

ADULT VACCINE SURVEILLEENCE IN CLINTON COUNTY, NY: WHAT ARE THE GAPS
AND BARRIERS TO UP-TO-DATE VACCINATIONS?

by

SARA J. BUBENIK

M.D., Oregon Health and Science University, 2013
B.A., Portland State University, 2007

A FIELD EXPERIENCE REPORT

Submitted in partial fulfillment of the requirements for the degree

MASTER OF PUBLIC HEALTH

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2016

Approved by:

Major Professor
Dr. Justin Kastner

Copyright

SARA J BUBENIK

2016

Abstract

BACKGROUND: Baseline adult vaccinations in the United States are lower than the Healthy People 2020 goal. Literature has shown evidence that this disparity is associated with increased morbidity and mortality of common preventable illnesses within the community and increases health-care related costs for individuals, and on the state and national level. The Clinton County Adult Vaccine Project was a collaborative project between the Clinton County Health Department, Pharmacies, and physicians. Its primary goal is to assess the current adult vaccine barriers in Clinton County

METHODS: Data obtained from the New York State Department of Health database was analyzed for estimation of adult immunization rates in Clinton County. Then a systematic literature review was conducted via Google scholar, PubMed, and the CDC to review prior recommendations and reports on adult immunizations. Survey tools were developed based on this literature for the assessment of vaccine knowledge and barriers with the Clinton County residents, physicians and pharmacies.

RESULTS: The barriers toward adult immunizations in Clinton County the findings are consistent with the results of both past and recent vaccine administration research.

CONCLUSION: Collaboration between public and private health care providers, along with pharmacy immunization practices would be best for efficient vaccine delivery in the adult population of Clinton County. In addition, an improved vaccine registration system in NY state would allow for greater access to adult vaccination information promoting a system of recall and reminders in the population.

Table of Contents

List of Figures.....	3
List of Tables	4
Chapter 1 - Field Experience	5
Introduction.....	5
Community Demographics.....	5
Clinton County Health Department	7
Administration	7
The Adirondack Rural Health Network	8
Spectrum of prevention.....	9
Champlain Valley Physician Hospital	10
Programs	11
Bridges out of Poverty	11
Healthy neighborhoods.....	11
Vaccines for Adults.....	13
Chapter 2 - Back ground on Adult Vaccination.....	14
Introduction.....	14
Background.....	16
Provider Responsibilities in immunization.....	17
Pharmacy Role in Immunization	18
Chapter 3 - Capstone project.....	19
Intro.....	19
Objectives of this Project.....	19
Research questions.....	19
Research Outcomes.....	20
Methodology.....	20
Questionnaire	20
Community survey.....	20
Physician survey	21
Pharmacy survey.....	21
Sampling.....	21

Community survey.....	21
Physician survey	22
Pharmacy survey.....	22
Results and analysis	22
Community Survey	22
Summary	25
Physician survey	25
Summary	28
Pharmacy survey.....	31
Summary.....	32
Limitations	33
Conclusions and Recommendations	33
References.....	36
Appendix A - Community Survey	40
Appendix B - Pharmacy Survey	41
Appendix C - Physician Survey	45

List of Figures

Figure 1 – Spectrum of Prevention	10
Figure 2 – Community Survey Responses to Why They Are Not Fully Vaccinated	23

List of Tables

Table 1 – Base line Vaccination Rates vs Health People 2020 Goals	15
Table 2 - Routinely Assess Vaccination Status	26
Table 3 - Do you routinely Stock the Vaccine.....	27
Table 4 - Causes to Refer Patients Elsewhere for immunization administration	27
Table 5 - Provider Barriers to Stocking and Administering Vaccines.....	30
Table 6 - Percent of Vaccines Administered in Clinton County Pharmacies	32

Chapter 1 - Field Experience

Introduction

Each community has its own unique culture and social structure based on a shared history and defined by its needs and resources. The North Country region of New York State encompasses the state's extreme northern frontier, bordering Lake Ontario on the west, the Saint Lawrence River and the Canadian provinces of Ontario and Quebec on the north and northwest, and Lake Champlain and Vermont on the east (Landon, 1932). North Country is comprised of 6 counties with a total estimated population of 428,357 (Empire State Development, 2010). The region is the most sparsely populated in the state but it is also the largest territory geographically. The core of North Country consists of three counties: Clinton, Essex, and Franklin (Hallas, 2013). Each of these counties have very different economies but there is great fluidity of movement in the population making public health concerns a collaborative effort between the three counties. The focus of this report will be on Clinton County.

I completed 240 hours at the Clinton County Health Department (CCHD) in Plattsburgh, New York from October 1st through April 15th. My preceptor at the CCHD was Ms. Jerie Reid, Director of CCHD. During my time at CCHD, my main objective was to gather data on adult vaccination barriers and gaps in order to determine strategies and services needed to help ensure adults receive the recommended vaccines.

Community Demographics

Clinton County is located in the North Country region of New York State south of the Canadian province of Quebec and bordering Burlington, Vermont. According to the 2010 census, it has a population of 82,128 residents. Nearly 64% of residents live within rural areas and 36% in urban clusters (U.S. Census Bureau, 2010). Caucasians make up about 93% of the

population, with African Americans (3.9%), and American Indians (.4%) composing most of the balance (U.S. Census Bureau, 2010). Hispanics or Latinos are about 2.5% of the population. About 16.6% of Clinton County residents have household incomes below the federal poverty level, and it is estimated that 10% of adult residents lack health insurance (U.S. Census Bureau, 2010). In fact, poverty in Clinton County is exacerbated by geographic isolation, as it is one of the most rural counties in the State.

Clinton County contains Plattsburgh, the only city in the northern region of New York with a population of 19,989 (U.S. Census Bureau, 2010). Plattsburgh housed an Air Force Base from 1950-1995 (Pratt, 2014). During this time the city expanded with the construction of the Adirondack Northway (I-87) and the addition of Plattsburgh State University (Pratt, 2014). The closure of Plattsburgh Air Force Base in 1995 was economically devastating for the community and many civilians lost their jobs (Pratt, 2015). Plattsburgh has slowly regained a stronger economy since that time. There are noted differences between Plattsburgh and the other towns of Clinton County in both socioeconomic and demographic characteristics. The city contains a state university bringing in a diverse student population; a regional hospital operated under the University of Vermont, which is estimated to be the largest employer of the city; and Plattsburgh International Airport (Pratt, 2015). The other urban clusters in Clinton County have much smaller populations (<6000) and do not have significant economic foundations (US Census Bureau, 2010). These socioeconomic factors have profound influences on community health and should be considered in any public health mission.

Clinton County Health Department

Administration

During fieldwork and employment at the Clinton County Health Department, there have been many instances to observe the many roles and responsibilities within the public health workforce. With collaborations such as the Healthy Neighborhood program, the Community Health Improvement Plan, and the Immunization clinics, there are varieties of public health stakeholders within the public health system. The collaborative efforts have provided an excellent opportunity to observe the many dimensions of public health.

Being a part of the Clinton County Health Department has allowed the opportunity to view the administrative efforts within public health. I spent much of my time meeting with Jerie Reid, the department director, and Margaret searing, the Quality coordinator. Together, I was able to discuss Clinton County public health concerns and determine the needs of the health department and the community. I participated in training nursing students to assist in survey dispersal. I learned about the various branches and personnel the run the complex health department.

The Clinton County Health Department (CCHD) has a mission to improve and protect the health, well being and environment of the people of Clinton County (CCHD, 2015). Clinton County Health Department (CCHD) works in the city of Plattsburgh and the 14 towns and associated villages located within the county to implement improved access to all aspects improving overall health (CCHD, 2015). The county provides a Community Health Assessment (CHA) each year to evaluate the needs of the community (CCHD, 2015). There are three divisions that the CCHD oversees: The Environmental Health and Safety Division, which monitors and controls environmental risk factors that may contribute to disease in Clinton County;

The Health Planning and Promotion Division, which utilizes Evidence based research to promote and plan community based interventions; and The Healthcare Services Division, which focuses on primary and secondary healthcare promotion methods to prevent disease (CCHD, 2015).

These work together in collaboration to promote improved community health. In addition, the Clinton County Health Department and Champlain Valley Physicians Hospital (CVPH) Medical Center have an established partnership. CVPH is part of the University of Vermont Health Network (CCHD and CVPH, 2013).

Due to the fluidity of movement within the eastern Adirondack region, the CCHD collaborated with the Eastern Adirondack Health Care Network to implement MAPP (Mobilizing for Action through Planning and Partnership) (CCHD, 2013). The MAPP process allowed for the development of partnerships and shared responsibility for the health of the community (CCHD, 2013). This collaborative effort provides a background for policy/system and built environment change in the County (CCHD, 2013).

