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## Acceptance and Uptake of Influenza Vaccination by Health Care Workers

LeShonda Wallace  
*Walden University*

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# Walden University

College of Health Sciences

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LeShonda Wallace

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2015

Abstract

Acceptance and Uptake of Influenza Vaccination by Health Care Workers

by

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MSN, University of Medicine & Dentistry of New Jersey, 2004

BSN, Rutgers University, 1996

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Public Health

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## Abstract

Influenza is a preventable infectious disease, against which vaccination is the primary means of protection. Health care workers (HCW) are among the most vulnerable to the illness and are likely to be sources of infection transmission while caring for patients. Circumstantial evidence suggests higher rates of vaccination coverage by HCW will coincide with a lower incidence of influenza transmission, yet a gap remains in the literature regarding governing health agencies' (i.e., licensing boards, medical and nursing associations) influence on the influenza vaccination practices of their constituents. Moreover, discrepancies exist between governing health agencies' and the National Vaccine Advisory Committee's recommendations on mandatory influenza vaccination for HCW. The main purpose of this quantitative cross-sectional study was to explore the relationship between influenza vaccination uptake by HCW and guidance from governing health agencies to vaccinate. The health belief model and social cognitive theory were used to identify the most influential determinant for HCW to vaccinate against influenza. The sample consisted of 388 HCW who provided direct patient care at the same hospital. Data were analyzed using Fisher's exact test. Study findings suggest that a workplace mandate for influenza vaccination has an influence on HCW uptake of the vaccine and that governing agencies' lack of uniformity on the matter has minimal impact on their constituents' beliefs and behavior. It is recommended that a universal policy be adopted for health agencies' implementation of an influenza vaccine mandate, which could lead to positive social change by supporting preventive self-care practices, minimizing spread of the disease to workers and patients, and maintaining workplace productivity.

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## Chapter 1: Introduction to the Study

Influenza illness is a preventable infectious disease that is spread from one person to the next through droplets from sneezing, coughing, or touching contaminated objects (Centers for Disease Control and Prevention [CDC], 2014). Vaccination is the primary means of protection against the illness. In addition, hand washing, social distancing, and covering a cough are measures to prevent the illness (CDC, 2014).

Over the past decade, influenza illness has affected vulnerable populations (children, pregnant women, elderly, and autoimmune compromised). Health care workers (HCW) inclusive of physicians, midlevel providers, nurses, and allied health professionals are among the most vulnerable to the illness and are likely to be a source of infection transmission while caring for patients. Health care agencies such as outpatient clinics, hospitals, and long-term care facilities house the most vulnerable individuals at risk for influenza infection: their patients and HCW. These groups are considered the highest priority to receive the influenza vaccine (U.S. Department of Health and Human Services [HHS], 2013). Influenza vaccine administration rates for patients in hospital and long-term facility settings have been acceptable—typically moderate to high. Ironically, those who care for patients (HCW) in all settings have historically had below the recommended rates for vaccination (Akker, Marsaoui, Hak, & van Delden, 2009; Kimura et al., 2007; HHS, 2013).

Common approaches to influencing HCW influenza vaccine acceptance and uptake have included employer recommendation, provision of vaccine at the worksite for convenience, and general influenza vaccine health campaigns (Hood & Smith, 2009; Kimura, Nguyen, Higa, Hurwitz, & Vugia, 2007). Prevention of illness by vaccination

may reduce HCW absenteeism and use of surplus resources (HHS, 2013). Employers have attempted to incentivize HCW employees with token gifts or departmental prizes for the highest vaccine participation rates. However, many employers have allowed employees to opt out of vaccination. Reasons for opting out of vaccination against influenza for HCW are not limited to adverse reaction or religious belief; fear and mistrust toward the vaccine are among personal reasons HCW have chosen not to vaccinate (Evans, 2012). The personal choice to opt out of vaccination has been a major reason that the aforementioned strategies have remained moderately effective (Evans, 2012; Hood & Smith, 2009; Kimura et al., 2007).

Increased influenza vaccination rates have been demonstrated at worksites where vaccination mandates were implemented. A mandate for influenza vaccination of HCW has been a successful strategy used by employers that have been unable to meet the recommended benchmark for influenza vaccine uptake (AHC Media LLC, 2010; Wynia, 2007). However, some employees affected by mandates have felt coerced by their employers, suffered adverse reactions, and expressed workplace dissatisfaction (Buchta, 2012; Wynia, 2007; Yassi, Lockhart, Buxton, & McDonald, 2010).

Circumstantial evidence suggests that the higher the rate for vaccination coverage by HCW, the lower the incidence of influenza transmission (HHS, 2013). However, without direct evidence of this pattern, a universal policy of influenza vaccination mandates for HCW remains unfounded. The HHS has not endorsed a federal mandate for HCW to vaccinate against influenza. However, HHS has listed legislation and regulations as effective strategies for improving HCW vaccination rates (HHS, 2013). To confuse the matter more, a discrepancy exists between professional health associations

and the National Vaccine Advisory Committee (NVAC) on mandatory influenza vaccination for HCW (Evans, 2012). Opinions vary among organizations concerning the implementation of mandatory compliance, mandatory vaccination, standard methods of measurement that link vaccination to quality improvement, definitions of exemption, alternative protection strategies, and consequences for noncompliance such as termination of employment (Evans, 2012).

Consensus concerning strict mandates, rather than the flexible recommendations that currently exist, is unlikely to be reached without sufficient evidence for vaccine acceptance and vaccination as the sole strategy to protect public health (Evans, 2012). The ideal approach to motivating HCW to accept and voluntarily vaccinate against influenza, thereby achieving the recommended vaccination rate without conveying a sense of coercion while also upholding the health profession's code of ethics, remains unknown. HCW self-care is an indirect obligation within the context of health professionals' code of ethics. HCW are anticipated to put their personal interest aside by voluntarily vaccinating to protect the health of their patients and coworkers. Such actions foster worksite productivity and the delivery of quality care (Evans, 2012).

This research was developed as an exploration of the relationships between (a) influenza vaccination uptake by HCW and guidance from governing agencies to vaccinate against influenza, and (b) influenza vaccine uptake and vaccine mandates for specific types of health care workers. In addition, the study explored whether the lack of explicit guidelines from policy makers to vaccinate against influenza impacted health care workers' attitudes toward influenza vaccine.

Increased rates of influenza vaccination may lower the transmission of infection and serious illness, thereby promoting and protecting the health of HCW and their patients. Potential positive outcomes include minimizing the spread of disease, decreasing illness-related absenteeism, and maintaining workplace productivity (HHS, 2013). Vaccinations of health workers are implemented at organizational levels and evaluated by quality indicators (Bénet et al., 2012). Public health leaders and policy makers could use evidence-based outcomes from prior research and this research to support health care policy decisions at the local and national levels.

This chapter provides information on the history of the influenza vaccine and its administration, the study's problem statement, and a description of the gap in knowledge identified from the literature. The chapter also contains descriptions of the purpose of the study and the key variables investigated. Discussion of the theoretical foundation, nature of the study, and definitions is presented. Assumptions and limitations of the research study are also presented.

### **Background**

When available, vaccination is the primary defense for protection against infectious disease (Wynia, 2007). Vaccines prevent complications of severe illness, particularly among vulnerable populations. However, health personnel have varied in rates of vaccine participation, have lacked consistent protection against preventable illness for themselves, and have subsequently posed a risk for their patients.

Implementation of public health strategies that included mandating vaccine administration for preventable diseases resulted in the eradication of illnesses such as polio, measles, mumps, and rubella (Wynia, 2007). Vaccination-mandate strategies have

included multiple childhood immunizations prior to admission to school (or exclusion from school if not vaccinated, unless proof is provided of a reason to opt out) and Hepatitis B vaccination of HCW and environmental service workers. A constitutional right does not exist for religious and philosophical reasoning to decline vaccination, and most people abide. However, some states do allow these exemptions (Malone & Hinman, 2003).

Vaccines are effective at preventing diseases. A 95–100% reduction in vaccine-preventable diseases was found among children in the United States when 20<sup>th</sup>-century annual morbidity was compared with current morbidity (Malone & Hinman, 2003). This was a remarkable outcome, while vaccine coverage percent ranged from 68–94% for children ages 19 to 35 months (Malone & Hinman, 2003). The influenza vaccine has been approximately 60% effective at protecting individuals of all ages 95% CI [52, 68] from the virus (Morbidity and Mortality Weekly Report [MMWR], 2014). H1N1 (influenza A) accounts for 98% of detected influenza virus strains and has been a component of the traditional vaccine (MMWR, 2014).

Influenza vaccine is safe; if and when adverse effects are experienced, they are primarily minor events such as tenderness at the site of injection or redness. Adverse effects are not persistent or life threatening (Demicheli, Jefferson, Rivetti, & Deeks, 2000; Ng & Lai, 2011; Weingarten, 1988). These findings have remained consistent for the past few decades.

Health promotion strategies that incentivize HCW to vaccinate have not been effective in sustaining the targeted influenza vaccine participation rates from year to year, have been costly, and have lacked persistent funding (Blue & Valley, 2003; Hakim, Guar,



& McCullers, 2011; Hood & Smith, 2009). Historically, influenza vaccine uptake reached the recommended target rate when mandatory vaccination policies were implemented (Blue & Valley, 2003; Hakim et al., 2011; Hood & Smith, 2009).

Differences in vaccine participation rates among HCW subgroups exist. It has been found that pharmacists are vaccinated most (88.7%) and health care assistants are vaccinated least (46.8%; CDC, 2013a). Midlevel providers (85%), other clinical professionals (75.5%), and nonclinical support staff (54.3%) have significant strides to make toward improving vaccination participation (CDC, 2013a). Physicians and nurses demonstrated remarkable improvement in their vaccination rates—from 75.5% to 85.3% and from 61.5% to 79.7%, respectively—between influenza seasons 2011-2012 and 2012-2013 (CDC, 2013a). The influenza vaccination rate for HCW was greatest in the hospital setting (82.5%) and lowest in long-term care facilities (47.9%; CDC, 2013a). The influenza vaccination rate for HCW who work in physician offices or ambulatory care settings was 61.9% (CDC, 2013a). HCW who provided direct patient care were vulnerable to influenza illness and shared reciprocal risks of disease transmission among patients and coworkers (Akker, Marsaoui, Hak, & van Delden, 2009; Kimura, Nguyen, Higa, Hurwitz, & Vugia, 2007). While most reports have indicated that HCW vaccinated against influenza have a shielding effect in relation to the spread of illness to patients, few have suggested the difference to be substantial (Benet et al., 2012; Burls et al., 2006).

Governing health associations for clinicians and health agencies have differed in their recommendations and endorsement of influenza vaccine. The NVAC has endorsed influenza vaccination of HCW; however, it has remained at the institutions' discretion how policies, mandates, and exemptions from the vaccine are implemented (HHS, 2013).

The American Nurses Association (ANA) has endorsed voluntary vaccination practices and has rejected the notion of mandating vaccination (Hellyer et al., 2011). The American Medical Association (AMA) has advised physicians to uphold their pledge to do no harm and take actions that benefit others as a moral obligation; AMA has endorsed health care institutions' policy for physicians to vaccinate against influenza as terms for initial as well as continued employment (Hellyer et al., 2011). The Occupational Safety and Health Administration (OSHA) has opposed the ambiguous recommendations offered by NVAC for employers to require vaccination (Evans, 2012). OSHA's concern is that in addition to low and inconsistent influenza vaccine participation rates of health care agencies, the NVAC language allows for reprisal by employers to the extent of termination for employees who do not vaccinate (Evans, 2012), and this could be considered coercion.

The aforementioned governing health agencies have an influence on the influenza vaccination practices of their constituents. This research explored how substantial their influences were. The research disclosed whether their differing stances and the ambiguous language for influenza vaccine recommendations were (a) potential barriers to increasing the participation rates of HCW and (b) an indication of the differences for vaccine rates among subgroups.

### **Problem Statement**

Vaccination against the influenza virus is the primary strategy to protect against influenza (CDC, 2013b). Circumstantial evidence suggests that the higher the rate for vaccination coverage by HCW, the lower the incidence of influenza transmission (HHS, 2013). Despite the understanding that this protective measure can prevent illness and the

spread of disease, governing health agencies have not reached consensus concerning the use of mandates versus recommendations for HCW to vaccinate against influenza. In the interim, HCW have continued to opt out of voluntary vaccination and have remained a major vehicle for virus transmission to their patients (CDC, 2013a).

HCW are anticipated to put their personal interest aside by voluntarily vaccinating to protect the health of their patients and coworkers. Such action fosters worksite productivity, delivery of quality care, and altruism (Evans, 2012). According to Evans (2012), HCW self-care is an indirect obligation in the context of health professionals' code of ethics. The majority of professional groups have supported the professional obligation to vaccinate against influenza, especially during pandemic times (Hellyer et al., 2011).

Significant differences in participation rates for influenza vaccine among HCW subgroups exist (CDC, 2013a). Health associations and medical groups have taken differing stances in relation to vaccine mandates (Hellyer et al., 2011). However, their influence on constituents has not been explored in the literature. Therefore, this research provided an opportunity to address a meaningful gap in the literature.

