shingles and therefore they had difficulty answering question 1.3. During the pretest interviews the question was re-read, and with some additional thought, respondents answered along the lines of: “well, I guess it would be ‘not at all important’”. This question was changed to ask respondents if they knew of anyone who was sick with shingles.

1.3 When you decided to get the shingles vaccination, how important was it that someone in your family or among your friends had already been sick with shingles? Was it:

Please read:
1. Not at all important
2. A little important
3. Somewhat important
4. Extremely important
5. Don't know / Not sure
6. Refused

1.3 Do you know anyone who was sick with shingles?

1. Yes
2. No
3. Don't know / Not sure
4. Refused
Two questions were added to ask respondents what they thought were the primary symptoms of shingles, and one question was added to the non-vaccinated section that asked respondents if they knew anyone that had shingles:

1.7 What would you say is the primary symptom of shingles?

[Do Not Read List]
1 Rash/Itchiness on the face or body
2 Blisters
3 Pain/Tingling of skin
4 Blindness/Sight Complications
5 Other (specify)
7 Don't Know/Not Sure
9 Refused

7.3 Do you know anyone that was sick with shingles?

1 Yes
2 No
7 Don’t know / Not sure
9 Refused

7.4 What would you say is the primary symptom of shingles?

[Do Not Read List]
1 Rash/Itchiness on the face or body
2 Blisters
3 Pain/Tingling of skin
4 Blindness/Sight Complications
5 Other (specify)
7 Don’t Know/Not Sure
9 Refused

For the following questions several respondents focused on the percentages rather than the text after the percentage. There was a concern that if a respondent felt that the chances were about 20% (or any number not specified in the response options), they would not answer the question correctly. Therefore, the response options were changed to include ranges to assist respondents in providing an accurate answer.

1.9 Before you were vaccinated with the shingles vaccine, what did you think your chances were of getting sick with shingles during your lifetime? Would you say that it was:

Please read:
1 Very low, 0 to 29% chance
2 Low, 30 to 49% chance
3 Moderate, 50 to 79% chance
4 High, 80 to 100% chance
1 10% chance, or very low
2 30% chance, or low
1.10 Now that you got the shingles shot, what do you think your chances are of getting sick with shingles during your lifetime? Would you say that it is:

Please read:
1 Very low, 0 to 29% chance
2 Low, 30 to 49% chance
3 Moderate, 50 to 79% chance
4 High, 80 to 100% chance
1 10% chance, or very low
2 30% chance, or low
3 50% chance, or moderate
4 80% chance, or high
7 Don’t know / Not sure
9 Refused

7.6 What do you think your chances are of getting sick with shingles during your lifetime? Do you think it is a:

Please read:
1 Very low, 0 to 29% chance
2 Low, 30 to 49% chance
3 Moderate, 50 to 79% chance
4 High, 80 to 100% chance
1 10% chance, or very low
2 30% chance, or low
3 50% chance, or moderate
4 80% chance, or high
7 Don’t Know/Not Sure
9 Refused

Question 2.1 did not collect the information that was anticipated. Nearly all respondents provided a response that was categorized with an “Other, specify” verbatim, and overall, respondents told interviewers that they were vaccinated in order to avoid getting shingles. Therefore, question 2.1 was deleted and question 2.2 was added to ask respondents what part of the disease they wanted to avoid by getting vaccinated. A probe was also included to assist respondents.

2.1 What was the primary reason that you got the shingles vaccination?

[Do Not Read List]
1 Rash/Itchiness on the face or body
2 Blisters
3 Pain/Tingling of skin
4 Blindness/Sight Complications
2.2 What part of the shingles disease were you hoping to avoid by getting vaccinated?

[If need to probe, ask “what specific symptom of shingles were you hoping to avoid by getting vaccinated?”]

[Do Not Read List]
1 Rash/Itchiness on the face or body
2 Blisters
3 Pain/Tingling of skin
4 Blindness/Sight Complications
5 Other (specify)
7 Don't Know/Not Sure
9 Refused

Interviewers found the question wording for 3.5 awkward, in regards to the response given in 3.4. Therefore, these two questions were reworded as follows:

3.4 Did your doctor or health care professional recommend that you not get the shingles vaccination? Did your doctor or health care professional advise against you getting the shingles vaccine?

1 Yes [GO TO SUBSECTION 4] [If code=1, then ask question 3.5]
2 No [ASK Q3.5] [GO TO SUBSECTION 4]
7 Don't know / Not sure [GO TO SUBSECTION 4]
9 Refused [GO TO SUBSECTION 4]

3.5 You stated that your doctor did not recommend that you get the shingles vaccination, yet you still got the shingles vaccine? You stated that your doctor advised against you getting the shingles vaccination, yet you still got the shingles vaccine?

1 Yes
2 No
7 Don't know / Not sure
9 Refused

Changes were made to questions 5.5A, 5.5B, and 5.5C to facilitate the ease of administration. The introduction to this section and slight wording changes to each individual question were made to make the questions easier to read. A skip pattern was also added so that once the respondent gave us a “yes” response, they could skip to the next question, 5.6.

5.5 The next series of questions ask about how the shingles vaccine was kept cold between the pharmacy and your doctor’s office. For each of the following, please say “yes” or “no”. How was the shingles vaccine kept cold between the pharmacy and your doctor’s office?
5.5A: Did the Pharmacy transport the vaccine to the doctor's office? Yes OR No

1 Yes [if code=1, then skip 5.5B through 5.5D]
2 No [if code=2, then ask 5.5B]
7 Don't know / Not sure
9 Refused

5.B: Did the Pharmacy give you a package with ice for the vaccine so you could take it back to your doctor? Yes OR No

1 Yes [if code =1, then skip 5.5C; go to 5.6]
2 No [if code=2, then ask 5.5C]
7 Don't know / Not sure
9 Refused

5.C: Did you come to the pharmacy with your own ice pack for the vaccine? Yes OR No

1 Yes [if code=1, the skip 5.5D]
2 No [if code=2, then ask 5.5D]
7 Don't know / Not sure
9 Refused

5.5C: Did the Pharmacy transport the vaccine to the doctor's office? Yes OR No

1 Yes
2 No
7 Don't know / Not sure
9 Refused

5.5D: Did you transport the vaccine to the doctor's office without ice?

1 Yes
2 No
7 Don't know / Not sure
9 Refused

Text changes were made to the response options of question 6.1 to match those used in question 12.6, as it flowed better during the interview.

6.1 How much did you pay to receive the vaccination? Please include any co-payments or co-insurance fees. Was it:

Please Read:
1 0 to less than $25
2 $25 to less than $50
3 $50 to less than $100
4 $100 to less than $200
The wording of question 9.4 was awkward and there was concern that given the wording of questions 9.2 and 9.3 it would lead respondents to misinterpret question 9.4. During the course of the pretest the distinction between the questions 9.2 and 9.4 was less clear. Therefore, the wording for these questions was revised as follows:

9.2 Was one reason why you did not get the shingles shot because Did your doctor or health care professional recommend that you get the shingles vaccine? your doctor recommended that you not get the shot?

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<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>Don’t Know/Not Sure</td>
</tr>
<tr>
<td>9</td>
<td>Refused</td>
</tr>
</tbody>
</table>

9.3 Was one reason why you did not get the shingles shot because Did your doctor or health care professional advise against you getting the shingles vaccine? your doctor recommended that you get the shingles shot but you refused the vaccination?

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes [if code=1, go to Subsection 10]</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>Don’t Know/Not Sure</td>
</tr>
<tr>
<td>9</td>
<td>Refused</td>
</tr>
</tbody>
</table>

9.4 Was one reason why you did not get the shingles shot because your doctor recommended that you get the shingles shot but you refused to get the vaccination? Was one reason why you did not get the shingles shot because your doctor did not recommend the shingles shot to you?

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>Don’t Know/Not Sure</td>
</tr>
<tr>
<td>9</td>
<td>Refused</td>
</tr>
</tbody>
</table>
Skip patterns were changed for the following questions:

6.2 Did you have to file a medical insurance claim to your insurance company to be reimbursed for the shingles shot?

Please Read:
1 Yes
2 No [if code=2, GO TO CLOSING STATEMENT skip 6.3 & 6.4; ask 6.5]
7 Don't know / Not sure GO TO CLOSING STATEMENT
9 Refused GO TO CLOSING STATEMENT

IF (Q12.4=1) (Yes) AND (MA BRFSS) AGE>=65 AND (MA BRFSS) HINS7=1 (Has Medicare), ASK Q12.5. ELSE, SKIP TO Q12.6

12.5 As part of your Medicare insurance, do you have a prescription drug plan, also known as Part D?

1 Yes
2 No
7 Don't Know/Not Sure
9 Refused

After review and approval from the MDPH, these changes were programmed and ready for implementation. As questionnaire changes were made, these 40 interviews were not included in the final data set.

The final BRFSS Shingles Follow-up Survey questionnaire was divided into 13 sections, and was composed of a variety of questions about the shingles vaccination:

- An introduction, informed consent, and shingles vaccine awareness and vaccination validation section.
- Six sections for respondents who were vaccinated, including topics on:
  - Awareness of shingles and shingles vaccine
  - Self motivation / responsibility
  - Doctor recommendation
  - Vaccine safety and efficacy
  - Vaccine supply and convenience
  - Vaccine cost
- Six sections for respondents who were not vaccinated, including topics on:
  - Awareness of shingles and shingles vaccine
  - Self motivation / responsibility
  - Doctor recommendation
  - Vaccine safety and efficacy
  - Vaccine supply and convenience
  - Vaccine cost
- A closing statement.
Mid-Data Collection Questionnaire Changes

On August 15 minor changes were made to the questionnaire in consultation with the MDPH principal investigator after a series of remote monitorings by the client. Each of these is detailed below.

- The average interview length stated in the introduction was changed from 15 to 10 minutes to better reflect the actual time it took respondents to complete the interview:

  In the next few questions, I would like to ask you about your experiences with the shingles shot. I will not ask for your last name, address, or other personal information that can identify you. You do not have to answer any question you do not want to, and you can end the interview at any time. Any information you give me will be confidential. If you have any questions about the survey, please call 877-286-6318. This interview will last about \textbf{15} \textbf{10} minutes.

- An interviewer note was added to questions 1.2 and 8.2 to remind interviewers that the questions allowed multiple responses:

  \textbf{1.2, 7.2} How did you hear about the shingles vaccination? Was it from:

  [READ LIST – MULTIPLE RECORD]

- The interviewer probe for questions 2.4 and 8.2 was updated to better assist respondents:

  \textbf{2.4, 8.2} How often do you get the influenza vaccination? Is it:

  [Read if necessary: \textbf{We are referring to the flu shot}. The \textbf{flu} vaccine is either sprayed in the nose or injected in the arm.]

- An interviewer probe was added to questions 2.6 and 8.4 to better assist respondents:

  \textbf{2.6, 8.4} Since your 65th birthday, did you get the pneumococcal vaccination?

  [IF NECESSARY: \textbf{We are referring to the pneumonia shot}]

- A response option was added to question 5.2:

  \textbf{5.2} Where did you get the shingles shot? Was it at the:

Please Read:
1 Doctor's office
2 Pharmacy/retail stores
3 Vaccination clinics
4 Health Department or other public clinic
5 Veteran's administration
6 Senior centers or assisted living settings
8 Hospital
• A response option was added to question 12.6:

12.6 What is the most you would be willing to spend on the shingles vaccination?

Please Read:
1 0 to less than $25
2 $25 to less than $50
3 $50 to less than $100
4 $100 to less than $200
5 $200 plus
6 (VOL) Will never get the shingles shot
7 (VOL) Don’t Know/Not Sure
9 (VOL) Refused

The final questionnaire that was administered to respondents can be found in Appendix A: The 2012 BRFSS Shingles Follow-up Survey Questionnaire.
IV. Data Collection Protocol

A computer-assisted telephone interviewing (CATI) approach was implemented for data collection.

Interviewing Protocol
The telephone survey was fielded from Abt SRBI’s Fort Myers, Florida and Hadley, Massachusetts call centers. A majority of the interviewing was conducted in Fort Myers. However, interviewers in our Hadley call center were trained and conducted interviews from November 22 – 27, 2012 while the Fort Myers call center was closed for Thanksgiving and for call center facility renovations. Data collection began on May 16, 2012 and ended on February 2, 2013. The telephone survey was conducted with a 15-attempt protocol, in which 15 attempts were made until a final disposition was obtained. Once the total number of interviews of 1,000 was reached, dialing ceased regardless of the number of attempts. A final disposition was attained when:

- The respondent completed the interview;
- The telephone number was found to be invalid;
- The record reached 15 attempts distributed among three different day-parts; or,
- The respondent gave a final refusal.

Experienced, supervised personnel conducted the BRFSS Shingles Follow-up Survey interviews using the Quancept CATI software package. Abt SRBI concentrated calls between 9am and 9 p.m. Monday through Friday, and between 10 a.m. and 9:30 p.m. on Saturday and Sunday, E.S.T.

The average interview length was 7.82 minutes.

Contacting Respondents
The following protocols were followed when contacting eligible adults:

Treatment of No Answers. If a call to a sampled telephone number was not answered, the number was repeatedly called at different times, during daytime and evening hours (9 a.m. to 9 p.m. Monday through Friday; 10 a.m. to 9 p.m. Saturday; 1 p.m. to 9 p.m. Sunday), on different days of the week, in a pattern designed to maximize the likelihood of contact with a minimum number of calls. At least 15 contact attempts, over a minimum five-day period (typically 15 days), were made to reach a sampled number. Once any contact was made at a residence, as many calls as necessary were made to reach the eligible adult (within the permitted time schedule).

Rings per Attempt. The telephone rang a minimum of five times on each attempt made on a record.

Busy Lines. Busy lines were called back at least twice at 10-minute intervals. If the line was still busy after the third attempt, the number was assigned a “busy” disposition and called during the next shift.
Language of Interviewing. Interviewing for the MA BRFSS Shingles Follow-up Survey was conducted in English and Spanish. Abt SRBI sent the questionnaire to a translation company that provides translations for our BRFSS states. The translated questionnaire was then examined to determine if the questions were translated appropriately for the Massachusetts Hispanic population. When the translations are final they are programmed into the CATI. Abt SRBI ensures that all Spanish translations are applicable for the sample’s Hispanic population.

Given that this was a follow-up survey to the MA BRFSS, we already knew if the record required a Spanish-speaking interviewer. A Spanish-speaking interviewer will then dial all numbers designated as needing a Spanish call-back and attempt to conduct the interview.

For the MA BRFSS Shingles Follow-up Survey, 1.1% of interviews were conducted in Spanish.
V. Interviewer Training

Interviewers with prior experience with the BRFSS and Asthma Call-Back Surveys were training for the MA BRFSS Shingles Follow-up Survey prior to data collection. The training, in conjunction with Abt SRBI’s quality control measures (discussed in the next chapter), assured consistent, high quality interviewing during data collection. Interviewers in Abt SRBI’s Ft. Myers, FL call center were first trained on April 16th for the pretest, and then re-trained on May 16 and 17, 2012 prior to the start of the survey data collection. The quality of data collection depends largely on the performance of the interviewing staff. Interviewers on this study were specifically recruited for health care research.

Training Aspects

Abt SRBI’s training sessions for the BRFSS Shingles Follow-up Survey focused on the following aspects of the survey research process:

Introduction to the Survey. The first part of Abt SRBI’s training introduced the interviewers to the purpose and scope of the survey. This part of the training explained the significance of a high response rate, the effect that a high number of refusals has on the study, the importance of confidentiality, the purpose of this study, and any terminology specific to the project.

Introduction to Sampling. The second section discussed the type of sampling being used in the BRFSS Shingles Follow-up Survey and described the interview targets. In this section, the importance of making multiple attempts and converting refusals was stressed.

The Role of Abt SRBI. In this training section, the role of each member of Abt SRBI’s staff was explained to the interviewers. Specifically, the role of the project managers, the data collection management team, the interviewers, the quality assurance assistants, and the data processing team were discussed.

Overview of the Questionnaire. The next step in the training process was an overview of the questionnaire and a brief review of the most important pieces of information related to administering the survey, such as survey length, verification of telephone numbers, protocol, and question type overviews.

Approaches to Interviewing. A brief refresher on interviewing techniques was conducted. This section focused on how to move a respondent through a survey and ask the questions appropriately. Also emphasized in this section was keeping question non-response to a minimum and avoiding respondent refusals. Probing techniques included clarification of respondent responses, open-end verification, and re-reading of response categories.

Knowing the Questionnaire. This included a word-for-word review of the questionnaire, done interactively with the CATI program. Each interviewer worked on a terminal and completed each screen of the CATI program. Many different scenarios, such as respondent reactions, skip pattern scenarios, and disposition protocols, gave the interviewer a better understanding of the CATI program and the questionnaire.

BRFSS Shingles Follow-up Survey Protocols. Protocols unique to the BRFSS Shingles Follow-up Survey were emphasized in this section, such as reading verbatim, respondent
selection procedures, assuring respondent confidentiality, probing and clarifying, and dealing with refusals.

