

Adult Vaccination: Barriers to Compliance in the 65+ Population in Western New York

Maica Punzalan*, Mah-Rukh Anjum and Tracy L Beattie

D'Youville College, USA

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***Corresponding author:** Maica Punzalan, 11 Holly Lane Apt 8, Tonawanda, NY 14150, USA, Tel: 71-628-8970; Email: maicapunzalan@gmail.com

Abstract

Purpose: This study examined the incidence of vaccination against influenza, pneumonia, and shingles in community dwelling adults over the age of 65 in Western New York. The contributing factors which prevented vaccination compliance among this population were also examined.

Methodology: An 11 question survey designed for the purpose of this study was administered at two Western New York Pharmacies over the course of 4 weeks to patients 65 years of age and older. The survey was a one-time, optional, anonymous survey that queried participant's demographic information, vaccination history, where they received their vaccinations, if they had any underlying medical conditions and the reasons for non-compliance. The data analysis was completed with Microsoft Excel 2013.

Results: 32 surveys were collected for data analysis which revealed that influenza had the highest vaccination compliance rate and that the shingles and pneumococcal vaccination rates were sub-optimal. Survey results showed participants expressed lack of general knowledge about the prevalence, symptoms, transmission, risk and serious health consequences of shingles and pneumococcal disease.

Conclusion: The results of this survey suggest there is a need for more adult patient education on influenza, shingles and pneumococcal vaccinations in the primary care setting to achieve higher compliance rates. The data indicates participants who utilize both primary care offices and pharmacies for vaccination recommendations and procedures have a higher compliance for all three of the recommended vaccines.

Keywords: Adult; Vaccination; Barriers; Compliance; Western; New York; Influenza; Pneumococcal; Shingles

Abbreviations: CDC: Center for Disease Control; PCP: Primary Care Physician; WNY: Western New York; IRB: Internal Review Board

Introduction

Purpose

The objective of this study was to determine the incidence of vaccination against influenza, pneumonia and shingles in community dwelling adults over the age of 65 in Western New York. In addition, the contributing factors which prevented vaccination compliance among the older adult population were also examined.

Statement of Problem

Health care costs for adults over the age of 65 account for roughly 36% of the total U.S health expenditure [1]. Contributing to this medical expense is the high prevalence of

influenza, pneumonia, and shingles among individuals over the age of 65. Despite preventative care efforts, the Center of Disease Control reported that 28.8 - 44.2% of the older adult population has never received an influenza vaccine, while 30.0-51.3% remains unvaccinated to pneumococcal [2]. Reports also conclude that roughly one third of the population will develop shingles during their life time with half of these cases occurring in people above the age of 60 [3]. In addition to high mortality rates, by not utilizing the influenza, pneumococcal, and shingle vaccinations readily available, the noncompliant portion of the older adult population places greater demands upon national health care resources. Hospitalization rates for those suffering from influenza are highest among the age 65 and above. Data reveals that 90% of all influenza-induced deaths occur in the

65 and older age group [4]. By surveying residents of this age group, the study was able to identify the local factors which prevent vaccination compliance within the Western New York area and it was also determined which portion of the targeted population's remains susceptible to these diseases.

Literature Synopsis

Influenza is a respiratory condition caused by Influenza A or B virus usually in the winter months. Studies suggest that the complications of influenza range from pneumonia, cardiac involvement, to toxic shock syndrome [5]. Two types of vaccination are available for use: one being an inactivated virus delivered through injection, while the other is a live attenuated virus which is delivered nasally [6]. Influenza vaccination has led to significant reduction of morbidity and mortality and is recommended for patients 6 months of age and above. Adults over the age of 65 are recommended a single high dose trivalent vaccine yearly. The immune response in elderly is weaker leading to more severe illness; the high dose trivalent influenza vaccine is recommended as it produces a stronger immune response in adults over the age of 65 [7]. A research study conducted in Ontario, Canada found that influenza vaccination reduced hospitalization and death in 4% of the older population [8]. Despite preventative efforts to improve influenza vaccination, the overall rate in 2011 remained at 36.2% [9]. These rates are still well below the >60% required for herd immunity [10].

Streptococcus pneumonia is the causative organism of many illnesses ranging from middle ear infections to pneumonia, meningitis, or bacteremia [11]. The burden of disease is greatest in adults over the age of 65 as the mortality rates are highest in this age group [12]. According to the 2013 CDC MMWR data released on pneumococcal vaccination coverage, of the same population subset, is between 40.3-66.5% overall depending on race. The recommended vaccine for adults age 65 or older is PPSV23. If the adult has been vaccinated before the age of 65 and at least 5 years have passed since the last immunization, then another dose is recommended, otherwise single dose of PPSV23 at or after the age of 65 is recommended [6]. Additive benefits to patients receiving both influenza and pneumococcal vaccine are reduction of influenza hospitalization to 37%, pneumonia to 29%, invasive pneumococcal disease (IPD) to 44%, while reducing mortality by 35% [13].