### **Purpose of the Study**

The purpose of this quantitative study was to (a) explore the relationship between influenza vaccination uptake by HCW and guidance from governing health agencies to vaccinate against influenza; (b) describe influenza vaccine uptake and vaccine mandates among specific types of HCW, and (c) determine whether the lack of explicit guidelines from policy makers to vaccinate against influenza impacts HCW attitudes toward the influenza vaccine. It was anticipated that the evidence gathered would contribute to

conclusive and explicit policy to adopt or oppose an influenza vaccine mandate for HCW at the national and possibly global level.

The independent variables for this study were guidance from governing agencies to vaccinate against influenza, vaccine mandate, and lack of explicit guidelines from policy makers. The dependent variables were extent of influenza vaccine recommendation awareness, influenza vaccine uptake among specific types of HCW, and HCW attitude toward influenza vaccine. Confounders were age, gender, and practice setting. Covariates were factors that HCW mentioned as main reasons to vaccinate or not vaccinate, other than guidance from governing agencies.

### **Research Questions**

The research questions were as follows:

RQ1. (Quantitative). Is there a relationship between influenza vaccination uptake by HCW and guidance from governing agencies to vaccinate against influenza?

H1<sub>0</sub> There is no relationship between influenza vaccination uptake by HCW and guidance from governing agencies to vaccinate against influenza.

H1<sub>a</sub> There is a relationship between influenza vaccination uptake by HCW and guidance from governing agencies to vaccinate against influenza.

Independent variable: Guidance from governing agencies to vaccinate against influenza.

Dependent variable: Influenza vaccine uptake by HCW.

RQ2. (Quantitative). Is there a relationship between influenza vaccine uptake and vaccine mandate among specific types of HCW?

H2<sub>0</sub> There is no relationship between influenza vaccine uptake and vaccine mandate among specific types of HCW.

H2<sub>a</sub> There is a relationship between influenza vaccine uptake and vaccine mandate among specific types of HCW.

Independent variable: Vaccine mandate.

Dependent variable: Influenza vaccine uptake among specific types of HCW.

RQ3. (Quantitative). Would the lack of explicit guidelines from policy makers to vaccinate against influenza impact HCW attitude toward influenza vaccine?

H3<sub>0</sub> The lack of explicit guidelines from policy makers does not impact HCW attitude toward influenza vaccine.

H3<sub>a</sub> The lack of explicit guidelines from policy makers has an impact on HCW attitude toward influenza vaccine.

Independent variable: Lack of explicit guidelines from policy makers.

Dependent variable: HCW attitude toward influenza vaccine.

### **Theoretical Foundation**

The health belief model (HBM) and social cognitive theory (SCT) are theoretical frameworks that suggest that behavior is practiced and adopted through motivational influence. The HBM indicates that individuals' personal beliefs and perceptions influence the behaviors practiced to protect their health (Hochbaum, 1958). If individuals do not perceive a threat to their health, they will not take action to maintain or protect it (Hochbaum, 1958). Personal choice is practiced until the threat of illness is taken seriously, susceptibility is perceived, and minimal barriers exist to taking action, so that voluntary self-care measures prevail (Painter, Hynes, & Glanz, 2008). In the interim, as

HCW practice personal choice, they also influence patients' decision-making. The possibility exists that HCW will perpetuate misperceptions concerning vaccine safety and efficacy (Evans, 2012). SCT indicates that social interactions of individuals within the same environment allow opportunities for cues to model behavior that influence belief, expectations, emotions, and cognitive competence (Bandura, 1986). Increased acceptance and uptake of influenza vaccine by health professionals may sustain preventive self-care practices that are proactive.

### **Nature of the Study**

The study was a quantitative, cross-sectional study of HCW who provided direct patient care in a hospital setting. Variation in Immunization Practices (VIP), a Likert-scale tool developed by Clark, Cowan, and Wortely (2009), was adapted for this research project and distributed as an anonymous, electronic questionnaire that was completed independently to assess attitudes and relationships between variables. This Likert-scale tool was useful to assess opinions and contributing factors specific to vaccination uptake practice. The questions on the tool were related to one another and relevant to the research questions, and the data collected were used to create a chart of distribution across groups. The target population was HCW from the same institution, inclusive of physicians, midlevel providers (nurse practitioners and physician assistants), clinical pharmacists, and nurses. These HCW had direct contact with patients in a hospital setting and were anticipated to follow recommendations set forth by their respective licensing agencies. Data were analyzed using Fisher's exact tests.

The independent variables for this study, guidance from governing agencies to vaccinate against influenza, vaccine mandate, and lack of explicit guidelines from policy

makers, referred to recommendations from government-approved health professional licensing agencies, vaccine requirements imposed for medical and safety reasons, and advice from health policy makers, respectively. The dependent variables, influenza vaccine uptake, influenza vaccine uptake among specific types of HCW, and HCW attitude toward influenza vaccine, referred to taking action to accept vaccination, differentiation in groups of HCW who accepted vaccination, and HCW thinking about vaccination that influenced their behavior, respectively. The confounders of gender or age may have influenced the relationships between the independent and dependent variables. Other reasons that HCW wrote in as main reasons why they were or were not vaccinated were covariates that may have affected the relationship between variables.

### **Definitions**

*Governing agencies:* For the purpose of this study, *governing agencies* referred to government-approved health professional associations and licensing agencies for physicians, nurses, and pharmacists.

*Health care workers (HCW):* For the purposes of this study, HCW were physicians, midlevel providers (advanced practice nurses and physician assistants), nurses (RN and LPN), and clinical pharmacists. These HCW have frequent contact with patients in long-term, ambulatory care, and hospital health care settings.

*Influenza:* Influenza (flu) is a contagious virus that is spread through droplets from sneezing, coughing, or touching contaminated objects between one person and the next. There are two main types, A and B (CDC, 2014).

*Influenza vaccine:* The flu vaccine helps to produce antibodies approximately 2 weeks after it is administered to protect individuals from the viruses in the vaccine (CDC, 2014).

*Vaccine mandate:* Vaccine requirements imposed for medical and safety reasons (Malone & Hinman, 2003).

*Vaccine uptake:* For the purpose of this study, vaccine uptake is belief in or taking action to accept vaccination.

### **Assumptions**

Several assumptions existed for this study. The first assumption was that HCW were aware of the recommendations or stance their governing agency supported concerning influenza vaccination for HCW. The second assumption was that HCW were aware of the role they played in disease prevention for those they cared for. The third assumption was that all HCW enrolled in the study were affiliated with a professional licensing agency. Physicians, midlevel providers, nurses, and clinical pharmacists are not employable without licensing and/or credentials to practice approved by a governing agency. Lastly, it was assumed that HCW were informed about their employers' policy on influenza vaccination for HCW. These assumptions were relevant in inferring whether a relationship existed between variables.

### **Scope and Delimitations**

This research was designed to study vaccine uptake belief and attitudes in HCW who provided frequent and direct patient care (i.e., physicians, midlevel providers, nurses, and clinical pharmacists). I focused on the most recent influenza season at a



health facility with a policy on influenza vaccination of HCW and managed vaccination statistics for their employees.

A representative sample size for the population was used. The sample size was large enough to determine whether inferences about the population could be made (Frankfort-Nachmias, & Nachmias, 2008). The sample size chosen reflected the health facility's population of health care workers necessary to obtain a 95% confidence level and confidence interval of 5. Purposive sampling was used for this quantitative study to assess beliefs and attitudes at the point in time when data were collected.

### **Limitations**

There were several limitations to the study design. First, the research findings were gathered from HCW at a hospital during a snapshot in time. One should not presume that this study's findings are a representation of HCW in different settings or at different times. Second, the beliefs, attitudes, and behaviors of the participants may have been influenced by something other than their licensing agency. There was substantial research to support alternate influences on vaccination practices for HCW. Additionally, historical events in media coverage, an influenza epidemic, or the political climate in health care leadership may have influenced participants' attitudes and behaviors towards acceptance of influenza vaccination. The possibility of alternative explanations for HCW beliefs, attitudes, and behaviors was a limitation of the study and posed threats to validity.

This study addressed the gap in literature for governing health agencies' influence on the influenza vaccination practices of their constituents. Existing research lacked exploration of how substantial their influences were. This research disclosed whether

governing health agencies' stances and the ambiguous language for influenza vaccine recommendations constituted a potential barrier to increasing the participation rates of health care workers and possibly an indication of the differences in vaccine rates among subgroups.

Development of a reliable research tool was essential to gather information concerning gaps in literature and provided an opportunity for alternate explanations of influence or impact to be explored. The participants were affiliated with licensing and/or professional health agencies (professional association, facility, and subgroup). Inference was made about the selective subgroups; however, external validity was weak because research findings represented those at the particular agency from which the sample was chosen from, and results were not generalized to the outside population.

### **Significance**

Influenza vaccination is a safe and effective means to prevent the spread of infection. HCW are anticipated to promote vaccination for their patients, but if they remain unvaccinated, they can be a source of infection themselves. Increased rates of vaccination by HCW may lower the transmission of infection and serious illness. Health agencies that have imposed explicit mandates for influenza vaccine have demonstrated successful rates of vaccine uptake, whereas most agencies that have not have continued to stagger below the national target. This study's contribution to practice is its indication of the importance of consistent vaccine recommendations across licensing agencies of HCW. If this is perceived as an effective strategy, it may influence vaccine uptake, increase rates of vaccination, minimize the spread of disease, decrease illness-related absenteeism, and maintain workplace productivity (HHS, 2013).

This study has implications for positive social change, in that the findings may be used to promote protection from influenza for HCW and their patients. Data collected from this study may help to advance knowledge in the discipline. The information gathered can be used by public health leaders and policy makers to suggest conclusive and explicit health policy guidelines for influenza vaccination, thereby encouraging a unified culture of health promotion.

### **Summary**

Influenza vaccine has proven to be the most effective strategy to protect individuals from the illness. Vaccination is recommended for all persons age 6 months and older. Vulnerable populations are urged to vaccinate, including those with chronic illnesses and HCW. HCW are often exposed to the illness in providing direct care to patients. However, HCW have not been vaccinated at the recommended target rate. As a result, HCW have remained vulnerable to infection and have posed a risk for transmission of illness to their patients.

HCW have been encouraged by their employers and governing professional agencies to vaccinate; however, vaccination policies and mandates have differed across the nation. The purpose of this study was to explore the relationships between influenza vaccination uptake by HCW and guidance from governing health agencies to vaccinate against influenza; to describe influenza vaccine uptake and vaccine mandate among specific types of HCW, and lastly, to determine whether the lack of explicit guidelines from policy makers to vaccinate against influenza impacted HCW attitudes toward the influenza vaccine.

Chapter 2 is a review of prior research that supports the influenza vaccine's efficacy and safety in addition to indicating effective health promotion strategies to influence vaccine uptake. Over the decades, advancements and challenges for influenza uptake strategies have persisted. This study's inquiry provides insight into the gap in literature about the influence and impact of influenza vaccine recommendations for HCW from their respective governing agencies.

## Chapter 2: Literature Review

### **Introduction**

Influenza illness is a transmissible virus that causes severe health complications and possible death among vulnerable populations (i.e., those with chronic respiratory disease, chronic cardiovascular disease, obesity, pregnancy, smoking, diabetes mellitus, renal disease, and immunosuppression, as well as those who delay seeking medical care; Hui, Lee, & Chan, 2010). HCW inclusive of physicians, midlevel providers, nurses, and allied health professionals are among the most vulnerable to the illness and are likely to be sources for virus transmission while caring for patients.

Influenza illness is spread by droplets from sneezing, coughing, or touching contaminated objects between one person and the next. In addition to hand washing, social distancing, and covering a cough, vaccination against influenza virus is a primary prevention strategy (CDC, 2013a, 2013b). HCW have been informed of strategies to prevent the spread of influenza and may have had access to free vaccination at their work sites. However, HCW have continued to opt out of voluntary vaccination and have been primary vehicles for virus transmission to patients (CDC, 2013a). During the 2012-2013 influenza season, HCW influenza vaccine rates were suboptimal (63.4%), lower than Healthy People's 2020 recommendation for the amount of HCW to vaccinate (90%; CDC, 2013a).

Public health policy leaders have encouraged mandates for influenza vaccination by employers; however, guidelines for policy implementation have not been explicit. As a result, there have been various ways in which influenza vaccination for HCW policies have been implemented by agencies, despite sufficient research to suggest improved

protection of patients' health and work productivity in agencies that implemented strict guidelines. Universal adoption of strict guidelines has not existed, and the HCW industry's voluntary vaccination behaviors have not mimicked the behaviors the general public has been encouraged to uphold (CDC, 2013a, 2013b; HHS, 2013). Therefore, the purpose of this study was to explore the relationships between influenza vaccination uptake by HCW and guidance from governing health agencies to vaccinate against influenza.

Chapter 2 presents the literature search strategy, theories used to predict behaviors between variables for this study, and existing literature about the influenza vaccine. The literature search strategy section summarizes how the criteria for inclusion of relevant studies for review were chosen. Existing literature about influenza vaccination includes discussion about the history of the vaccine, vaccine administration implementation strategies, and attitudes among HCW and policy makers about vaccination.