The Adirondack Rural Health Network

The Adirondack Rural Health Network (ARHN) is a program of the Adirondack Health Institute, Inc. (AHI, 2015). The mission of AHI is to promote, sponsor, foster and deliver programs, activities and services, which support the provision of comprehensive health care services to the people residing in the Adirondack region ((AHI, 2015). AHI is a shared initiative of Adirondack Health (Adirondack Medical Center), Community Providers, Champlain Valley Physicians Hospital Medical Center (CVPH) and Hudson Headwaters Health Network (AHI, 2015).

The Adirondack Rural Health Network (ARHN) is a regional coalition of multiple stakeholders that manage community health planning events by providing a forum for local







public health services, community health centers, hospitals, community mental health programs, emergency medical services, and other community-based organizations to assess regional needs and the effectiveness of the rural health care delivery system (AHI, 2015). ARHN plans, facilitates and coordinates many different activities required for successful transformation of the health care system (AHI, 2015).

Spectrum of prevention

CCHD has embraced the concepts for improving the public's health by applying the Spectrum of Prevention Model (See Figure 1) (CCHD, 2013). The Spectrum of Prevention model provides an infrastructure for tracking policy, system and built environment changes as the local public health system partners implement the annual Community Health Improvement Plan (CHIP) (CCHD, 2013). There are seven areas outlined within the Spectrum of Prevention: Influencing Policy and Legislation, Mobilizing neighborhoods and communities, changing organizational practices, fostering coalitions and networks, education providers, promoting community education, strengthening individual skills and knowledge (CCHD, 2013).

Throughout the development of each annual CHIP, the Spectrum of Prevention has provided a framework to evaluate and sort the activities of local public health system partners (CCHD, 2013). Each level of the Spectrum of Prevention complements the others, and efforts have been proven to be more effective when focus is placed on all levels (CCHD, 2013). No level is considered more important than another and the potential to impact larger numbers of people increases as work focuses higher on the spectrum (CCHD, 2013).

Figure 1 – Spectrum of Prevention

	<p>Influencing Policy and Legislation</p>	<p>Changes in local, state and federal laws have potential for achieving the broadest impact across a community. Effective formal and informal policies lead to widespread behavior change and ultimately a change in social norms.</p>
	<p>Changing Organizational Practices</p>	<p>Changes in internal regulations and norms allow an organization to affect the health and safety of its members and the greater community.</p>
	<p>Fostering Coalitions and Networks</p>	<p>Coalitions and expanded partnerships are vital to public health movements and can be powerful advocates for legislative and organizational change. From grassroots partners to governmental coalitions, all have the potential to develop a comprehensive strategy for prevention.</p>
	<p>Educating Providers</p>	<p>Providers have the influence within their fields of expertise to transmit information, skills, and motivation to their colleagues, patients and clients. They can become front line advocates for public health encouraging the adoption of healthy behaviors, screening for risks and advocating for policies and legislation.</p>
	<p>Promoting Community Education</p>	<p>Community education goals include reaching the greatest number of people possible with a message, as well as mass media to shape the public's understanding of health issues.</p>
	<p>Strengthening Individual Knowledge and Skills</p>	<p>This is the classic public health approach and involves nurses, educators and trained community members in working directly with clients in their homes, community settings or clinics in order to promote health.</p>

Champlain Valley Physician Hospital

CVPH Medical Center is a strong community partner. The New York State Health Department (NYSDOH) required the union of the Community Health Assessment (CHA) with the hospital required Community Services Plan (CSP) (CCHD and CVPH, 2015). The united CHA and CSP allowed for enhanced strategic planning, implementation and evaluation of

prevention and intervention efforts addressing the greatest areas of health concern facing our community (CCHD and CVPH, 2015).

Programs

Bridges out of Poverty

Health is defined as a state of complete physical social and mental well being and not merely the absence of disease (WHO, 2015). CCHD understands the complex relationship between individual, social, economic, and environmental factors that can affect ones health. I was invited to attend the Bridges out of poverty seminar, which focuses on Health and Poverty Through the Lens of Economic Class. This seminar was held to help employees understand the psychology of poverty and manners to support the clients who come into Clinton County. Jerie Reid, the Public health Director for Clinton County, ran the in-service. The topics that were covered included the environment of poverty, effective communication, strategies' to improve outcomes in struggling clients, and building community sustainability. A list of variables contributing to the cycle of poverty was presented to the group and some of support mechanisms were discussed in detail.

Healthy neighborhoods

The health of individuals is affected in complex ways by environmental factors. It is reported that positive health outcomes are more prevalent in neighborhoods where people have easy access to wholesome and inexpensive food; safe and pedestrian friendly streets; and active playgrounds and public spaces (CCHD, 2015). Neighborhoods that lack these elements decrease the desirability for daily exercise, which consequently is related to higher rates of obesity, diabetes, or other chronic illnesses. New York State Health Foundation (NYSHHealth) introduced the Healthy Neighborhoods Fund initiative to assist New York State communities to develop

healthier and more active environments (CCHD, 2015). The Healthy Neighborhoods Fund initiative was given \$2 million over two years by NYSEHealth to support six communities across the State to increase access to wholesome, inexpensive food; develop better access to safe places where residents can exercise and be active; and connect children and adults to programs that support healthy behaviors (CCHD, 2015).

CCHD was selected as one of NYSEHealth's six Healthy Neighborhoods Fund grantees, playing the lead role in coordinating a multipronged approach to improve the health of its residents (CCHD, 2015). Based on data from 2011, there were only 24 grocery stores in Clinton County, and only 50% of them were WIC authorized (CCHD, 2015). Other reported barriers to achieving the goals presented by NYSEHealth included high food prices and transportation issues as obstacles to healthy food choices (CCHD, 2015). The NYSEHealth grant was awarded to CCHD in 2015 and goes toward addressing the barriers to food access faced by both retailers and consumers (CCHD, 2015).

Clinton County has a rich agricultural community. The strategy, adopted by CCHD, is to improve access to nutritious food through local farmers markets and farm stands (CCHD, 2015). CCHD hopes to increase both the number of farmers markets and farm stands in the community, but also to increase the acceptance of Supplementary Nutrition Assistance Program (SNAP), WIC, and Electronic Benefits Transfer (EBT) by 50% (CCHD, 2015). In addition, CCHD also will attempt to increase amount of local fruits and vegetables in schools (CCHD, 2015).

Health Neighborhoods also has worked to increase access to and affordability of physical activity and nutrition opportunities in Clinton County. To achieve this goal, CCHD increased the number of public transportation riders to local grocery and food stores; developed and conducted community surveys to determine the need for additional routes and times of current routes to

increase ridership; and promoted ridership in low-income rural areas (CCHD, 2015). A Complete Streets initiative was also started to improve the walkability of communities and enhance other physical activity opportunities (CCHD, 2015). Eastern Adirondack Healthcare Network, CVPH Medical Center, and CVPH Foundation matched the CCHD funds for these initiatives (CCHD, 2015).

Vaccines for Adults

Local health departments continue to play a large role in providing services not met by providers or community programs. Financial constraints or the lack of a medical provider are often causative. To target this population, CCHD began participation in the NYSDOH's "Adult Vaccine Program". Use of this vaccine is the focus of a division performance objective for 2016-2017, incorporating the CCHD Strategic Plan to advance prevention, protection and wellness promotion.

In 2015, a new program was initiated by New York State Department of Health, "Vaccines For Adults (VFA)". The criteria for this program, mirrors that of the NYSDOH Vaccine for Children (VFC) program, allowing for no cost vaccine for adults that are underinsured or uninsured. Additionally, new guidelines were established by the VFC and VFA programs, requiring CCHD to computerize all vaccine inventories for ordering and tracking. Specific chart documentation was developed and initiated to meet this regulation.

Chapter 2 - Back ground on Adult Vaccination

Introduction

One hundred years ago the leading cause of death was due to infectious disease. Immunization is one of the most effective and successful public health interventions this past century. Despite this effective preventative measure adult vaccine rates are not meeting the healthy people 2020 targets (U.S. DHS, 2011). The Major concern seen is that hundreds of thousands of adults every year become ill, and approximately 42,000 adults and in the United States die each year from influenza, pneumococcal disease, and other vaccine-preventable diseases (Miller, 2006). This is a substantial disease burden that could be prevented in the adult population in the United States.