A description of the qualifications of the interviewers is provided in *Appendix B: Qualifications of Interviewers*. 
VI. Quality Assurance Protocol and Interviewer Monitoring

Abt SRBI implements stringent quality assurance protocols to ensure the highest quality data for our clients.

Data Collection Quality Control

Abt SRBI programmed the questionnaire using the SPSS Quancept software package, which is designed specifically for programming and managing CATI studies. Quancept, used by Abt SRBI to program all of its CATI surveys, is a powerful questionnaire programming software that provides:

- Ability to customize sample management;
- Permits real-time data entry;
- Allows error and range checking;
- Allows complex skip patterns;
- Quota specification and control;
- Real-time interviewer monitoring;
- Allows single, multiple, numeric, real or open-ended responses;
- Ability to rotate and randomize response lists and questions;
- Database facility for large response lists;
- Allows complex routing based on any condition or set of conditions;
- Flexible call scheduling capability;
- Detailed and flexible scheduling capability;
- Window-based multimedia coding program;
- Full arithmetic capability;
- Ability to scroll response lists;
- Multilingual capability; and,
- Translation facility.

Upon programming completion, Abt SRBI project managers rigorously tested the survey. Testing included:

- Developing scenarios to test all possible paths through the questionnaire;
- Checking frequencies of randomly generated data; and,
- Verifying frequencies of the data after the first day of interviewing.

To track quality control indicators, Abt SRBI generated reports that read the survey data file, generating summary statistics on the following:

- Interviewer efficiencies (completes/hour, both on an individual and project level);
- Demographics on completed interviews; and,
- All call dispositions (both interim and final).

These reports were generated by the project manager and distributed to the project management team for review. This enabled the management team to detect and resolve any problems. Checks were performed on open-ended responses to determine the accuracy of data
entry by interviewers. Inconsistencies or problems were documented in internal progress reports.

**Interviewer Monitoring**

All interviewers undergo two types of unobtrusive monitoring; audio and visual. The call center supervisor sits at a computer terminal where he/she can visually monitor what the interviewer has recorded, while simultaneously audio-monitoring the interview, listening to both the interviewer and respondent. A fifteen percent monitoring rate was used for the survey using silent and unobtrusive monitoring by a supervisor over the course of the data collection.

This monitoring allows the supervisor to determine the quality of the interviewer's performance in terms of:

- Initial contact and recruitment procedures;
- Reading the questions, fully and completely, as written;
- Reading response categories, fully and completely, (or not reading them) according to study specifications;
- Whether or not open-ended questions are properly probed;
- Whether or not ambiguous or confused responses are clarified;
- How well questions from the respondent are handled without alienating the respondent or biasing his/her response;
- Avoiding bias by either comments or vocal inflection;
- Ability to persuade wavering, disinterested or hostile respondents to continue the interview (refusal conversion techniques); and,
- General professional conduct throughout the interview.

The supervisor also visually monitors the interviewer's recording of survey response on the computer monitor. The supervisor's computer monitor emulates the interviewer's computer monitor. Consequently, the supervisor can see whether the interviewer enters the correct code, number, or verbatim in response to the answer.

Abt SRBI's confidentiality agreement is show in Appendix C: Confidentiality Agreement while the form used for monitoring is provided in Appendix D: Quality Assurance Form.
VII. Data Editing and Processing Procedures

Although the MA BRFSS Shingles Follow-up Survey was conducted on Abt SRBI's CATI system on which data were effectively key entered by interviewers and translated immediately to computer readable form, data were scrutinized at several points in the research process. Each data element obtained in response to a closed-ended query was checked as it was recorded/key entered to ensure that it conformed both to acceptable range requirements imposed on the item and that it was consistent with related items.

All open-ended questions underwent coding following the MDPH instructions. Coding is the technical procedure by which raw data are assigned to categories. These categories are numbers which can be recorded in a computer data file, tabulated, and counted through automatic data processing.

Abt SRBI checked all datasets to ensure completeness of information and data consistency. All identified problems were examined and corrected.

Abt SRBI produced final weighted data files in both SAS and SPSS based on a data file layout that we constructed. This data file included the Shingles Follow-up questions as well as key variables from the Massachusetts BRFSS including demographic variables and key health variables. These data were sent to the MDPH at the end of the project. Identifying information was not included with these files when distributed but the original IDs for all completed interviews were part of the data set.
VIII. Issues with Survey Implementation

There were the following issues with the implementation of the MA BRFSS Shingles Follow-up Survey:

- Data collection was suspended for two months, from September 29 through November 19, 2012, while decisions were made about the sample for the study.

- As detailed in Section II, Sample Design and Eligibility Requirements, on October 14, 2012, the sample plan was modified to stop adding sample for white vaccinated women aged 65 and older. This change was made to ensure that there was an equal number of vaccinated and unvaccinated adults, as well as a higher number of non-whites and men.
IX. Weighting

Overview of Weights

The Massachusetts Shingles Follow-up is a subsample of respondents aged 50 and over from the 2012 Massachusetts BRFSS landline sample. There were interviews with 10,822 BRFSS respondents who were 50 and over in the 2012 Massachusetts BRFSS. Each was asked if he or she would be willing to be recontacted for future research with 6,873 agreeing to such follow-up. Of those who said yes, a subsample of 2,528 was selected for the Shingles Follow-up Survey. The subsample for the shingles follow-up was designed to oversample minority respondents and those who have been vaccinated for Shingles.

Sampling design weights are needed for the original BRFSS sample and the MA Shingles follow-up subsample. Nonresponse adjustments are needed to account for three forms of nonresponse—BRFSS telephone survey nonresponse, refusal to conduct follow-up research, and agreeing to but not completing the follow-up survey. Therefore the telephone survey respondents are weighted to represent the Massachusetts 50+ adult household population using five steps:

1) calculation of BRFSS landline design weight;
2) propensity score adjustment for a 50+ BRFSS respondent to agree to recontact;
3) calculation of MA Shingles subsampling weights;
4) propensity score adjustment for a selected respondent to complete the follow-up; and,
5) calculation of the final weight based on raking to population control targets.

Note that each weight is used in the calculation of the subsequent weight in this sequence.

The formula used is as follows:

\[
\text{PRE-RAKED WEIGHT} = \frac{\text{NRECSTR}}{\text{NRECSEL}} \times \frac{\text{ADULTS}}{\text{PHONES}} \times \text{RECONTACT WEIGHT} \times \text{SUBSAMPLING WEIGHT} \times \text{NONRESPONSE WEIGHT}
\]

The Pre-raked weight is then the initial weight for the raking process. The FINAL WEIGHT is the weight determined through the raking and is the correct weight to use when analyzing the data.

The specific steps are outlined below.
Weighting Methods

1) BRFSS landline design weights

The first stage in the weighting involved creating sampling weights that correct for disproportionate probabilities of selection, design weights. The design weight for a sampling unit is the inverse of the probability that the particular unit is drawn into the sample. The design weight has three components:

Selection of the phone number. The weight for selecting a telephone number is the number of telephone numbers on the frame (NRECSTR) divided by the number of telephone numbers selected (NRECSEL). MA BRFSS selected sample from seven geographic strata. Telephone numbers in each strata were substratified into a high density stratum if the telephone number was listed in the telephone directory or a low density stratum if the telephone number was not listed in the telephone directory.

<table>
<thead>
<tr>
<th>Geographic Stratum</th>
<th>High density stratum</th>
<th>Low density stratum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NRECSTR</td>
<td>NRECSEL</td>
</tr>
<tr>
<td>1</td>
<td>132,441</td>
<td>11,585</td>
</tr>
<tr>
<td>2</td>
<td>69,359</td>
<td>21,677</td>
</tr>
<tr>
<td>3</td>
<td>63,744</td>
<td>22,153</td>
</tr>
<tr>
<td>4</td>
<td>26,107</td>
<td>4,848</td>
</tr>
<tr>
<td>5</td>
<td>46,334</td>
<td>6,695</td>
</tr>
<tr>
<td>6</td>
<td>47,079</td>
<td>7,327</td>
</tr>
<tr>
<td>7</td>
<td>1,584,182</td>
<td>39,804</td>
</tr>
</tbody>
</table>

Multiple telephone number adjustment. Households with multiple telephones have a higher chance of being selected into sample. The selection probability is proportional to the total number of telephones in the household. Therefore, we divide the telephone weight by the number of telephones in the household (PHONES). The number of telephones is capped at 3 to limit extreme weight differentials.

Selection of household member. For the BRFSS, one member (18+ adult) from each household was randomly selected to take the survey. To account for the within household selection probability, we multiplied the weight by the number of eligible adults in the household (ADULTS). The number of adults is capped at 3 to avoid extreme weight differentials.

With these three components, we calculate the design weight as DESIGN_WT = NRECSTR/NRECSEL*(ADULTS/PHONES).

2) Propensity score adjustment for a 50+ BRFSS respondent to agree to recontact

At the end of the BRFSS survey, respondents are asked if they can be recontacted for future research. The purpose of this adjustment is to mitigate the risk of nonresponse bias as a result of recontact refusal. We estimated the propensity for 50+ BRFSS respondents to agree to be recontacted recall using a logistic regression model where the outcome is 1 = agree to recontact.

---

Sample is selected quarterly. The number of records on the frame can vary slightly each quarter. We used the maximum quarterly value for each geographic and density combination.
and 0 = refuse recontact. The model predictors were based on data items obtained during the BRFSS survey.

**Variables examined that were not significant predictors:**
- Gender
- Has health coverage
- Had time in the past 12 months when you needed to see a doctor but could not because of cost
- Has personal doctor or health care provider (one, more than one, no)
- General health (excellent, very good, good, fair, poor)
- Participated in physical activities or exercises in past month

**Significant predictors retained in the model:**
- Educational attainment (less than high school, high school grad, some college or technical school, college grad)
- Age group (50-54, 55-59, 60-64, 65-69, 70-74, 75+)
- Race/Ethnicity (Hispanic, non-Hisp white, non-Hisp black, non-Hisp Asian/other)
- Marital status (married, divorced/widowed/separated, never married)
- Vaccinated for shingles vaccine

Using the variables above, modeled propensity scores were developed for the BRFSS 50+ respondents and grouped into quintiles. The distribution by quintile among those who agree and those who refuse recontact is presented below. Within each quintile, those who agree are ratio adjusted to account for those who refuse.

<table>
<thead>
<tr>
<th>Quintile</th>
<th>Agree to recontact</th>
<th>Refuse recontact</th>
<th>Total</th>
<th>Recontact Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10.2%</td>
<td>10.0%</td>
<td>20.2%</td>
<td>1.98</td>
</tr>
<tr>
<td>2</td>
<td>12.0%</td>
<td>8.3%</td>
<td>20.3%</td>
<td>1.69</td>
</tr>
<tr>
<td>3</td>
<td>13.2%</td>
<td>6.7%</td>
<td>19.9%</td>
<td>1.51</td>
</tr>
<tr>
<td>4</td>
<td>16.3%</td>
<td>6.2%</td>
<td>22.5%</td>
<td>1.38</td>
</tr>
<tr>
<td>5</td>
<td>12.7%</td>
<td>4.5%</td>
<td>17.2%</td>
<td>1.35</td>
</tr>
</tbody>
</table>

3) Shingles follow-up subsample

The Shingles follow-up sample was selected from all 50+ adults who agreed to be recontacted. The sample was selected from 16 strata formed by shingles vaccination status (vaccinated, not vaccinated), race (white, non-white), gender, and age group (60-64, 65+). The subsampling weights were calculated by ratio adjusting the subsample to equal the total eligible in each stratum. The subsampling weights were based on the design weight adjusted for recontact.
<table>
<thead>
<tr>
<th>Follow-up Stratum</th>
<th>Vaccinated</th>
<th>Not vaccinated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Selected</td>
</tr>
<tr>
<td>1 = White Male, 50-64</td>
<td>6,187</td>
<td>5,492</td>
</tr>
<tr>
<td>2 = White Male, 65+</td>
<td>19,674</td>
<td>17,749</td>
</tr>
<tr>
<td>3 = Non-White Male, 50-64</td>
<td>518</td>
<td>478</td>
</tr>
<tr>
<td>4 = Non-White Male, 65+</td>
<td>563</td>
<td>503</td>
</tr>
<tr>
<td>5 = White Female, 50-64</td>
<td>9,303</td>
<td>8,052</td>
</tr>
<tr>
<td>6 = White Female, 65+</td>
<td>28,899</td>
<td>15,349</td>
</tr>
<tr>
<td>7 = Non-White Female, 50-64</td>
<td>317</td>
<td>317</td>
</tr>
<tr>
<td>8 = Non-White Female, 65+</td>
<td>1,630</td>
<td>1,302</td>
</tr>
</tbody>
</table>

4) Propensity score adjustment for a selected respondent to complete the follow-up

Similar to step 2, we create a propensity score adjustment to mitigate the risk of nonresponse bias as a result of not responding to the follow-up survey. We use a logistic regression model where the outcome is 1 = respond to follow-up survey and 0 = do not respond to follow-up survey. The model predictors were based on data items obtained during the BRFSS survey.

**Variables examined that were not significant predictors:**
- Had time in the past 12 months when you needed to see a doctor but could not because of cost
- Has personal doctor or health care provider (one, more than one, no)
- General health (excellent, very good, good, fair, poor)
- Participated in physical activities or exercises in past month

**Significant predictors retained in the model:**
- Gender
- Educational attainment (less than high school, high school grad, some college or technical school, college grad)
- Age group (50-54, 55-59, 60-64, 65-69, 70-74, 75+)
- Race/Ethnicity (Hispanic, non-Hisp white, non-Hisp black, non-Hisp Asian/other)
- Marital status (married, divorced/widowed/separated, never married)
- Vaccinated for shingles vaccine
- Has health coverage

Using the variables above, modeled propensity scores were developed for the MA Shingles follow-up sample and grouped into quintiles. The distribution by quintile among respondents and non-respondents is presented below. Within each quintile, the respondents are ratio adjusted to account for the nonrespondents.

---

*2012 Massachusetts BRFSS Shingles Follow-Up Survey Methodological Report*
Table 4. Nonresponse Weights

<table>
<thead>
<tr>
<th>Quintile</th>
<th>Agree to recontact</th>
<th>Refuse recontact</th>
<th>Total</th>
<th>Nonresponse weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.0%</td>
<td>16.3%</td>
<td>20.4%</td>
<td>5.03</td>
</tr>
<tr>
<td>2</td>
<td>6.1%</td>
<td>13.8%</td>
<td>19.9%</td>
<td>3.26</td>
</tr>
<tr>
<td>3</td>
<td>9.8%</td>
<td>9.9%</td>
<td>19.7%</td>
<td>2.00</td>
</tr>
<tr>
<td>4</td>
<td>12.8%</td>
<td>11.8%</td>
<td>24.6%</td>
<td>1.92</td>
</tr>
<tr>
<td>5</td>
<td>11.1%</td>
<td>4.4%</td>
<td>15.4%</td>
<td>1.39</td>
</tr>
</tbody>
</table>

5) Population calibration

As the final weighting step, we poststratified the combined sample into demographic categories and ratio adjusted the weights so that the final weighted sample matches the population with respect to those demographic characteristics. We used a raking algorithm that iteratively calibrates the weighted sample to the population on these dimensions: race/ethnicity, educational attainment, marital status, race/ethnicity by sex, race/ethnicity by age group, and age group by sex. The population data is based on the 2011 American Community Survey (ACS) 3 year estimates. After one iteration of raking, we trimmed extreme weights and the re calibrated to the demographic distributions. The distributions are listed in the Appendix E.
X. The Final Dataset

Abt SRBI provided MDPH with a copy of the dataset at the end of the project on April 16, 2013 in both SPSS and SAS format:

- Data for all completed records in SPSS
  
  File Name: 5560_ALL_VAR_weights_130411.SAV

- Data for all completed records in SAS
  
  File Name: 5560_ALL_VAR_weights_130411.sas7bdat
XI. Response Rates

Response rates provide a measure of interviewing success and are one main means of assessing the quality of the data. In 2012 CDC updated all disposition codes and the calculation of the response rates. This update was partly to allow the cell phone response rates and landline response rates to be calculated in a similar manner as well as have the BRFSS rates conform to the CASRO rates used by AAPOR. The new disposition codes were collected throughout 2012 and the rates below are calculated using these formulas. In calculating the response rates, we worked closely with CDC officials who determine the rates for the asthma call-back survey. While they had not updated their calculations for the new disposition codes, they completed an update so we could follow their formulas. Table 5 shows the number of adults interviewed in 2012 who were eligible for the MA BRFSS Shingles Follow-up Survey, the number who agreed to be recontacted for the MA BRFSS Shingles Follow-up Survey of those eligible, the agreement rate, the number sampled for the follow-up in those target groups with large numbers of eligible respondents and the actual number interviewed. The groups are defined based on their vaccination status as reported in the 2012 MA BRFSS. Note that of the 16 defined target groups (8 vaccinated and 8 unvaccinated), 4 categories of vaccinated adults were collapsed into one category (non-white vaccinated adults) and two categories of unvaccinated adults were collapsed into one category (unvaccinated non-white males) due to small sample sizes.