### **Literature Search Strategy**

The literature search for this study was conducted with Walden's library database using Academic Search Complete and CINAHL Plus with full text. Additionally, the Fales Health Science Library was used to access Ovid MedLine and CINAHL Plus with full text. Peer- and non-peer-reviewed literature was browsed. Key search terms were *influenza vaccines, vaccine mandate, hospitals, employees, health personnel, health belief model, social cognitive theory, and social learning theory*; multiple combinations of key terms were also used. The combinations of terms were *influenza vaccine and mandate; influenza vaccine and health care workers; influenza vaccine and health policy; and influenza vaccine, attitudes, and health care workers*. The years for literature

collected extended from 1980 to the present. Several articles that were not accessible by full text from the academic libraries were obtained using Google Scholar.

The literature search resulted in approximately 50 references. Most of the research studies collected were quantitative cross-sectional investigations (16), systemic reviews (4), and qualitative studies (4). The remaining references were commentary publications regarding vaccine guidelines, epidemiology reports, theory, and policy updates.

## **Theoretical Foundation**

### **Conceptual Background**

Theories are used in research to explain or predict behavior. Applying theory to practice, one may test relationships between variables as well as validate, invalidate, or strengthen what was previously stated in research (Painter, Hynes, & Glanz, 2008). This research was based upon two theoretical foundations: the health belief model (HBM) and social cognitive theory (SCT). The conceptual backgrounds of each support positive implications for the research. The HBM suggests that addressing four constructs—(a) perception of disease severity, (b) susceptibility to disease, (c) benefits for taking action, and (d) minimizing barriers for self-care—will encourage cues to take action. SCT indicates that one behaves according to an expectation from one's environment, or due to an incentive, which is the value placed on the behavior's outcome (Rosenstock, Stretcher, & Becker, 1998).

### **Health Belief Model**

According to the HBM, behavior is practiced and adopted by motivational influence. The HBM proposes that one's beliefs and perception of an issue influence one's behavior practices to protect one's health (Hochbaum, 1958). If the perception of a

threat to health is nonexistent, one may not take voluntary action to maintain or protect one's health (Hochbaum, 1958). Personal choice is commonly practiced until the threat of illness is taken seriously, susceptibility is perceived, and minimal barriers exist to taking action (Painter et al., 2008). The HBM was referenced for this research due to the suggestion that barriers and cues to action for influenza vaccination by HCW were strong predictors for HCW acceptance of influenza vaccination (Blue, 2002). Common barriers to HCW receiving influenza vaccination included beliefs about vaccine efficacy and fear of vaccination. In existing research, constructs for the HBM proposed that cues to action for HCW volunteering to be vaccinated included guidance from leadership, unity within the health care industry, and employer recommendation (Chor et al., 2009; Hubble, Zontek, & Richards, 2011; Raftopoulos, 2008).

Public health policies have an influence on health care delivery, and expert opinion matters among HCW. Expert opinion is taken into consideration in HCW decisions concerning clinical and self-care practice. Sharing knowledge of health outcomes and implementing discrete evidence-based practice guidelines provide reference for consistent clinical practice. Raftopoulos (2008) conducted a qualitative study with focus groups for nurses in Greece. Forty-two nurses from a large public health organization, as well as private and public hospitals, participated in the study to investigate their attitudes toward influenza vaccination. Findings of the study suggests that barriers to nurses' acceptance of influenza vaccination include perception of low efficacy for the vaccine, not having access to mandated guidelines for vaccination from the Greek Ministry for Health and Social Solidarity at the private institutions, and not recognizing oneself as a mode of transmission because one did not consider oneself



vulnerable to infection (Raftopoulos, 2008). Cues to action included guidance from content experts and free vaccination. HCW lacked adequate information about vaccine effectiveness for themselves and their patients. Additionally, public and private hospitals did not have the same knowledge about policies for vaccine mandates. The research concluded that public policy was a major barrier to voluntary vaccination by HCW.

Hubble, Zontek, and Richards (2011) conducted a cross-sectional study during the influenza season of 2007-2008, of North Carolina EMS employees and identified predictors for EMS employee voluntary influenza vaccination. The researchers identified barriers to emergency service medical personnel receiving the influenza vaccine as the perception of personal health as protection against illness, disbelief in the vaccine's effectiveness, and lack of employer mandate (Hubble et al., 2011). Cues to action and predictors for vaccination included previous influenza illness, perceived higher risk for illness because of personal health status, age, favorable risk-benefit ratio, employer recommendation, and free vaccinations.

Chor et al. (2009) repeated a cross-sectional study in Hong Kong public health hospitals that assessed the willingness of health care workers to accept pre-pandemic influenza vaccination. Positive factors associated with health care workers' willingness to vaccinate included prior vaccination and their perceived risk for acquiring influenza. Barriers to willingness to vaccinate included fear of the vaccine's adverse effects and uncertainties about vaccine efficacy.

### **Social Cognitive Theory**

SCT indicates that a reciprocal influence exists for behavior among those who share an environment (Bandura, 1986). Interactions and observations within the

environment allow opportunities for cues to model behavior. Behavior patterns influence beliefs, expectations, and cognitive competence (Bandura, 1986). According to role, the power dynamics of influence may vary. Professional role, status, gender, race, and age within a group are determinants of how effective influence may be (Rosenstock, Stretcher, & Becker, 1998; Wallace, 2012). Bandura (2001) theorized that an individual may not take action by personal choice to achieve a desired outcome, but rather influence from a proxy or collective agency by coordinated response and interdependent effort may promote the individual's behavior. The behavioral intentions of the agency motivate the proactive commitment of an individual, which will ultimately effect the environment (Bandura, 2001). This assumption indicates that the acceptance of voluntary self-vaccination may rely upon a shared belief system, not individual self-efficacy. A gap in the literature existed for prediction of acceptance for self-voluntary influenza vaccination by HCW according to the conceptual framework of SCT.

### **Literature Review Related to Key Concepts**

#### **Influenza Vaccinations**

Influenza vaccinations are administered to individuals to protect against the influenza virus. The vaccinations are composed of three (trivalent) or four (quadrivalent) strains of influenza virus. Once vaccinated, individuals acquire immunity to the different viruses; however, cross immunity among subtypes is rare (European Center for Disease Control and Prevention [ECDC], 2014). The trivalent vaccine contain two influenza virus A strains (H1N1 and H3N2) and one influenza virus B strain (Victoria or Yamagata; ECDC, 2014). H1N1, the most popular strain, is also known as *swine flu*. The term *swine flu* is used because the illness is also common among pigs. H1N1 was first

detected in 2009, and was pandemic worldwide. H1N1 is now a seasonal flu virus. The quadrivalent vaccine contains two influenza virus A strains and two influenza virus B strains (CDC, 2013b). Trivalent vaccines are available as a shot for individuals 6 months and older. The quadrivalent vaccine is available to individuals age 2 to 49 years as an intranasal spray. Both vaccines are grown in eggs. However, variations in the vaccinations are available: egg free, or for intranasal, intradermal and high dose. Age and health criteria for vaccine receipt vary (CDC, 2013b).

### **Influenza Vaccine Uptake Strategies**

Common approaches to influencing HCW influenza vaccine acceptance and uptake have included employer recommendation, provision of vaccine administration at the worksite for convenience, and general influenza vaccine health campaigns (Hood & Smith, 2009; Kimura et al., 2007). Employers may attempt to incentivize employees with token gifts or departmental prizes for the highest vaccine participation rates. However, many employers allow employees to opt out of vaccination. Reasons for opting out of vaccination against influenza for HCW include adverse reaction, religious belief, fear, and mistrust of the vaccine (Evans, 2012). The personal choice to opt out of vaccination has been a major reason that less assertive vaccination strategies have remained moderately effective (Evans, 2012; Hood & Smith, 2009; Kimura et al., 2007). Increased influenza vaccination rates have been demonstrated at worksites where mandates were implemented. Mandating the influenza vaccination of HCW has been a successful strategy used by employers that could not meet the recommended benchmark for influenza vaccine uptake (AHC Media LLC, 2010; Wynia, 2007). Subsequently, employees have felt coerced by their employers, suffered adverse reactions, and

expressed workplace dissatisfaction (Buchta, 2012; Wynia, 2007; Yassi, Lockhart, Buxton, & McDonald, 2010).

Health care agencies that have implemented the aggressive practice of actively requesting vaccination participation, having a written policy, making vaccination a contingency for employment, offering free vaccines, and providing information have demonstrated increased influenza vaccination participation rates of up to 87% (Akker et al., 2009). In contrast, health care agencies that have had a passive to moderate practice of offering free vaccination, encouraging voluntary vaccination, and written policy without declination reprisal, had influenza vaccination participation rates as low as 10% (Akker et al., 2009). Although agencies that have aggressive vaccination policies with mandates have improved vaccine uptake rates, mandatory influenza vaccination is not always favored by administrators or HCW. Some health agency administrators have preferred a softer vaccine mandate with a requirement for employees to wear a mask during an influenza pandemic if they opted out of vaccination, whereas other agency administrators have favored a harsher mandate of termination for those not vaccinated, without exemption (AHC Media LLC, 2010). The Hood et al. (2009) study demonstrated a positive increase for mandatory influenza vaccination among HCW who worked in high-risk departments such as hematology or oncology.

Physicians have been more in favor of mandatory influenza vaccination than nurses (Hellyer et al., 2011). Nurses have demonstrated less understanding of the vaccine risk or did not perceive themselves as vulnerable to infection (Canning et al., 2004). When asked in a focus group study, participants significantly expressed the desire to have an employer that promoted respect for autonomy without penalty or consequence (Yassi

et al., 2010). Penalty for declining influenza vaccination due to personal preference was considered coercion by many HCW (Yassi et al., 2010).

### **Influenza Vaccine Implementation**

Implementing policy for influenza vaccination among HCW requires knowledge about efficacy, safety, and cost effectiveness. Vaccine efficacy encompasses the ability of the vaccine to prevent and protect against influenza illness for those vaccinated (Burls et al., 2006). Efficacy is assessed by reduction of confirmed laboratory cases of influenza, reduction of influenza-like illness, and reduced missed work days by HCW related to influenza or influenza-like illness (Ng & Lai, 2011). Vaccine safety refers to adverse events from vaccine administration (CDC, 2011). In the United States, vaccines are continuously monitored for safety and side effects through the Vaccine Adverse Event Reporting System (VAERS; CDC, 2011). Cost-effectiveness was implied by the benefits achieved from the cost and resources necessary to implement influenza vaccine administration. It was anticipated that vaccine cost and implementation of resources would reduce disease burden, revenue spent to treat preventable illness, and maintain workplace productivity among HCW (Burls et al., 2006).

### **Influenza Vaccine Efficacy**

Protection against and prevention of influenza outcomes for patients and health care workers have varied in reporting. Inconsistencies in research outcomes may be why vaccine efficacy fell short in contributing to policy decisions for influenza vaccine mandates. Wilde et al. (1999) reported 88% vaccine efficacy in serologically confirmed cases for influenza A among vaccinated HCW 95% CI [47, 97]. Ng and Lai (2011) found it impossible to report on vaccine efficacy in the systemic review “Effectiveness of

Seasonal Influenza Vaccination in Health Care Workers.” The reporting for the incidence of influenza-like illness, number of influenza-like illnesses, or days with influenza-like illness were inconsistent in the studies’ criteria for influenza illness or were missing data for standard deviations. Two random control trials from the 1990s in Scotland assessed whether vaccinating HCW against influenza protected those at risk (Burls et al., 2006). Both studies were conducted at long-term health facilities. The studies reported mortality reduction from 17% to 10%,  $p = .013$ , OR 0.56, 95% CI [0.4, 0.8] and uncorrected mortality of 13.6% when compared to the control arm of 22.4%, OR 0.58, 95% CI [0.36, 1.04]; Burls et al., 2006). A nested control prospective surveillance control study conducted by Benet et al. (2012) reported a 35% shielding effect for protecting patients in acute care settings against influenza when HCW were vaccinated. Of the 55 patients analyzed in the study, 11% had laboratory confirmed hospital-acquired influenza (Benet et al., 2012). Significance resulted for the mean amount of unvaccinated HCW (11.5%) for cases versus vaccinated HCW (36.1%;  $p = .11$ ) for controls (Benet et al., 2012). The authors noted that less than 35% of HCW being unvaccinated had no effect on hospital-acquired influenza among patients; however, a minimum of 35% of HCW vaccinated against influenza may have a protective impact on patients (Benet et al., 2012).

### **Influenza Vaccine Safety**

Burls et al. (2006) noted that vaccine safety reports from influenza primarily revolved around pain at the site of injection. When influenza vaccine injection was compared to placebo injection, 51% reported a sore arm or erythema (11%), versus 7% and 0% respectively (Weingarten, 1988). Additionally, it was twice as common to have reports of pain from influenza vaccine injection when compared to placebo injection (RR

2.1, 95% CI [1.4, 3.4]; Demicheli, Jefferson, Rivetti, & Deeks, 2000). Similarly, Ng and Lai (2011) reported mild and transitory adverse effects from influenza vaccination.

Adverse effects were neither persistent nor life threatening (Ng & Lai, 2011).