The 2008 influenza vaccination rate for adults 18-65 years of age was only 25% compared with the Healthy People 2010 goal of 80%, and for adults 65 years of age and older (a high risk target population) the rate was approximately 67% compared with the goal of 90% (HealthyPeople.gov). Only 60%-65% have received the pneumococcal vaccine compared with the 90% goal (Table 1). Due to these findings the National Vaccine Advisory Committee (NVAC) and the Center for Disease Control and Prevention (CDC) in 2011 recommended an emphasis on adult vaccination age 18 and older for vaccine preventable illness (Miller, 2006). This recommendation was placed due to the low and variable rates of adult vaccination. For example, Clinton County was found to be below the Healthy People 2010 target of seasonal influenza vaccination immunized last year. (NYSDH, 2013)

Table 1 – Base line Vaccination Rates vs Health People 2020 Goals

Baseline Vaccination Rates vs Healthy People 2020 Goals: Gaps Persist

Vaccine and Group	Baseline Rate (year)	Healthy People 2020 Goal
Influenza		
Noninstitutionalized, 18-64 years	25% (2008)	80%
Noninstitutionalized, ≥ 65 years	67% (2008)	90%
Healthcare workers	45% (2008)	90%
Pregnant women	28% (2008)	80%
Pneumococcal		
≥ 65 years	60% (2008)	90%
High-risk, < 65 years	17% (2008)	60%
Institutionalized adults	66% (2006)	90%
Zoster		
≥ 60 years	7% (2008)	30%
Hepatitis B		
Healthcare workers	64% (2008)	90%

US Department of Health and Human Services. Healthy People 2020.
<http://healthypeople.gov/2020/topicsobjectives2020/pdfs/immunization.pdf>

Current adult vaccination decreases morbidity and mortality of common preventable illnesses within the community and improves the quality of life by counteracting sequelae of preventable infectious diseases. (Miller, 2006) Additionally, it decreases health-care related costs for individuals, and on the state and national level (NVAC, 2012). For example, the health and productivity costs of influenza alone are estimated to be as high as \$87 billion per year (Maglione, 2014). Coordination between public policy, health based, and community based interventions is needed for maintenance of high levels of adult vaccination in the community.

This chapter provides information on how the community needs assessment for adult vaccination awareness developed. The need for this assessment was based on the data collected from the New York health agency, which reported that Clinton County did not meet the 2010 healthy people goals for adult vaccination.

Background

Research has revealed that adult vaccinations are underutilized despite proven efficacy and cost-effectiveness. A 2014 survey of 607 general internists and family physicians in the United States indicated several barriers in place to completing the recommended vaccination schedule for adults (Hurley, 2014). The CDC reports the prevalence of illness attributable to vaccine-preventable diseases is greater among adults than among children (Williams, 2016). The CDC also recognizes that there are several factors attributable to low vaccination rates including: limited public awareness about adult vaccinations, misinformation about vaccines, lack of vaccine requirements for adults, gaps in incorporation of routine vaccine needs assessment and recommendations for adults during health care visits, the cost of stocking vaccines and providing vaccination services, inadequate and/or inconsistent payment for vaccines and vaccine administration, complexities in how adult vaccinations are paid for by private as well as public insurers, lack of health insurance and limited funding for programs to vaccinate uninsured adults, and acute medical care taking precedence over preventive services (Williams, 2016). The Advisory Committee on Immunization Practices (ACIP) recommends that adults receive vaccinations based on their age, underlying medical conditions, lifestyle, prior vaccinations, and other considerations; with the exception of the influenza vaccine required yearly (Williams, 2014).

Provider Responsibilities in immunization

Provider recommendation has been demonstrated to be among the most potent predictors of up-to-date vaccinations (Hurley, 2014). Patients are likely to become vaccinated if the PCP gives a clear, unequivocal recommendation to their patients (Hurley, 2014). Missed visits and missed opportunities for immunization when necessary vaccines are not administered at a visit are also notable barriers to timely completion of immunization requirements. (Norwalk, 2006). One study of an influenza season showed that over 50% of patients needing an influenza vaccination left a healthcare visit unvaccinated (Norwalk, 2006). There were similar findings for pneumococcal vaccination as well, with 5-10 encounters over a 3-year period in which patients didn't receive this one-time vaccine.

Vaccine safety appears to be a common concern, with patients asking whether they will become ill because of the vaccination (Hurley, 2014). Vaccines used in the United States today for adults and for children are very safe and effective, and these facts must be communicated in a provider's recommendation (Hurley, 2014). Data suggest that patients find their provider's recommendation as important as that of public health authorities and of the US Centers for Disease Control and Prevention (Hurley, 2014).

A third barrier noted is logistical. Logistical barriers faced by health care providers include the cost of immunizations, vaccine storage or capacity, lack of access to patients' prior immunization records (Kimmel, 2007). Vaccines have stringent storage requirements, such as varicella vaccine or live attenuated influenza vaccine, and are challenging to maintain national standards. Often patient care is fragmented; making it more likely PCPs will not have complete immunization records for patients (Kimmel, 2007).

Having an immunization registry that healthcare providers would utilize would improve knowledge and assessment of adult immunizations (NVAC, 2014). It is also noted that immunization rates improve when health care providers utilize immunization registries to check immunization status and notify patients about vaccinations that are due or overdue immunization (NVAC, 2014). Greater use of electronic medical record systems should make reminder and recall systems more efficient.

Pharmacy Role in Immunization

Community pharmacies that contribute in vaccination services benefit the health care system through both increased numbers of providers and settings from which patients can receive vaccines. Research from the 2012 National Health Interview Survey showed that adult vaccination coverage remains low and far below Healthy People 2020 targets (Williams, 2016). More than one-half of the nation's community pharmacies are offering pneumococcal, zoster, and tetanus vaccines but Adult Americans have suboptimal coverage (Posey, 2014). Compared with 2011 estimates, coverage for most vaccines and risk groups did not improve, and racial and ethnic disparities persisted for routinely recommended adult vaccines . Wider use of practices shown to improve adult vaccination is needed, CDC said.

Receiving immunizations for the adult population is often a matter of convenience (Grabenstein, 2004). A majority of community pharmacies are available to administer vaccinations without an appointment, have almost no waiting, and do not charge visit fees (Grabenstein, 2004). Community pharmacies also have extended hours of operation in order to provide access. Large numbers of patients benefit from increased access and convenience to immunization services though these extended hours, especially the younger and healthier adults where rates of immunizations are lower (Goad, 2014).

Chapter 3 - Capstone project

Intro

The Clinton County Adult Vaccine Project was a collaborative project, organized with the help of Jerie Reid the CCHD director; Margaret Searing, the quality control coordinator; Darwina Factaeu, a public health nursing supervisor; and MaryAnn Barto in the Healthy Neighborhood community program. Its primary goal is to assess the current adult vaccine barriers in Clinton County. This MPH project consisted of collaboration with the Clinton County Health department in developing and conducting a community health assessment, assisting with data collection, and analysis of data. The results from this study will determine if an intervention is needed to increase knowledge of adult vaccination in Clinton County.

Objectives of this Project

The purpose of this proposal is to gather data to determine strategies, barriers, gaps in treatment, and services needed to help ensure adults receive the recommended vaccines.

Research questions

- What is the status of adult vaccination rates in Clinton County?
- What is the accessibility and availability of recommended adult vaccines in Clinton County?
- What is the general adult population's knowledge or awareness of adult vaccine needed and scheduled?
- What are the perceived barriers to offering adult vaccine management and application by health-care providers?
- What/Where are the gaps in vaccine management?
- What recommendations should be given for ensuring Clinton County meets the Healthy People 2020 objective for adult vaccination?

Research Outcomes

- Address barriers to vaccination through individual, community organization, and neighborhood levels and included dissemination of information, presentations at provider meetings in Clinton County to ensure vaccination of adults in part of the routine clinic visit.

Methodology

To assess vaccination barriers and gaps in Clinton County for adults >18 years, data was first assessed using the New York State Department of Health database for adult immunizations in Clinton County. The report highlights the breakdown of the prior two years of adult immunization in the county and the analysis of data collected to examine the barriers in adult immunization in Clinton County. Then a systematic literature review was conducted via Google scholar, PubMed, and the CDC to review prior recommendations and reports on adult immunizations. Survey tools were developed based on this literature for the assessment of vaccine knowledge and barriers with the Clinton County residents, physicians and pharmacies.

Questionnaire

Three questionnaires were developed in consultation with the CCHD director, quality improvement coordinator, supervising public health nurse and other personnel in the public health department. The primary survey sought out potential barriers in the community at large. The second survey was administered to physicians and attempted to answer the question of barriers to administration in the clinic. The final survey was administered to pharmacies to determine how the gaps in immunization are addressed.