Complete disposition codes can be found in Appendix F: Final Disposition Classification. Characteristics of target groups and their completion rate are presented in Table 5.

Table 5: Eligibility and Follow-up by Subgroup

<table>
<thead>
<tr>
<th>Group</th>
<th>Eligible</th>
<th>Agreed to Follow-Up</th>
<th>Agreement Rate$^3$</th>
<th>Sampled</th>
<th>Interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>10,624</td>
<td>6,811</td>
<td>64.1%</td>
<td>2,528</td>
<td>1,000</td>
</tr>
<tr>
<td>Vaccinated:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White males aged 50-64</td>
<td>146</td>
<td>102</td>
<td>69.9%</td>
<td>88</td>
<td>55</td>
</tr>
<tr>
<td>White males aged 65+</td>
<td>422</td>
<td>281</td>
<td>66.6%</td>
<td>252</td>
<td>143</td>
</tr>
<tr>
<td>White women aged 50-64</td>
<td>247</td>
<td>171</td>
<td>69.2%</td>
<td>147</td>
<td>90</td>
</tr>
<tr>
<td>White women aged 65+</td>
<td>847</td>
<td>549</td>
<td>64.8%</td>
<td>295</td>
<td>192</td>
</tr>
<tr>
<td>Non-White adults, 50 and over</td>
<td>113</td>
<td>74</td>
<td>66.5%</td>
<td>67</td>
<td>20</td>
</tr>
<tr>
<td>Non-vaccinated:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White males aged 50-64</td>
<td>1,579</td>
<td>1,051</td>
<td>66.6%</td>
<td>253</td>
<td>90</td>
</tr>
<tr>
<td>White males aged 65+</td>
<td>1,179</td>
<td>737</td>
<td>62.5%</td>
<td>204</td>
<td>78</td>
</tr>
<tr>
<td>White women aged 50-64</td>
<td>2,535</td>
<td>1,743</td>
<td>68.8%</td>
<td>178</td>
<td>85</td>
</tr>
<tr>
<td>White women aged 65+</td>
<td>2,193</td>
<td>1,211</td>
<td>55.2%</td>
<td>206</td>
<td>85</td>
</tr>
<tr>
<td>Non-White males, 50 and over</td>
<td>485</td>
<td>301</td>
<td>64.7%</td>
<td>279</td>
<td>46</td>
</tr>
<tr>
<td>Non-White women aged 50-64</td>
<td>518</td>
<td>355</td>
<td>68.5%</td>
<td>337</td>
<td>63</td>
</tr>
<tr>
<td>Non-White women aged 65+</td>
<td>380</td>
<td>236</td>
<td>62.1%</td>
<td>222</td>
<td>53</td>
</tr>
</tbody>
</table>

Table 6 presents summary indicators for the survey including response rates and refusal rates overall and for subgroups with at least 50 completes (with the exception of vaccinated non-white adults where only 20 interviews were completed and unvaccinated non-white males over 50 where only 46 interviews were completed). The formulas used to calculate the rates are also shown.

$^3$Agreed to Follow-up/Eligible
Table 6: Response and Refusal Rates Overall and by Subgroup

<table>
<thead>
<tr>
<th>Group</th>
<th>Interviewed</th>
<th>Refused in callback</th>
<th>Refused in BRFSS</th>
<th>Ineligible</th>
<th>Eligibles Lost</th>
<th>P Follow-up Rate</th>
<th>Response Rate</th>
<th>Refusal Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>1,000</td>
<td>61</td>
<td>1,460</td>
<td>4,283</td>
<td>1,467</td>
<td>0.20</td>
<td>74.0%</td>
<td>47.4%</td>
</tr>
<tr>
<td>Vaccinated:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White males aged 50-64</td>
<td>55</td>
<td>6</td>
<td>44</td>
<td>14</td>
<td>27</td>
<td>0.81</td>
<td>66.3%</td>
<td>46.3%</td>
</tr>
<tr>
<td>White males aged 65+</td>
<td>143</td>
<td>14</td>
<td>141</td>
<td>29</td>
<td>95</td>
<td>0.84</td>
<td>60.3%</td>
<td>40.1%</td>
</tr>
<tr>
<td>White women aged 50-64</td>
<td>90</td>
<td>2</td>
<td>76</td>
<td>24</td>
<td>55</td>
<td>0.79</td>
<td>66.4%</td>
<td>45.9%</td>
</tr>
<tr>
<td>White women aged 65+</td>
<td>132</td>
<td>5</td>
<td>181*</td>
<td>264</td>
<td>98</td>
<td>0.44</td>
<td>80.1%</td>
<td>51.9%</td>
</tr>
<tr>
<td>Non-White adults over 50</td>
<td>20</td>
<td>5</td>
<td>39</td>
<td>7</td>
<td>42</td>
<td>0.78</td>
<td>34.6%</td>
<td>22.7%</td>
</tr>
<tr>
<td>Non-vaccinated:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White males aged 50-64</td>
<td>70</td>
<td>5</td>
<td>129*</td>
<td>798</td>
<td>158</td>
<td>0.11</td>
<td>80.5%</td>
<td>53.6%</td>
</tr>
<tr>
<td>White males aged 65+</td>
<td>85</td>
<td>2</td>
<td>81*</td>
<td>1,565</td>
<td>91</td>
<td>0.05</td>
<td>92.6%</td>
<td>63.7%</td>
</tr>
<tr>
<td>White women aged 50-64</td>
<td>85</td>
<td>2</td>
<td>174*</td>
<td>1,006</td>
<td>119</td>
<td>0.08</td>
<td>88.1%</td>
<td>48.7%</td>
</tr>
<tr>
<td>White women aged 65+</td>
<td>63</td>
<td>5</td>
<td>163</td>
<td>16</td>
<td>269</td>
<td>0.79</td>
<td>22.4%</td>
<td>15.4%</td>
</tr>
<tr>
<td>Non-White males over 50</td>
<td>53</td>
<td>5</td>
<td>144</td>
<td>14</td>
<td>164</td>
<td>0.81</td>
<td>27.9%</td>
<td>17.3%</td>
</tr>
</tbody>
</table>

*indicates that actual refusal number was multiplied by the sampling fraction for this group.

Where:

- \( P = \) Interviewed + Refused in Callback
  Interviewed + refused in Call back + Ineligible

- Follow-up rate = Interviewed
  Interviewed + Refused in Callback + (P*Eligibles Lost)

- Response Rate = Follow-up Rate \times Agreement Rate

- Refusal Rate = 1 – Agreement Rate + Refused in Callback
  Interviewed + Refused in Callback + (P*Eligibles Lost)

2012 Massachusetts BRFSS Shingles Follow-Up Survey Methodological Report 30
The overall study response rate which includes the original Massachusetts BRFSS response rate meaning it rate equals the 2012 MA BRFSS response rate x the shingles response rate. The overall study response rate is 45.0% \( \times \) 47.4% = 21.3%.

Table 7 shows the vaccination status in the 2012 MA BRFSS compared to the MA BRFSS Shingles Follow-up Survey. The difference in responses for the non-vaccinated group is attributed to adults who were vaccinated after they participated in the MA BRFSS and before they participated in the MA Shingles Follow-up Survey. Please note that if someone from the non-vaccinated group was found to be vaccinated, they could complete the survey and would be counted as a vaccinated adult in the appropriate target group.

<table>
<thead>
<tr>
<th>Table 7: BRFSS Versus Shingles Survey Vaccination Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Vaccinated:</td>
</tr>
<tr>
<td>White males aged 50-64</td>
</tr>
<tr>
<td>White males aged 65+</td>
</tr>
<tr>
<td>White women aged 50-64</td>
</tr>
<tr>
<td>White women aged 65+</td>
</tr>
<tr>
<td>Non-White males aged 50-64</td>
</tr>
<tr>
<td>Non-White males aged 65+</td>
</tr>
<tr>
<td>Non-White women aged 50-64</td>
</tr>
<tr>
<td>Non-White women aged 65+</td>
</tr>
<tr>
<td>Non-vaccinated:</td>
</tr>
<tr>
<td>White males aged 50-64</td>
</tr>
<tr>
<td>White males aged 65+</td>
</tr>
<tr>
<td>White women aged 50-64</td>
</tr>
<tr>
<td>White women aged 65+</td>
</tr>
<tr>
<td>Non-White males aged 50-64</td>
</tr>
<tr>
<td>Non-White males aged 65+</td>
</tr>
<tr>
<td>Non-White women aged 50-64</td>
</tr>
<tr>
<td>Non-White women aged 65+</td>
</tr>
</tbody>
</table>

\(^{4}\) This rate has been calculated internally for 2012. The CDC calculated rate may differ and the overall rate should be updated with the CDC calculated rate.
Appendix A: 2012 Massachusetts BRFSS Shingles Survey Questionnaire

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Interviewer’s Introductory Script

HELLO, my name is __________ (name) __________. I am calling from the Massachusetts Department of Public Health and the Centers for Disease Control and Prevention about a shingles study we are doing in your state.

During a recent phone interview, [provide person’s first name or initials as provided by consenting respondent in shingles call-back permission script] indicated (he/she) would be willing to participate in this study.

S.1 Are you [name / initials]?
   1 Yes (go to informed consent section)
   2 No (go to S.2)

S.2 May I speak with [sample person’s name]?
   1 Yes (when sample person comes to phone go to S.4)
   2 No (if respondent not available set time for return call in S.3)

S.3 CALLBACK CALENDAR

S.4 Am I speaking with [name / initials]?
   1 Yes (read introduction below)
   2 No (return to S.2)
   3 Refused [THANK & END, HARD REFUSAL]

If respondent identifies as the person whom the interviewer is asking to speak with, then read the below introductory statement and proceed to informed consent section:

HELLO, my name is __________ (name) __________. I am calling from the Massachusetts Department of Public Health and the Centers for Disease Control and Prevention about a shingles study we are doing in your state.

During a recent phone interview you indicated that would be willing to participate in this study. You agreed to us calling you.

CONTINUE TO INFORMED CONSENT
Informed Consent

Before we continue, I’d like you to know that this survey is authorized by the U.S. Public Health Service Act.

You were selected to participate in this study about shingles because of your responses to questions in a prior survey.

In the next few questions, I would like to ask you about your experiences with the shingles shot. I will not ask for your last name, address, or other personal information that can identify you. You do not have to answer any question you do not want to, and you can end the interview at any time. Any information you give me will be confidential. If you have any questions about the survey, please call 877-286-6318.

This interview will last about 10 minutes.

S.5 PERMISSION: Some of the information that you shared with us when we called you before could be useful in this study. May we combine your answers to this survey with your answers from the survey you did a few weeks ago? Everyone’s answers will be combined to give us information about the health practices of people in this state.

1 YES [Skip to Panel filter segment, Questions S.7-S.9]
2 NO [GO TO S.6 TERMINATE]
7 DON’T KNOW [GO TO S.6 TERMINATE]
9 REFUSED [GO TO S.6 TERMINATE]

S.6 TERMINATE:
Upon survey termination, READ:

Those are all the questions I have. I’d like to thank you on behalf of the Massachusetts Department of Public Health and the Centers for Disease Control and Prevention for answering these questions. If you have any questions about this survey, you may call my supervisor toll-free at 877-286-6318. If you have questions about your rights as a survey participant, you may call the chairman of the Institutional Review Board at 888-772-4269. Thanks again. Goodbye.
Panel Filter Segment

Shingles & Shingles Vaccine Awareness and Vaccination Validation
Interviewer Note: ask and record responses to Questions S.7 - S.9.

- The Survey sample will include the respondents' answer to the 2012 CDC Module 11 “Shingles (Zostavax or ZOS)” question 'SHINGLE2'. Respondents' answers to the BRFSS Landline Survey shingles vaccination question will be compared to their response to the screener question S.9.

- For Question S.8, if code=1 (Yes) the participant is eligible to proceed with remainder of survey.
  - For Question S.8, if code= 2 (No), the participant is ineligible to proceed with remainder of survey and the call is ended (read S.6, terminate).

- Question S.9 validates the participant's response provided in the 2012 BRFSS on shingles vaccination coverage (CDC Shingles Module 11, ('SHINGLE2' variable)). Based on the response to Question S.9, assign participant into vaccinated or non-vaccinated panel.

- If participant reported in the 2012 BRFSS Shingles Module 11, ('SHINGLE2' variable) that they did not have a shingles shot (SHINGLE2=2 (No)), but in Question S.9 report that they had a shingles shot (S.9=1 (Yes)), ask Question S.10. If Question S.10=1 (Yes), then assign participant into vaccinated arm panel and proceed with subsections.

- If participant reported in the 2012 BRFSS Shingles Module 11, ('SHINGLE2' variable) that they had a shingles shot (SHINGLE2=1 (Yes)), and in Question S.9 respondent reports that they did NOT receive a shingles shot (S.9=2 (No)), do NOT assign participant into non-vaccinated arm panel and terminate the call (read S.6, terminate).

S.7  Do you know about a medical condition called shingles?

1  Yes
2  No

Do Not Read:
7  Don’t Know/Not Sure
9  Refused

S.8  Are you aware that there is a vaccine to prevent shingles?

1  Yes
2  No  [GO TO S.6 TERMINATE]

Do Not Read:
7  Don’t Know/Not Sure  [GO TO S.6 TERMINATE]
9  Refused  [GO TO S.6 TERMINATE]
S.9 Have you had the shingles vaccination?

1 Yes
2 No

Do Not Read:
7 Don't know / Not sure [GO TO S.6 TERMINATE]
9 Refused [GO TO S.6 TERMINATE]

CATI LOGIC, DUMMY VARIABLE VACCINATION STATUS

- S.9=1 (Yes) AND SAMPLE SHINGLE2=1 (Yes, received shingles vaccination), CODE VACSTAT=1 AND GO TO QUESTIONNAIRE SECTIONS 1-6.
- IF S.9=1 (Yes) AND SAMPLE SHINGLE2=2 (No, did not receive shingles vaccination), ASK S.10.
- IF S.9=2 (No, DK, Ref) AND SAMPLE SHINGLE2=2 (No, did not receive shingles vaccination), GO TO QUESTIONNAIRE SECTIONS 7-12.
- IF S.9=2, 7, 9 (No, ) AND SAMPLE SHINGLE2=1 (Yes, received shingles vaccination), GO TO S.6 TERMINATE.

VACSTAT Shingle vaccination status

1 BRFSS=Yes, S9 confirmed [GO TO SUBSECTION 1]
2 BRFSS=No, S9=Yes [ASK S.10]
3 BRFSS=No, S9 confirmed [GO TO SUBSECTION 7]
4 BRFSS=Yes, S9=No [GO TO S.6 TERMINATE]

S.10 Previously when you were interviewed, you said that you had NOT had the shingles vaccination but just now you said that you HAVE HAD the shingles vaccination. Have you had the shingles vaccination since your interview?

1 Yes [GO TO SUBSECTION 1]
2 No [GO TO S.6 TERMINATE]

Do Not Read:
7 Don't Know/Not Sure [GO TO S.6 TERMINATE]
9 Refused [GO TO S.6 TERMINATE]
Section A: Shingles Call-Back Questions for Vaccinated Respondents

Subsection 1: Awareness of Shingles and Shingles Vaccine

NOTE: Subsections 1 through 6 are asked of respondents who responded “Yes” (code = 1) to CDC Optional Module 11: Shingles (shingles vaccine question) and whose response was validated by Questions S.8 and S.9.

1.1 When you decided to get the shingles vaccination, how important was it for you to prevent getting shingles? Was it:

Please read:
1. Not at all important
2. A little important
3. Somewhat important
4. Extremely important

Do not read:
7. Don’t know / Not sure
9. Refused

1.2 How did you hear about the shingles vaccination? Was it from:

(READ LIST – MULTIPLE RECORD)
1. CDC website
2. Facebook
3. Television Show (Dr. Oz or Oprah) or radio
4. Newspaper/Magazine or Billboard Advertisement
5. Pharmacy/Store advertisement—intercom or poster, etc
6. Doctor
7. Friends or family
8. Work
9. Other (Please specify) ________________________________

Do not read:
77. Don’t know / Not sure
99. Refused

1.2A Do you know anyone who was sick with shingles?

1. Yes
2. No

GO TO Q1.4

Do not read:
7. Don’t know / Not sure
9. Refused

GO TO Q1.4
1.3 When you decided to get the shingles vaccination, how important was it that someone in your family or among your friends had already been sick with shingles? Was it:

Please read:
1. Not at all important
2. A little important
3. Somewhat important
4. Extremely important

Do not read:
7. Don’t know / Not sure
9. Refused

1.4 When you decided to get the shingles vaccination, how important was hearing from your friends that you should get the shingles shot? Was it:

Please read:
1. Not at all important
2. A little important
3. Somewhat important
4. Extremely important

Do not read:
7. Don’t know / Not sure
9. Refused

1.5 When you decided to get the shingles vaccination, how important was hearing from your family that you should get the shingles shot? Was it:

Please read:
1. Not at all important
2. A little important
3. Somewhat important
4. Extremely important

Do not read:
7. Don’t know / Not sure
9. Refused

1.5A What would you say is the primary symptom of shingles?