Herpes zoster or Shingles is one of the two illnesses caused by Varicella-zoster virus (VZV), the other one being Chickenpox or Varicella. Initial infection due to VZV is Chickenpox and subsequent reactivation of the virus causes shingles. Shingles manifests as a vesicular rash in a single dermatomal pattern usually, but can occur in two or three neighboring dermatomes. Complications arising from Shingles range from post herpetic neuralgia (PHN), herpes zoster ophthalmicus, secondary bacterial infection, motor neuropathy and herpes zoster oiticus to meningitis. Post herpetic neuralgia, a syndrome of

persistent pain, occurs in 50% of individuals older than 60 years [14]. Shingles vaccine is a live attenuated VZV, delivered subcutaneously. Vaccine reduces the risk of contracting Shingles by 51.3% [15]. The incidence of Shingles is rising in United States since the implementation of chickenpox vaccination in children [3]. The reasons for this rise is not well understood, which makes it all the more important to ensure that the older population is compliant with Shingles vaccination.

Significance and Justification

The purpose of this study was to determine the percentage of vaccine compliant residents, over the age of 65 that are living independently within the Western New York area. According to Center of Disease Control the immunization target by 2020 is > 50.9% [16], with herd immunity being possible once 70% of the population is immunized [17]. Western New York has a higher number of African American and Hispanic population as well as a large refugee population. Even though the economics of the city is fairly dire, we expected Western New York results to correlate with most urban cities in the region. Vaccination incidence studies for influenza, pneumonia, and shingles together in one study, for adults 65 years and older, was not available. The compiled data from this study would reveal if the influenza, pneumococcal, and shingle incidence in the older population in Western New York was significantly different from the rest of the state and would also provide insights to recognize any barriers to vaccinations.

This study also served to identify the local factors that contribute and prevent vaccination compliance. Health care providers can then target this population based on the findings and provide effective immunization methods and health education on the benefits of preventative vaccination, therefore reducing the morbidity and mortality associated with these preventable infections.

Limitations

One limitation of this study was the inability to assess individual cognitive functions of surveyors 65 years of age and older. It has been established that the prevalence of dementia increases with age, with estimates ranging from 20 to 50 percent after age 85 [18]. This can alter the accuracy of the data collected since results were dependent upon one's ability to read and interpret the survey questions. Additionally, since the surveys were going to be conducted in a pharmacy, external factors such as transportation may alter the study's ability to accurately represent the targeted populace. Another limitation of the study was its exclusion of mandated vaccinations such as those of nursing home residents.

Summary

The literature has shown that vaccine compliance reduces hospitalization and death rates among the older adult population. Vaccinations reduced all causes of death and hospitalization for

pneumonia and influenza: hospitalizations were reduced by 19%–20% and 18%–24%, and deaths were reduced by 60%–61% and 35%–39% [9]. Despite these methods, vaccination rates remain low among the United States. This study would help identify the local factors that contribute and prevent vaccination compliance regardless of its effectiveness among the residents in Western New York.

Materials and Methods

Introduction

The objective of this study was to determine the adherence to recommended vaccinations against influenza, pneumonia and shingles in community dwelling adults over the age of 65 in Western New York. Additionally, contributing factors which may prevent vaccination compliance among the older adult population was also examined. A survey research method was implemented to collect the data. The survey was distributed at one urban and two suburban pharmacies located in Western New York with permission of the pharmacy manager. The participants would complete one 11- question survey pertaining to their vaccination history.

Setting

The survey was distributed at one urban and two suburban pharmacies located in Western New York permission of the pharmacy manager over the course of 2 weeks, with the option of extending to 4 weeks dependent on the level of participation.

Population and Sample

The survey was distributed to all willing participants 65 years of age or older at one urban and two suburban pharmacies. One pharmacy sees about 1000 patients per month, the other about 800 patients per month, and the third about 400 patients per month. Patients at these locations would have completed a one-time survey consisting of 11 total questions, the first four questions relating to age, gender, and if they had any underlying conditions such as hypertension, diabetes, cancer, heart disease, and other chronic medical illnesses. The survey contained 6 questions in regards to whether the patient has received either their influenza, pneumococcal, and/or shingles shot with follow-up questions if they did receive them to answer why. There was also a question in the end regarding where the patients routinely receive their vaccinations at whether it's at the doctor's office or pharmacy or neither. A sample size of 30-50 participants 65 years of age and older was the target. Incentives worth a monetary value of \$5.00 would be provided to those participants who choose to complete the survey. 5 prizes were awarded at each pharmacy location but were completely optional and separate from the survey. Participant identifiers were not linked between survey completion and the option to participate in the gift raffle. A box labeled "Raffle Tickets" was located by the register and waiting room.

Data Collection Method

A one-time survey was left at the pharmacy counter and distributed by the pharmacy cashier to be completed at the time they pick up their prescriptions. The pharmacy cashiers were trained by the researchers on how to distribute the survey to the patients, including only giving the survey to any older adult aged 65 and older. Surveys were also left in the waiting area. Upon completion of the survey, the patient was instructed to place the survey in the box located by the register and waiting room labeled "completed research surveys." The researchers would collect the surveys weekly from the locations. The survey consists of a total of 11 questions. The first 4 questions of the survey are demographic, pertaining to gender, age, and race, if they had any underlying conditions such as hypertension, diabetes, cancer, heart disease, and other chronic medical illnesses. This was important because the literature has shown that mortality and morbidity increases when patients have certain co-morbidities. The survey contained 6 questions in regards to whether the patient had received either their influenza, pneumococcal, and/or shingles shot. There were also follow-up questions if they have not received that vaccination and reasons for participant noncompliance. There was also a question regarding the location where the patients routinely receive their vaccination (either their doctor's office or their pharmacy or both or neither). The surveys were printed on colored paper, with one pharmacy a yellow-color, the other pharmacy a green-color, and the third pharmacy in a white-color, in order to determine the source of the data after survey collection. A cover letter was attached to the survey to obtain informed consent from the participant. Because the survey was anonymous once the survey was submitted the participant can't withdraw from the study. A Center for Disease Control (CDC) fact sheet on the benefits of the influenza, pneumococcal, and shingles vaccine was available next to the survey collection box. Participants were being instructed at the end of the survey to pick up a fact sheet. After the data had been collected and analyzed we would make the results available to the pharmacy manager. Please see [Appendix](#) for a copy of the informed consent and survey.