Community survey

The target group was identified as adults 18 years and older living in Clinton County. Respondents were surveyed on the acceptability of immunization, knowledge of recommended

immunizations, chronic health conditions, ease of availability to immunization, and knowledge of where to obtain immunizations. The survey also included demographic questions on age, gender, smoking history and county of residence. All respondents were asked if they had health insurance and a primary care provider. In addition to the above items, they were asked if their physician administered vaccinations and if not, their knowledge of locations offering immunizations.

Physician survey

All Primary care physicians in Clinton County who treat patients >18 years were targeted to complete this survey. There are roughly 40 primary care practitioners in Clinton county who treat adults >18 years. Respondents were surveyed on immunization practices including: assessment of patient's medical records for vaccine coverage, vaccines in stock and storage capabilities, vaccine referral, and barriers to vaccine administration.

Pharmacy survey

All Pharmacies in Clinton County were targeted to complete the survey addressing if vaccination is offered and the numbers served per pharmacy. Demographic questions were included such as: age, gender, years in practice and prescription volume. Pharmacies were surveyed on the acceptability of immunization, involvement in immunization services, feelings toward offering immunizations in the pharmacy, obstacles to immunization services, and documentation of vaccinations.

Sampling

Community survey

Surveys were dispersed using email and face-to-face interviews for a total of 335 collected responses in a population of 82,128 with a noted 6% margin of error. A convenience

sampling method was selected due to the limited access to phone numbers, including cell phone numbers, for Clinton County residents. Email with a link to Survey Monkey was delivered to all employees of Clinton County Health Department and Clinton County Correctional institution. Face-to-face interviews were conducted in various high-populated locations of Clinton County and through the Healthy Neighborhood program.

Physician survey

There are roughly 40 primary care practitioners in Clinton county who treat adults >18 years. All physicians' clinics were notified of this surveys availability and phone calls to each clinic were made out as reminders. There were 7 respondents for this survey. The sample was then weighted to be closely representative of the population.

Pharmacy survey

There are 21 pharmacies in Clinton County. Each pharmacy was asked to complete the survey either by hand or via an online link to Survey Monkey. After survey distribution, reminder phone calls were placed. There were 7 respondents for this survey. The sample was then weighted to be representative of various provides. The sample was then weighted to be closely representative of the population.

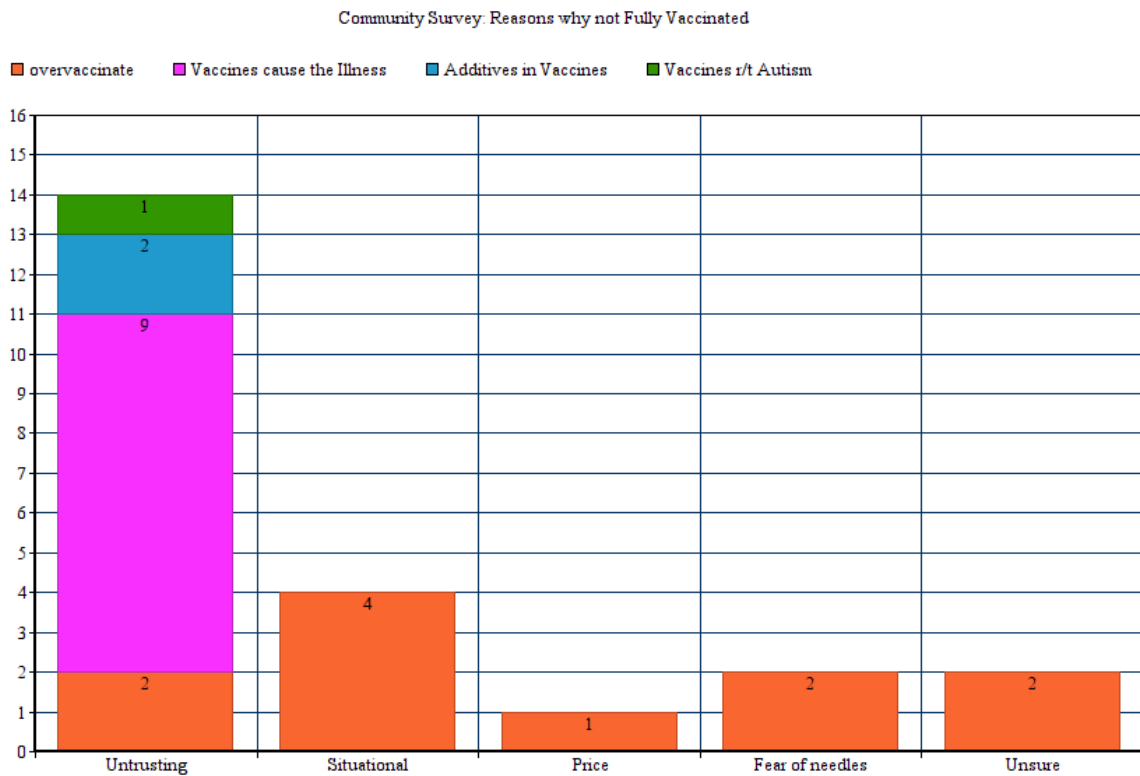
Results and analysis

Community Survey

The community survey population was divided between men (23%) and women (77%). Age distribution was 13% aged 18 to 30, 29% aged 31 to 45, 41% aged 46 to 60, 17% aged > 60. Of the 335 persons in the community survey, 15% were smokers while 85% were non-smokers. Most respondents (85%) rated positive feelings toward routine immunization, but 15% reported negative feelings toward routine vaccinations. Of the 15% negative responses, it was further separated into either not important (3.6%), risky (6.4%), or no confidence (4.88). There were 33

hand-written responses to negative vaccine associations. The most common concerns listed were distrust of vaccinations (9.1%), situational (2.6%), and fear of needles (1.2%). A majority of the respondents listing distrust as a concern for not receiving routine vaccinations believed that vaccines caused illness (8%); while others listed over vaccination (1.2%), too many additives in vaccinations (1.2%), and vaccines caused autism (0.5%) as factors (Figure 1).

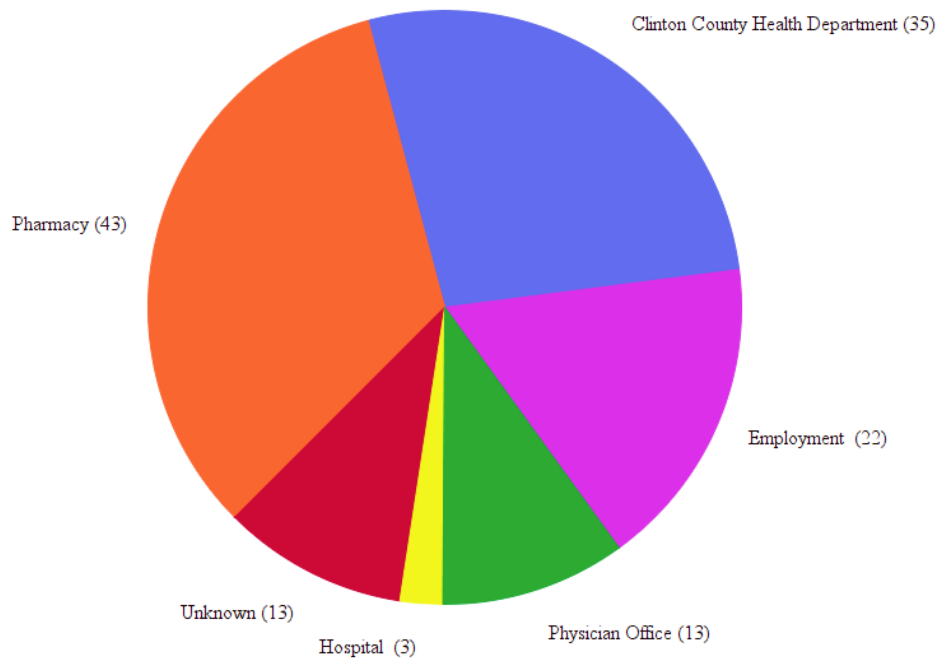
Figure 2 – Community Survey Responses to Why They Are Not Fully Vaccinated



Overall, the majority of the survey population (67.8%) believed they knew what immunizations were recommended for them and 70.2% did not have a chronic health condition. Only 33.6% required immunization for school or employment. There was an equal distribution between time (37%) and lack of information (42%) preventing routine immunization while 20% reported that the cost of immunization was a factor.