### **Cost-Effectiveness of Influenza Vaccine**

Although reporting for cost effectiveness for influenza vaccination existed and contributed to recommendations by the National Action Plan to Prevent Health Care Associated Infections, the data were inclusive of patient outcomes and health care workers (HHS, 2013). Cost effectiveness from influenza vaccination was reported to be \$28,000 per quality-adjusted life year (QALY) saved for older adults (50-64 years) and \$980 per QALY for those 65 years and older (HHS, 2013). Health care provider visits were reduced by 13-44% among adults younger than 65 years (HHS, 2013). Fewer work days were lost (18-45%) and there were fewer days with low productivity (18-28%) (HHS, 2013). Antibiotic use decreased by 25% due to influenza vaccination (HHS, 2013).

Burls et al. (2006) examined 14 studies on cost effectiveness with influenza vaccination among HCW. Ten out of the 14 studies reported cost savings by replacing staff from absenteeism. According to Wilde et al. (1999) influenza vaccination of HCW reduced employee absenteeism by 0.4, 95% CI [0.1, 0.8] working days per person; while another study by Demicheli et al.(2000) indicated absenteeism associated with respiratory illness was reduced by 1.0 days/person among health care workers vaccinated compared to 1.4 days/person among those unvaccinated ( $p = .02$ ). In the systemic review by Ng and Lai (2011), it was reported from the comparisons of two random control trials that there was a mean difference of -0.08 for work days lost between the intervention and control

groups for influenza vaccination of health care workers  $p = .11$ , 95% CI [0.19, 0.02].

Chan's 2006 retrospective cohort study examined if vaccinating emergency department HCW (including nurses and health care attendants; excluding excluded physicians) reduced influenza like-illness related absenteeism from work. Chan's study concluded that vaccinated HCW reported 1.0 days lost compared to 1.75 days lost by non-vaccinated HCW during that influenza season (Chan, 2006).

### **Attitudes and Beliefs About Influenza Vaccine**

Attitudes and beliefs toward influenza vaccine by HCW provide a unique look at the trends for voluntary self-care practices of HCW and their perspectives for why they chose to vaccinate (Brickerd, 2013). The predominant themes that emerged from several studies was that physicians vaccinate more than nurses with likelihood that knowledge about vaccine safety may be an influential factor; guidance from health officials may make a difference in decision making for HCW to vaccinate; HCW who perceive that self-vaccination protect their patients are more likely to be vaccinated; and HCW who were vaccinated the year prior are more likely to vaccinate the current year.

### **Health Care Workers' Attitudes and Beliefs**

Brickerd's (2013) phenomenological study identified five reasons Delaware HCW chose to voluntarily vaccinate against influenza. The reasons included advocacy (role-modeling or health promotion), perceived benefit, need for education, policy development (mandates), and fear of illness, respectively. Brickerd's (2013) inquiry of what initiatives Delaware HCW thought could increase rates of influenza vaccination revealed-enhanced education, dissemination of accurate information, and dispelling myths about vaccine efficacy and safety. Policy development and addressing vaccination



fear were perceived to be influential for increasing vaccination rates, but only as part of the educational strategy.

In a systemic review conducted by Burls et al. (2006), 10 studies were included to assess why HCW declined or accepted influenza vaccine. From the review, the majority of respondents (82-83%) vaccinated to protect themselves and 62% to 67% vaccinated to protect patients. Reasons provided to decline influenza vaccine included fear of side effects (8-51%), fear of causing influenza (21-45%), dislike of injections (5-27%), unaware the vaccine was available or useful (3-53%), forgetting or lack of time (5-60%), and perception of being at low risk for contracting influenza (5-29%; Burls et al., 2006).

In 2009, the H1N1 epidemic possibly created more fear for vaccine safety administration than prior years. HCW became ambivalent about self-vaccination and mentioned vaccine safety as the most common reason not to vaccinate (Arda et al., 2011). A cross sectional study among 807 Turkish HCW revealed that 44.2% were unwilling to vaccinate with the H1N1 vaccine component (Arda et al., 2011). Vaccine side effects and lack of field evaluation was the most common (78%) reason provided for unwillingness or hesitancy to vaccinate (Arda et al., 2011). Although, 80% of HCW perceived themselves at risk, less than 20% (17.7%) had intentions to vaccinate (Arda et al., 2011). Vaccination rates were greatest among health departments with patients with high risk, infectious disease, respiratory disease, and campus outpatient clinics (76.9, 70.6, and 57.1% respectively; Arda et al., 2011). Physicians had intentions to vaccinate three times more (25.9%) than nurses (7.2%;  $p = .001$ ; Arda et al., 2011). Of the 49 HCW vaccinated the year prior, 31.8% had intentions to vaccinate, and 14.3% of the 92 not vaccinated the year prior had intentions to vaccinate (Arda et al., 2011). Additionally,

80.6% of HCW less than 50 years old (584) perceived being at risk for influenza illness, unlike the 59.3% of those 50 years and older (35) who did not (Arda et al., 2011).

In 2009, Chor et al. (2009) conducted a repeated cross sectional study to assess the willingness of HCW (doctors, nurses, and allied health professionals) to accept pre-pandemic influenza vaccination during the Phase 3 and Phase 5 of World Health Organization (WHO) alert levels. WHO constructed a 6 Phase alert level for participating countries to consider for the planning and implementation for preparedness of pandemic influenza. Phases 1 to 3 are planning efforts and Phases 4 to 6 are implementation of efforts. During alert Phase 3 (January to March 2009), community level influenza outbreaks had not occurred, but sporadic cases of illness were identified. Pre-pandemic influenza vaccine H5H1 was offered to HCW during phase 3 alert, and only 28.4% of study respondents were willing to accept vaccination. During Phase 5 (May 2009), the threat of pandemic was imminent and human to human spread of influenza was identified in at least 2 of the WHO participating countries. During Phase 5 alert, pre-pandemic H1N1 was offered to HCW. Then, willingness of HCW to vaccinate was 47.9%. Primary intentions to vaccinate were to protect one's health and following the advice of WHO. Fear of vaccine safety and efficacy was a predominate barrier for intentions to vaccinate. Perceived risk of infection and having received influenza vaccine in the past were positive factors associated with the intention to vaccinate.

Clark, Cowan, Pascale, and Wortley (2009) surveyed 2,000 registered nurses (RN) from the states of Colorado, Pennsylvania, Missouri, and Florida to explore knowledge, attitudes, and beliefs associated with influenza vaccination of RNs. This cross sectional study was conducted from January to March 2006. A majority of

respondents (59%) reported being vaccinated the season prior and that protection of their health was the common reason for being vaccinated (95%). Adverse reaction to vaccination was the most common reason (39%) reported for not being vaccinated (Clark et al., 2009). Vaccination rates were higher among older respondents, those with chronic illness, and those who cared for patients perceived at higher risk for contracting influenza (Clark et al., 2009). Only 58% of respondents agreed to having a professional responsibility to being vaccinated (Clark et al., 2009). Respondents 'very aware' of the CDC recommendation for HCW to be vaccinated each year were more likely to be vaccinated (70%) compared to those 'aware' and 'somewhat' or 'not aware' (41 and 37% respectively,  $p = .0001$ ; Clark et al., 2009, p. 553). Most (59%) believed the CDC recommended HCW vaccinate to protect themselves, while fewer (39%) mentioned the recommendation was made to protect patients (Clark et al., 2009).

Ferguson, Ferguson, Golledge, and McBride (2010) conducted a cross section study in Queensland, a rural area of Australia to assess HCW intention to receive pandemic influenza vaccination. Of the 252 staff members surveyed, 44% had intentions to vaccinate, 25% did not, and 31% remained undecided (Ferguson et al., 2010). It was noted that respondents who had concerns about the vaccines safety, adverse reaction, or perception of limited vaccine trials were less likely to accept the vaccine (Ferguson et al., 2010). Additionally, HCW were less motivated to vaccinate if they contracted influenza the past year or had limited interaction with patients (Ferguson et al., 2010). Factors likely to motivate HCW to vaccinate were: protecting self, OR 4.72, 95% CI [1.96, 11.40], protecting others, OR 2.61, 95% CI [1.00, 6.81], and ease of accessibility for vaccine receipt (Ferguson et al., 2010). Characteristics of those with intentions to

vaccinate included HCW who were older in age, had a medical condition for which vaccination was advised, and had received season influenza vaccine (Ferguson et al., 2010).

St. Jude's Children's Research Hospital had 3,625 employees who served children with autoimmune disorders of malignancy, human immunodeficiency virus, and sickle cell (Hakim, Gaur, & McCullers, 2011). This institution does not have a mandatory influenza vaccination policy in place for employees; however, more than 90% of their staff were vaccinated each year (Hakim et al., 2011). Hakim et al. (2010) explored factors that motivate these employees to maintain such high adherence for voluntary influenza vaccination and assessed their attitudes regarding influenza mandate policy. The most common cited reasons HCW accepted vaccination was to protect themselves (83.5%) and their patients or family (78.3%; Hakim et al., 2011). Fear of illness (30.6%), rare but serious side effects (24.5%), or perception that the vaccine did not work (24.5%) were common responses to refusals for vaccination (Hakim et al., 2011). Approximately 37% of HCW who responded (857) opposed influenza vaccine mandate for HCW (Hakim et al., 2011). Autonomy and freedom of choice was the primary reason (54.4%) vaccine mandate was opposed (Hakim et al., 2011). In this study, no significant difference was demonstrated among age, profession, or length of employment for those respondents who cited prevention of disease transmission to patients as a reason to accept influenza vaccination. Hakim et al. (2011) noted that preventive measures at St. Jude's for influenza prevention equally reached all employees and created a unique culture despite HCW differing backgrounds (Hakim et al., 2011).

During the 2009-2010 influenza season, HCW in primary and acute care settings of London were surveyed about reasons for H1N1 vaccine refusal. Respondents agreed that pandemic and influenza vaccine protected their health, the health of their patients, and reduced staff absenteeism (90%; Head et al., 2012). Eighty five percent of respondents supported the notion that influenza vaccine protected transmission of disease from workers to patients (90%; Head et al., 2012). It was suggested that the perceived risk of transmission to patients has a significant impact on influence for HCW acceptance and uptake for influenza vaccine. More than 90% of respondents who were vaccinated provided positive feedback about their vaccination experience. Respondents' perceived information shared about vaccination was sufficient; time and location was convenient; the HCW had confidence in the practitioner administering the vaccine; and the environment was confidential and gave privacy (Head et al., 2012). The three primary reasons for vaccine refusal were side effects, perception that swine flu was not severe, and worries about clinical effectiveness (40, 38, and 37% respectively; Head et al., 2012). Agreement and uptake of influenza vaccination stemmed around risk perception for morbidity and mortality for the HCW or their patients.

In 2006, hospital employees at a tertiary care university hospital in Germany were surveyed to assess perceived risk of adverse effects from influenza vaccine (Ehrenstein et al., 2010). It was concluded that correlation exists for overestimation of the actual low rates for adverse effects with non-vaccination of HCW and work absenteeism (Ehrenstein et al., 2010). The overestimation of the actual low rate adverse effects was more commonly seen among non-vaccinated nurses, when compared to vaccinated nurses. However, physicians' failure to vaccinate was associated with over estimation of non-

severe and severe adverse effects from influenza vaccine such as skin necrosis at the injection site (67%) and severe hepatitis (70%; Ehrenstein et al., 2010).

### **Health Care Officials' Attitudes and Beliefs**

Consensus exists among health care officials and medical associations that HCW should vaccinate against influenza, however mandatory policy adoption is not universal. Mandatory vaccination was considered as a last resort by agencies when voluntary vaccination participation rates remain insufficient. Health care leaders were more likely to implement multiple concurrent strategies to promote vaccine uptake by HCW, without impingement of strict mandate (Wallace, 2013). The ANA endorses voluntary vaccination practices and rejects the notion to mandate them (Hellyer et al., 2011). The AMA advises physicians to uphold their pledge to do no harm and take action that benefit others as a moral obligation; AMA endorses health care institutions policy for physicians to vaccinate against influenza as terms for initial as well as continued employment (Hellyer et al., 2011). OSHA opposes the ambiguous recommendations offered by NVAC for employers to require vaccination (Evans, 2012). The concern was that the language allows for reprisal by employers to the extent of termination for employees who do not vaccinate (Evans, 2012) and could be considered coercion.

An increase in influenza vaccination rates among HCW was noted in a study with Australian health officials who implemented multiple passive to moderate assertive strategies to encourage vaccine uptake by HCW. Although their attempts did increase vaccine rates, participation remained lower than the recommended 80%. Australian health officials perceived that if consequences were enforced for not being vaccinated or

policy mandate was set forth from the state or national departments, compliance among HCW and influenza vaccination would be higher (Seale, Kaur, & MacIntyre, 2012).

### **Influenza Vaccine Policy for Health Care Workers**

Universal policy for mandatory influenza vaccination among HCW appears to be lacking. However, the WHO, National Advisory Committee on Immunization (NACI), and CDC recommend all HCW be vaccinated against influenza and that health care institutions implement strategies to increase participation rates. Health care facilities around the world have various influenza vaccine participation rate outcomes among their HCW. A consistency was noted for increased participation rates among facilities that employ strict policy with consequences for employees who do not vaccinate against influenza.