Human Rights Protection

All surveys were being anonymous with no patient identifying information on the survey. The participants were not being asked for their name, address, or any other personal identifiers. The informed consent sheet attached to the surveys would explain the anonymity of the survey. All participants were 65 years of age or older as enforced by the office staff, the informed consent form, and the note on the top of the survey. The surveys were being anonymously collected. Once the participant completed the survey form they were instructed to place the form into a box labeled "completed research surveys." Before the research study was commenced, the research team would seek approval of the D'Youville College NIH IRB.

Treatment of Data

The data collected from the completed surveys were analyzed using Microsoft Excel 2013. Data analyzed would comprise of descriptive statistics including mean, median, and mode, and percent distribution in all variables.

Summary

The research was conducted at three Western New York Pharmacies over the course of 4 weeks using a one-time, optional, anonymous survey that included 11 questions regarding the participants' demographic information, vaccination history, where they get their vaccinations, and if they had any underlying medical conditions. The purpose of the survey was to obtain information on the incidence of vaccination against influenza, pneumonia, and shingles for the older adult population over aged 65 in Western New York. The goal of the survey was to identify areas or barriers that lead to non-compliance in getting vaccinated and using that knowledge to help providers and pharmacies get a better understanding to what influences their patients to get vaccinated or not.

Results and Discussion

Introduction

The purpose of this research project was to investigate adherence to the recommended vaccinations against influenza, pneumonia and shingles in community dwelling adults over the age of 65 in Western New York. The contributing factors which may prevent vaccination compliance among this population were examined. Survey distribution was in pharmacy locations around Buffalo, New York. An informed consent letter was provided with each survey distributed by the pharmacy personnel upon patients picking up their prescriptions. The survey consisted of 11 questions with a particular emphasis to their vaccination history and barriers to receiving the recommended preventions. Additional items surveyed were diagnosed co-morbidities, demographics and sites where the participants received vaccinations.

The survey was distributed at one urban and two suburban pharmacies located in Western New York. Over a four week period, the surveys were completed by willing participants 65 years of age or older. We anticipated a large number of respondents based on the patient flow in a pharmacy setting. One of the suburban pharmacy locations decided to withdraw from the study, leaving one urban pharmacy in the downtown area of Buffalo, New York and one suburban pharmacy in the suburb of Tonawanda New York. A total of 32 surveys were collected from the two pharmacy locations. At the urban pharmacy location a total of 14 surveys were collected, the majority towards the end of the fourth week when prescription refills were being renewed for the next month. At the suburban pharmacy location, a total of 18 surveys were collected, averaging about four to five surveys

a week. The survey response data collected was entered into Microsoft Excel 2010 for analysis.

Description of the Sample

The intent of this study was to gather data about barriers to vaccination among adults over the age of 65 in a pharmacy setting and the compliance rate to the recommended vaccinations, with an emphasis on any differences in responses among those who went to an urban location versus a suburban location. Of participants in the urban location, 7 respondents (50%) were males and 7 (50%) were females, for a total of 14 respondents. For the suburban location, 8 respondents (44%) were males and 10 respondents (56%) were females, for a total of 18 respondents. Combined, 15 respondents (47%) were males and 17 respondents (53%) were females, for a total of 32 respondents (Figure 1-3).

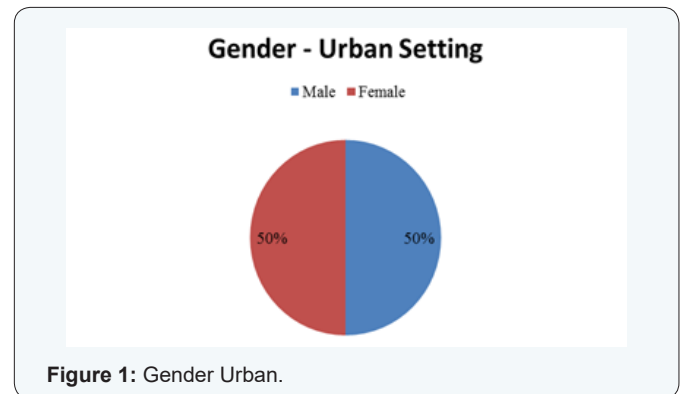


Figure 1: Gender Urban.