Almost all survey respondents reported having health insurance (97%) with the majority of insured covered under private health insurance (72%). The remainder reported having public health insurance (18%) or both public and private health insurance (5%). Approximately 3 of 4 respondents (72%) said their health insurance plan covered immunizations and the remainder (24%) were unsure. Most people reported having a primary care provider (90.5%) and 2 out of 5 respondents (40%) reported that their Primary care provider did not discuss immunizations with them or refer them elsewhere for immunization services. When the primary care provider did not provide immunizations, the respondents were asked to comment on where they obtained their immunizations giving 111 hand written responses divided into six general categories: Pharmacy (39%), Clinton County Health department (31.5%), Employment (20%), Physician offices (12%), Hospital (3%), unknown (13%) (figure 2).

Figure 2 -Reported Vaccination Locations



Summary

The results indicate that the assumed knowledge and opinions toward of recommended vaccines in the adult population is high in the Clinton County community. Most of the Clinton county community had health insurance and a primary care provider. Things that prevented routine immunization administration included lack of time (37%) and information (42%). This corresponded to the percentage of respondents (40%) that did not feel their PCP discussed immunizations during clinic visits. Overall, most respondents reported immunization availability in local pharmacies, the CCHD, and through their employment.

Physician survey

Inquires to specific vaccinations were asked in the survey for primary care providers (PCPs); of these, seasonal influenza, Tdap, pneumococcal and Zoster were reported to be routinely assessed by the PCPs during office visits and routinely stocked in clinics (Table 2 & 3). The majority of primary care providers (PCPs) (71.43%) refer patients elsewhere when they do not routinely stock vaccines. The reported causes of vaccine referral were divided between: routinely stock, but run out of vaccine; Do not routinely stock vaccines; The patients insurance does not cover a vaccine; The patients insurance covers a vaccine, but I can not be reimbursed for it or reimbursement is inadequate (Table 3). When vaccines are delivered in their practice almost half (42.86%) reported that they document in both the patient medical record and the state or regional database. PCPs reported that 28.6% assess immunization status at every visit, a small percentage (14%) assess immunization status annually, and another 14% reported that immunization assessment is only conducted at the initial intake visit; The remainder (42.86%) only assess vaccine status when the patients disease state warrants vaccination. When assessing adult immunization records the majority of survey respondents asked the patients verbally

(71%), while 42% both checked their clinic medical records and asked the patient verbally; some practices (29%) used a questioner and others (29%) checked the state or regional system for records.

Table 2 - Routinely Assess Vaccination Status

	Yes	No
Hep A	16.67	83.33
Hep B	16.67	83.33
HPV	16.67	83.33
Seasonal influenza	71.43	28.57
Meningococcal	33.33	66.67
MMR	16.67	83.33
Pneumococcal	71.43	28.57
Tdap	71.43	28.57
Td	16.67	83.33
Varicella	16.67	83.33
Zoster	71.43	28.57

Table 3 - Do you routinely Stock the Vaccine

	Yes	No
Hep A	14.29	85.71
Hep B	0	100
HPV	0	100
Seasonal influenza	83.33	16.67
Meningococcal	14.29	85.71
MMR	0	100
Pneumococcal	66.67	33.33
Tdap	66.67	33.33
Td	14.29	85.71
Varicella	0	100
Zoster	71.43	28.57

Table 4 - Causes to Refer Patients Elsewhere for immunization administration

	Never	Rarely	Sometimes	Always	N/A	Weighted Average
We routinely stock, but have run out of the vaccine.	28.57%	42.86%	0.00%	0.00%	28.57%	1.60
We do not routinely stock vaccines.	0.00%	0.00%	57.14%	14.29%	28.57%	3.20
The patients insurance does not cover a vaccine.	0.00%	0.00%	57.14%	14.29%	28.57%	3.20
The patients insurance covers a vaccine, but I cannot be reimbursed for it or reimbursement is inadequate.	42.86%	14.29%	14.29%	0.00%	28.57%	1.60

Barriers to vaccinations were reported and can be seen in table 4. In summary: Buying the vaccines upfront had a 80% minor barrier and a 20% major barrier; maintenance and cost of adequate vaccine storage equipment was divided between no barrier (40%), minor barrier (40%) and major barrier (20%); Not enough patients in their practice to justify the cost and hassle of stocking all vaccines was divided between no barrier (17%), mild barrier (50%), and moderate barrier (33%); Possible financial loss due to expired vaccinations was noted to have a no barrier (40%), minor barrier (20%) and moderate barrier (20%); Difficulty determining if a patients insurance would reimburse for immunizations was divided between no barrier (20%) and moderate barrier (20%) with the majority (60%) believing it is only a mild barrier; The patient not having insurance for vaccines was noted to have a 40% mild barrier, 40% moderate barrier and a 20% major barrier; No barrier (60%) was reported for ongoing education for knowledgeable personnel to manage and support vaccine administration and 20% felt it was a mild barrier; other preventative services taking precedence during time-limited visits had a 40% reported mild barrier; 20% reported no barrier to acute problems taking precedence over immunization administration while 40% felt it was a moderate barrier to vaccination; patients not coming in regularly for office visits was equally divided between no barrier, mild barrier and moderate barrier.

Summary

The physician responses to immunization administration and delivery fit with the community responses. The majority of PCPs (71.43%) refer patients elsewhere when they do not routinely stock vaccines. The main rationale to vaccine referral was divided evenly between not stocking the vaccine and the patient's insurance not covering a vaccine. When vaccines are

delivered in their practice almost half reported that they document in both the patient medical record and the state or regional database.

Assessment of patient's immunization status was variable. A large percentage of PCPs only assessed immunization status only when their patient's disease state warranted assessment. This lack of assessment and discussion about necessary immunizations in the physician's office is a noted barrier to up-to-date adult vaccinations and contributes to the lack of immunization knowledge reported by community respondents (Kimmel, 2007).

Table 5 - Provider Barriers to Stocking and Administering Vaccines

	No Barrier	Minor Barrier	Moderate Barrier	Major Barrier	N/A	Weighted Average
Costs of buying vaccines upfront	0.00%	80.00%	0.00%	20.00%	0.00%	2.40
Maintenance and cost of adequate vaccine storage equipment.	40.00%	40.00%	0.00%	20.00%	0.00%	2.00
Not enough patients in your practice who need vaccines to justify the cost and hassle of stocking all vaccines.	16.67%	50.00%	33.33%	0.00%	0.00%	2.17
Possible financial loss due to expiration of vaccines prior to use.	40.00%	20.00%	40.00%	0.00%	0.00%	2.00
Difficulty determining if a patient's insurance will reimburse for a vaccine.	20.00%	60.00%	20.00%	0.00%	0.00%	2.00
The patient does not have insurance for vaccines.	0.00%	40.00%	40.00%	20.00%	0.00%	2.80
Persons who administer vaccines and staff who manage or support vaccine administration are knowledgeable and receive ongoing education.	60.00%	20.00%	0.00%	0.00%	20.00%	1.25
The hassle of ordering vaccines.	100.00%	0.00%	0.00%	0.00%	0.00%	1.00
Difficulty determining whether a patient has received a particular vaccine.	0.00%	60.00%	20.00%	20.00%	0.00%	2.60
Other preventative services take precedence during time-limited visits.	40.00%	40.00%	0.00%	0.00%	20.00%	1.50
Acute problems take precedence over vaccinations.	20.00%	0.00%	40.00%	0.00%	40.00%	2.33
Patients can receive vaccines elsewhere.	60.00%	20.00%	20.00%	0.00%	0.00%	1.60
Patients refuse vaccines for safety concerns or because they believe they do not need them.	0.00%	60.00%	40.00%	0.00%	0.00%	2.40
Patients do not come in regularly for office visits.	20.00%	20.00%	20.00%	0.00%	40.00%	2.00

Pharmacy survey

The Pharmacy population was divided between men (57%) and women (43%). Age distribution was 43% aged 18 to 30 and 57% aged 31 to 45. Prescription volume was near equal between moderate (57%) and high (43%) volumes and all respondents reported positive feelings toward offering immunization services in pharmacies. All respondents reported involvement in vaccine administration and vaccine promotion; all respondents also reported excellent training and high confidence in vaccine administration. Over half of the respondents (57%) reported excellent staff support for ongoing education on immunization practices and protocols for current vaccine administration, while 29% report adequate staff support, and 14% reported not enough staff support. All respondents report administration of high volumes of (>200) vaccines per year. The majority (86%) report adequate space in the pharmacy and (71.1%) report excellent physician support to administer vaccinations while 28.6% moderate physician support. All respondents reported excellent understanding of state laws for vaccine administration.