[DO NOT READ LIST]
1. Rash/Itchiness on the face or body
2. Blisters
3. Pain/Tingling of skin
4. Blindness/Sight Complications
5. Other (specify)
7. Don’t Know/Not Sure
9. Refused

1.6 How painful do you think shingles is? Do you think it is:

Please Read:
1. Not at all painful
2. Somewhat painful
3. Moderately painful
4. Very painful

Do Not Read:
7. Don’t Know/Not Sure
9. Refused
1.7 Before you were vaccinated with the shingles vaccine, what did you think your chances were of getting sick with shingles during your lifetime? Would you say that it was:

**Please read:**
1. Very low, 0 to 29% chance
2. Low, 30 to 49% chance
3. Moderate, 50 to 79% chance
4. High, 80 to 100% chance

**Do not read:**
7. Don’t know / Not sure
9. Refused

1.8 Now that you got the shingles shot, what do you think your chances are of getting sick with shingles during your lifetime? Would you say that it is:

**Please read:**
1. Very low, 0 to 29% chance
2. Low, 30 to 49% chance
3. Moderate, 50 to 79% chance
4. High, 80 to 100% chance

**Do not read:**
7. Don’t know / Not sure
9. Refused

**Subsection 2: Self Motivation/ Responsibility**

2.2 Was one reason why you got the shingles vaccination because you wanted to take care of your health and be healthy?

1. Yes
2. No

**Do not Read:**
7. Don’t Know/Not Sure
9. Refused

2.2A What part of the shingles disease were you hoping to avoid by getting vaccinated?

[If need to probe, ask “what specific symptom of shingles were you hoping to avoid by getting vaccinated?”]

**[DO NOT READ LIST]**
1. Rash/Itchiness on the face or body
2. Blisters
3. Pain/Tingling of skin
4. Blindness/Sight Complications
5. Other (specify)
7. Don’t Know/Not Sure
9. Refused

ASK Q2.3 IF (MA BRFSS) EMPLOY=1 OR 2. ELSE GO TO 2.4

2.3 Was one reason why you got the shingles vaccination because you didn’t want to miss work or lose pay?

1. Yes
2. No

**Do not Read:**
7. Don’t Know/Not Sure
9. Refused
2.4 How often do you get the influenza vaccination? Is it:

[Read if necessary: We are referring to the flu shot. The flu vaccine is either sprayed in the nose or injected in the arm.]

Please Read:
1. Every year
2. Most years
3. Rarely
4. Have only gotten it once
5. Never

Do Not Read:
7. Don’t Know/Not Sure
9. Refused

2.5 Within the past 10 years, did you get a tetanus shot?

1. Yes
2. No

Do not Read:
7. Don’t Know/Not Sure
9. Refused

ASK Q2.6 IF (MA BRFSS) AGE>=65, ELSE GO TO SUBSECTION 3

2.6 Since your 65th birthday, did you get the pneumococcal vaccination?

[IF NECESSARY: We are referring to the pneumonia shot.]

1. Yes
2. No

Do not Read:
7. Don’t Know/Not Sure
9. Refused

Subsection 3: Doctor Recommendation

3.1 In the past 5 years, did you and your doctor talk about the shingles vaccine?

1. Yes
2. No

Do not Read:
7. Don’t Know/Not Sure
9. Refused

GO TO Q3.3

3.2 Did your doctor or healthcare professional bring up the topic of getting the shingles shot, or did you?

[Read only if necessary: By “healthcare professional” we mean a nurse practitioner, a physician’s assistant, or some other licensed health professional, such as a nurse.]

Please Read:
1. You brought up the topic
2. Your doctor or health care professional brought up the topic

Do Not Read:
7. Don’t know / Not sure
9. Refused

GO TO Q3.3
3.3 Did your doctor or health care professional recommend that you get the shingles vaccination?

1 Yes  GO TO SUBSECTION 4
2 No  

Do Not Read:
7 Don’t know / Not sure
9 Refused

3.4 Did your doctor or health care professional advise against you getting the shingles vaccine?

1 Yes ask Q3.5
2 No  GO TO SUBSECTION 4

Do Not Read:
7 Don’t know / Not sure  GO TO SUBSECTION 4
9 Refused  GO TO SUBSECTION 4

3.5 You stated that your doctor advised against you getting the shingles vaccination, yet you still got the shingles vaccine?

1 Yes
2 No

Do Not Read:
7 Don’t know / Not sure
9 Refused

Subsection 4: Vaccine Safety and Efficacy

4.1 How safe do you think the shingles vaccination is? Would you say it is:

Please Read:
1 Not at all safe
2 A little safe
3 Somewhat safe
4 Very safe

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

4.2 Before you got vaccinated, did you know that the shingles vaccination is a live virus vaccine?

1 Yes  GO TO 4.4
2 No  

Do Not Read:
7 Don’t know / Not sure  GO TO 4.4
9 Refused  GO TO 4.4

4.3 If you had known that the vaccination is a live virus, would you have still gotten the vaccine?

1 Yes
2 No

Do Not Read:
7 Don’t know / Not sure
9 Refused
4.4 How effective do you think the shingles shot is at preventing shingles?

Please Read:
1. Not at all effective
2. Only a little effective
3. Somewhat effective
4. Very effective

Do Not Read:
7. Don’t know / Not sure
9. Refused

Subsection 5: Vaccine Supply and Convenience

5.1 How convenient was it to get the shingles shot?

Please Read:
1. Not at all convenient
2. A little convenient
3. Somewhat convenient
4. Very convenient

Do Not Read:
7. Don’t know / Not sure
9. Refused

5.2 Where did you get the shingles shot? Was it at the:

Please Read:
1. Doctor’s office
2. Pharmacy/retail stores
3. Vaccination clinics
4. Health Department or other public clinic
5. Veteran’s administration
6. Senior centers or assisted living settings
8. Hospital

Do Not Read:
7. Don’t know / Not sure
9. Refused

5.3 Did that location have the shingles vaccine available for you right away?

Please Read:
1. Yes, the vaccine was available right away
2. No, the vaccine had to be ordered

Do Not Read:
7. Don’t know / Not sure
9. Refused
IF Q5.2=1, 3, 4, 5, 6, 7, or 9 GO TO SUBSECTION 6. 
IF Q5.2=2, ASK Q5.4.

5.4 Did the pharmacist administer the shingles shot at the pharmacy or did you have to pick the vaccine up at the pharmacy and bring it to your doctor’s office so that your doctor could give you the shot?

Please Read:
1. The vaccine was administered by the pharmacist in the pharmacy GO TO SUBSECTION 6
2. You picked up the vaccine in the pharmacy and brought it to a doctor’s office for them to give it. ASK Q5.5 SERIES

Do Not Read:
7. Don’t know / Not sure GO TO SUBSECTION 6
9. Refused GO TO SUBSECTION 6

5.5 The next series of questions ask about how the shingles vaccine was kept cold between the pharmacy and your doctor’s office. For each of the following, please say “yes” or “no”.

5.5A: Did the Pharmacy transport the vaccine to the doctor’s office? Yes OR No
1. Yes GO TO Q5.6
2. No

Do Not Read:
7. Don’t know / Not sure
9. Refused

5.5B Did the Pharmacy give you a package with ice for the vaccine so you could take it back to your doctor? Yes OR No
1. Yes GO TO Q5.6
2. No

Do Not Read:
7. Don’t know / Not sure
9. Refused

5.5C: Did you come to the pharmacy with your own icepack for the vaccine? Yes OR No
1. Yes GO TO Q5.6
2. No

Do Not Read:
7. Don’t know / Not sure
9. Refused

5.5D: Did you transport the vaccine to the doctor’s office without ice?
1. Yes
2. No

Do Not Read:
7. Don’t know / Not sure
9. Refused
5.6 About how long did it take to go from the pharmacy to your doctor’s office so you could get your shingles shot?

Please Read:
1. Less than 30 minutes
2. 30 minutes to just under 1 hour
3. 1 hour to just under 2 hours
4. Over 2 hours

Do Not Read:
7. Don’t know / Not sure
9. Refused

5.7 Would you have been willing to have the pharmacist administer the shingles vaccine in a pharmacy instead of getting the shot in a doctor’s office?

1. Yes
2. No

Do Not Read:
7. Don’t know / Not sure
9. Refused

Subsection 6: Vaccine Cost

6.2 How much did you pay to receive the vaccination? Please include any co-payments or co-insurance fees. Was it:

Please Read:
1. 0 to less than $25
2. $25 to less than $50
3. $50 to less than $100
4. $100 to less than $200
5. $200 plus

Do Not Read:
7. Don’t know / Not sure
9. Refused

6.2 Did you have to file a medical insurance claim to your insurance company to be reimbursed for the shingles shot?

Please Read:
3. Yes
4. No

Do Not Read:
7. Don’t know / Not sure
9. Refused
6.3 Who filed the medical insurance claim for you? Was it the:

Please Read:
1 Physician or office staff
2 Pharmacy
3 Patient (you)
4 Spouse/caregiver
5 Someone else (Please specify) __________________

Do Not Read:
7 Don’t know / Not sure
9 Refused

6.4 Did your medical insurance company reimburse you for the shingles vaccination?

1 Yes
2 No

Do Not Read:
7 Don’t know / Not sure
9 Refused

(MA BRFSS) AGE>=65 AND (MA BRFSS) HINS7=1 (Has Medicare)), ASK Q6.5. ELSE, SKIP TO CLOSING STATEMENT

6.5 As part of your Medicare insurance, do you have a prescription drug plan, also known as Part D?

Please Read:
1 Yes
2 No

Do Not Read:
7 Don’t know / Not sure
9 Refused

Closing Statement for Vaccinated Arm

Please read:

That was my last question. I’d like to thank you on behalf of the Massachusetts Department of Public Health and the Centers for Disease Control and Prevention for answering these questions.

If you have any questions about this survey, you may call my supervisor toll-free at 877-286-6318.

If you have questions about your rights as a survey participant, you may call the chairman of the Institutional Review Board at 888-772-4269.

Thank you very much for your time and cooperation. Goodbye.
Section B: Shingles Call-Back Questions for Non Vaccinated Respondents

Subsection 7: Awareness of Shingles and Shingles Vaccine

NOTE: Subsections 7 through 12 are asked of respondents who responded “NO” (code = 2) to CDC Optional Module 11: Shingles (shingles vaccine question) and whose response was validated by Questions S.8 and S.9.

7.1 Was one reason why you did not get the shingles shot because you do not think you will get the disease?

1 Yes
2 No

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

7.2 How did you hear about the shingles vaccination? Was it from:

(READ LIST – MULTIPLE RECORD)
1 CDC website
2 Facebook
3 Television Show (Dr. Oz or Oprah) or radio
4 Newspaper/Magazine or Billboard Advertisement
5 Pharmacy/Store advertisement—intercom or poster, etc
6 Doctor
7 Friends or family
8 Work
9 Other (Please specify) ________________________________

Do not read:
77 Don’t know / Not sure
99 Refused

7.2A Do you know anyone that was sick with shingles?

1 Yes
2 No

Do not read:
7 Don’t know / Not sure
9 Refused

7.2B What would you say is the primary symptom of shingles?

[DO NOT READ LIST]
1 Rash/Itchiness on the face or body
2 Blisters
3 Pain/Tingling of skin
4 Blindness/Sight Complications
5 Other (specify)
7 Don’t Know/Not Sure
9 Refused
7.3 How painful do you think shingles is? Do you think it is:

Please Read:
1 Not at all painful
2 Somewhat painful
3 Moderately painful
4 Very painful

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

7.4 What do you think your chances are of getting sick with shingles during your lifetime? Do you think it is a:

Please Read:
1 Very low, 0 to 29% chance
2 Low, 30 to 49% chance
3 Moderate, 50 to 79% chance
4 High, 80 to 100% chance

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

**Subsection 8: Self Motivation/ Responsibility**

8.1 What was the primary reason that you did not get the shingles vaccination?

**DO NOT READ LIST; CATEGORIZE GIVEN RESPONSES INTO:**

6 Vaccine Cost was too much
7 Inadequate vaccine supplies (went to get vaccine but store did not have it)
8 Recently found out about shingles vaccine /haven’t gotten vaccine yet
9 I don’t have shingles/don’t think I will get shingles/not concerned about shingles
10 I already had shingles and there would be no point in getting shingles vaccine now
6 Doctor did not recommend vaccine (patient either too young or doctor felt vaccine not necessary)
7 Fear of vaccine (safety/allergic reaction concerns) or afraid of needles
8 Vaccine would not help me/ efficacy concerns
9 Other (specify)
77 Don’t Know/Not Sure
99 Refused

8.2 How often do you get the influenza vaccination? Is it:

**[Read if necessary: We are referring to the flu shot. The flu vaccination is either sprayed in the nose or injected in the arm.]**

Please Read:
1 Every year
2 Most years
3 Rarely
4 Have only gotten it once
5 Never

Do Not Read:
7 Don’t Know/Not Sure
9 Refused
8.3 Within the past 10 years, did you get a tetanus shot?

1 Yes
2 No
Do not Read:
7 Don’t Know/Not Sure
9 Refused

ASK Q8.4 IF (MA BRFSS) AGE>=65, ELSE GO TO SUBSECTION 9

8.4 Since your 65th birthday, did you get the pneumococcal vaccination?

[IF NECESSARY: We are referring to the pneumonia shot.]

1 Yes
2 No
Do not Read:
7 Don’t Know/Not Sure
9 Refused

Subsection 9: Doctor Recommendation

9.1 In the past 5 years, did you and your doctor talk about the shingles vaccine?

1 Yes
2 No
Do Not Read:
7 Don’t Know/Not Sure
9 Refused

9.2 Did your doctor or health care professional recommend that you get the shingles vaccine?

1 Yes GO TO N9.4
2 No
Do Not Read:
7 Don’t Know/Not Sure
9 Refused

9.3 Did your doctor or health care professional advise against you getting the shingles vaccine?

1 Yes
2 No
Do Not Read:
7 Don’t Know/Not Sure
9 Refused

ASK N9.4 IF N9.2=YES. ELSE SKIP TO SUBSECTION 10.

9.4 Was one reason why you were not vaccinated for shingles, because you refused the shot even though your doctor recommended it?

1 Yes
2 No
Do Not Read:
7 Don’t Know/Not Sure
9 Refused
Subsection 10: Vaccine Safety and Efficacy

Now I will read a list of reasons why some people decide not to get the shingles shot. For each reason, please tell me if that reason was a major reason, a minor reason, or not a reason in your decision to not get the shingles shot:

10.1 “I do not trust the shingles vaccine.” Was not trusting the shingles vaccine a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1. Major reason
2. Minor reason
3. Not a reason

Do Not Read:
7. Don’t know / Not sure
9. Refused

10.2 “I do not like needles.” Was not liking needles a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1. Major reason
2. Minor reason
3. Not a reason

Do Not Read:
7. Don’t know / Not sure
9. Refused

10.3 “I thought I might get sick from the shingles vaccine.” Was thinking you might get sick from the shot a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1. Major reason
2. Minor reason
3. Not a reason

Do Not Read:
7. Don’t know / Not sure
9. Refused

10.4 “I do not think the shingles vaccine is effective at preventing shingles.” Was thinking that the vaccine is not effective a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1. Major reason
2. Minor reason
3. Not a reason

Do Not Read:
7. Don’t know / Not sure
9. Refused

10.5 Was the cost of the vaccine a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1. Major reason
2. Minor reason
3. Not a reason

Do Not Read:
7. Don’t know / Not sure
9. Refused
10.6 Was inconvenience a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1  Major reason
2  Minor reason
3  Not a reason

Do Not Read:
7  Don’t know / Not sure
9  Refused

10.7 The shingles vaccine is a live virus vaccine. How important was this to your decision not to get the shingles shot?

Please Read:
1  Very important
2  Somewhat important
3  Only a little important
4  Not at all important

Do Not Read:
7  Don’t know / Not sure
9  Refused

10.8 How effective do you think the shingles shot is at preventing shingles? Do you think it is . . .

Please Read:
1  Not at all effective
2  Only a little effective
3  Somewhat effective
4  OR Very effective

Do Not Read:
7  Don’t Know/Not Sure
9  Refused

Subsection 11: Vaccine Supply and Convenience

11.1 Was one reason why you did not get the shingles shot because the vaccine was not available at your doctor’s office?

1  Yes  GO TO Q11.4
2  No

Do Not Read:
7  Don’t Know/Not Sure
9  Refused

11.2 Was one reason why you did not get the shingles shot because the vaccine was not available at your pharmacy?

1  Yes  GO TO Q11.4
2  No

Do Not Read:
7  Don’t Know/Not Sure
9  Refused
11.3 Was one reason why you did not get the shingles shot because the vaccine was not available at any of the local health centers/clinics where you normally get care?