Health care officials (infection control officers, public health nurses, and health department leaders) responsible for vaccinating and campaigning for influenza vaccination at 82 hospitals in 3 states of Australia reported access to free influenza vaccines, promoting education campaigns, using mobile carts, and incentives viewed as a benefit to increasing vaccination rates among HCW (Seale et al., 2012). These strategies have greater impact when performed concurrently. However, participation rates for HCW were not maintained and failed to persist in subsequent years due to lack in continuity of resources to support the intensive strategies (Lim & Seale, 2013; Seale et al., 2012). Barriers to influenza vaccination among HCW included resource allocation of staffing to implement vaccination programs at various sites; signing of declination forms that risk the fear of retribution from employers; and inconsistencies for documenting vaccine uptake among HCW, agency employees, students, and volunteers via electronic or

hardcopy at various sites (Seale et al., 2011). The barriers were perceived as tasking due to feasibility and unreliability for data collection purposes. The lack of credible evidence for the impact for vaccinating HCW against influenza was another challenge perceived for convincing well informed HCW to vaccinate (Lim & Seale, 2013; Seale et al., 2012).

Seale, Kaur, and MacIntyre (2012) noted that the Australian health care agencies differed in their approach to influenza vaccination endorsement for their staff. HCW participation rates are less than the recommended uptake rate of 80% at most institutions, unless there were incentives or declination forms to complete (Lim & Seale, 2013; Seale et al., 2012). In Australia, influenza vaccination of HCW is recommended and printed in the *Australian Immunisation Handbook – 9<sup>th</sup> edition*. This recommendation was consistent with the WHO, NACI, and CDC. Similar to the U.S., Australian health care agencies did not implement a mandate to vaccinate against influenza (Seale et al., 2011).

After the 2007-2008 influenza season, a cross sectional study was conducted of North Carolina Emergency Medical Services (EMS) workers in an effort to identify predictors of vaccine uptake (Hubble, Zontek, & Richards, 2011). Respondents held the following beliefs: they were at risk for influenza (68.7%); the vaccine was safe and effective (91.3 and 75.1% respectively); it was important to be vaccinated to protect their health and their patients' health (76.5 and 72.2% respectively); and prevention of disease outweighed the risk of adverse reactions from the vaccine (85.4%; Hubble et al., 2011). The majority of respondents also recollected their employers recommending the vaccine, providing the vaccine free of charge, and offering education about the vaccine (Hubble et al., 2011). Although, many EMS workers favored the actions of education about the vaccine and free vaccination by employers, only 9.1% believed influenza vaccination of



EMS workers should be mandatory (Hubble et al., 2011). Thirty nine percent of the respondents supported influenza mandate with an opt out option (Hubble et al., 2011). Twenty one percent of respondents who were not vaccinated, stated they were not vaccinated because 'it was not required by my employer' while 76.7% of those vaccinated stated they did so because their 'employer provides free vaccinations' (Hubble et al., 2011, p. 178). The researchers suggested that risk perception alone does not predict acceptance and uptake of influenza vaccination and that leadership role of employers' impact belief and practice patterns for vaccine uptake (Hubble et al., 2011).

### **Summary and Conclusion**

Healthcare workers (HCW) and patients alike are at risk for influenza illness. HCW may transmit the virus to patients while providing care. The risks of disease transmission from HCW to patients were lower when HCW are vaccinated. Despite this acknowledgement, the rates of HCW workers vaccinated were not consistent among subgroups (i.e., physicians, midlevel providers, nurses, and allied health professionals). Reasons for low or inconsistent vaccination rates among HCW varied. The common reasons were personal choice, perception of low efficacy, fear of vaccination, not recognizing self as mode for transmission, and low risk perception. Higher rates for vaccine uptake were associated with incentives, being informed about modes for transmission, the desire to protect patients, perception of illness susceptibility, and employer influence by encouragement or mandate.

Modest, but consistent positive outcomes in research existed for vaccine safety and cost effectiveness of influenza vaccine in the health care work force. Reporting for vaccine safety, cost effectiveness, and sharing of successful vaccine uptake strategies

were referenced for health care institutions to strengthen individual agency policy or mandate. Medical and health societies were consistent in their assertion that it is an ethical obligation for HCW to vaccinate against influenza. However, the impact of these positions was unmeasured (Lim & Seale, 2013). There is likelihood that the intentions for HCW to vaccinate were motivated by leaders in health care. Having a shared belief system as demonstrated in the study among HCW at St. Jude's Children's Hospital, may counteract individual self-efficacy which was noted to be counterintuitive to reaching the goal of 90% of HCW to be vaccinated (Hakim et al., 2011).

The research demonstrated that if influence from leadership existed for anticipatory behavior, action was taken accordingly as theory predicts. Health care leaders that share valid evidence of influenza vaccine effectiveness with HCW and set expectations of a standard practice may impact the uptake of influenza vaccine by HCW. If so, shared beliefs and practices within the profession may sustain preventive self-care behaviors that are proactive. Such consistency can positively impact social change. This study was designed to specifically reveal the influence and impact that health leaders and policy makers have on HCW belief and attitude towards influenza vaccine. Chapter 3 will detail the methodology for this research study.

## Chapter 3: Methodology

### **Introduction**

The purpose of this quantitative study was to explore the relationships between influenza vaccination uptake by health care workers (HCW) and guidance from governing health agencies to vaccinate against influenza. A quantitative approach was used to identify specifically how leaders in health care and policy decisions impact beliefs, attitudes, and decision making on HCW influenza vaccine practices. Chapter 3 contains a discussion of the rationale for the research design and methodology used to conduct the study. Operationalization of the variables, data collection, and statistical measurements used to analyze data are detailed in this chapter. Additionally, threats to validity are reviewed. Lastly, ethical considerations are discussed.

### **Research Design and Rationale**

A cross-sectional, quantitative design was used for this study. A 5-point Likert-scale survey was adapted from prior cooperative research conducted by the CDC and University of Michigan to assess influenza vaccination attitudes and practices among U.S. registered nurses. The survey instrument, VIP, was used once, and formal validity and reliability were not established. Dr. Sarah Clark, the instrument's creator, granted permission for use and adaptation of the survey. An adapted survey (Appendix A) was constructed as an electronic version and emailed to the target population to attain a convenience sample from the same setting. The survey was completed independently and anonymously by participants. Prior to formal data collection, the adapted survey was pilot tested with a convenience sample of 13 HCW to ensure clarity and ease of administration.

This research design was appropriate because the purpose of the study was to (a) explore the relationships between influenza vaccination uptake by HCW and guidance from governing health agencies to vaccinate against influenza, (b) describe influenza vaccine uptake and vaccine mandate among specific types of HCW, and (c) determine whether the lack of explicit guidelines from policy makers to vaccinate against influenza impacted HCW attitudes toward influenza vaccination. The Likert-scale responses measured attitudes. The responses had assigned values that expressed the extent of awareness or favorability of the item in question. Each question was related to the research purpose. The independent variables for this study were guidance from governing agencies to vaccinate against influenza, vaccine mandate, and lack of explicit guidelines from policy makers. The dependent variables were influenza vaccine recommendation awareness, influenza vaccine uptake among specific types of HCW, and HCW attitude toward influenza vaccine. Confounders were age, gender, and practice setting. Covariates were other factors HCW mentioned as main reasons to vaccinate or not vaccinate.

## **Methodology**

### **Population**

Participants for the study included HCW from an institution that had an existing influenza vaccine policy and provided the vaccine free of charge to employees through employee health services. To ensure confidentiality, the institution is referred to in this study as XYZ Health Center.

The existing policy at XYZ Health Center stated that all patients, staff, physicians, and volunteers would receive the influenza vaccine annually unless there was a documented contraindication or supply shortage. The policy further specified that

immunity was required in employees through uptake of the influenza vaccine to avoid the risk of transmission to vulnerable patients, staff, and visitors. This requirement was based on recommendations set by the CDC and Advisory Committee on Immunization Practices.

The sample was gathered from the approximately 2,000 HCW who provided direct patient care at the facility. There were 1,400 nurses and 600 providers inclusive of physicians, midlevel providers, and clinical pharmacists at the health care facility where the research was conducted. These health care workers were recruited to participate in the survey. The health care facility was a Level 1 hospital with emergency, surgical, inpatient and outpatient services.

### **Sampling and Sampling Procedures**

Participants were recruited by workplace email. The health care facility had email groupings that could be used to separate providers, nurses, and pharmacists from the population. Only these prospective participants received an email to participate in the study. The criteria for participation indicated that participants needed to be physicians, midlevel providers, nurses, and clinical pharmacists at the health care facility who provided direct patient care. The survey was anonymous and was collected by SurveyMonkey. The electronic data collection was secured and accessible only by me, with coding procedures used for data analysis.

Purposive sampling was used for the quantitative study chosen. Purposive sampling was appropriate to use for assessing attitudes or opinions at the point in time when data were collected. To conduct a reliable study, use of a representative sample size for the population was essential; otherwise, the results might have been biased. The

sample size was large enough to determine whether inferences about the population could be made (Frankfort-Nachmias & Nachmias, 2008). The sample size chosen reflected the population of providers and nurses necessary to obtain a 95% confidence level and confidence interval of 5. The sample size of 322 was needed to yield inferences for a population of 2,000 (Creative Research Systems, 2012). The chance of detecting false positive findings, also known as the *alpha level*, was set at a significance of 0.05 for this modest sample size (Suresh & Chandrashekar, 2012). The power level was set at 0.80. The power level demonstrated the likelihood that if differences between groups existed, they would be detected. If differences were not detected, I could be confident no differences existed (Suresh & Chandrashekar, 2012)

### **Procedures for Recruitment, Participation, and Data Collection**

Participants were recruited by an inquiry for participation sent via workplace email. In the email, I introduced the study, described its purpose, and included an invitation to participate. If the recruit agreed to participate, a link prompt was available at the end of the email for the participant to proceed. Completion of the survey by HCW confirmed their consent. The survey contained questions relevant to the research, as well as prompts for demographic information such as gender, age, type of health profession, and work setting. Upon completion of the survey, a “Thank You” message appeared and the survey closed. Data were collected and stored electronically by the survey tool. After completion of the research, study results were disseminated to the health care facility and participants.

Data were collected by using an adapted survey tool created for use by SurveyMonkey. SurveyMonkey is an Internet service that allows researchers to

customize their data collection tools, collect responses from the sample population, and analyze the results (SurveyMonkey, 2014). The data collected were secured in the web-based program. I had complete control of the data collection, how data were analyzed, and data security.

### **Instrumentation and Operationalization of Constructs**

The tool selected to perform this research study was a modified version of the VIP survey (Appendix A) that was originally developed for the study “Influenza Vaccination Attitudes and Practices Among U.S. Registered Nurses” (Clark, Cowan, & Wortely, 2009). The tool was used for a one-time study conducted by the CDC and the University of Michigan to explore nurses’ perspectives on influenza risk and receipt of influenza vaccine (Clark et al., 2009). The data collected were used to help the CDC target their efforts to promote influenza vaccination (Clark et al., 2009). The tool was developed by Dr. Sarah Clark, Associate Director for Research of the University of Michigan. The tool was not formally assessed for validity and reliability. Permission was granted by Dr. Sarah Clark through email communication to use and adapt the tool for this research study.

Researchers identified similar barriers to influenza vaccine receipt as noted in prior research—concerns about adverse reactions and vaccine effectiveness. Higher vaccination rates existed among health care workers most knowledgeable about influenza vaccination (Clark et al., 2009). Respondents in the study were more likely to be vaccinated if they perceived that their patients were at high risk for influenza infection and agreed with statements regarding influenza disease and influenza vaccination (Clark et al., 2009). More than half of the participants (58%) were very aware of the CDC

recommendations to vaccinate. Those who were very aware (70%) were more than likely to be vaccinated against influenza when compared to those who were aware (41%), or somewhat aware and not aware combined (37%). Most participants (95%) agreed that influenza can cause serious illness, and 58% agreed that health care workers have a professional obligation to get vaccinated against influenza. The Clark et al. (2009) research inquiry for perception and acceptance for influenza vaccination recommendations posed by the CDC was similar to the inquiry conducted for this research study. The tool was successful in achieving the intended purpose, and for this reason, adaptation and use of the tool was appropriate. A pilot survey with the adapted tool was disseminated to a small sample to provide evidence of the tool's reliability and validity. Approximately 20 people from the target population were contacted by email to participate in completion of the pilot survey to assess for validity and reliability of the tool. In Table 1, operationalization of the variables is detailed. How each variable was measured and levels of measurement are listed.