Over half of the respondents report moderate issues with insurance reimbursement while 29% reported no issues with insurance reimbursement. Almost 30% of the respondents reported vaccine administration greatly interfered with their other responsibilities, 57% of the respondents reported that vaccine administration moderately impedes their other responsibilities, and 14% responded that they have sufficient time to administer vaccinations without impeding their other responsibilities. More than 85% of documentation of vaccines in the pharmacy is kept in the pharmacy network of vaccination records, 71.4% of the electronic vaccination registries and 43% report documentation in an automated database that allows for long-term storage of patient immunization records. About 42% of pharmacy staff is reported to use the immunization registry with 100% of users being very confident. Of the vaccines administered in pharmacies, 100% of

the respondents reported administration of influenza, pneumococcal, and H. Zoster; About 85% report administration of Tdap; 57% reported meningococcal administration (Table 5).

Table 6 - Percent of Vaccines Administered in Clinton County Pharmacies

Vaccine Administered	Percentage
Influenza	100.00%
Pneumococcal	100.00%
Meningococcal	57.14%
H. zoster	100.00%
Tetanus	85.71%
Diphtheria	85.71%
Pertussis	85.71%

Summary

All respondents reported positive feelings toward vaccine administration in their pharmacies but a majority felt vaccine administration was a moderate impedance in their daily routine. Most pharmacies provided adult vaccinations and only required an off premises physician standing order to administer. The majority also felt that they had excellent knowledge of state and federal regulations in vaccine administration and had excellent staff support.

Limitations

Response rates and survey statistical confidence was a concern when developing this survey project. I found that this study was subject to several limitations. As with any survey of this kind, self-report is a source of recall bias. The low response rate both overall and among provider and pharmacy surveys was a predominant weakness that limited the statistical accuracy of the study. The self-reported results are likely to impact the accuracy and reliability of the immunization estimates. The low response rate obtained in this cycle of the survey does indicate that the results of the survey may not be entirely representative of the Clinton County population of adults.

The community survey relied on a convenience samples from non- random sampling drawn from face-to-face interviews and healthy neighborhood registration lists. This may have accounted for the predominantly female responses. Some survey questions allowed respondents to write in their own answer either to further describe their selection of ‘other’ or in response to a qualitative question. Qualitative answers were compared against answer choices, then categorized and grouped into themes.

Conclusions and Recommendations

In addressing the barriers toward adult immunizations in Clinton County the findings are consistent with the results of both past and recent vaccine administration research. The results of this survey have demonstrated that there is availability of obtaining up-to-date adult immunizations in Clinton County via the PCP’s office or the pharmacy. Despite the availability, many PCPs are reported to not assess or discuss immunizations with their patients routinely leaving many patients unaware that they need vaccination. Research from the National Federation of Infectious Disease (NFID) reports that 47% of PCPs only discuss influenza

vaccination and 45% of patients bring up vaccine discussions with the physician at routine healthy visits (Hurley, 2014). The focus among primary care providers in the adult population lean toward chronic disease prevention and other health-care related screenings. Consequently, vaccinations are not emphasized in routine health management in the adult population.

Overall, the general adult population felt they were knowledgeable about their needed vaccinations. Future questioning should involve a more thorough discussion regarding individual vaccines. Although there was overwhelming positive support of immunizations, misconceptions do exist in the population. The majority of survey respondents rated positive feelings toward routine immunizations. A small percentage of the Clinton County community (15%) felt negatively about routine immunizations with the most common concerns listed as distrust of vaccinations as they believed that vaccines caused illness. It is not surprising that low perceived susceptibility to or severity of vaccine-preventable diseases, along with concerns about vaccine safety, have been associated with vaccine refusal.

There are noted gaps in documentation of adult vaccine histories within Clinton County limiting the knowledge of population immunization. The obstacles to assessing prior vaccine rates in Clinton County were secondary to non-standardized documentation methods in the physicians and pharmacies. Physician's offices use different electronic medical records contributing to the difficulty in streamlining accessible vaccine histories. Immunization registries are computerized databases that consolidate vaccination data from multiple health care providers within a defined geographic area and can generate reminder and recall notices. Currently, children are mandated to participate in an immunization registry, however adult vaccinations are not required.

Collaboration between public and private health care providers, along with pharmacy immunization practices would be best for efficient vaccine delivery in the adult population of Clinton County. Pharmacists are now permitted to administer vaccines in all states. As such, they serve an increasingly important role as community vaccinators. Because of their abundant presence in communities (93% of Americans live within five miles of a community retail pharmacy), pharmacists are uniquely situated to provide broad-reaching care. Overall, improvement of the adult vaccination infrastructure would enhance vaccine awareness for potential disease outbreaks. Results from this survey suggest that efforts to increase communication and interaction between PCPs, The public health agency, and pharmacy vaccine providers may improve adult vaccination rates to meet the healthy people 2020 goals.

References

- AHI. (2015). Adirondack Rural Health Network. Retrieved from: <http://www.ahihealth.org/arhn/>
- Bach, A, Goad, J. (2015). The role of community pharmacy-based vaccination in the USA: current practice and future directions. *Integrated Pharmacy Research and Practice* 4, 67.
- Centers for Disease Control and Prevention (CDC). (2011). Early release of selected estimates based on data from the January-June 2011. National Health Interview Survey. <http://www.cdc.gov/nchs/nhis/released201112.htm>.
- Centers for Disease Control and Prevention (CDC). (2011). Final state-level influenza vaccination coverage estimates for the 2010-11 season—United States, National Immunization Survey and Behavioral Risk Factor Surveillance System. Retrieved from: http://www.cdc.gov/flu/fluview/coverage_1011estimates.htm
- Centers for Disease Control and Prevention (CDC). (2012). Recommended adult immunization schedule—United States, *MMWR*; 61(04):1-7. Retrieved from: <http://www.cdc.gov/vaccines/schedules/hcp/adult.html>
- Centers for Disease Control and Prevention (CDC). (2012). Adult vaccination coverage—United States, *MMWR*; 61(04):66-72. Retrieved from: <http://www.cdc.gov/vaccines/imz-managers/coverage/adultvaxview/data-reports.html>
- Clinton County Health Department (CCHD). (2015). Clinton County Health Department Health Care Services Division Annual Report 2015. Retrieved from: <http://www.clintonhealth.org/pdf%20files/HCS%20Annual%20Report.pdf>
- Clinton County Health Department (CCHD), and Champlain Valley Physician Hospital (CVPH). (2013). MAPPING Our Way to a Healthier Community in Clinton County New York, 2013 – 2017, Community Health Assessment/Community Services Plan Priorities and Strategies. Retrieved from: http://www.clintonhealth.org/pdf%20files/CHA_MAPP2013.pdf
- Clinton County Health Department (CCHD). (2015). Clinton County Community Health Improvement Plan. Retrieved from: <http://www.clintonhealth.org/pdf%20files/CHIP2016.pdf>
- Clinton County Health Department (CCHD). (2015). Healthy Neighborhoods program. Retrieved from: <http://www.clintonhealth.org/healthyneighborhoods/>
- Empire State Development. (2010) North country regional office – Inside North Country. Retrieved from: <http://esd.ny.gov/RegionalOverviews/NorthCountry/InsideRegion.html>
- Goad JA, Taitel MS, Fensterheim LE, Cannon AE. (2013). Vaccinations administered during off-clinic hours at a national community pharmacy: implications for increasing patient access and convenience. *Annals of Family Medicine*;11(5):429-436.