1 Yes
2 No

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

11.4 If you were to get the shingles vaccination, would you be willing to have the pharmacist administer the shingles vaccination in a pharmacy instead of getting the shot in a doctor’s office?

1 Yes
2 No

Do Not Read:
7 Don’t Know/Not Sure
9 Refused

Subsection 12: Vaccine Cost

12.1 Was one reason for not receiving the shingles shot because the shingles vaccine is not recommended for your age group?

1 Yes
2 No

Do not Read:
7 Don’t Know/Not Sure
9 Refused

ASK Q12.2 IF (MA BRFSS) HLTHPLAN=1 (Yes, has health care coverage), ELSE GO TO Q12.4.

12.2 Was one reason why you did not get the shingles shot because your medical insurance would not pay for the shot?

1 Yes
2 No

Do Not Read:  
7 Don’t Know/Not Sure  
9 Refused  

GO TO Q12.4

12.3 Would you get a shingles shot if your medical insurance plan paid the full cost of the vaccination?

1 Yes
2 No

Do Not Read:  
7 Don’t Know/Not Sure  
9 Refused

12.4 Was one reason why you did not get the shingles shot because your cost was too much?

1 Yes
2 No

Do Not Read:  
7 Don’t Know/Not Sure  
9 Refused
As part of your Medicare insurance, do you have a prescription drug plan, also known as Part D?

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
</tr>
</tbody>
</table>

Do Not Read:
- 7 Don't Know/Not Sure
- 9 Refused

What is the most you would be willing to spend on the shingles vaccination?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1</td>
<td>0 to less than $25</td>
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<td>2</td>
<td>$25 to less than $50</td>
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<tr>
<td>3</td>
<td>$50 to less than $100</td>
</tr>
<tr>
<td>4</td>
<td>$100 to less than $200</td>
</tr>
<tr>
<td>5</td>
<td>$200 plus</td>
</tr>
<tr>
<td>6</td>
<td>(VOL) Will never get the shingles shot</td>
</tr>
<tr>
<td>7</td>
<td>(VOL) Don’t Know/Not Sure</td>
</tr>
<tr>
<td>9</td>
<td>(VOL) Refused</td>
</tr>
</tbody>
</table>

Would you get vaccinated if the shingles shot were free?

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<tbody>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
</tr>
</tbody>
</table>

Do Not Read:
- 7 Don't Know/Not Sure
- 9 Refused

**Closing Statement for Non-Vaccinated Arm**

Please read:

That was my last question. I’d like to thank you on behalf of the Massachusetts Department of Public Health and the Centers for Disease Control and Prevention for answering these questions.

If you have any questions about this survey, you may call my supervisor toll-free at 877-286-6318.

If you have questions about your rights as a survey participant, you may call the chairman of the Institutional Review Board at 888-772-4269.

Thank you very much for your time and cooperation. Goodbye.

**MNSRVY CATI**

1. Pretest
2. Main Survey
Appendix B: Qualifications of Interviewers

Survey Staff
Abt SRBI places a high value on the recruitment, qualifications, and monitoring of the telephone interviewing staff. This section outlines the strategies and standards that Abt SRBI employs to ensure the consistent, accurate, and professional administration of surveys by the interviewers.

Interviewer Recruitment
Abt SRBI understands the high turnover of interviewers and the need for nearly constant recruitment. Our locations for interviewing are one advantage to ensuring a large pool of interviewers. We believe the different settings of each of our call centers aids in recruitment and having a constant supply of high-quality interviewers throughout the year. Our Florida office is situated near several college and community college campuses and therefore affords us a large share of students who are interviewers, although we have an impressive number of mature interviewers (retired persons) who have been with us for years. Our New York office also enables us to recruit a large number of talented interviewers and find individuals conversant in nearly any language needed. Our New Jersey call center is located on the Jersey shore and allows us access to retirees and young people willing to interview. Our Massachusetts call center is located near many colleges. Finally, our West Virginia office has a stable labor pool of interviewers of all ages since our call center is one of the most stable employers in the area.

Abt SRBI has a long history of ensuring that talented interviewers remain with the company and often move into management positions. As mentioned, we have former interviewers in nearly all areas of the company. All Abt SRBI supervisors began as interviewers. Interviewers are able to move up in pay and participate in more challenging studies as they accumulate experience. Interviewers are briefed upon hire as to the time and effort required to move up in pay and responsibility.

Interviewer Qualifications
Prospective interviewers must meet three criteria before becoming part of Abt SRBI’s interviewing staff:

- **A minimum high school-level educational standing.** While Abt SRBI’s interviewers must meet minimum high school education standards, many of Abt SRBI’s interviewers exceed this requirement. Abt SRBI’s long-term recruiting strategy includes targeting local colleges with programs and courses in specific fields related to Abt SRBI’s survey research projects. The CATI data collection manager develops relationships with college advisors and program administrators to obtain interviewers experienced in fields such as counseling, community development, nursing, nutritional sciences, public health, psychology, and social work. Interviewers with these types of backgrounds are considered highly eligible for public health survey projects.

- **Communication skills.** Interviewers must exhibit good communication skills and in order to be hired, must first undergo a job interview that seeks to evaluate their abilities in this area. A prospective employee’s performance in the initial interview is generally a good indicator of his or her future performance as a survey interviewer. During this interview, each applicant completes a brief spelling and keyboarding test, reads a standard diagnostic text, and is asked to participate in several role-played
mock interviews. During the initial interview, recruiters assess the applicant’s overall ability to understand, retain, and follow complex instructions related to completing a survey. All interviewers must have a thorough command of the English language; additional languages are considered highly desirable. Bilingual interviewers may be specifically recruited to work on surveys administered in languages other than English.

- **Professional manner.** Abt SRBI’s recruiters are trained to look for clues regarding specific personality traits or qualities of prospective interviewers that will facilitate the tasks of interviewing. Good interviewers are persuasive, patient, calm, compassionate, optimistic, and empathetic. They must maintain a positive, fresh approach in a job that can be repetitive in nature. They must remain alert and focused. They must also remain calm and courteous in the face of potential objections or outright rejection by respondents.

**General Training**

Abt SRBI is known in the industry for its rigorous approach to the recruitment, training, supervision, and monitoring of interviewers. SRBI has assembled a management, operations and interviewing staff with an extremely broad background in survey research. This, combined with our support services for supervising quality control and one of the most exceptional analytic staffs in the country, gives SRBI an unusual ability to provide high quality data collection services in a cost efficient manner.

New interviewers receive special instruction and training in the methods. All new interviewers are thoroughly screened, their references checked and their interviewing abilities tested before being hired as a telephone interviewer. New interviewers receive extensive instruction in the methods and procedures expected at SRBI before they ever perform a single interview. New interviewers are monitored extremely closely during the first two weeks of their employment. Subsequent to this test period their performance is monitored regularly, as are all of our interviewers, twice per shift.

New telephone interviewers must attend, and perform satisfactorily in, a four-hour training session before being permitted to conduct interviews. A general manual on standard interviewing procedures is provided to all new interviewers so that they will understand the basic interviewing standards. In addition, special manuals and training materials are developed for individual projects that require more extensive training or somewhat different data collection procedures. After an initial training session, interviewers are constantly monitored by field supervisors in their application of correct interviewing techniques. Interviewers receive constant feedback from the Field Department on the quality of their work and areas of improvement.

The areas considered important in the general background training of interviewers, regardless of the specific project, include:

- An understanding of sampling procedures and the importance of rigorous adherence to sampling procedures in the field;
- An understanding of respondent selection procedures within a household and the importance of following these procedures as rigorously as unit sampling procedures;
- The role of the interviewer in the survey process;
• Recommended methods for contacting potential respondents and procedures for setting appointments;
• Effective methods for gaining initial agreement to be interviewed, both in person and over the telephone;
• Methods for overcoming initial reluctance to schedule or agree to be interviewed;
• Interviewer behavior in the interview setting — how to be courteous, neutral and non-intrusive;
• How to avoid biasing responses by verbal and non-verbal cues;
• How to ask and record closed-ended questions;
• How to probe and record open-ended questions;
• How to control irrelevancies and digressions without offending the respondent;
• How to reassure respondents about the confidentiality of the information collected and the anonymity of survey respondents;
• The general standards of completion, comprehensibility and legibility required for recording;
• General recording conventions; and,
• Field reporting standards.

After initial training, new interviewers are extensively tested and closely monitored by the supervisory staff. Those prospective interviewers who cannot perform to expectations are not retained. Those who demonstrate an ability to conduct telephone interviews according to our standards become part of our core interviewing staff. These individuals receive additional training on specific projects. The core telephone interview staff for these studies will be recruited from among those individuals who have successfully conducted other important government or executive surveys.
Appendix C: Confidentiality Agreement

Statement of Policy
Abt SRBI is firmly committed to the principle that the confidentiality of individual data obtained through our surveys must be protected. This principle holds whether or not any specific guarantee of confidentiality was given at the time of interview (or self-response), or whether or not specific contractual obligations regarding confidentiality have been entered into.

Procedures for Maintaining Confidentiality

1. All Abt SRBI interviewers sign confidentiality agreements.
2. Survey data containing personal identifiers in Abt SRBI offices is kept in a locked container or a locked room when not being used each working day in routine survey activities. Reasonable caution is exercised in limiting access to survey data to only those persons who are working on the specific project and who have been instructed in the confidentiality requirements for that project.
3. Random identification numbers are assigned to respondents prior to creating a machine-processible record and identifiers such as name and address are not part of the machine record. When identifiers are part of the machine data record, Abt SRBI’s data processing manager determines adequate confidentiality measures in consultation with the project manager. When a separate file is set up containing identifiers or linkage information, which could be used to identify data records, this separate file is kept locked up when not actually being used each day in routine survey activities.
4. When records with identifiers are transmitted to another party, such as for keypunching or key taping, the other party is informed of these procedures and must sign a Confidentiality form.
5. When there are specific contractual obligations to the client regarding confidentiality, the project manager develops additional procedures to comply with the project in these additional procedures. At the end of the period of survey performance, the project manager arranges for proper storage or disposal of survey data according to any particular contractual requirements for storage or disposition. When required to turn over survey data to our clients, we provide proper safeguards to ensure confidentiality up to the time of delivery.
6. Project managers ensure that survey practices adhere to the provisions of the U.S. Privacy Act of 1974 with regards to surveys of individuals for the Federal Governments. Project managers ensure that procedures are established in each survey to inform each respondent of the authority for the survey, the purpose and use of the survey, the voluntary nature of the survey (where applicable) and the effects on the respondents, if any, of not responding.
Confidentiality Agreement

Abt SRBI, Inc. Market and Opinion Research
7431 College Parkway, Suite A
Fort Myers, FL 33907

Confidentiality Agreement

Abt SRBI, Inc. provides an essential and valuable community service through the research of public information on a broad range of topics. Our projects often involve sensitive and confidential information from our clients and from our respondents. Truthful and accurate respondent and sponsor information is critical to the accuracy of the survey results and procedures.

As a result, the nature of the information surveyed requires a commitment of confidentiality to protect clients’ and respondents’ rights to privacy. Frequently, a commitment of confidentiality is a prerequisite to facilitate participation by respondents. Therefore, a commitment of confidentiality to its respondents and survey sponsors is important. Because unauthorized breaches of that confidentiality would violate assurances that are essential to obtaining truthful and accurate information, thereby impinging on our ability to produce accurate and reliable products, unauthorized disclosure of research information would result in a greater harm than benefit to the public interest. As a result, we request that each employee read and sign the following confidentiality agreement as a condition of employment.

I HEREBY AGREE NOT TO RELEASE THE FOLLOWING PRIVILEGED INFORMATION TO ANY PERSONNEL WITHOUT PROPER AUTHORIZATION FROM A DULY AUTHORIZED EMPLOYEE OR AGENT:

1. Information leading to the identification of a survey respondent.
2. Individual survey responses.

__________________________
Signature

__________________________
Date
## Appendix D: Quality Assurance Form

<table>
<thead>
<tr>
<th>DATE</th>
<th>KEY NUMBER</th>
<th>INTERVIEWER</th>
<th>TIME START AM/PM</th>
<th>TIME END AM/PM</th>
<th>MONITOR</th>
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### Introduction

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<td>1</td>
<td>2</td>
<td>3</td>
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#### Verifies Telephone Number
1 2 3 4 5

#### SCREENING: Executes Respondent Selection Process Correctly
1 2 3 4 5

#### SCREENING: Makes CB for Appropriate Respondent
1 2 3 4 5

#### REFCON: Answers Respondent’s Questions Appropriately
1 2 3 4 5

#### REFCON: Interviewer Sounds Confident
1 2 3 4 5

#### REFCON: Persuades Respondent To Continue
1 2 3 4 5

#### REFCON: Goes From Intro to First Question Quickly
1 2 3 4 5

### Survey

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<tbody>
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<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

#### ATTITUDE: Interviewer Sounds Confident & Enthusiastic
1 2 3 4 5

#### ATTITUDE: Interviewer Does Not Sound Bored/Sarcastic
1 2 3 4 5

#### DELIVERY: Reads Verbatim
1 2 3 4 5

#### DELIVERY: Pronunciation
1 2 3 4 5

#### DELIVERY: Speech is Clear - Enunciation
1 2 3 4 5

#### PACE: Does Not Hurry Respondent
1 2 3 4 5

#### PACE: Respectful Control of Respondent Rambling
1 2 3 4 5

#### ADMIN: Accurate Data Entry of Answers
1 2 3 4 5

#### ADMIN: Effective & Neutral Category Probing
1 2 3 4 5

#### DELIVERY: Smooth & Professional Closing of Interview
1 2 3 4 5

### General Administration

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<tr>
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</table>

#### Courtesy & Politeness
1 2 3 4 5

Would you want to be interviewed by this Interviewer on a survey? Yes No
## Appendix E: Population Distributions

### Dimension 1. Race/Ethnicity

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<thead>
<tr>
<th>Race/Ethnicity</th>
<th>2011 ACS 50+ Pop</th>
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<tbody>
<tr>
<td>Hispanic</td>
<td>93,541</td>
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<tr>
<td>NH white</td>
<td>1,868,137</td>
</tr>
<tr>
<td>NH black</td>
<td>94,035</td>
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<tr>
<td>NH other</td>
<td>99,312</td>
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### Dimension 2. Educational attainment

<table>
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<th>Educational attainment</th>
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<tr>
<td>LT HS</td>
<td>286,808</td>
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<tr>
<td>HS grad</td>
<td>631,533</td>
</tr>
<tr>
<td>Some college</td>
<td>510,447</td>
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<tr>
<td>College grad</td>
<td>726,237</td>
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### Dimension 3. Age Group by Sex

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<tr>
<th>Marital status</th>
<th>2011 ACS 50+ Pop</th>
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<tbody>
<tr>
<td>Married</td>
<td>1,289,160</td>
</tr>
<tr>
<td>Never married</td>
<td>218,044</td>
</tr>
<tr>
<td>Divorced, widowed, separated</td>
<td>647,821</td>
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</table>

### Dimension 4. Age Group by Race/Ethnicity

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<th>Age group</th>
<th>Race/Ethnicity</th>
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<tbody>
<tr>
<td>50-59</td>
<td>NH white</td>
<td>1,096,391</td>
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<tr>
<td></td>
<td>Non-white</td>
<td>196,532</td>
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<tr>
<td>65+</td>
<td>NH white</td>
<td>771,746</td>
</tr>
<tr>
<td></td>
<td>Non-white</td>
<td>90,356</td>
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### Dimension 5. Sex by Race/Ethnicity

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<thead>
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<th>Gender</th>
<th>Race/Ethnicity</th>
<th>2011 ACS 50+ Pop</th>
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<tbody>
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<td>Male</td>
<td>NH white</td>
<td>856,462</td>
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### Dimension 6. Age Group by Sex

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Appendix F: Final Disposition Classification

The following are the final dispositions used for the BRFSS Shingles Follow-up Survey.

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<th>Code</th>
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<td>Household, not known if respondent eligible</td>
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<tr>
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<td>Physical or mental impairment (household level)</td>
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<tr>
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<td>Break off/termination within questionnaire</td>
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<td>Language barrier (household level)</td>
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<td>2210</td>
<td>Respondent never available</td>
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<td>On never call list</td>
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<td>Household answering device</td>
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<td>Respondent physically or mentally unable to complete interview</td>
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<td>Unknown if housing unit</td>
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<td>Answering device, unknown if residence or respondent eligible</td>
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<td>Non residence</td>
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<td>Household, no eligible respondent</td>
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<td>Frequency</td>
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**Response Rate**: 47.4%

**Follow-up Rate**: 74.0%
Table 10
Frequency of Dispositions – Vaccinated Adults

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<th>Disposition Code</th>
<th>White Males 50-64</th>
<th>White Males 65+</th>
<th>White Females 50-64</th>
<th>White Females 65+</th>
<th>Non-White Adults</th>
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Response Rate 46.3% 40.1% 45.9% 51.9% 22.7%

Follow-up Rate 66.3% 60.3% 66.4% 80.1% 34.6%
Table 11
Frequency of Dispositions – Non-Vaccinated Adults

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Response Rate  53.6%  48.6%  14.2%  63.7%  48.7%  15.4%  17.3%

Follow-up Rate  80.5%  77.7%  22.0%  92.6%  88.1%  22.4%  27.9%
Appendix I  Propensity, Response and Refusal Rates & Vaccination

Verification Status

Survey Response Propensity Predictors (Non-Response Bias)*

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<th>Significant Predictors</th>
<th>Non-Significant Predictors</th>
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<tr>
<td>Propensity of 50+ BRFSS Respondent Agreeing for Re-Contact</td>
<td>Propensity of shingles survey respondents completing survey</td>
</tr>
<tr>
<td>Educational attainment</td>
<td>Gender</td>
</tr>
<tr>
<td>Age group</td>
<td>Age group&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td>Race/Ethnicity&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Marital status</td>
<td>Marital status&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Vaccinated for shingles vaccine</td>
<td>Vaccinated for shingles vaccine</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Less than high school, high school grad, some college or technical school, college grad.