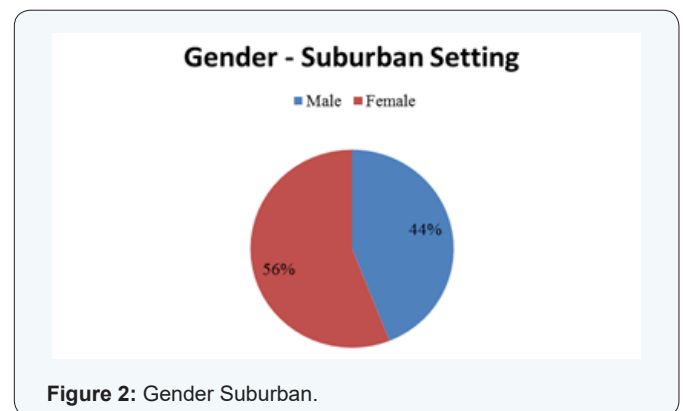


Figure 2: Gender Suburban.

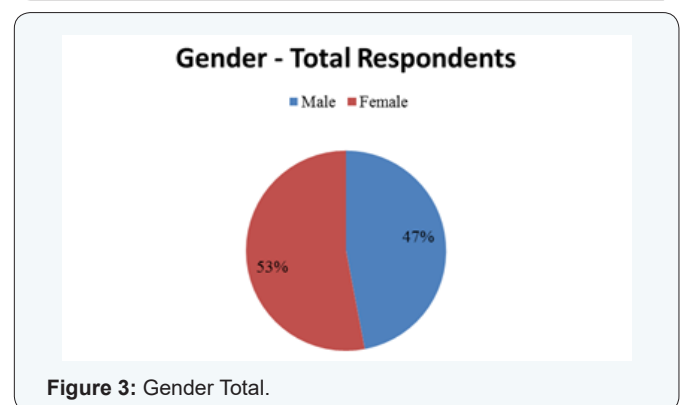
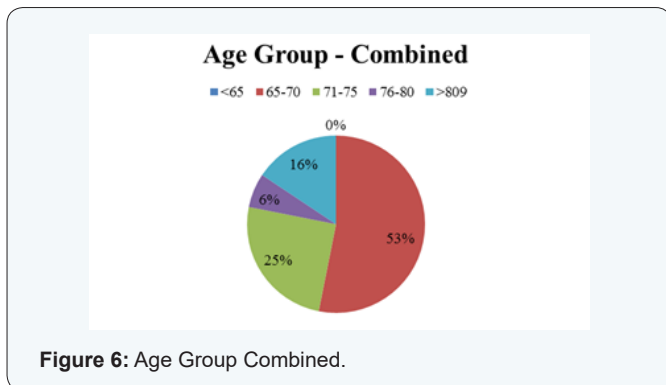
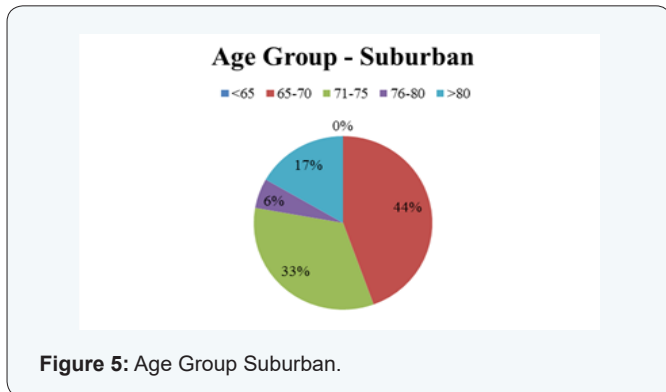
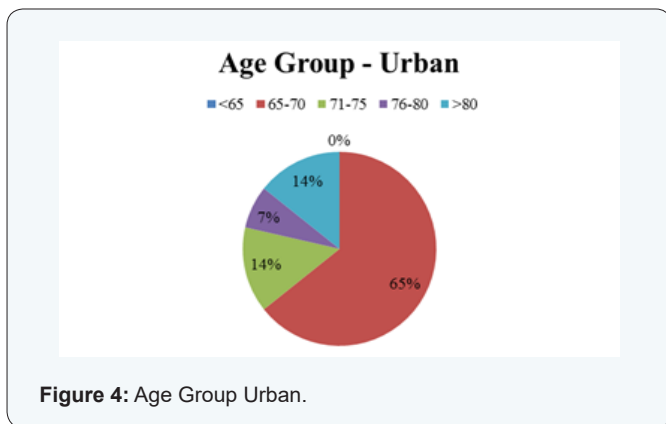
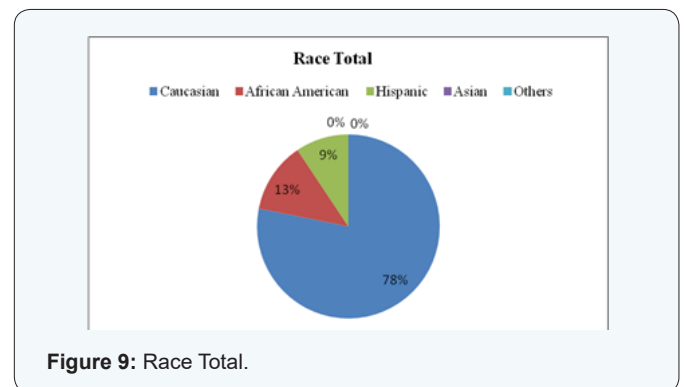
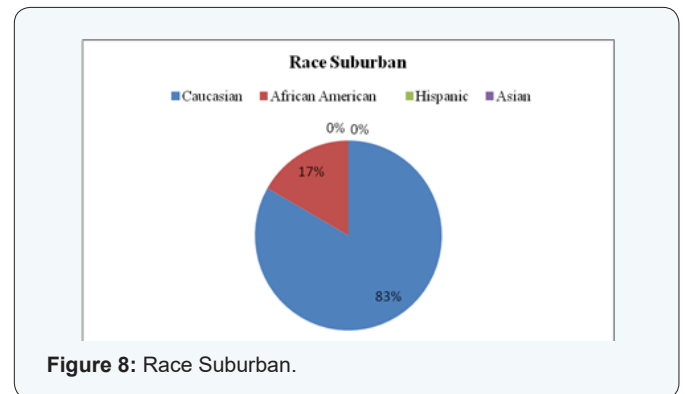
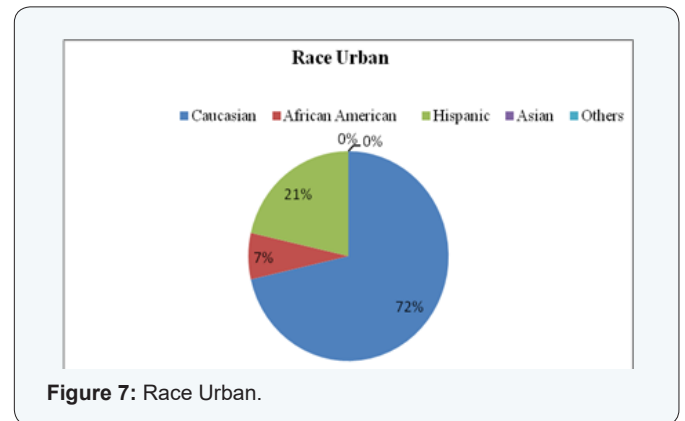