Table 1

*Operationalization of the Variables*

Variable type	Variable name	Variable source	Possible responses	Level of measurement
Dependent	Extent of awareness	To what extent are you aware...	Not aware at all, Somewhat aware, Very aware	Ordinal
	HCW influenza uptake	Health profession	Physician, Physician assistant, LPN, RN, APN, Pharmacist	Nominal
		Did you receive an influenza vaccine	Yes, No	Nominal
	HCW attitude toward influenza vaccine	Health profession	Physician, Physician assistant, LPN, RN, APN, Pharmacist	Nominal
		... attitude about the influenza vaccine	Yes, No	Nominal
		Agreement with statements:		
		Influenza and its complications can't be serious	Strongly disagree, Disagree, Neutral, Agree, Strongly agree	Ordinal
		Systemic side effects from flu vaccine are rare	Strongly disagree, Disagree, Neutral, Agree, Strongly agree	Ordinal
		Benefits of flu vaccine outweigh risk of side effects	Strongly disagree, Disagree, Neutral, Agree, Strongly agree	Ordinal
		HCW are at higher risk of getting influenza than the general public	Strongly disagree, Disagree, Neutral, Agree, Strongly agree	Ordinal
		Vaccination of HCW can prevent the spread of influenza to patients	Strongly disagree, Disagree, Neutral, Agree, Strongly agree	Ordinal

*(table continues)*

Variable type	Variable name	Variable source	Possible responses	Level of measurement
		HCW have the professional responsibility to get an annual flu vaccine	Strongly disagree, Disagree, Neutral, Agree, Strongly agree	Ordinal
		Do you agree with a worksite influenza policy	Strongly disagree, Neutral, Strongly Agree	Ordinal
Independent	Guidance from governing agencies	Main reason for not getting a flu vaccine	... do not recommend it	Nominal
		Main reason for getting a flu vaccine	... recommend it	Nominal
	Vaccine mandate	Main reason for not getting a flu vaccine	Workplace did not mandate	Nominal
		Main reason for getting a flu vaccine	Workplace mandate	Nominal
	Lack of explicit guidelines	... affect your attitude about the influenza vaccine	Yes, No	Nominal
Confounders	Age	Age	20-30, 31-40, 41-50, 51-60, 61-70, 71-80	Interval
	Gender	Gender	Male, Female	Nominal
	Practice setting	Practice setting	Inpatient, Outpatient	Nominal
Covariates	Main reason for not getting a flu vaccine	Main reason for not getting a flu vaccine	... adverse reactions, limited contact with high-risk patients, small chance of contracting influenza, flu vaccine not effective enough, Too busy/forgot, Other	Nominal
	Main reason for getting a flu vaccine	Main reason for getting a flu vaccine	Protect myself ..., Protect my patients ..., Local epidemic/Bad influenza season, member of target group ..., Other	Nominal

## **Data Analysis Plan**

The research questions were examined using quantitative research methods. SAS 9.4 (SAS Institute, Cary, NC) was used to analyze the data and make inferences about the population. The statistical test of Fisher's exact was used to assess whether a relationship between the variables existed, and the significance level was set at 0.05. Descriptive statistics were used to characterize the sample population by age, gender, health profession, and practice setting. Descriptive statistics were useful in providing the most comprehensive insight into the populations' characteristics and ability to describe the relationships between variables with the use of cross tabulations and frequency distributions.

Data cleaning removed erroneous data that appeared isolated in the data series. Data cleaning corrected external errors that occurred during data collection and reporting (Frankfort-Nachmias & Nachmias, 2008). This process ensured that collected data entries were consistent and supported integrity of the statistical analysis.

## **Research Questions and Hypotheses**

The research questions and hypotheses were as follows:

RQ1. (Quantitative). Is there a relationship between influenza vaccination uptake by health care workers (HCW) and guidance from governing agencies to vaccinate against influenza?

H1<sub>0</sub> There is no relationship between influenza vaccination uptake by HCW and guidance from governing agencies to vaccinate against influenza.

H1<sub>a</sub> There is a relationship between influenza vaccination uptake by HCW and guidance from governing agencies to vaccinate against influenza.

Independent variable: Guidance from governing agencies to vaccinate against influenza.

Dependent variable: Influenza vaccine uptake by HCW

RQ2. (Quantitative). Is there a relationship between influenza vaccine uptake and vaccine mandate among specific types of HCW?

H2<sub>0</sub> There is no relationship between influenza vaccine uptake and vaccine mandate among specific types of HCW.

H2<sub>a</sub> There is a relationship between influenza vaccine uptake and vaccine mandate among specific types of HCW.

Independent variable: Vaccine mandate

Dependent variable: Influenza vaccine uptake among specific types of HCW

RQ3. (Quantitative). Would the lack of explicit guidelines from policy makers to vaccinate against influenza impact HCW attitude toward influenza vaccine?

H3<sub>0</sub> The lack of explicit guidelines from policy makers does not impact HCW attitude toward influenza vaccine.

H3<sub>a</sub> The lack of explicit guidelines from policy makers has an impact on HCW attitude toward influenza vaccine.

Independent variable: Lack of explicit guidelines from policy makers

Dependent variable: HCW attitude toward influenza vaccine

Inclusion of the descriptors age, gender, and work setting were confounding variables that may influence the relationships between the dependent and independent variables. Main reasons health care workers may or may not vaccinate were solicited in the study and written in as “other” for further delineation as covariates. Inclusion of such

variables provided comprehensive insight into the populations' characteristics and ability to describe the relationships between variables.

### **Threats to Validity**

There were two central threats to external validity. First, the participants were affiliated with licensing and or professional health agencies (professional association, facility, and subgroup) and inference was made about the selective subgroups. However, the information gathered represented those at the particular agency the sample was chosen, and results were generalized to the outside population. Secondly, participants were employees of an agency that had an expectation for influenza vaccination by employees. Participants may have felt an obligation to respond in a manner that was perceived favorable by their employer or provided biased responses based on personal agenda. In an attempt to control for this, participants were informed that their results were confidential and anonymous with hope that respondents responded to the survey honestly.

There were several threats to internal validity. One was mediating variables. Chances were that causal inferences existed as explanations for outcomes of the independent variable. Question 5 of the survey allowed for alternative explanations and "other" to be written in by surveyors. This was an attempt to control for alternate explanations of affect between the variables. The second threat for internal validity was history. History was not controlled for in this study, however was noted as a potential influence to the participants' attitudes and beliefs. A third threat for internal validity was instrumentation. This was controlled for by pilot testing prior to conducting the official research. Pilot testing determined tool reliability as well.

The modest significance level of 0.05 was chosen to minimize the threat to statistical conclusion validity. A lower statistical power may have risked a Type II error. To strengthen statistical conclusion validity, pilot study measures was be used on the same scales proposed for the study.

### **Ethical Procedures**

Ethical procedures and protection of human rights were initially addressed when seeking approval from the Institutional Review Boards (IRB) to conduct the study. IRB approval ensured research activities that involve humans and access to personal information maintained the participants' benefit more than risk, confidentiality, and a process for informed consent.

Agreements to gain access to participants and data were obtained from Walden University and the health facility's IRB prior to conducting research. Recruitment of participants was free of coercion, protected anonymity, and undue repercussion from enrollment. Prior to collecting data from participants, informed consent was obtained. The consent form preceded the survey and summarized the purpose of the study. Risks and benefits to voluntary participation were explained, along with my role as the researcher. Recruits who declined participation opted out prior to completion of the survey. Those participants who proceeded and provided consent completed the survey. Data collected was anonymous and stored in SurveyMonkey, a secured Internet research database. Data were accessible only to me. Research data will be stored for a minimum of five years in the SurveyMonkey secured Internet research database.

## **Summary**

The research was a cross-sectional, quantitative study with use of a Likert-scale survey that explored the relationships between influenza vaccination uptake by HCW and guidance from governing health agencies to vaccinate against influenza. Data were collected from a total population of approximately 2,000 HCW at a hospital during the 2014-2015 influenza season. Information gathered described influenza vaccine uptake and vaccine mandate among specific types of HCW. Analysis of data aided me in determining if the lack of explicit guidelines from policy makers to vaccinate against influenza impacted HCW attitude towards influenza vaccine. Chapter 4 presents the results of the study.

## Chapter 4: Results

### Introduction

The purpose of this cross-sectional, quantitative study was to explore the relationships between influenza vaccination uptake by HCW and guidance from governing health agencies to vaccinate against influenza. The research questions and hypotheses were as follows:

RQ1. (Quantitative). Is there a relationship between influenza vaccination uptake by HCW and guidance from governing agencies to vaccinate against influenza?

H1<sub>0</sub> There is no relationship between influenza vaccination uptake by HCW and guidance from governing agencies to vaccinate against influenza.

H1<sub>a</sub> There is a relationship between influenza vaccination uptake by HCW and guidance from governing agencies to vaccinate against influenza.

RQ2. (Quantitative). Is there a relationship between influenza vaccine uptake and vaccine mandate among specific types of HCW?

H2<sub>0</sub> There is no relationship between influenza vaccine uptake and vaccine mandate among specific types of HCW.

H2<sub>a</sub> There is a relationship between influenza vaccine uptake and vaccine mandate among specific types of HCW.

RQ3. (Quantitative). Would the lack of explicit guidelines from policy makers to vaccinate against influenza impact HCW attitude toward influenza vaccine?

H3<sub>0</sub> The lack of explicit guidelines from policy makers does not impact HCW attitude toward influenza vaccine.



H3<sub>a</sub> The lack of explicit guidelines from policy makers has an impact on HCW attitude toward influenza vaccine.

This chapter presents the pilot study, data collection, and analysis of the results. Following a brief discussion of the pilot study, the methods for data collection are presented, followed by a discussion of findings that may contribute to filling a gap in the existing literature.

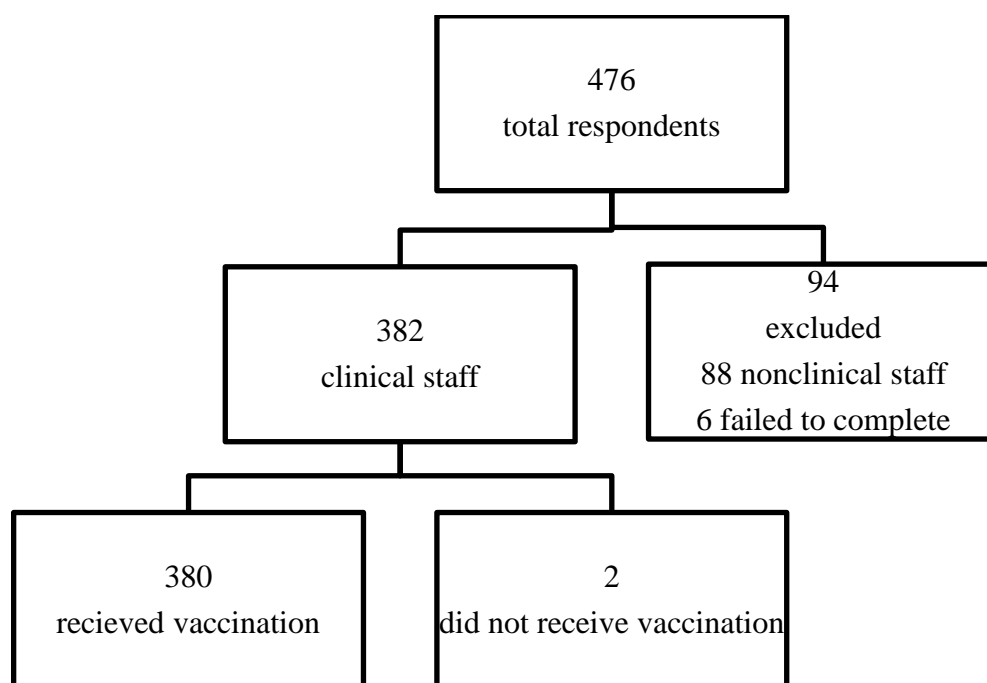
### **Pilot Study**

A pilot study was conducted prior to conducting the formal research. Approximately 20 HCW from the study's population of interest were contacted by email to complete the survey and provide feedback for readability. The results were used to assess for accuracy in collecting the information intended and to measure whether the answers to the questions were consistent. The electronic survey performed as intended. HCW who indicated that they did not provide direct patient care were excluded from completing the survey and thanked for their participation. To progress through the survey, participants were required to complete each preceding question. This ensured complete data collection. After 3 days, there were 13 respondents who had completed the survey. Feedback from respondents indicated that the survey questions were understandable, were clear, and lacked ambiguity. The survey tool gathered accurate information as intended and demonstrated consistency of answers. Validity and reliability of the survey tool were demonstrated during the pilot study. No changes were made to the survey tool, and the formal study commenced.

### **Data Collection**

The formal study was conducted over a period of 20 days. Participants were contacted by work email with an invitation to participate. A link was provided in the email that directed participants to the survey. Information about the study preceded the survey questions. If respondents answered “no” to a question concerning whether they provided direct patient care, the survey closed and thanked them for their participation. If respondents answered “yes,” they progressed to complete nine questions, and then the survey ended with “Thank You.” There were no discrepancies from the data collection plan presented in Chapter 3.

After 12 days, 311 participants responded. On the 13th day, a reminder was emailed to health care workers to complete the survey if they had not done so. The remaining 165 respondents completed the survey, and the study was closed on the 20th day. At the time the survey was disseminated, there was a total population of 2,335 health care workers at the facility who met the criteria to participate. Four hundred seventy-six survey responses were collected, and 88 (18.5%) were excluded for not providing direct patient care. A total of 388 respondents provided direct patient care (Figure 1). The number of participants exceeded the recalculated sample size (330) needed to conduct the study. Of these respondents, the majority were female (87.9%), were aged 31 to 40 (33.3%), were registered nurses (70.1%), and worked in an inpatient setting (67.7%, Table 2). Most respondents were very aware of their organizational guidelines (77.1%), felt that a lack of guidelines would not affect their attitude about the vaccination (71.1%), and strongly agreed with a workplace influenza policy (68.2%, Table 2).