<sup>b</sup> 50-54, 55-59, 60-64, 65-69, 70-74, 75+.

<sup>c</sup> Hispanic, non-Hisp white, non-Hisp black, non-Hisp Asian/other.

<sup>d</sup> Married, divorced/widowed/ separated, never married.

<sup>e</sup> Excellent, very good, good, fair, poor.

*Information adapted from Abt SRBI 2012 Massachusetts BRFSS Shingles Follow-Up Survey Methodology Report, June 2013. ps 24-26; presented in Appendix H.

The response rate (calculated by Abt SRBI) for the shingles survey was 47.4%. This factored in the BRFSS refusal rate, number of ineligibles, ineligibles lost to follow up. The overall study response rate (2012 MA BRFSS response rate multiplied by the shingles response rate) is 21.3% (using an internally calculated CDC rate). The overall agreement rate, or percentage of respondents who agreed in the State BRFSS to participate in the follow-up shingle survey divided by number of eligible was 64.1%. The shingle survey overall follow-up rate, or the
percent of respondents who were interviewed from the “agreed to survey” cohort,” factoring in sampling fraction, refusals, and lose to follow up, was 74.0%. The overall response rate, which considers the follow-up and agreement rate, or also the ratio of completed interviews divided by all eligible units, (CASRO, 1982) was 47.4%. The overall refusal rate, which considers those who agreed and refused over those interviewed, refused and lost to follow-up, was 40.4%. The overall completion rate, calculated as the number of completed interviews divided by the re-contacted sample, and which takes into account research design complexities, e.g. ineligibles from the filter screening panel, eligible loss to follow up, and refusal, was 40%. The highest completion rate was in the younger white male subgroup (62%) and older white female (65%) groups. The lowest completion rate was in the non-white male group of both ages (16%) and younger non-white females (19%).

Three ratios were required to calculate the Council of American Survey Research Organizations (CASRO) and obtain cell-specific response rate for the sub- sampled populations (Non-White Males, Non-White Females, White males, White females): (1) resolution rate, or “percentage of total telephone numbers that can be classified as non-working, non-residential, or residential,”

(2) screening completion rate, or “percentage of known households that are successfully screened for the presence of eligible” respondents, and (3) cooperation rate, or “percentage of households that complete the household interview”), otherwise known as the response rate (Nonresponse in Social Science Survey, 2013, p. 18, 2nd paragraph, 1st, 2nd, 3rd and 4th sentences), however, considering the complex research design, sampling and difficulty with re-contacting
eligible participants, and to assess “patterns of non-response,” only response rates and sub-group resolution rates are available.
### Eligibility, Re-Contact & Follow Up Response, and Refusal Rates

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<th>Group</th>
<th>Eligible BRFSS</th>
<th>Ineligible BRFSS</th>
<th>Refused in BRFSS</th>
<th>Agreed to Follow-Up</th>
<th>Agreement Rate(^b)</th>
<th>Shingles Survey Sample(^c)</th>
<th>Eligible Lost(^e)</th>
<th>Call Back Refused</th>
<th>Inter-viewed</th>
<th>Completion Rate(^d)</th>
<th>P(^f)</th>
<th>Follow-up Rate(^g)</th>
<th>Response Rate(^h)</th>
<th>Refusal Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>10,624</td>
<td>4,283</td>
<td>1,460</td>
<td>6,811</td>
<td>64.1%</td>
<td>2,528</td>
<td>1,467</td>
<td>61</td>
<td>1,000</td>
<td>0.40</td>
<td>0.20</td>
<td>74.0%</td>
<td>47.4%</td>
<td>40.4%</td>
</tr>
<tr>
<td>VACCINATED</td>
<td>146</td>
<td>14</td>
<td>44</td>
<td>102</td>
<td>69.9%</td>
<td>88</td>
<td>27</td>
<td>6</td>
<td>55</td>
<td>0.62</td>
<td>0.81</td>
<td>66.3%</td>
<td>46.3%</td>
<td>37.4%</td>
</tr>
<tr>
<td>White Male 50–64</td>
<td>422</td>
<td>29</td>
<td>141</td>
<td>281</td>
<td>66.6%</td>
<td>252</td>
<td>95</td>
<td>14</td>
<td>143</td>
<td>0.56</td>
<td>0.84</td>
<td>60.3%</td>
<td>40.1%</td>
<td>39.3%</td>
</tr>
<tr>
<td>White Male 65+</td>
<td>247</td>
<td>24</td>
<td>76</td>
<td>171</td>
<td>69.2%</td>
<td>157</td>
<td>55</td>
<td>2</td>
<td>90</td>
<td>0.57</td>
<td>0.79</td>
<td>66.4%</td>
<td>45.9%</td>
<td>32.2%</td>
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<tr>
<td>White Female 50–64</td>
<td>847</td>
<td>254</td>
<td>181(^j)</td>
<td>549</td>
<td>64.8%</td>
<td>295</td>
<td>98</td>
<td>5</td>
<td>192</td>
<td>0.65</td>
<td>0.44</td>
<td>80.1%</td>
<td>51.9%</td>
<td>37.3%</td>
</tr>
<tr>
<td>White Female 65+</td>
<td>113</td>
<td>7</td>
<td>39</td>
<td>74</td>
<td>66.5%</td>
<td>67</td>
<td>42</td>
<td>5</td>
<td>20</td>
<td>0.30</td>
<td>0.78</td>
<td>34.6%</td>
<td>22.7%</td>
<td>43.2%</td>
</tr>
<tr>
<td>Non-White adults 50+</td>
<td>1,579</td>
<td>798</td>
<td>129(^j)</td>
<td>1,051</td>
<td>66.6%</td>
<td>253</td>
<td>158</td>
<td>5</td>
<td>90</td>
<td>0.35</td>
<td>0.11</td>
<td>80.5%</td>
<td>53.6%</td>
<td>37.9%</td>
</tr>
<tr>
<td>UNVACCINATED</td>
<td>1,179</td>
<td>533</td>
<td>124(^j)</td>
<td>737</td>
<td>62.5%</td>
<td>204</td>
<td>120</td>
<td>6</td>
<td>78</td>
<td>0.38</td>
<td>0.14</td>
<td>77.7%</td>
<td>48.6%</td>
<td>43.5%</td>
</tr>
<tr>
<td>White Male 50–64</td>
<td>2,535</td>
<td>1,565</td>
<td>81(^j)</td>
<td>1,743</td>
<td>68.8%</td>
<td>178</td>
<td>91</td>
<td>2</td>
<td>85</td>
<td>0.47</td>
<td>0.05</td>
<td>92.6%</td>
<td>63.7%</td>
<td>33.4%</td>
</tr>
<tr>
<td>White Male 65+</td>
<td>2,193</td>
<td>1,005</td>
<td>174(^j)</td>
<td>1,211</td>
<td>55.2%</td>
<td>206</td>
<td>119</td>
<td>2</td>
<td>85</td>
<td>0.41</td>
<td>0.08</td>
<td>88.1%</td>
<td>48.7%</td>
<td>46.9%</td>
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<tr>
<td>White Female 50–64</td>
<td>465</td>
<td>22</td>
<td>164</td>
<td>301</td>
<td>64.7%</td>
<td>279</td>
<td>229</td>
<td>4</td>
<td>46</td>
<td>0.16</td>
<td>0.69</td>
<td>22.0%</td>
<td>14.2%</td>
<td>37.2%</td>
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<tr>
<td>Non-white males 50+</td>
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<td></td>
</tr>
<tr>
<td>Non-White Femal e 50–64</td>
<td>518</td>
<td>18</td>
<td>163</td>
<td>355</td>
<td>68.5%</td>
<td>337</td>
<td>269</td>
<td>5</td>
<td>63</td>
<td>0.19</td>
<td>0.79</td>
<td>22.4%</td>
<td>15.4%</td>
<td>33.2%</td>
</tr>
<tr>
<td>Non-White Femal e 65+</td>
<td>380</td>
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<td>144</td>
<td>236</td>
<td>62.1%</td>
<td>222</td>
<td>164</td>
<td>5</td>
<td>53</td>
<td>0.24</td>
<td>0.81</td>
<td>27.9%</td>
<td>17.3%</td>
<td>40.5%</td>
</tr>
</tbody>
</table>
Eligibility, Re-Contact & Follow Up Response, and Refusal Rates (cont.)

a. Number cooperated from BRFSS for follow-up post screening.
b. Screening cooperation rate.
c. Number selected for shingles survey based on sampling fraction, by strata.
d. Completion rate calculated as number of sampled divided by completed interviews by subgroup.
e. Respondents ineligible because lack of awareness of the shingles vaccine (S8) and/or unwillingness to consent (S5).
f. \[ P = \frac{\text{Interviewed} + \text{Refused in Callback}}{\text{Interviewed} + \text{Refused in Callback} + \text{Ineligible}} \]
g. Follow-up rate = \[ \frac{\text{Interviewed}}{\text{Interviewed} + \text{Refused in Callback} + (P \times \text{Eligibles Lost})} \]
h. Response Rate = Follow-up Rate \times Agreement Rate

i. Refusal Rate = \[ \frac{[1 - \text{Agreement Rate} + \text{Refused in Callback}]}{\text{Interviewed} + \text{Refused in Callback} + (P \times \text{Eligibles Lost})} \]
j. Indicates that actual refusal number was multiplied by the sampling fraction for this group.
k. Category collapsed to include Non-White Male 50–64 and Non-White Male 65+.
l. Category collapsed to include Non-White Males and non-White Females.

*Table adapted from Abt SRBI 2012 Massachusetts BRFSS Shingles Follow-Up Survey Methodology Report, June 2013 (Tables 5 and 6); [presented in Appendix H.]*
<table>
<thead>
<tr>
<th>Vaccinated</th>
<th>Vaccination Reported Status</th>
<th>Change in Vaccination Status</th>
<th>Final Vaccination Status Counts</th>
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<tbody>
<tr>
<td>Vaccinated</td>
<td>2012 BRFSS</td>
<td>2012 Shingles Survey</td>
<td></td>
</tr>
<tr>
<td>White Male 50–64</td>
<td>55</td>
<td>55</td>
<td>NC</td>
</tr>
<tr>
<td>White Male 65+</td>
<td>143</td>
<td>143</td>
<td>NC</td>
</tr>
<tr>
<td>White Female 50–64</td>
<td>90</td>
<td>90</td>
<td>NC</td>
</tr>
<tr>
<td>White Female 65+</td>
<td>192</td>
<td>192</td>
<td>NC</td>
</tr>
<tr>
<td>Non-white Male 50 – 64</td>
<td>1</td>
<td>1</td>
<td>NC</td>
</tr>
<tr>
<td>Non-White Male 65+</td>
<td>3</td>
<td>3</td>
<td>NC</td>
</tr>
<tr>
<td>Non-white Female 50 – 64</td>
<td>4</td>
<td>4</td>
<td>NC</td>
</tr>
<tr>
<td>Non-White Female 65+</td>
<td>12</td>
<td>12</td>
<td>NC</td>
</tr>
<tr>
<td>SUBTOTAL</td>
<td>500</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Unvaccinated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White Male 50 – 64</td>
<td>90</td>
<td>90</td>
<td>NC</td>
</tr>
<tr>
<td>White Male 65+</td>
<td>78</td>
<td>71</td>
<td>C</td>
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<td>White Female 50 – 64</td>
<td>85</td>
<td>81</td>
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<td>85</td>
<td>75</td>
<td>C</td>
</tr>
<tr>
<td>Non-white Male 50 – 64</td>
<td>25</td>
<td>23</td>
<td>C</td>
</tr>
<tr>
<td>Non-White Male 65+</td>
<td>21</td>
<td>18</td>
<td>C</td>
</tr>
<tr>
<td>Non-white Female 50 – 64</td>
<td>63</td>
<td>61</td>
<td>C</td>
</tr>
<tr>
<td>Non-White Female 65+</td>
<td>53</td>
<td>52</td>
<td>C</td>
</tr>
<tr>
<td>SUBTOTAL</td>
<td>500</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

| TOTAL               |                             |                             |                                 |
|                     | 1,000                       |                             | 29                              | 1,000                           |

a. NC=No Change in vaccination status after participating in MA BRFSS and before shingles survey; C= Change in respondent vaccination status after participating in MA BRFSS and before shingles survey.
b. Final vaccination status count takes into account total subgroup vaccinated status of respondents who reported being vaccinated after participating in MA BRFSS.

*Table adapted from Abt SRBI 2012 Massachusetts BRFSS Shingles Follow-Up Survey Methodology Report, June 2013 (Table 7); [presented in Appendix H.]
Appendix J    Shingles Survey Raw Data

Raw data, expressed as percent (%), is presented below for each question. Cumulative percent may not add up to 100% due to decimal rounding.

Panel Filter Segment

S.7 Do you know about a medical condition called shingles?
   1   Yes           99%
   2   No            1%

S.8 Are you aware that there is a vaccine to prevent shingles?
   1   Yes           100%

S.9 Have you had the shingles vaccination?
   1   Yes           53%
   2   No            47%

S.10 Previously when you were interviewed, you said that you had NOT had the shingles vaccination but just now you said that you HAVE HAD the shingles vaccination. Have you had the shingles vaccination since your interview?
   1   Yes           100%

Vaccinated Status (VACSTAT2)
   1   Vaccinated    53%
   2   Unvaccinated  47%
VACCINATED PANEL SHINGLES CALL BACK SURVEY QUESTIONS

I. Awareness of Shingles and Shingles Vaccine

1.1 When you decided to get the shingles vaccination, how important was it for you to prevent getting shingles? Was it:

Please read:

1. Not at all important  1%
2. A little important     3%
3. Somewhat important    17%
4. Extremely important   79%

Do not read:

7. Don’t know / Not sure  1%

1.2 How did you hear about the shingles vaccination? Was it from:

(READ LIST – MULTIPLE RECORD)

1. CDC website
2. Facebook
3. Television Show (Dr. Oz or Oprah) or radio
4. Newspaper/Magazine or Billboard Advertisement
5. Pharmacy/Store advertisement—intercom or poster, etc
6. Doctor
7. Friends or family
8. Work
9. Other (Please specify) ________________________________

Do not read:

77. Don’t know / Not sure
99. Refused
1.2 *Do you know anyone who was sick with shingles?*

1. Yes 84%
2. No 16%

**Do not read:**
3. Don’t know/Not sure 1%

1.3 *When you decided to get the shingles vaccination, how important was it that someone in your family or among your friends had already been sick with shingles? Was it:*

**Please read:**
1. Not at all important 10%
2. A little important 3%
3. Somewhat important 22%
4. Extremely important 63%

**Do not read:**
7. Don’t know / Not sure 3%

1.4 *When you decided to get the shingles vaccination, how important was hearing from your friends that you should get the shingles shot? Was it:*

**Please read:**
1. Not at all important 42%
2. A little important 13%
3. Somewhat important 21%
4. Extremely important 21%

**Do not read:**
7. Don’t know / Not sure 4%

1.5 *When you decided to get the shingles vaccination, how important was hearing from your family that you should get the shingles shot? Was it:*

**Please read:**
1. Not at all important 45%
2. A little important 10%
3. Somewhat important 16%
4. Extremely important 25%

**Do not read:**
7. Don’t know / Not sure 3%
9. Refused 1%
1.5A What would you say is the primary symptom of shingles?

[DO NOT READ LIST]

1. Rash/Itchiness on the face or body 35%
2. Blisters 3%
3. Pain/Tingling of skin 54%
4. Blindness/Sight Complications 0%
5. Other (specify) 2%
7. Don’t Know/Not Sure 6%

1.6 How painful do you think shingles is? Do you think it is:

Please Read:
1. Not at all painful 0.2%
2. Somewhat painful 1%
3. Moderately painful 7%
4. Very painful 89%

Do Not Read:
7. Don’t Know/Not Sure 3%

1.7 Before you were vaccinated with the shingles vaccine, what did you think your chances were of getting sick with shingles during your lifetime? Would you say that it was:

Please read:
1. Very low, 0 to 29% chance 17%
2. Low, 30 to 49% chance 19%
3. Moderate, 50 to 79% chance 42%
4. High, 80 to 100% chance 15%