Figure 3: Gender Total.

The age group of less than 65 was used as a survey answer to ensure the proper aged adults participated. There were 0 participants in the less than 65 years category for both urban and suburban locations. For the urban location, there were 9 participants (65%) in the 65-70 group, followed by 2 participants (14%) in the 71-75 group, 1 participant (7%) in the 76-80 group, and 2 participants (14%) in the >80 group. For the suburban location, there were 8 participants (44%) in the 65-70 group, followed by 6 participants (33%) in the 71-75 group, 1 participant (6%) in the 76-80 group, and 3 participants (17%) in the >80 group. Combined, there were 17 participants (53%) in the 65-70 group, 8 participants (25%) in the 71-75 group, 2 participants (6%) in the 76-80 group, and 5 participants in the >80 group (Figure 4-6).



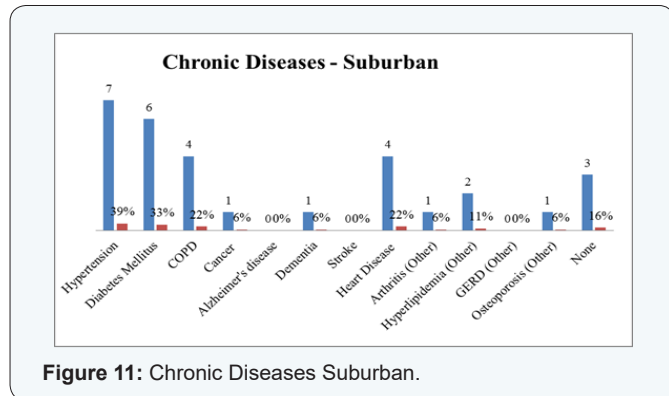
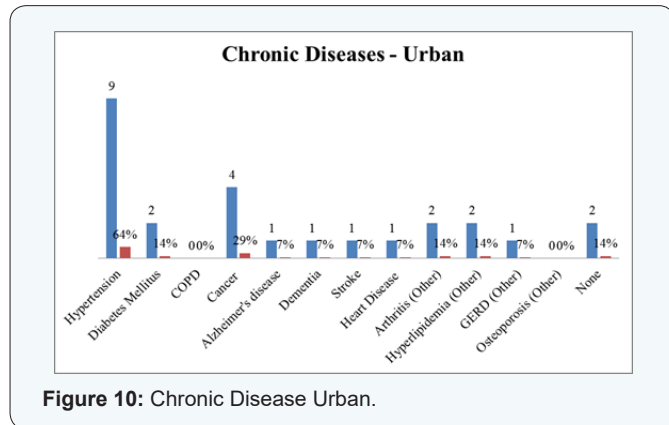
The next question that was explored was the respondent's race. At the urban location, there were 10 Caucasian (71%), 1 African-American (7%), 3 Hispanic (22%), and zero for the Asian and other races (0%). At the suburban location, there were 15 Caucasian (83%), 3 African-American (17%), zero for the Hispanic, Asian and other races (0%). For the total, there were 25 Caucasian (78%), 4 African-American (13%), 3 Hispanic (9%), and zero for the Asian and other races (0%) (Figure 3). This was studied due to the research that indicated minorities were less likely to get vaccinated (Figure 7-9).