*Figure 1.* Study respondents.

## Results

### Descriptive Statistics

The sample population of HCW who provided direct patient care was derived from a total of 2,335 HCW ( $N = 388$ ). Among respondents, 10.1% were physicians (41), 2.3% were physician assistants (9), 71.1% were nurses (276), 7% were advanced practice nurses (27), 4.9% were clinical pharmacists (19), and 4.1% were inclusive of certified medical assistants/nursing assistants (CMA/NA) and other (16). The majority of respondents represented the population of interest. Table 2 shows the characteristics of respondents identified in the data set.

Table 2

*Respondent Characteristics*

Characteristics		N (%)
Age	20 to 30	75 (19.7)
	31 to 40	127 (33.3)
	41 to 50	71 (18.6)
	51 to 60	86 (22.6)
	61 to 70	22 (5.8)
Gender	Female	335 (87.9)
	Male	46 (12.1)
Primary Practice	Inpatient	258 (67.7)
	Outpatient	123 (32.3)
Received Vaccine		380 (99.5)
Profession	RN	272 (70.1)
	Physician	41 (10.6)
	Adv. Practice Nurse	27 (7.0)
	Clinical Pharmacist	19 (4.9)
	CMA/NA	11 (2.8)
	PA	9 (2.3)
	LPN	4 (1.0)
	Other	5 (1.3)
To what extent are you aware that the Medical Board, Board of Nursing, and recognized professional affiliations (i.e. American Medical Association, American Nurses Association and American Pharmacist Association) recommend that HCW receive influenza vaccine each year?	Not Aware at All	17 (4.4)
	Somewhat Aware	72 (18.6)
	Very Aware	299 (77.1)
Would the lack of explicit guidelines from policy makers for HCW to receive influenza vaccination affect your attitude about the influenza vaccine?	No	275 (71.1)
	Yes	112 (28.9)
Do you agree with a worksite influenza policy, similar to some worksite hepatitis B vaccine policies, in which (a) the employer is required to offer influenza vaccine, and (b) any employee who chooses not to be vaccinated must sign a form declining vaccination?	Strongly Disagree	34 (9.0)
	Neutral	87 (22.9)
	Strongly Agree	259 (68.2)

The majority (299) of respondents, 77.1% indicated that they were very aware of organizational recommendations that HCW receive influenza vaccine each year and while others indicated they were not aware at all (17) or somewhat aware (72) of organizational recommendations, 4.4% and 18.6% respectively (Table 2). Seventy-one percent (275) of HCW responded that the lack of explicit guidelines from policy makers to receive influenza vaccination would not affect their attitude about the influenza vaccine; and 68% of HCW agreed with a worksite influenza policy. Twenty-three percent (87) of respondents remained neutral to a worksite influenza policy and 9% (34) strongly disagreed (Table 2).

Of the six questions asked about beliefs regarding influenza vaccine, most HCW strongly agreed that contracting influenza pose serious consequences and that adverse effects were rare. Eighty-one percent of HCW believe the benefits of influenza vaccine outweigh the risks and approximately 80% believe they are at a higher risk of contracting influenza than the general public. Eighty-five percent of HCW believe influenza vaccines prevent the spread of disease. A minimal amount of HCW disagreed or remained neutral to the belief that HCW have a professional responsibility to get an annual flu vaccine, 12.6% and 15.1% respectively. While 72% believe HCW have a professional responsibility to get an annual flu vaccine. Table 3 shows the summary of HCW responses to beliefs regarding influenza vaccine.

Table 3

*Beliefs Regarding Benefits of Vaccination*

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Contracting influenza can have serious consequences	9 (2.4)	2 (0.5)	3 (0.8)	91 (23.8)	277 (72.5)
Systemic side effects from flu vaccine are rare	8 (2.1)	60 (15.8)	56 (14.7)	147 (38.6)	110 (28.9)
Benefits of flu vaccine outweigh risk of side effects	12 (3.2)	13 (3.4)	47 (12.4)	116 (30.5)	192 (50.5)
HCW are at higher risk of getting influenza than the general public	7 (1.8)	27 (7.1)	47 (12.3)	126 (32.9)	176 (46.0)
Vaccination of HCW can prevent the spread of influenza to patients	9 (2.4)	15 (3.9)	35 (9.1)	110 (28.7)	214 (55.9)
HCW have a professional responsibility to get an annual flu vaccine	21 (5.5)	27 (7.1)	58 (15.1)	98 (25.6)	179 (46.7)

*Note.* Data reported in *N* (%).

The majority, 99.5 % of respondents, received the influenza vaccine (Table 2).

The most commonly reported reason for vaccination was workplace mandate (78.2%), followed by protecting the respondent (77.4%) and their patients (59.2%) from illness (Table 4). Only two respondents were not vaccinated, one due to health contraindications, and the other to limited contact with high risk patients.

When asked about their beliefs regarding the benefits of vaccination, most respondents agree or strongly agree that contracting the flu can have serious consequences (96.3%). Less than three quarters of the respondents agree or strongly agree that HCW have a professional responsibility to be vaccinated or that systemic side effects from the flu vaccination are rare (Table 3).

Table 4

*Reasons for Vaccination*

Reasons for vaccination	N (%)
Workplace mandate	297 (78.2)
Protect myself from illness	294 (77.4)
Protect my patients from illness	225 (59.2)
Professional affiliations recommend it	73 (19.2)
Local epidemic/Bad flu season	63 (16.6)
Member of target group for vaccination	61 (16.1)
Protect my family from illness [write in response]	24 (6.3)
Other	7 (1.8)

**Statistical Methods**

Data was reported in counts and frequencies. Fisher's exact using SAS 9.4 was used to summarize the relationships between influenza vaccination uptake by HCW and guidance from governing health agencies to vaccinate against influenza existed. *P*-values less than .05 were considered significant. The sample size was small and more than 20% of expected cell counts were less than 5 therefore, Fisher's exact provided accuracy and was preferred for the final analysis. The results demonstrate the effect of how leaders in health care and policy decisions impact belief, attitudes and decision making of HCW influenza vaccine practices. For clarity, grouping for Likert-scale responses "Strongly Agree" with "Agree" and "Strongly Disagree" with "Disagree" was made.

Research question 1, states: "Is there a relationship between influenza vaccination uptake by HCW and guidance from governing agencies to vaccinate against influenza?" There was no relationship between influenza vaccination uptake by HCW and guidance from governing agencies to vaccinate against influenza. Of the 99.5% respondents who received influenza vaccine, 78.2% stated worksite policy was the reason they were vaccinated and 19.2% of the respondents stated they received the vaccine because their

professional affiliation recommended it. Persons who were unaware of their professional guidelines were much more likely to disagree that contracting influenza can have serious consequences ( $p = .0103$ ), that the benefits of the flu vaccine outweigh the risks ( $p = .0139$ ), and that HCW have a professional responsibility to get an annual flu vaccine ( $p = .0057$ ). There was no relationship between awareness of professional guidelines and agreement that systemic side effects from the flu vaccine are rare, that HCW are at higher risk of getting influenza than the general public, or that vaccination of HCW can prevent the spread of influenza to patients (Table 5).

More than half (68.2%) respondents agreed with worksite policy in which the employer is required to offer the vaccine and the employee who chooses not to be vaccinated must sign a form declining vaccination. Only 9% disagreed with this policy. The remaining 22.9% were neutral to such policy. There was a significant relationship between those who agreed with a worksite policy, and in agreement with the statements: contracting influenza can have serious consequences, systemic side effects from the flu vaccine are rare, benefits of the flu vaccine outweigh the risks, HCW are at higher risk of getting influenza than the general public, vaccination of HCW can prevent the spread of influenza to patients and HCW have a professional responsibility to get an annual flu vaccine ( $p = .0263$ ,  $p < .001$ ,  $p < .001$ ,  $p = 0.0204$ ,  $p < .001$ , and  $< .001$  respectively; Table 5).

Respondents were asked, “To what extent are you aware that the Medical Board, Board of Nursing, and recognized professional affiliations (i.e. American Medical Association, American Nurses Association and American Pharmacist Association) recommend that HCW receive influenza vaccine each year?” Two-thirds (77.1%) were



very aware, 18.6% were somewhat aware and 4.4% were not aware at all of governing agencies recommendations that HCW receive influenza vaccine each year. There was a significant relationship between those who are aware of professional recommendations and in agreement with the statements: contracting influenza can have serious consequences, benefits of the flu vaccine outweigh the risks and HCW have a professional responsibility to get an annual flu vaccine ( $p = .0103$ ,  $p = .0139$ , and  $p = .0057$  respectively). There was no relationship between awareness of professional affiliation recommendations and agreement with the following statements: systemic side effects from the flu vaccine are rare, HCW are at higher risk of getting influenza than the general public and vaccination of HCW can prevent the spread of influenza to patients ( $p = .2833$ ,  $p = .1509$ , and  $p = .0559$  respectively; Table 5).

Research question 2 states: “Is there a relationship between influenza vaccine uptake and vaccine mandate among specific types of HCW?” Vaccine uptake was 99.5%, inclusive of all types of HCW despite profession, age, gender, and practice setting. For that reason, a relationship between influenza vaccine uptake and vaccine mandate among different types of HCW would not be observed. However, the majority of respondents, 78.2% indicated worksite policy was the main reason for getting vaccinated.

Research question 3 states: “Would the lack of explicit guidelines from policy makers to vaccinate against influenza impact HCW attitude towards influenza vaccine?” More than half, 71.1% of the respondents stated the lack of explicit guidelines from policy makers do not impact their attitude towards influenza vaccine. There was no significant relationship between those who are influenced by guidelines, and those in agreement with the statements: contracting Influenza can have serious consequences,

systemic side effects from the flu vaccine are rare and vaccination of HCW can prevent the spread of influenza to patients ( $p = .5265$ ,  $p = .5066$ , and  $p = .1012$  respectively; Table 5). Similarly to those who agree with a worksite policy, there was not a significant relationship between those who are influenced by guidelines, and in agreement with the statement: benefits of the flu vaccine outweigh the risks, HCW are at higher risk of getting influenza than the general public and HCW have a professional responsibility to get an annual flu vaccine ( $p = .0008$ ,  $p = .0312$ , and  $p < .001$  respectively; Table 5).

Table 5

*Respondent Perceptions*

	Disagreement within statement	Overall disagreement	P-value
<b>Respondents who <u>STRONGLY DISAGREE</u> with a worksite influenza policy, similar to some worksite hepatitis B vaccine policies, in which (a) the employer is required to offer influenza vaccine, and (b) any employee who chooses not to be vaccinated must sign a form declining vaccination.</b>			
Contracting influenza can have serious consequences	2 (5.9)	11 (2.9)	.0263
Systemic side effects from flu vaccine are rare	14 (42.4)	68 (17.9)	<.001
Benefits of flu vaccine outweigh risk of side effects	9 (26.5)	25 (6.6)	<.001
HCW are at higher risk of getting influenza than the general public	5 (14.7)	34 (8.9)	.0204
Vaccination of HCW can prevent the spread of influenza to patients	7 (20.6)	24 (6.3)	<.001
HCW have a professional responsibility to get an annual flu vaccine	14 (41.2)	48 (12.6)	<.001
<b>Respondents for whom lack of explicit guidelines from policy makers for HCW to receive influenza vaccination <u>DOES</u> <u>AFFECT</u> their attitude about the influenza vaccine.</b>			
Contracting influenza can have serious consequences	2 (1.8)	11 (2.9)	.5265
Systemic side effects from flu vaccine are rare	19 (17.1)	68 (17.9)	.5066
Benefits of flu vaccine outweigh risk of side effects	10 (9.0)	25 (6.6)	<.001
HCW are at higher risk of getting influenza than the general public	15 (13.4)	34 (8.9)	.0312
Vaccination of HCW can prevent the spread of influenza to patients	10 (8.9)	24 (6.3)	.1012
HCW have a professional responsibility to get an annual flu vaccine	22 (19.6)	48 (12.6)	<.001
<b>Respondents who are <u>NOT AWARE</u> that the Medical Board, Board of Nursing, and recognized professional affiliations (i.e., American Medical Association, American Nurses Association, and American Pharmacist Association) recommend that HCW receive influenza vaccine each year.</b>			
Contracting influenza can have serious consequences	1 (6.7)	11 (2.9)	.0103
Systemic side effects from flu vaccine are rare	3 (20.0)	68 (17.9)	.2833
Benefits of flu vaccine outweigh risk of side effects	3 (20.0)	25 (6.6)	.0139
HCW are at higher risk of getting influenza than the general public	2 (13.3)	34 (8.9)	.1509
Vaccination of HCW can prevent the spread of influenza to patients	3 (20.0)	24 (6.3)	.0559
HCW have a professional responsibility to get an annual flu vaccine	4 (26.7)	48 (12.6)	.0057

Note. Data reported in N (%).

## Summary

The research was unable to assess if a relationship existed between uptake for influenza vaccination and guidance from governing agencies to vaccinate against influenza. Almost all respondents, 99.5%, were vaccinated and the amount of participants not vaccinated 0.50%, was not sufficient to observe a significance between uptake for vaccine and governing agencies recommendations. Two-thirds of the HCW were aware of governing agency's recommendations to vaccinate. However, worksite policy mandate was noted to have more influence than governing agency recommendations on uptake of influenza vaccination. It was also less likely for HCW to have influence by local epidemic (16.6%) or be representative of a target group for vaccination (16.1%) noted as reasons they received the influenza vaccination (Table 4). Most HCW strongly agree that contracting influenza pose serious consequences and that adverse effects were rare. Influence and reasons for receiving influenza vaccination were the same identified in existing literature.