Do not read:
7. Don’t know / Not sure 7%

1.8 Now that you got the shingles shot, what do you think your chances are of getting sick with shingles during your lifetime? Would you say that it is:

Please read:
1. Very low, 0 to 29% chance 68%
2. Low, 30 to 49% chance 20%
3. Moderate, 50 to 79% chance 8%
4. High, 80 to 100% chance 2%

Do not read:
7. Don’t know / Not sure 2%
II. Self-Motivation/Responsibility

2.2 Was one reason why you got the shingles vaccination because you wanted to take care of your health and be healthy?
   1. Yes 97%
   2. No 3%

2.2A What part of the shingles disease were you hoping to avoid by getting vaccinated?
   [DO NOT READ LIST]
   1. Rash/Itchiness on the face or body 10%
   2. Blisters 1%
   3. Pain/Tingling of skin 71%
   4. Blindness/Sight Complications 1%
   5. Other (specify) 17%
   6. Don’t Know/Not Sure 11%

2.3 Was one reason why you got the shingles vaccination because you didn’t want to miss work or lose pay?
   1. Yes 29%
   2. No 70%

2.4 How often do you get the influenza vaccination? Is it:
   Please Read:
   1. Every year 79%
   2. Most years 6%
   3. Rarely 3%
   4. Have only gotten it once 7%
   5. Never 4%

2.5 Within the past 10 years, did you get a tetanus shot?
   1. Yes 80%
   2. No 12%
   Do not Read:
   7. Don’t Know/Not Sure 8%

2.6 Since your 65th birthday, did you get the pneumococcal vaccination?
   1. Yes 75%
   2. No 16%
   Do not Read:
   7. Don’t Know/Not Sure 9%
III. Doctor Recommendation

3.1 *In the past 5 years, did you and your doctor talk about the shingles vaccine?*

1 Yes 78%
2 No 20%
Do not Read:
7 Don’t Know/Not Sure 3%

3.2 *Did your doctor or healthcare professional bring up the topic of getting the shingles shot, or did you?*

Please Read:
1 You brought up the topic 44%
2 Your doctor or health care professional brought up the topic 50%
Do Not Read:
7 Don’t know / Not sure 6%

3.3 *Did your doctor or health care professional recommend that you get the shingles vaccination?*

1 Yes 83%
2 No 15%
Do not Read:
7 Don’t Know/Not Sure 2%

3.4 *Did your doctor or health care professional advise against you getting the shingles vaccine?*

1 Yes 9%
2 No 91%

3.5 *You stated that your doctor advised against you getting the shingles vaccination, yet you still got the shingles vaccine?*

1 Yes 100%
IV. Vaccine Safety and Efficacy

4.1 How safe do you think the shingles vaccination is? Would you say it is:

Please Read:
1. Not at all safe 0.4%
2. A little safe 1%
3. Somewhat safe 11%
4. Very safe 84%

Do Not Read:
7. Don’t Know/Not Sure 4%

4.2 Before you got vaccinated, did you know that the shingles vaccination is a live virus vaccine?

1. Yes 73%
2. No 21%

Do not Read:
7. Don’t Know/Not Sure 6%

4.3 If you had known that the vaccination is a live virus, would you have still gotten the vaccine?

1. Yes 88%
2. No 7%

Do not Read:
7. Don’t Know/Not Sure 5%

4.4 How effective do you think the shingles shot is at preventing shingles?

Please Read:
1. Not at all effective 1%
2. Only a little effective 1%
3. Somewhat effective 23%
4. Very effective 69%

Do Not Read:
7. Don’t know / Not sure 7%
V. VACCINE SUPPLY AND CONVENIENCE

5.1 How convenient was it to get the shingles shot?

Please Read:
1. Not at all convenient 8%
2. A little convenient 4%
3. Somewhat convenient 13%
4. Very convenient 75%

1.2. Where did you get the shingles shot? Was it at the:

Please Read:
1. Doctor’s office 69%
2. Pharmacy/retail stores 12%
3. Vaccination clinics 6%
4. Health Department or other public clinic 6%
5. Veteran’s administration 3%
6. Senior centers or assisted living settings 0.4%
7. Hospital 3%
8. Don’t know / Not sure 1%

5.3 Did that location have the shingles vaccine available for you right away?

Please Read:
1. Yes, the vaccine was available right away 65%
2. No, the vaccine had to be ordered 31%
7. Don’t know / Not sure 3%

5.4 Did the pharmacist administer the shingles shot at the pharmacy or did you have to pick the vaccine up at the pharmacy and bring it to your doctor’s office so that your doctor could give you the shot?

Please Read:
1. The vaccine was administered by the pharmacist in the pharmacy 84%
2. You picked up the vaccine in the pharmacy and brought it to a doctor’s office for them to give it. 14%
7. Don’t know / Not sure 2%
5.5A: **Did the Pharmacy transport the vaccine to the doctor’s office?** *Yes OR No*
- 1 Yes 22%
- 2 No 78%

5.5B **Did the Pharmacy give you a package with ice for the vaccine so you could take it back to your doctor?** *Yes OR No*
- 1 Yes 43%
- 2 No 57%

5.5C: **Did you come to the pharmacy with your own icepack for the vaccine?** *Yes OR No*
- 1 Yes 75%
- 2 No 25%

5.5D: **Did you transport the vaccine to the doctor’s office without ice?**
- 1 Yes 100%
- 2 No

5.6 **About how long did it take to go from the pharmacy to your doctor’s office so you could get your shingles shot?**
**Please Read:**
- 1 Less than 30 minutes 100%

5.7 **Would you have been willing to have the pharmacist administer the shingles vaccine in a pharmacy instead of getting the shot in a doctor’s office?**
- 1 Yes 89%
- 2 No 11%

### VI. Vaccine Cost

1.1. **How much did you pay to receive the vaccination?** *Please include any co-payments or co-insurance fees. Was it:*
**Please Read:**
- 1 0 to less than $25 62%
- 2 $25 to less than $50 8%
- 3 $50 to less than $100 6%
- 4 $100 to less than $200 6%
- 5 $200 plus 6%
**Do Not Read:**
- 7 Don’t know / Not sure 13%
6.2 Did you have to file a medical insurance claim to your insurance company to be reimbursed for the shingles shot?

Please Read:
1. Yes 10%
2. No 85%

Do Not Read:
7. Don’t know / Not sure 5%

6.3 Who filed the medical insurance claim for you? Was it the:

Please Read:
1. Physician or office staff 55%
2. Pharmacy 10%
3. Patient (you) 29%
4. Spouse/caregiver 2%
5. Someone else (Please specify) ________________ 2%

Do Not Read:
7. Don’t know / Not sure 2%

6.4 Did your medical insurance company reimburse you for the shingles vaccination?

1. Yes 60%
2. No 26%

Do Not Read:
7. Don’t know / Not sure 14%

6.5 As part of your Medicare insurance, do you have a prescription drug plan, also known as Part D?

1. Yes 62%
2. No 32%

Do Not Read:
7. Don’t know / Not sure 6%
UNVACCINATED PANEL SHINGLES CALL BACK SURVEY QUESTIONS

I. Awareness of Shingles and Shingles Vaccine

1.1. Was one reason why you did not get the shingles shot because you do not think you will get the disease?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
</tr>
</tbody>
</table>

Do Not Read:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Don’t Know/Not Sure</td>
</tr>
</tbody>
</table>

7.2. How did you hear about the shingles vaccination? Was it from:

(READ LIST –MULTIPLE RECORD)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CDC website</td>
</tr>
<tr>
<td>2</td>
<td>Facebook</td>
</tr>
<tr>
<td>3</td>
<td>Television Show (Dr. Oz or Oprah) or radio</td>
</tr>
<tr>
<td>4</td>
<td>Newspaper/Magazine or Billboard Advertisement</td>
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<tr>
<td>5</td>
<td>Pharmacy/Store advertisement—intercom or poster, etc</td>
</tr>
<tr>
<td>6</td>
<td>Doctor</td>
</tr>
<tr>
<td>7</td>
<td>Friends or family</td>
</tr>
<tr>
<td>8</td>
<td>Work</td>
</tr>
<tr>
<td>9</td>
<td>Other (Please specify) ________________________________</td>
</tr>
</tbody>
</table>

Do not read:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>77</td>
<td>Don’t know / Not sure</td>
</tr>
<tr>
<td>99</td>
<td>Refused</td>
</tr>
</tbody>
</table>
7.2A Do you know anyone that was sick with shingles?
1 Yes 74%
2 No 27%

7.2B What would you say is the primary symptom of shingles?
[DO NOT READ LIST]
1 Rash/Itchiness on the face or body 34%
2 Blisters 5%
3 Pain/Tingling of skin 47%
4 Blindness/Sight Complications 0.2%
5 Other (specify) 3%
6 Don’t Know/Not Sure 11%

7.3 How painful do you think shingles is? Do you think it is:
Please Read:
1 Not at all painful 0.2%
2 Somewhat painful 3%
3 Moderately painful 9%
4 Very painful 84%
Do Not Read:
7 Don’t Know/Not Sure 4%
7.4 What do you think your chances are of getting sick with shingles during your lifetime? Do you think it is a:

Please Read:
1. Very low, 0 to 29% chance 24%
2. Low, 30 to 49% chance 24%
3. Moderate, 50 to 79% chance 31%
4. High, 80 to 100% chance 11%

Do Not Read:
7. Don’t Know/Not Sure 10%

VIII. SELF MOTIVATION/ RESPONSIBILITY

8.1 What was the primary reason that you did not get the shingles vaccination?

DO NOT READ LIST; categorize given responses into:

1. Vaccine Cost was too much 6%
2. Inadequate vaccine supplies (went to get vaccine but store did not have it) 2%
3. Recently found out about shingles vaccine /haven’t gotten vaccine yet 9%
4. I don’t have shingles/don’t think I will get shingles/not concerned about shingles 22%
5. I already had shingles and there would be no point in getting shingles vaccine now 8%
6. Doctor did not recommend vaccine (too young, or not necessary) 19%
7. Fear of vaccine (safety/allergic reaction concerns) or afraid of needles 10%
8. Vaccine would not help me/ efficacy concerns 3%
9. Other (specify) 20.4%
77. Don’t Know/Not Sure 2%

8.2 How often do you get the influenza vaccination? Is it:

Please Read:

1. Every year 55%
2. Most years 9%
3. Rarely 7%
4. Have only gotten it once 8%
5. Never 21%

8.3 Within the past 10 years, did you get a tetanus shot?

1. Yes 74%
2. No 19%

8.4 Since your 65th birthday, did you get the pneumococcal vaccination?

1. Yes 54%
2. No 37%

Do not Read:
7. Don’t Know/Not Sure 4%
IX. DOCTOR RECOMMENDATION

9.1 In the past 5 years, did you and your doctor talk about the shingles vaccine?

1. Yes 28%
2. No 70%
Do Not Read:
7. Don’t Know/Not Sure 2%

N9.2 Did your doctor or health care professional recommend that you get the shingles vaccine?

1. Yes 17%
2. No 81%
Do Not Read:
7. Don’t Know/Not Sure 2%

N9.3 Did your doctor or health care professional advise against you getting the shingles vaccine?

1. Yes 6%
2. No 93%
Do Not Read:
7. Don’t Know/Not Sure 2%

N9.4 Was one reason why you were not vaccinated for shingles, because you refused the shot even though your doctor recommended it?

1. Yes 30%
2. No 71%

X. VACCINE SAFETY AND EFFICACY

10.1 “I do not trust the shingles vaccine.” Was not trusting the shingles vaccine a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1. Major reason 10%
2. Minor reason 14%
3. Not a reason 75%
Do Not Read:
7. Don’t know / Not sure 1%

10.2 “I do not like needles.” Was not liking needles a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1. Major reason 6%
2. Minor reason 11%
3. Not a reason 83%
10.3 “I thought I might get sick from the shingles vaccine.” Was thinking you might get sick from the shot a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1. Major reason
2. Minor reason
3. Not a reason

Do Not Read:
7. Don’t know / Not sure

11% 16% 72%

10.4 “I do not think the shingles vaccine is effective at preventing shingles.” Was thinking that the vaccine is not effective a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1. Major reason
2. Minor reason
3. Not a reason

Do Not Read:
7. Don’t know / Not sure

4% 12% 76%

10.5 Was the cost of the vaccine a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1. Major reason
2. Minor reason
3. Not a reason

Do Not Read:
7. Don’t know / Not sure

10% 8% 78%

10.6 Was inconvenience a major reason, a minor reason, or not a reason in your decision not to get the shingles shot?

1. Major reason
2. Minor reason
3. Not a reason

1. Major reason
2. Minor reason
3. Not a reason

4% 13% 83%
10.7 *The shingles vaccine is a live virus vaccine. How important was this to your decision not to get the shingles shot?*

Please Read:

1. Very important 17%
2. Somewhat important 10%
3. Only a little important 11%
4. Not at all important 60%

Do Not Read:

7. Don’t know / Not sure 2%

10.8 *How effective do you think the shingles shot is at preventing shingles? Do you think it is*

Please Read:

1. Not at all effective 2%
2. Only a little effective 7%
3. Somewhat effective 26%
4. OR Very effective 31%

Do Not Read:

7. Don’t Know/Not Sure 35%

XIVACCINE SUPPLY AND CONVINIENCE

11.1 *Was one reason why you did not get the shingles shot because the vaccine was not available at your doctor’s office?*

1. Yes 20%
2. No 70%

Do Not Read:

7. Don’t Know/Not Sure 11%

11.2 *Was one reason why you did not get the shingles shot because the vaccine was not available at your pharmacy?*

1. Yes 2%
2. No 88%

Do Not Read:

7. Don’t Know/Not Sure 11%

11.3 *Was one reason why you did not get the shingles shot because the vaccine was not available at any of the local health centers/clinics where you normally get care?*

1. Yes 1%
2. No 90%

Do Not Read:

7. Don’t Know/Not Sure 9%
11.4 If you were to get the shingles vaccination, would you be willing to have the pharmacist administer the shingles vaccination in a pharmacy instead of getting the shot in a doctor’s office?

<table>
<thead>
<tr>
<th></th>
<th>Answer</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>52%</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>43%</td>
</tr>
<tr>
<td>7</td>
<td>Don’t Know/Not Sure</td>
<td>5%</td>
</tr>
</tbody>
</table>

### XII VACCINE COST

12.1 Was one reason for not receiving the shingles shot because the shingles vaccine is not recommended for your age group?

<table>
<thead>
<tr>
<th></th>
<th>Answer</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>15%</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>71%</td>
</tr>
<tr>
<td>7</td>
<td>Don’t Know/Not Sure</td>
<td>14%</td>
</tr>
</tbody>
</table>

12.2 Was one reason why you did not get the shingles shot because your medical insurance would not pay for the shot?

<table>
<thead>
<tr>
<th></th>
<th>Answer</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>12%</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>72%</td>
</tr>
<tr>
<td>7</td>
<td>Don’t Know/Not Sure</td>
<td>16%</td>
</tr>
</tbody>
</table>

12.3 Would you get a shingles shot if your medical insurance plan paid the full cost of the vaccination?

<table>
<thead>
<tr>
<th></th>
<th>Answer</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>87%</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>7%</td>
</tr>
<tr>
<td>7</td>
<td>Don’t Know/Not Sure</td>
<td>6%</td>
</tr>
</tbody>
</table>

12.4 Was one reason why you did not get the shingles shot because your cost was too much?

<table>
<thead>
<tr>
<th></th>
<th>Answer</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>13%</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>77%</td>
</tr>
<tr>
<td>7</td>
<td>Don’t Know/Not Sure</td>
<td>10%</td>
</tr>
</tbody>
</table>

12.5 As part of your Medicare insurance, do you have a prescription drug plan, also known as Part D?

<table>
<thead>
<tr>
<th></th>
<th>Answer</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>38%</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>63%</td>
</tr>
</tbody>
</table>
12.6 *What is the most you would be willing to spend on the shingles vaccination?*

**Please Read:**

1. 0 to less than $25  
2. $25 to less than $50  
3. $50 to less than $100  
4. $100 to less than $200  
5. $200 plus  
6. (VOL) Will never get the shingles shot  
7. (VOL) Don’t Know/Not Sure  

<table>
<thead>
<tr>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to less than $25</td>
<td>53%</td>
</tr>
<tr>
<td>$25 to less than $50</td>
<td>24%</td>
</tr>
<tr>
<td>$50 to less than $100</td>
<td>7%</td>
</tr>
<tr>
<td>$100 to less than $200</td>
<td>2%</td>
</tr>
<tr>
<td>$200 plus</td>
<td>3%</td>
</tr>
<tr>
<td>(VOL) Will never get the shingles shot</td>
<td>2%</td>
</tr>
<tr>
<td>(VOL) Don’t Know/Not Sure</td>
<td>10%</td>
</tr>
</tbody>
</table>

12.7 *Would you get vaccinated if the shingles shot were free?*

**Do Not Read:**

1. Yes  
2. No  
7. Don’t Know/Not Sure  

<table>
<thead>
<tr>
<th>Response</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>60%</td>
</tr>
<tr>
<td>No</td>
<td>33%</td>
</tr>
<tr>
<td>Don’t Know/Not Sure</td>
<td>8.3%</td>
</tr>
</tbody>
</table>
### Appendix K  Missing and Low Variability Cases in MA Shingles Survey

<table>
<thead>
<tr>
<th>Questions Retained in Analysis</th>
<th>Missing Cases (%)</th>
<th>Questions Removed from Analysis</th>
<th>Missing Cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you know anyone who was sick with shingles?</td>
<td>0.4</td>
<td>Pneumococcal Vaccination</td>
<td>83</td>
</tr>
<tr>
<td>How painful think shingles is?</td>
<td>3.8</td>
<td>Did Doctor Advise Against Vaccination</td>
<td>110</td>
</tr>
<tr>
<td>Chances of getting shingles</td>
<td>9</td>
<td>Willing to have Pharmacist Administer Vaccination</td>
<td>117</td>
</tr>
<tr>
<td>Frequency of Influenza Vaccination</td>
<td>0.3</td>
<td>How Effective is the Shingles Shot at Preventing Shingles</td>
<td>25</td>
</tr>
<tr>
<td>Tetanus Shot</td>
<td>8</td>
<td>How Much Paid or Willing to Pay for Vaccine Income (rgp’ed)</td>
<td>14</td>
</tr>
<tr>
<td>Did You and Doctor Discuss Shingles Vaccination</td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did Your Doctor Recommend the Shingles Vaccination</td>
<td>2.4</td>
<td>Health Insurance</td>
<td>0</td>
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<tr>
<td>Gender</td>
<td>0</td>
<td>Medicare</td>
<td>462</td>
</tr>
<tr>
<td>Age Group</td>
<td>0</td>
<td>Cost</td>
<td>0.1</td>
</tr>
<tr>
<td>Race (rgp’ed)</td>
<td>8</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>General Health</td>
<td>0</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Marital Status (rgp’ed)</td>
<td>0.4</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Education (rgp’ed)</td>
<td>0.3</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Employed (rgp’ed)</td>
<td>0.1</td>
<td>-----</td>
<td>-----</td>
</tr>
</tbody>
</table>
REFERENCES AND ENDNOTES


15. Beth Israel Deaconess Medical Center Zostavax (Shingles) Clinic. Available at: http://www.bidmc.org/CentersandDepartments/Departments/Medicine/Divisions/InfectiousDisease/TravelClinic/ZostavaxClinic.aspx; date accessed 28 December 2010.