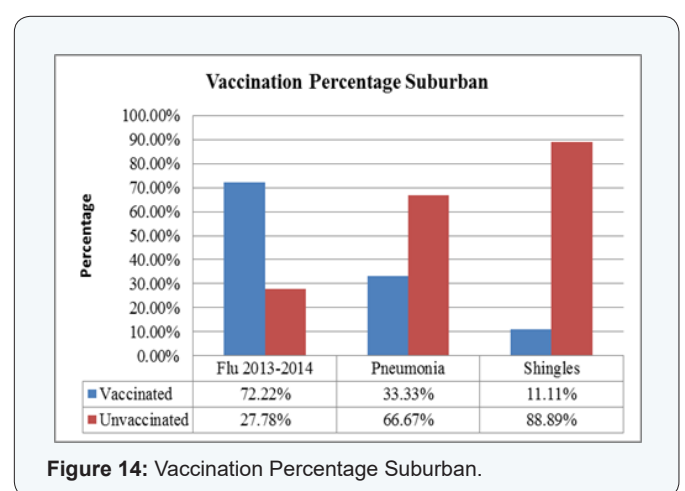
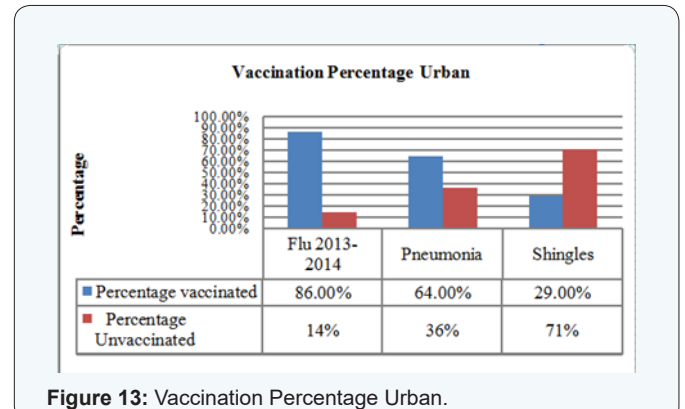
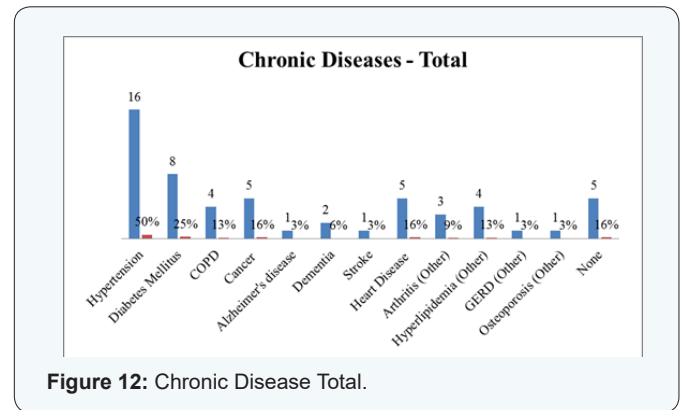
The next question was to ascertain if the participants had any diagnosed chronic conditions that were significant for the recommended vaccinations. The following chart percentages are based on how prevalent the response was for each participant

who could have multiple co-morbidities. For the urban location, 9 were diagnosed with Hypertension (64%), 2 with Diabetes (14%), zero for COPD (0%), 4 had Cancer (29%), 1 with Alzheimer’s disease (7%), 1 with Dementia (7%), 1 with Stroke (7%), 1 with Heart Disease, 5 others (2 with Arthritis (14%), 2 with Hyperlipidemia (14%), and 1 with GERD (7%)). 2 were healthy (14%) and had no underlying conditions. For the suburban location, 7 were diagnosed with Hypertension (39%), 6 with Diabetes (33%), 4 for COPD (22%), 1 had Cancer (6%), zero with Alzheimer’s disease (0%), 1 with Dementia (6%), zero with Stroke (0%), 4 with Heart Disease (22%), 3 others (1 with arthritis (6%), 2 with Hyperlipidemia (11%), 0 for GERD (0%), and 1 with osteoporosis (6%)). 3 were healthy (16%) and had no underlying conditions. In total, 16 were diagnosed with Hypertension (50%), 8 with Diabetes (25%), 4 for COPD (13%), 5 had Cancer (16%), 1 with Alzheimer’s disease (3%), 2 with Dementia (6%), 1 with Stroke (3%), 5 with Heart Disease (16%), 9 others (3 with arthritis (9%), 4 with Hyperlipidemia (13%), 1 with GERD (3%) and 1 with osteoporosis (6%)). 5 were healthy (16%) and had no underlying conditions (Figure 3). This is important because the literature has shown that mortality and morbidity increases when patients have certain chronic illnesses (Figure 10-12).

had received a pneumonia vaccination, and 4 (29%) had the herpes zoster vaccine. In the suburban setting (n=18), 13 (72%) participants did receive the flu vaccine for the 2013-2014 season, 6 (33%) had received the pneumonia vaccination and 2 (11%) had the herpes zoster vaccination (Figure 13-15). One of the goals of the research project was to identify barriers to vaccination compliance in Western New York in the adult community over the age of 65. To gather the information for not receiving the recommended vaccines, certain options were asked of each participant and there was an area for the participant to write in an answer.