- Grabenstein JD, Guess HA, Hartzema AG, Koch GG, Konrad TR. (2002). Attitudinal factors among adult prescription recipients associated with choice of where to be vaccinated. *J Clinical Epidemiology*, 55(3), 279-284.
- Groom, H., Hopkins, D.P., Pabst, L.J., Morgan, J.M., Patel, M., Calonge, N., et al. (2015). Immunization Information Systems to Increase Vaccination Rates: a community Guide Systematic Review. *Journal of Public Health Management Practice*. 21(3), 227–248
- Hallas, H. (2013) Where exactly is North Country? Adirondack Almanac.
<http://www.adirondackalmanack.com/2013/05/where-exactly-is-the-north-country.html>
- HealthyPeople.gov. (2014) Immunization and infectious diseases: overview. Washington DC: DHHS. Retrieved from:
<http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=23>. Accessed September 16, 2014.
- HurleyLP, Bridges CB, Harpaz R, Allison MA, O’Leary ST, Crane LA, et al. (2014). U.S. Physicians’ Perspective of Adult Vaccine Delivery. *Annals of Internal Medicine*, 160:161-170. doi:10.7326/M13-2332. Retrieved from:
<http://annals.org/article.aspx?articleid=1819120>
- Infectious Diseases Society of America (IDSA). (2007). Immunization Work Group of the National and Global Public Health Committee of the IDSA. Actions to strengthen adult and adolescent immunization coverage in the United States: Policy principles of the Infectious Diseases Society of America. *Clinical Infectious Disease*; 44:e104-e108.
- Johnson DR, Nichol KL, Lipczynski K. (2008). Barriers to adult immunization. *American Journal of Medicine*. 121(suppl2): S28-S35.
- Kimmel, S, Burns, IT, Wolfe, RM, Zimmerman, RK. (2007). Addressing Immunization Barriers, Benefits, and Risks. *The Journal of Family Practice*, 56(2), s61-s69. Retrieved from:
<http://people.oregonstate.edu/~fishejos/content/H571/Vaccine/24126305.pdf>
- Kutty, P, Rota, J., Bellini, W., Redd, S.B., Barskey, A., Wallace, G. Centers for disease control and prevention. Chapter 7: Measles. *Centers for Disease Control and Prevention*. Retrieved from: <http://www.cdc.gov/vaccines/pubs/surv-manual/chpt07-measles.html>
- Landon, Harry F. (1932). *The North Country : a history embracing Jefferson, St. Lawrence, Oswego, Lewis and Franklin Counties, New York*. Indianapolis, Ind.: Historical Pub. Co.
- Lowry, F. (2014). Barriers to Adult Vaccination Identified. *Annals of Internal Medicine*, 160, 161-170. Retrieved from: <http://www.medscape.com/viewarticle/820146>
- Maglione, M.A., Gidengil, C., Das, L., et al. (2014) Safety of Vaccines Used for Routine Immunization in the United States. *Agency for Healthcare Research and Quality (US)*. 215. Retrieved from: <http://www.ncbi.nlm.nih.gov/books/NBK230043/>

- Miller, M.A., Sentz, J.T. (2006) Chapter 12: Vaccine-Preventable Diseases. *Disease and Mortality in Sub-Saharan Africa*. 2nd edition. Retrieved from: <http://www.ncbi.nlm.nih.gov/books/NBK2284/>
- Murphy PA, Frazee SG, Cantlin JP, Cohen E, Rosan JR, Harshburger DE. (2003). Pharmacy provision of influenza vaccinations in medically underserved communities. *Journal of American Pharmacists Association*, 52(1):67-70.
- National Vaccine Advisory Committee. (2012) A Pathway to Leadership for Adult Immunization: Recommendations of the National Vaccine Advisory Committee. *Public Health Reports.*, 127. Retrieved from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3235599/>
- National Foundation for Infectious Diseases. (2010). Physician survey on adult immunization. Online survey, conducted October 22-26, 2010, by Opinion Research Corporation. Retrieved from: <http://www.nfid.org/newsroom/news-conferences/2010-news-conferences/2010-cdc-vaccination-rates-news-conference/press-release-20101117.pdf>
- National Foundation for Infectious Diseases. (2010). American adult immunization survey. CARAVAN® omnibus surveys, conducted October 15–18, 2010, by Opinion Research Corporation. Retrieved from: <http://www.adultvaccination.org/resources/cta-adult.pdf>
- National Vaccine Advisory Committee. (2014). Recommendations from the National Vaccine Advisory Committee: Standards for Adult Immunization Practice. *Public Health Report*, 129(2): 115–123. Retrieved From: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3904889/>
- Nowalk MP, Zimmerman RK, Cleary SM, et al. (2005). Missed opportunities to vaccinate older adults in primary care. *Journal of American Board of Family Practice*, 18:20-27.
- Percentage of Adults Aged 18+ Years Who Report Flu Immunization in the Past Year Based on Expanded Behavioral Risk Factor Surveillance Survey (eBRFSS) Health Indicators by County and Region: 2013 -2014. *New York State Department of Health*. Retrieved from: <https://health.data.ny.gov/Health/eBRFSS-2013-2014-Percentage-of-Adults-Aged-18-Year/um27-k9f7>
- Posey, ML.(2014). Gaps in vaccines for adult Americans need to be addressed. *American Pharmacists Association*. Retrieved from: <https://www.pharmacist.com/gaps-vaccines-adult-americans-need-be-addressed>
- Poland GA, Schaffner W. (2007). Adult immunization guidelines: A patient safety and quality-of-care issue. *Annals of Internal Medicine*, 147(10):735-737.
- Pratt, A. Welcome to Clinton County Historians Office. *Clinton County Historian*. Retrieved from: <https://www.clintoncountygov.com/Departments/Historian/HistorianHomePage.html>

- Williams, WW, Lu, P-J, O'Halloran, A, Kim, D, Grohskopf, L, Pilishvili, T, Skoff, TH, et al. (2016). Surveillance of Vaccination Coverage Among Adult Populations — United States, 2014. *Morbidity and Mortality Weekly Report Surveillance Summary*, 65 (SS-1), 1-36. retrieved from: <http://www.cdc.gov/mmwr/volumes/65/ss/ss6501a1.htm>
- Williams WW, Lu P-J, O'Halloran A, et al. (2014). Centers for Disease Control and Prevention (CDC). Noninfluenza vaccination coverage among adults - United States, 2012. *MMWR Morbidity and Mortality Weekly Report*. 63(5):95-102.
- World Health Organization (WHO). (2016). Definition of Health. Retrieved from: <http://www.who.int/suggestions/faq/en/>
- U.S. Census Bureau. (2010). *State & county Quickfacts: Clinton County, N.Y.* Retrieved from <http://quickfacts.census.gov>.
- U.S. Department of Health and Human Services. (2011). Immunization And Infectious Diseases. *National Health Interview Survey (NHIS), CDC/NCHS*. Retrieved from: http://www.healthypeople.gov/2020/data-search/Search-the-Data?f%5B%5D=field_topic_area%3A3527&f%5B%5D=field_obj_age_group%3A535&pop=&ci=&se=
- U . S. Department of Health and Human Services. (2011). *Healthy People 2020*. Washington, DC. Retrieved from: <http://www.healthypeople.gov>

Appendix A - Community Survey

Date _____ Site _____

Adult Immunization Assessment Survey for Clinton County Health Department

Demographics				
1. Do you live in Clinton County?	Yes	No		
2. What is your gender?	Identifies as Female	Identifies as Male		
3. What is your age group?	18-30	31-45	46-60	> 60
4. Do you currently smoke tobacco?	Yes	No		

Personal Awareness				
5. What are your feelings toward routine immunizations? • If not positive, what reasons? _____	Positive	Not important	Risky	No confidence
6. Do you know what immunizations are recommended for you?	Yes	No		
7. Do you have a chronic health condition like asthma, cancer, heart disease, kidney disease or diabetes?	Yes	No		
8. Are you required to have immunizations for school or employment?	Yes	No		
9. Is there anything that prevents you from receiving immunizations?	Time	Cost	Lack of information	Other: _____

Provider Related				
10. Do you currently have either public or private health insurance?	Yes	No		
If yes, does it cover immunizations?	Yes	No		
11. Do you have a primary care provider?	Yes	No	Where? _____	
• If yes, do they discuss immunizations with you?	Yes	No		
• If yes, do they offer or refer you for immunizations?	Yes	No		
• If no, do you know where to obtain immunizations?	Yes	No		

Appendix B - Pharmacy Survey

Adult Immunization Survey for Pharmacists

Demographics

1. Age

18-30

31-45

46-60

>80

2. Sex

Identify as Male

Identify as Female

Other (please specify)

3. Years in Practice

0-5

6-10

11-15

> 15

4. Prescription Volume

High

Moderate

Low

Other (please specify)

2

Adult Immunization Survey for Pharmacists

Involvement in immunization services (Select one best answer)

5. What is your current involvement in immunization services?

Very Involved

Somewhat Involved

Oversees vaccination services but not involved

Not at all involved

Other (please specify)

6. What are your feelings toward the importance of offering immunization services in the pharmacy?

Positive

Average importance

Of little importance

Of No importance

Other (please specify):

7. What is your perception of your patients' interest in obtaining immunization services from pharmacies?

They are positive about obtaining immunization services from pharmacies

They are hesitant about obtaining immunization services from pharmacies

They have a negative interest in obtaining immunization services from pharmacies

Unsure of the patients interest in obtaining immunization services from pharmacies

Other (please specify):

3

8. What is your willingness to provide immunization services?

Very willing

Hesitant but willing

Conditional: Willing if only few vaccines are offered

Not at all willing

Other (please specify):

4

Adult Immunization Survey for Pharmacists

Which of the following activities are you, as a pharmacist, involved with? (Please answer yes or no)

9. Are you, as a pharmacist, involved in vaccine counseling?

Yes

No

N/A

Other (please specify)

10. Are you, as a pharmacist, involved in vaccine promotion?

Yes

No

N/A

Other (please specify)

11. Are you, as a pharmacist, involved in hosting nurses who administer immunizations?

Yes

No

N/A

Other (please specify)

12. Are you, as a pharmacist, involved in administering vaccinations yourself?

Yes

No

N/A

Other (please specify)

5

Adult Immunization Survey for Pharmacists

Obstacles to immunization administration

(Please select one answer that best correlates with the current pharmacy conditions)

13. Is there support for staff for ongoing education on immunization practices and protocols for current vaccine administration?