36. Centers for Disease Control and Prevention. Adult Vaccination Coverage — United States, 2010. MMWR 2012;61.4:66-72. Available at: [http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6104a2.htm?s_cid=mm6104a2_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6104a2.htm?s_cid=mm6104a2_w); date accessed 5 October 2013.


42. Centers for Disease Control and Prevention, National Center for Health Statistics. Health, United States, 2010 (Table 106) Available at: http://www.cdc.gov/nchs/data/hus/hus10.pdf; date accessed, 26 August 2012.
68. Hales, C., Harpaz, R., Ortega-Sanchez, I. Bialek, S. Update on Recommendations for Use of Herpes Zoster Vaccine. MMWR 2014;63:[729-731].


105. M.G.L. Chapter 111, Section 24M.


109. Massachusetts BRFSS, 2010. M11.01 A vaccine for shingles has been available since May 2006, it is called Zostavax®, the zoster vaccine, or the shingles vaccine. Have you had this vaccine? * 12.02 Are you Hispanic or Latino/? Race/ Age grp Crosstabulations. DataSet1] F:\PUBLIC\1files\4869 2010 MA BRFSS\DATA\SPSS\4869 - Jan - Dec Cum.sav.


126. Morgan, D. L. & Krueger, R. A. (1998). The focus group kit. Thousand Oaks CA: Sage. Vol. 1 - The focus group guidebook (Morgan); Vol. 2 - Planning focus groups (Morgan); Vol. 3 - Developing questions for focus groups (Krueger); Vol. 4 - Moderating focus groups (Krueger); Vol. 5 - Involving community members in focus groups (Krueger); Vol. 6 - Analyzing and reporting focus groups results (Krueger).
130. National Flu Survey, United States, 2011-12 Influenza Season. National Mid-Season Flu Vaccination Coverage. Available at: 


162. Public Health Service Act (PHS), Section 2133. Codified in 42 U.S.C. 300aa–33.


193. UT Southwestern Medical Center. 7 Steps to Analyzing Focus Group Data. Available at: http://www.utsouthwestern.edu/vgn/images/portal/cit_56417/19/61/205402FG_Analysis_Workshop_-_FINAL.pdf; date accessed 30 September 2011.


Shingles transmission can occur from an infected person to another, albeit the rate of infection via this route is low (ACIP, 2008). Treatment modalities for shingles also exist, but they are only partially effective, must be initiated within days of onset, and consist of antiviral, pain relieving, and immune suppressant medications, among others. These modalities decrease duration and severity of pain associated with zoster, but do not prevent zoster’s occurrence. The herpes zoster vaccine was originally FDA licensed in 2006 and shown to decrease the chances of developing shingles and its neurological effects (66% reduction, 95% CI = 47.5--79.2; p<0.001). ACIP recommended the vaccine use in individuals ≥60 years in 2008. Safety and efficacy of the shingles vaccine has been demonstrated in multiple clinical studies (Zostavax SBA, 2011; Tseng, 2011 and Tseng, 2012) and the vaccine has subsequently received expanded FDA licensure for the 50-59 year old cohort (FDA Zostavax Approval), however, ACIP has not recommended using the vaccine in the expanded cohort (MMWR, 2011).

Preventative health services encompass a range of focus areas, such as cancer and cardiovascular screening and prevention, physical and dental exams, tobacco control, prevention of human immunodeficiency virus (HIV) and sexually transmitted diseases (STD), and vaccination & infectious disease control.

The grant number for the shingles special project is 5H23IP122540-10. This grant was a sub-component of the main federal immunization grant for 2012.
Endnote 4
Vaccines are a distinct category of biological agents defined as “any preparation or suspension, including but not limited to a preparation or suspension containing an attenuated or inactive microorganism or subunit thereof or toxin, developed or administered to produce or enhance the body’s immune response to a disease or diseases and includes all components and ingredients listed in the vaccine’s product license application and product label” (Section 2133 of the Public Health Service Act).

Endnote 5
Vaccination coverage for the pediatric cohort starts off high in young children and continues to higher coverage levels as children enter kindergarten/school, but tapers off as children enter adolescence. Coverage levels for some universally recommended vaccines show that 96% in kindergarteners are vaccinated against polio (meeting the Healthy People 2020 objectives of 95%, IID-10.3); 95% of kindergarteners are vaccinated for the measles, mumps, and rubella (MMR) (meeting Healthy People 2020 objective of 95%, IID-10.2) (MMR VIS, 2012); 84% of young children are vaccinated for the diphtheria, tetanus, and pertussis (DTaP) vaccine, and while coverage for this age cohort does not fully meet the Healthy People 2020 objective of 90% (IID-7.1), DTaP vaccination coverage increases in kindergarteners to 95%, meeting Healthy People 2020 objective of 95% (IID-10.1). Moreover, 97% for kindergartens are vaccinated for hepatitis B (meeting the Healthy People 2020 objective of 90%, IID-10.4), and 94% of kindergartens are vaccinated for the varicella vaccine (almost meeting the Healthy People 2020 objective of 95%, IID-10.5).

It is prudent to note that not all childhood/adolescent vaccination programs have met their public health benchmark goals. Consider than only 47% of adolescents received the Tdap booster
(trailing the *Healthy People* 2020 objective of 80%, IID-11.1), less than 37% of adolescents received the varicella vaccine (trailing the *Healthy People* 2020 objective of 90%, IID-11.2), just half of all adolescents (43%) have received the recommended meningococcal vaccine (trailing the *Healthy People* 2020 objective of 80%, IID-11.3); and only 16% have received the recommended number of doses of the human papillomavirus (HPV) vaccine (trailing the *Healthy People* 2020 objective of 80%, IID-11.4).

**Endnote 6**
State school entry vaccination compulsion laws by their very nature restrict public liberty and this domain remains controversial (Marcuse, 2012; Goodman, 2007), however, it is settled legal opinion that compulsory school vaccination laws are constitutional. States can require one to submit for vaccination in the name of public safety under (1) the State’s police powers and (2) the doctrine of *parens patriae*, (Latin for "parent of his or her country," meaning that States have the power to act as protector in the name of public welfare, (Cornell LII, 2014)) (*Prince v. Massachusetts*), even if the disease is not contagious and there are other means of protection, so long as the requirement meets the compelling state interest test and the requirement is reasonable (Jackson, 1969; *Jacobson v Comm. of Mass*, 197 U.S. 11; *Zucht v King*, 260 U.S. 174).

While exemption policies exist for medical, religious, or philosophical reasons, it is noteworthy to point out that there are exceptions to states recognizing exemptions, such as Colorado’s statute that reads that in the event that the State finds “danger of an epidemic from any of the communicable diseases for which [a vaccination] is required pursuant to the rules and regulations promulgated pursuant to section 25-4-904, no exemption or exception from [vaccination] against such disease shall be recognized”. The statute authorizes quarantine as a legal alternative in such events (Colorado Revised Statues, 25-4-908).
Endnote 7
To be a public good, the good must exhibit the characteristics of not being deplete-able (the good is not used up in consumption), and has to be without rivalry and exclusion (all benefit from the good) (Hoppe, 1989; Perloff, 2007). Under this definition, vaccines are not public goods, because the good is deplete able and exhibits rivalry (a unit dose of vaccine that is manufactured is used for one person at some predefined cost, which decreases the total available doses that are available for others). On the other hand, considering the positive societal externalities of the free rider health benefits, coupled with increased longevity and economic growth effects, vaccines are non-exclusionary, since the benefits of vaccination are not restricted to those who participate in its finance and consumption. However, from the perspective of vaccine producers, these positive ripple/spillover effects (Feeney and Bozeman, 2007) are actually a negative externality because they are not compensated by the loss of sales of vaccine to passive beneficiaries (Hoppe, 1989, p. 28).

Endnote 8
The NVP was created to protect Americans from vaccine preventable diseases and charges federal agencies with developing priorities for vaccine research and development, licensing, production, and distribution, supporting communications infrastructure, securing supplies of and access to vaccines, and enhancing utilization of vaccines (DHHS NVP Goals, 2010), among other priorities. Responsibility and coordination of the NVP rests with DHHS National Vaccine Program Office (NVPO), which appropriates funds to federal executive level agencies that implement NVP policies. These include DHHS constituent agencies (Centers for Disease Control (CDC), National Institutes of Health (NIH), Food and Drug Administration (FDA), and Health Resources and Services Administration (HRSA)), Department of Defense (DOD),
Department of Veterans Affairs (VA), Department of Homeland Security (DHS), and the US Agency for International Development (USAID).

Endnote 9
Massachusetts State law mandates that hospital personnel be vaccinated against: influenza, (although there are permitted exceptions), and be vaccinated and/or demonstrate immunity against MMR for personnel working in material-newborn units. Some states require varicella vaccination of hospital personnel. A State-by-State list of mandatory vaccination requirements for hospital personnel is available at CDC’s website at:

http://www2a.cdc.gov/nip/statevaccapp/statevaccsapp/AdministrationbyPatientType.asp?PatientTypetmp=Hospital%20Employees.

Endnote 10
Many State laws mandate that residents in long-term care be vaccinated against influenza and pneumococcal (PPV) vaccination. Massachusetts does not have an immunization mandate for long-term care residents. A State-by-State list of mandatory vaccination requirements for residents in long-term care is available at Immunization Action Coalition’s website at:

http://www.immunize.org/laws/ltc.asp.

Endnote 11
Many States, including Massachusetts, mandate that students at colleges and universities be vaccinated against Hepatitis B and meningococcal vaccination. A State-by-State list of mandatory vaccination requirements for college and university students is available at Immunization Action Coalition’s websites at: http://www.immunize.org/laws/hepbcollage.asp (Hepatits B prevention mandates) and http://www.immunize.org/laws/menin.asp (Meningococcal prevention mandates).
Endnote 12
The government’s influence over vaccine buying power is noted in section 4204(a) of the PPACA which allows the Secretary of Health and Human Services “to negotiate and enter into contracts with vaccine manufacturers for the purchase and delivery of vaccines for adults,” and “[a]llows a state to purchase additional quantities of adult vaccines from manufacturers at the applicable price negotiated by the Secretary” (H.R.3590, Sec 4204(a)).

Endnote 13
The government’s ability to provide states with funding for specific programs is noted in Section 4204(b) of the PPACA, which calls for CDC to disperse funding for demonstration projects “to States to improve the provision of recommended immunizations for…adults through the use of evidence-based, population-based interventions for high-risk populations”. Demonstration project funds are used to support initiatives to provide education and vaccination reminders, reducing costs, immunization promotion strategies such as immunization incentives, and calling for states to create immunization information databases systems for immunization records.

Endnote 14
Surveys with providers found that many variables influence Medicare beneficiaries’ ability to access the shingles vaccine (GAO, 2011). Specifically, providers face challenges in their ability to stock, administer, or recommend the shingles vaccine. These include the high vaccine cost which must be purchased in advance, Medicare Part D administrative billing challenges (physician’s Part D out of network status complicates the verification of Part D enrollment), low vaccine supplies (due to manufacturing supply disruptions), patient cost sharing responsibilities (due to inconsistency in insurance coverage and associated out-of-pocket costs and trouble with billing/reimbursement), uncertain patient demand, vaccine transport (requirement to obtain
vaccine at pharmacy and transport to physician’s office to administration), and vaccine safety and efficacy concerns. At least one of these barriers were cited by ≥80% of physicians as a reasons to not provide the shingles vaccine.

Few physicians (31%) stock the shingles vaccine in their practices, with over 70% of physicians referring patients to a pharmacy to purchase the vaccine, however, only 35% of pharmacists stock the vaccine. The 58% of physicians who do not stock the shingles vaccine do so because of uncertainty in demand by patients. 21% of physicians classified this as a major barrier with 37% as a minor barrier. This is paradoxical because when physicians do not recommend the vaccine (per GAO, only 33% always recommend the shingles vaccine), then it follows that patient demand for the vaccine would be low and that this would affect vaccine stock in physician’s offices.

Many more beneficiaries received the routinely recommended Td/Tdap vaccine, however, a low number of beneficiaries sought reimbursement for the Td/ Tdap vaccination under Part D. This may be attributed to Medicare’s bifurcated coverage policies with the Td or Tdap vaccine. Medicare policies allow Part B to cover Td/Tdap vaccinations (no out-of-pocket costs) when the vaccine is prescribed as an “incident to the treatment of an injury or incidence of exposure” to tetanus (GAO, 2010, footnote 2, p. 1), rather than as a prophylactic booster which in such cases would be covered by Part D. Therefore, it is possible that the explanation of the 1% Part D reimbursement for the Td or Tdap vaccination was that the vaccine was reimbursed under Part B.
Other Part D recommended adult vaccines, which are indicated for adults with high-risk medical conditions such as hepatitis or for international travel such as yellow fever, were excluded from GAO’s analysis.

**Endnote 15**
CDC judges the practice of brown bagging to be unacceptable since it does not guarantee maintenance of the integrity and immunogenicity of the vaccine, however, FDA’s approved prescribing information for the shingles vaccine states that the vaccine may stored or transported under temporary temperature excursions at 2-8°C for up to 72 hours.

**Endnote 16**
Rothberg’s (2007) initial utility model that arrived at the $46 universal cost effectiveness figure includes indirect costs of lost wages by patient and caregiver, as well as burden of illness measurements (Rothberg, 2007, p.3, Table 3). While the cost-effectiveness assessment is not without consideration for the Rawlsian hedonic perspective of quality of life (societal perspective), it does not take into account what the public is willing to pay to be pain free. Also, the initial evaluation on health and economic burden of lost wages was performed on patients 60 years of age and over---a cohort whose employment and economic potential is reduced. So even when the orthogonal quality of life perspective is considered, there is a low cost-effectiveness value assigned to this vaccination given that this vaccine is indicated for an older cohort (holding constant the varying vaccine efficacy and vaccine duration by age). The conclusion from this is that this vaccine is uneconomic. An updated burden of illness evaluation (also societal perspective) was performed to include a younger pool of vaccine recipients (patients 50-59 years old (Le, 2015). The value of the vaccination was brought up to $80/dose since patients in this age group have an increased relative economic “value,” from a Benthamite perspective, however, because the calculations didn’t factor in society’s willingness to pay for less pain the vaccine is
still far too expensive, and “does not represent good value…” (Le, 2015, Discussion section, last paragraph, 1st sentence).

**Endnote 17**
Of note, the $46-80/dose estimates are based on the conventional $100,000-per-quality-adjusted-life-year (QALY) ceiling. PPACA has forbidden PCORI to use QALY’s for comparative effectiveness research (Neumann and Weinstein, 2010).