An integral part of the survey was self-reported vaccination compliance. In the urban setting (n=14), 12 participants (86%) did receive the flu vaccine for the 2013-2014 season, 9 (64%)



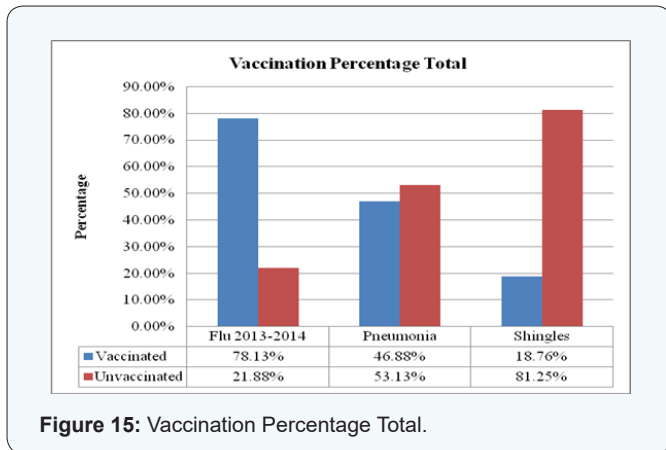


Figure 15: Vaccination Percentage Total.

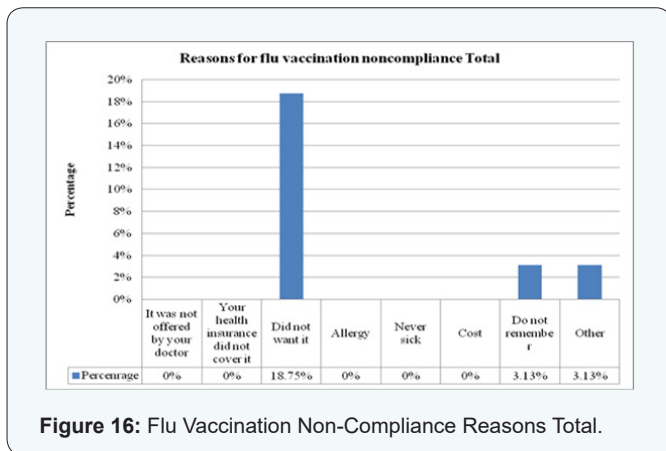


Figure 16: Flu Vaccination Non-Compliance Reasons Total.

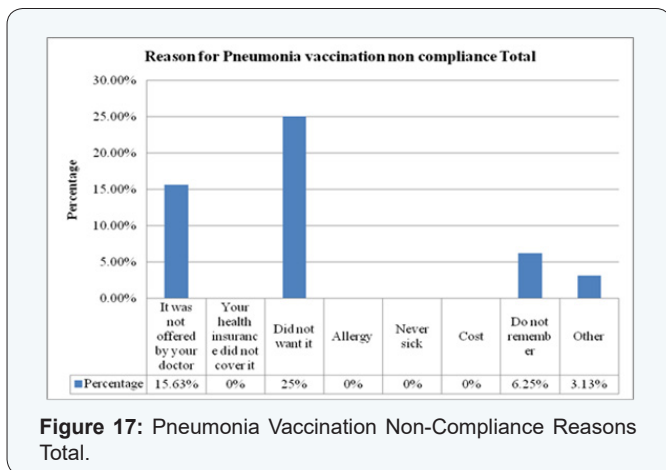


Figure 17: Pneumonia Vaccination Non-Compliance Reasons Total.

For the flu vaccine, at the urban setting (n=14), 2 (19%) did not want it and a write in response was 1 participant (7%) said that it made her sick so she chose not to get it. In the suburban setting (n=18), 4 (22%) did not want it, 1 (5%) could not remember if they received the flu vaccine for the 2013-2014 season (Figure 16). The pneumonia vaccine results from the urban pharmacy (n=14), 2 (14%) responded it was not offered by their doctor, 2 (14%) replied they did not want it; the one write in reason (7%) was the participant had pneumonia when they were younger. In the suburban population (n=18), 3 (17%)

replied it was not offered by their doctor, 6 (33%) responded they did not want it, 2 (11%) could remember if they had ever received the vaccination and one write in response (5%) was that the participant did not know about the pneumonia vaccination (Figure 17).

The most recent addition to the adult population recommended vaccinations is the shingles vaccine. In the urban pharmacy (n=14), the reasons for non-compliance 3 (21%) did not want it, 2 (14%) could not recall if they had received the vaccination, there were four write in responses, one (7%) replied they did not get the shingles vaccine because they had never had shingles, one (7%) was planning on getting it soon, there was one (7%) response with a check on the response for Other but no reason was given, and one (7%) response that they had already had shingles. In the suburban setting (n=18), 1 (5%) answered it was not offered by their doctor, 6 (33%) respondents said they did not want it, 2 (11%) participants said they did not get it due to cost, 2 (11%) people could not remember if they had gotten the vaccine, there were five write in response, 2 (11%) said they did not know about the shingles vaccine, 1 (5%) replied his doctor told him not get the vaccine, 1 (5%) person said they will not get shingles and 1 (5%) was thinking about getting the shingles vaccine (Figure 18).