Health care workers (HCW) at XYZ Health Center beliefs and attitudes are not influenced by policy makers' recommendations for vaccination. Their beliefs and attitudes about influenza illness consequences, vaccine safety, risks for infection and professional responsibility appears to be independent of the recommendations posed by governing agencies. Chapter 5 reviews the interpretation for this study's findings, limitations to the study, and recommendations for future research are discussed.

## Chapter 5: Discussion, Conclusions, and Recommendations

### **Introduction**

The purpose of this study was to explore the relationships between influenza vaccination uptake by HCW and guidance from governing health agencies to vaccinate against influenza. The intention was to also describe influenza vaccine uptake beliefs and practices among specific types of HCW and determine if the lack of explicit guidelines from policy makers to vaccinate against influenza impacts their attitude toward influenza vaccine. In prior research, differences in participation rates for influenza vaccine among HCW existed, and health associations and medical groups had differing stances about implementing vaccine mandates (CDC, 2013a; Hellyer et al., 2011). These governing agencies' influence on constituents was not explored in the literature, and this research provided an opportunity to address a meaningful gap. The evidence gathered could contribute to a conclusive and explicit policy to adopt or oppose an influenza vaccine mandate for HCW at the national and possibly global level.

The study was a quantitative, cross-sectional study of HCW who provided direct patient care in a hospital setting. The facility had an influenza vaccination mandate for all employees. The VIP tool developed by Clark et al. (2009) was adapted for this research project to assess opinions and contributing factors specific to vaccination uptake practice.

In this study, a worksite policy with an influenza vaccine mandate had more influence than governing agency recommendations on uptake of influenza vaccination. The lack of explicit guidelines did not affect HCW beliefs and attitudes toward

vaccination. Differences among vaccine uptake, beliefs, and attitudes were nonexistent among subgroups of HCW at XYZ Health Center.

### **Interpretation of the Findings**

These study findings were consistent with prior research. A workplace mandate for influenza vaccination has a primary influence on HCW uptake of the vaccine. However, health policy beyond the organizational level demonstrated no influence on HCW perception and behaviors. Vaccine uptake at XYZ Health Center was high and exceeded the recommended rate of 90% participation. HCW beliefs and attitudes about influenza vaccine were in favor of the vaccine's safety and effectiveness. Among HCW who provided direct patient care, perceptions and availability of the vaccine influenced behavior and led to the practice of vaccinating against the virus to protect their own health and the health of patients.

### **Context of the Theoretical Frameworks**

The health belief model (HBM) and social cognitive theory (SCT) were used to guide this study and were helpful in identifying the most influential determinant for HCW to vaccinate against influenza—a workplace mandate—and excluded the influence of governing agencies. The belief patterns identified in this study were congruent with the HBM and SCT assertions that the main reason that individuals take action to protect their health involves their perception of vulnerability to illness, severity of illness, and motivating factors that are cues to action.

### **Health Belief Model**

Beliefs about influenza illness and vaccination in this study were consistent with constructs from the HBM (perception of disease severity, perceived susceptibility to

disease, perceived benefits for taking action, and minimal barriers for self-care). Most (96.3%) HCW perceived that contracting influenza illness would have serious consequences, and more than half (67.5%) of respondents believed that systemic side effects from the vaccine were rare. These thoughts coincide with perceived severity in illness as described by Rosenstock et al. (1998), either by contracting influenza or receiving the vaccine. Seventy-nine percent of this study's participants believed that they were at higher risk of getting influenza than the general public. This belief speaks to the perception of susceptibility. The majority of respondents identified benefits to getting the vaccine as protection from illness for themselves and their patients. Respondents perceived that these benefits of vaccination outweighed the risk of vaccine side effects. The thought of taking action to vaccinate resulted as a benefit and confirmed in this study. Minimal barriers to vaccination were identified in this study. Two (0.50%) respondents in the study did not vaccinate and mentioned barriers to vaccination as contraindications to health, busy and/or forgot, and limited contact with high-risk patients. Perceived barriers to vaccination were minimal and did not impede self-care by the majority of participants.

### **Social Cognitive Theory**

Social cognitive theory (SCT) suggests that a reciprocal influence exists for behavior among those who share an environment and interactions within the environment that set precedence for a desired behavior. Within that environment, opportunity for cues to model desired behavior occurs. In this study, the informative and motivational role that professional affiliations could have on their constituents was not evident. However, increasing the influenza vaccination participation of HCW by mandating vaccination was

an effective strategy imposed by the XYZ Health Center and was cited as the main reason HCW vaccinated (78.2%).

Influence from the employer (XYZ Health Center) solicited a coordinated response and interdependent effort in the workplace, as described by Bandura (1986). The agency's intention motivated the proactive commitment of the HCW in accordance with an expectation and value placed on the behavior's outcome. HCW behavior to vaccinate was driven by the expected outcome to protect themselves from illness (77.4%) and to protect others from illness (65.5%).

### **Limitations of the Study**

There were limitations to generalizability, validity, and reliability that arose from the study. The research findings were gathered from HCW with direct patient care at a hospital during a snapshot in time. It should not be assumed that the findings represent all of the facility's employees or HCW in different settings or at different times. Administering the survey to HCW who do not provide direct patient care or administering the survey outside the influenza season might yield differing results.

The overwhelming amount of vaccinated HCW limited the exploration of differences in HCW vaccination uptake among subgroups defined by workplace setting, age, and gender. Beliefs, attitudes, and behaviors of the participants may have been influenced by the existing workplace mandate, which could be considered a strong strategy or coercion as suggested by Yassi et al. (2010), and by historical events such as media coverage. Inquiry concerning coercion or historical events was not explicitly delineated in the survey; however, the common alternate reason that 6% (24) of respondents mentioned as a reason to vaccinate was to protect their family.



HCW answered the prearranged question about awareness of their governing agencies' recommendations for influenza vaccination. The distinction of which governing agency or association the HCW identified with (i.e., American Medical Association vs. American Academy of Family Physicians; American Nurses Association vs. State Board of Nursing; and American Pharmacist Association vs. American Society of Health System Pharmacists) was not clarified in the study. Furthermore, the extent of awareness about what influenza vaccination recommendations were was not scrutinized to determine whether the responses were reliable.

### **Recommendations**

It is recommended to conduct a study in an environment without a workplace mandate for influenza vaccination and to conduct a study inclusive of all employees regardless of patient interactions at the worksite. Prior research demonstrated that preventive measures for influenza prevention that equally reached all employees created a unique culture despite HCW differing backgrounds (Hakim et al., 2011). Therefore, a collective voice from all HCW in future research is encouraged.

The year prior, XYZ Health Center had 100% influenza vaccine uptake achieved by the end of the influenza season. There was a 25% decrease in sick day hours used when compared to vaccine uptake of 55% at the beginning of the influenza season (XYZ Health Center, 2014). This institution's employee vaccine uptake and work productivity outcomes were historically positive and harmonious with existing literature. However, conducting the study at an institution without a workplace mandate for vaccination and inclusion of all HCW into the study might yield greater insight into influences on beliefs,

attitudes, and behaviors for influenza vaccine uptake. Inquiring about vaccine acceptance if a workplace mandate were not imposed might strengthen reliability for the participants' responses regarding the main reasons for getting vaccinated. In addition, asking open-ended questions or in-depth interviewing, as in a qualitative study, to learn more accurate information about HCW knowledge of their governing agencies' stances on influenza and which governing agency the HCW followed would be more intuitive and offer additional insight about HCW perceptions of a universal policy for an influenza vaccination mandate.

### **Implications**

This study can make an important contribution to the existing literature and enhance social change initiatives by encouraging a conclusive and explicit policy to adopt influenza vaccine mandate for HCW at the national and possible global level. Currently, the CDC and HHS recommend individual health agencies implement strategies to increase vaccination uptake by their employees. Pre-existing literature and this study overwhelmingly support workplace mandate for influenza vaccination as the strongest influence for vaccine uptake. Although licensing agencies for HCW differ on their stances for influenza vaccination of their constituents by recommending vaccination for continued employment or opposing mandate by employers, their lack of uniformity for the matter have minimal impact on their constituents' behavior. The potential impact for social change is at the organizational level. Adoption of a universal policy that health care agencies implement mandate for influenza vaccination by their employees is recommended. Substantial research of evidenced based practices exists that support the benefits for vaccination at the organizational level.

## **Conclusion**

In conclusion, the ambiguous language and differing stances among governing health agencies about the same topic did not impact their constituents' perception and behaviors to be proactive in their health practices to protect themselves and their patients at XYZ Health Center. Health policy and public health leaders have delayed implementation of universal policy for influenza vaccine mandate despite overwhelming evidence for vaccine safety and efficacy. Over the past decades, mandate for vaccinations to prevent infectious disease remained consistent for achieving improved health outcomes for population health. In the interim, risks for disease transmission of influenza persisted and HCW were a culprit.

Similar to Clark et al. (2009) study of "Influenza Vaccination Attitudes and Practices Among US Registered Nurses", this study concluded that the majority of HCW uphold the perception that they have a professional responsibility to get an annual flu vaccine, benefits of vaccination outweigh risks, and desire to protect their health as well as their patients. Organizations and their employees' interdependent commitment to take action and spend less time on rhetoric have prevailed to demonstrate the benefits to influenza vaccination.

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Appendix A. Survey of Health Care Workers (HCW) About 2014-2015 Influenza Season

Dear Colleague,

I am an Advanced Practice Nurse and provider at our medical center and would like to invite you to participate in a survey about the 2014 – 2015 influenza season. The survey is part of my research study for my dissertation at Walden University. The purpose of this study is to explore the relationships between influenza vaccination uptake by health care workers (HCW) and guidance from governing health agencies to vaccinate against influenza. The survey will take approximately 5-10 minutes of your time. Your responses may help influence a universal policy for explicit guidelines for flu vaccination of HCW.

Your participation in this survey is anonymous and voluntary. To minimize any risk to your privacy, all individual responses will be kept confidential and only aggregate data will be reported as part of the final study report. There will be no cost to you for participation.

Thank you for your consideration.

LeShonda Wallace, MSN, RN, FNP-

BC

Study Investigator

**Do you currently provide direct patient care?**

1. Yes → Please proceed. → (insert SurveyMonkey link)
2. No → Thank you for your time.

**1. What is your health profession?**

- a) Physician
- b) Physician Assistant
- c) LPN
- d) RN
- e) Advanced Practice Nurse
- f) Clinical Pharmacist
- g) Other: \_\_\_\_\_

**For the questions on this survey, please select the most accurate answer, based on your own experiences.**

2. To what extent are you aware that the Medical Board, Board of Nursing, and recognized professional affiliations (i.e. American Medical Association, American Nurses Association and American Pharmacist Association) recommend that HCW receive influenza vaccine each year?

1	2	3
Not aware at all	Somewhat aware	Very aware

3. Would the lack of explicit guidelines from policy makers for HCW to receive influenza vaccination affect your attitude about the influenza vaccine?

1. Yes
2. No
4. To what extent do you agree or disagree with the following statements:

<b>In general...</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
Influenza and its complications can't be serious	1	2	3	4	5
Systemic side effects from flu vaccine are rare	1	2	3	4	5
Benefits of flu vaccine outweigh risk of side effects	1	2	3	4	5
HCW are at higher risk of getting influenza than the general public	1	2	3	4	5
Vaccination of HCW can prevent the spread of influenza to patients	1	2	3	4	5
HCW have a professional responsibility to get an annual flu vaccine	1	2	3	4	5

5. Did you receive an influenza vaccine during the 2014 – 2015 influenza season?

A. No

**5.1 MAIN reason(s) for not getting a flu vaccine? (select all that were significant)**

- a) Concern about adverse reactions
- b) Limited contact with high-risk patients
- c) Small chance of contracting influenza
- d) Flu vaccine not effective enough
- e) Too busy / Forgot
- f) Medical Board, Board of Nursing, or recognized professional affiliations do not recommend it
- g) Workplace did not mandate
- h) Other

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B. Yes

**5.2. MAIN reason(s) for getting a flu vaccine? (circle all that were significant)**

- a) Protect myself from illness
- b) Protect my patients from illness
- c) Local epidemic / Bad influenza season
- d) Member of target group for vaccination
- e) Workplace mandate
- f) Medical Board, Board of Nursing, or recognized professional affiliations recommend it
- g) Other

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6. Do you agree with a worksite influenza policy, similar to some worksite hepatitis B vaccine policies, in which (a) the employer is required to offer influenza vaccine, and (b) any employee who chooses not to be vaccinated must sign a form declining vaccination?

1  
Strongly disagree

2  
Neutral

3  
Strongly agree

7. What is your age?

a) 20-30

b) 31-40

c) 41-50

d) 51-60

e) 61-70

f) 71-80

8. What is your gender?

a) Male

b) Female

9. What is the affiliation of your primary practice setting?

a) Inpatient

b) Outpatient