- Excellent staff support
- Adequate Staff Support
- Not enough staff support
- No staff support
- Unsure
- Other (please specify)

14. Is insurance reimbursement for vaccine administration an obstacle?

- No issues with insurance reimbursement
- Moderate insurance reimbursement concerns
- Slow insurance reimbursement
- Frequently no insurance reimbursement
- Unsure
- Other (please specify)

15. Is the time away from typical work responsibilities a barrier to vaccination administration?

- I have sufficient time to administer vaccinations without impeding my other responsibilities
- Vaccine administration moderately impedes my other responsibilities
- Vaccine administration greatly interferes with other responsibilities
- I do not have adequate time to give vaccinations during my workday.
- Unsure
- Other (please specify)

6

16. Is there adequate space to administer vaccinations in your pharmacy?

- There is adequate space in the pharmacy to administer vaccinations
- There is space in the pharmacy to administer vaccinations, but not completely private.
- There is NOT adequate space in the pharmacy to administer vaccinations
- I am unsure if there is adequate space to deliver vaccines in this pharmacy
- Other (please specify)

17. Do you feel confident in your training to administer vaccinations?

- I have excellent training and high confidence in vaccine administration
- I have moderate training and moderate confidence in vaccine administration
- I have poor training and low confidence in vaccine administration
- I have no training and no confidence in vaccine administration
- I am unsure about my confidence level in vaccine administration
- Other (please specify)

18. Does your pharmacy have adequate physician support to administer vaccinations?

- We have excellent physician support
- We have moderate physician support
- We have poor physician support
- We have no physician support
- I am unsure of the physician support within this pharmacy
- Other (please specify)

7

19. Do you, as a pharmacist, have an understanding of state laws for vaccine administration in a pharmacy setting?

- I have a high understanding of state laws regarding vaccine administration in a pharmacy setting
- I have a moderate understanding of state laws regarding vaccine administration in a pharmacy setting
- I have a poor understanding of state laws regarding vaccine administration in a pharmacy setting
- I have a no understanding of state laws regarding vaccine administration in a pharmacy setting
- I am unsure of the state laws regarding vaccine administration in a pharmacy setting
- Other (please specify)

8

Adult Immunization Survey for Pharmacists

Obstacles to Pharmacy-Based Immunization Services

(Please rate your perceptions to these patient obstacles for pharmacy-based immunization services)

20. What is your perceived accessibility to pharmacy-based immunization services?

- No Barrier to access the pharmacy-based immunization services
- Partial Barrier to access the pharmacy-based immunization services
- There is a Barrier to access the pharmacy-based immunization services
- Unsure
- Other (please specify)

21. What is your perception of Pharmacy-based immunization waiting times?

- No wait times
- Low wait times
- Moderate wait times
- High wait times
- Unsure
- Other (please specify)

9

Adult Immunization Survey for Pharmacists

22. Where do you receive your standing orders for vaccine administration? (Select all that apply)

- Private Providers
- Hospitals
- Local Health Department
- Written per patient specific order
- Other (please specify)

10

Adult Immunization Survey for Pharmacists

23. How/where do you document vaccines administered? (Select all that apply)

- Keep in pharmacy network of vaccination records
- Input in automated database that allow for long-term storage of patient immunization records
- Electronic vaccination registries such as NYIS

Please list all other documentation methods here:

11

Adult Immunization Survey for Pharmacists

24. Does the staff use the immunization registry?

- Yes
- No
- Unsure
- Other (please specify)

25. If answered YES to above question, how confident is the staff in using the immunization registry?

- Very confident
- Moderately confident
- Low confidence
- No Confidence
- Unsure
- Other (please specify)

12

Adult Immunization Survey for Pharmacists

26. How many patients are vaccinated per year in your pharmacy?

- 1-100
- 101-150
- 151-200
- >200
- Other (please specify)

13

Adult Immunization Survey for Pharmacists

24. Does the staff use the immunization registry?

- Yes
- No
- Unsure
- Other (please specify)

25. If answered YES to above question, how confident is the staff is in using the immunization registry?

- Very confident
- Moderately confident
- Low confidence
- No Confidence
- Unsure
- Other (please specify)

12

Adult Immunization Survey for Pharmacists

26. How many patients are vaccinated per year in your pharmacy?

- 1-100
- 101-150
- 151-200
- >200
- Other (please specify)

13

Adult Immunization Survey for Pharmacists

27. What vaccines do you administer? (Please all applicable)

- Influenza
- Pneumococcal
- Meningococcal
- H. zoster
- Tetanus
- Diphtheria
- Pertussis

Please add all other applicable vaccines

Appendix C - Physician Survey

Clinton County Health Department Vaccine Survey for Providers

1. Do you routinely assess the patient's vaccination status and stock the following vaccines for eligible adults?

	Do you routinely assess vaccination status?	Do you routinely stock the vaccine
Hepatitis A	<input type="checkbox"/>	<input type="checkbox"/>
Hepatitis B	<input type="checkbox"/>	<input type="checkbox"/>
HPV	<input type="checkbox"/>	<input type="checkbox"/>
Seasonal Influenza	<input type="checkbox"/>	<input type="checkbox"/>
Meningococcal	<input type="checkbox"/>	<input type="checkbox"/>
MMR	<input type="checkbox"/>	<input type="checkbox"/>
Pneumococcal Polysaccharide (Pneumovax23)	<input type="checkbox"/>	<input type="checkbox"/>
Td	<input type="checkbox"/>	<input type="checkbox"/>
Tdap	<input type="checkbox"/>	<input type="checkbox"/>
Varicella	<input type="checkbox"/>	<input type="checkbox"/>
Zoster	<input type="checkbox"/>	<input type="checkbox"/>

Clinton County Health Department Vaccine Survey for Providers

2. If you do not routinely stock the vaccine, are your patients referred elsewhere?

If you answered yes, where do you refer the patient?

Clinton County Health Department Vaccine Survey for Providers

3. What causes you to refer patients elsewhere for vaccinations?

	Never	Rarely	Sometimes	Always	N/A
We routinely stock, but have run out of the vaccine.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We do not routinely stock vaccines.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The patients insurance does not cover a vaccine.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The patients insurance covers a vaccine, but I can not be reimbursed for it or reimbursement is inadequate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Clinton County Health Department Vaccine Survey for Providers

4. How do you record information about vaccines your patients receive in your practice?

Clinton County Health Department Vaccine Survey for Providers

5. When do you usually assess an adult patient's immunization status for routinely recommended vaccination other than seasonal influenza? (Please select all that apply)

- Initial intake visit
- Annual visit
- Every visit
- Acute care visit
- Other

If selected other (please specify)

Clinton County Health Department Vaccine Survey for Providers

6. Which of the following does your practice routinely do to assess an adult immunization status for recommended vaccines other than seasonal influenza? (Please select all that apply)

- The patient is asked verbally
- Outside records
- Questions about immunization are part of a questionnaire
- Check clinic's medical record
- Check the state or regional immunization information system for records
- Other

If selected other (please specify)

Clinton County Health Department Vaccine Survey for Providers

7. What are the barriers to stocking and administering vaccines for adult patients in your practice?

	No Barrier	Minor Barrier	Moderate Barrier	Major Barrier	N/A
Costs of buying vaccines upfront	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintenance and cost of adequate vaccine storage equipment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not enough patients in your practice who need vaccines to justify the cost and hassle of stocking all vaccines.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Possible financial loss due to expiration of vaccines prior to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Difficulty determining if a patient's insurance will reimburse for a vaccine.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The patient does not have insurance for vaccines.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Persons who administer vaccines and staff who manage or support vaccine administration are knowledgeable and receive ongoing education.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The hassle of ordering vaccines.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Difficulty determining whether a patient has received a particular vaccine.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	No Barrier	Minor Barrier	Moderate Barrier	Major Barrier	N/A
Other preventative services take precedence during time-limited visits.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Acute problems take precedence over vaccinations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patients can receive vaccines elsewhere.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patients refuse vaccines for safety concerns or because they believe they do not need them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patients do not come in regularly for office visits.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>