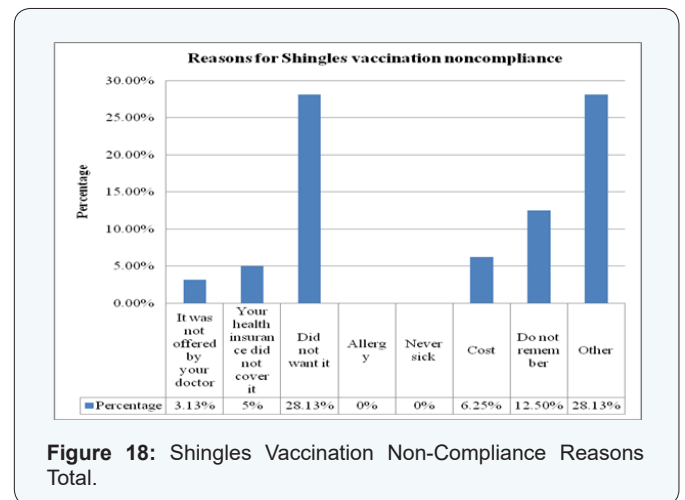


Figure 18: Shingles Vaccination Non-Compliance Reasons Total.

The final query on the survey was establishing the location where patients routinely receive their vaccinations, the choices were their doctor's office, their pharmacy, both, or neither. In the urban setting (n=14), 5 (36%) chose their doctor's office, 2 (14%) received vaccinations from their pharmacist, 4 (29%) replied both settings and 2 (14%) said they went to neither site for vaccinations. At the suburban pharmacy (n=18), 10 (56%) participants said they received their vaccinations at their doctor's office, 1 (6%) replied they went to their pharmacist for vaccinations, 3 (17%) respondents indicated they went to both settings, 3 (17%) people said they went to neither setting for vaccines. The total percentages for the two setting combined are

48% received vaccinations at their doctor's offices, 10% from their pharmacist, 26% had vaccination at both settings and 16 % responded they went to neither setting for vaccinations (Figure 19- 21).

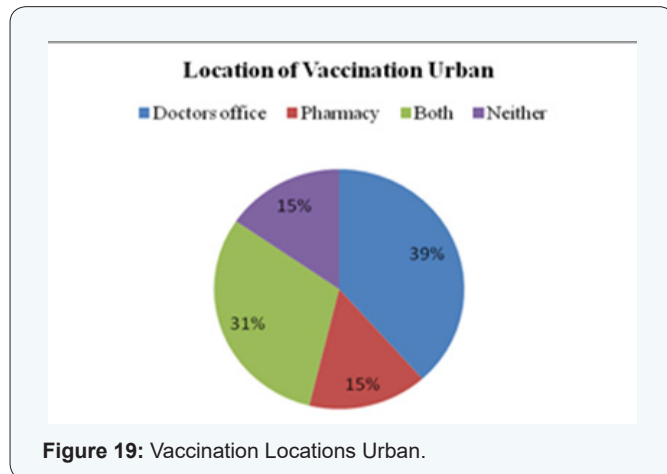


Figure 19: Vaccination Locations Urban.

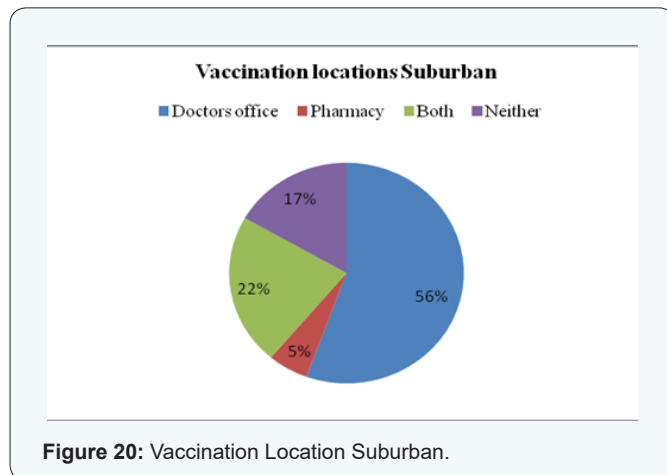


Figure 20: Vaccination Location Suburban.

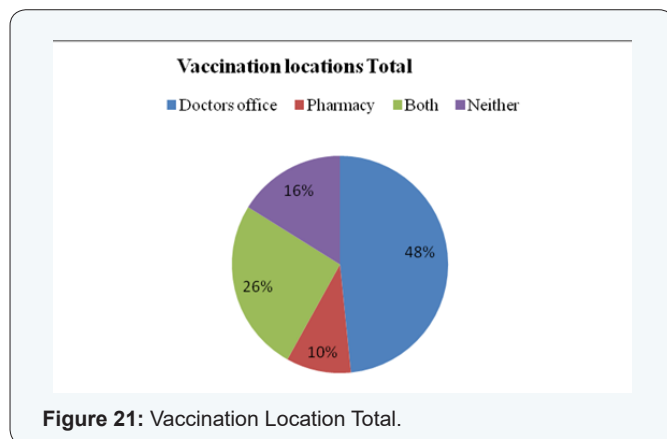


Figure 21: Vaccination Location Total.

Conclusion

- i. Vaccination rates in this study showed higher for influenza and shingles than WNY average
- ii. Pneumonia vaccination rates are lower than CDC

reported rates for this area.

- iii. Most important barrier to compliance was that participants did not want to get vaccinated.
- iv. 18% of patients did not have enough information on importance of vaccination.
- v. PCP offices were the most important locations to get vaccinations and advice.
- vi. Vaccination rates were higher when both PCP and pharmacy locations were utilized for vaccination.

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