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Promoting influenza vaccination: Insights from a qualitative meta-analysis of 14 years of influenza-related communications research by U.S. Centers for Disease Control and Prevention (CDC)

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Abstract

Introduction—A primary mission of the U.S. Centers for Disease Control and Prevention's (CDC) is promoting immunization against seasonal influenza. As with most education efforts, CDCs influenza-related communications are often informed by formative research.

Methods—A qualitative meta-analysis of 29 unpublished, primarily qualitative CDC-sponsored studies related to flu and flu vaccination knowledge, attitudes and beliefs (KABs). The studies, undertaken between 2000 and 2013, involved focus groups, in-depth interviews, message testing and surveys. Some involved health care professionals, while others involved members of the public, including sub-populations at risk for severe illness.

Findings—The themes that emerged suggested progress in terms of KABs related to influenza and influenza vaccination, but also the persistence of many barriers to vaccine acceptance. With respect to the public, recurring themes included limited understanding of influenza and immunization recommendations, indications of greater sub-group recognition of the value of flu vaccination, continued resistance to vaccination among many, and overestimation of the effectiveness of non-vaccine measures. Seven cognitive facilitators of vaccination were identified in the studies along with six cognitive barriers. For health care providers, the analysis suggests greater knowledge and more favorable beliefs, but many misperceptions persist and are similar to those held by the public. KABs often differed by type or category of health care provider.

Conclusions—The themes identified in this qualitative analysis illustrate the difficulty in changing KABs related to influenza and influenza vaccine, particularly on the scope and scale needed to greatly improve uptake. Even with an influenza pandemic and more vaccine options

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available, public and some health care provider perceptions and beliefs are difficult and slow to change. This meta-analysis does, however, provide important insights from previously unpublished information that can help those who are promoting influenza vaccination to health care providers, the general public and specific populations within the general population.

Keywords

Influenza; Health communication; Influenza vaccination; Influenza knowledge, Attitudes and beliefs (KABs); Communication research; Vaccine promotion

1. Introduction

Increasing the number of people vaccinated each year against seasonal influenza is a goal of many public and private health programs in the United States and a growing number of countries [1–5]. In the United States, seasonal influenza is a disease that causes substantial illness, hospitalizations and deaths every year [5–8], and leads to death from other causes, such as pneumonia or congestive heart failure [7,8]. Seasonal influenza places adults aged 65 years old and older, children, pregnant women, and persons of any age who have chronic medical conditions like asthma, diabetes and obesity at higher risk for serious illness and death [5,8]. The economic impact of influenza is also substantial, with one national study estimating the annual economic cost of seasonal influenza in the United States to be $87.1 billion, including $10.4 billion in direct medical costs [8].

Annual influenza vaccination is the most effective way to prevent influenza and its complications, and as such, the past decade has seen the U.S. Advisory Committee on Immunization Practices (ACIP) greatly broaden flu immunization recommendations. Since the 2010–2011 influenza season, ACIP and CDC have recommended that all persons 6 months old and older, unless medically contraindicated, should receive annual vaccination with the most up-to-date influenza strains [5]. Before 2010, only persons 50 years old and older, pregnant women, persons aged 18–49 years with medical conditions that place them at high risk for influenza complications, health-care personnel (HCP), and children aged 6 months–17 years were recommended for annual vaccination [5,9]. Illustrating the importance of expanding the number of people who receive an annual influenza vaccination, the U.S. *Healthy People 2020* goals call for 70 percent flu vaccine uptake among children 6 months to 17 years, 70 percent among adults 18 and older, and 90 percent for HCP [1].

The broadening of influenza vaccination recommendations, greater public health recognition of the value of seasonal vaccination to pandemic influenza preparedness and response (e.g., the 2009 H1N1 response suggested higher seasonal flu vaccination rates may foster pandemic flu vaccination acceptance), and more concerted efforts to increase both HCP vaccination and flu vaccination efforts, have fostered some increases in influenza vaccination coverage in the U.S. A compilation of influenza vaccination coverage studies done over the course of 2007–2008 to 2011–2012 flu seasons, for instance, found modest to large increases in most groups [10]. Influenza vaccination coverage among children 6 months to 17 years old increased from 31.1 percent in the 2007–2008 season to 56.7 percent in the 2011–2012 season while coverage during that period among adults 18 years old and

older increased from 33 percent to 38.3 percent. Coverage among HCP was around 62–67 percent in 2011–2012 compared to around 48 percent in 2007–2008 [10]. Most recently, seasonal flu vaccination coverage estimates from the 2013–2014 season found 42.2 percent of adults 18 years old and older were vaccinated, with the rate among 6 month to 17 year-old children being 58.9 percent [11]. Overall, however, influenza vaccination rates in the United States are substantially below the Healthy People 2020 goals.

Achieving compliance with influenza vaccination recommendations and ultimately, higher influenza coverage requires more than expanding the recommendations. Adequate vaccine supplies, timely distribution, easy access to vaccine and health care provider involvement are critical. A strong infrastructure, in turn, usually also requires effective influenza vaccination promotion and communication, including messaging that takes into account the knowledge, concerns and beliefs of both targeted population(s) and the health care professionals counted on to recommend and provide the vaccinations—with the goal in both cases being to foster favorable attitudes and intentions [12–15]. Messages and materials that are not informed or guided by audience or population research not only decrease the likelihood of success, they can dissuade people from taking recommended actions. At the U.S. CDC, the Health Communication Science Office (HCSO) in the National Center for Immunization and Respiratory Diseases (NCIRD) is responsible for developing influenza vaccination-related communications, messages and materials—with those efforts designed to educate HCPs, assist HCP in patient education efforts, and persuade people in targeted groups to get an annual influenza vaccination.

For over a decade, NCIRD's HCSO has undertaken a variety of formative communication research-related projects with members of a number of different public population groups as well as with HCPs to inform its influenza vaccination promotion, communication and messaging efforts. This research has been essential given the ever-changing flu vaccine environment—which in the past decade has included vaccine shortages and delays, evolving and expanding recommendations, a pandemic, the occasional publication and publicizing of low flu vaccine efficacy estimates in seasons where there is a weak match between vaccine strain(s) and circulating strains, and a growing number of flu vaccine options, including nasal spray, intradermal, cell-based, high-dose, and quadrivalent formulations. Focus group discussions, in-depth interviews (IDIs), message testing and surveys have been used to learn more about how different groups perceive influenza and influenza vaccines, and to identify knowledge, attitude and beliefs associated with obtaining and not obtaining a seasonal influenza vaccination.

The value of communication-related research goes far beyond campaigns. Communication research can inform and strengthen: (1) how the benefits, value, and risk of recommended vaccinations are framed or presented to those people the recommendation encompasses [16,17]; (2) the messaging and messages used to inform people about a vaccine or immunization recommendation, including those provided to the public, HCPs and the media [18]; (3) patient and parent immunization education materials, including those provided or found in physician offices [17]; (4) how providers address parent or patient questions and concerns related to vaccines and vaccinations [19,20]; and (5) other actions, steps or policies that may need to be considered to overcome barriers to providing (e.g., by physicians) or

accepting a recommended vaccination (e.g., by members of a targeted population) [18,21]. Thus, even if a formal education or promotion campaign is not used as a strategy to increase vaccination uptake, the insights and understandings gained from communications research have significant value for many of the major components of immunization programs and efforts.

A number of recently published systematic reviews and meta-analyses illustrate both the value of communications-related research and ways in which insights into the KAB's of health care provider and consumer/public population groups are applied to influenza vaccination promotion. McDonald et al. used a systematic review of 22 published studies from seven European countries to identify effective practices in promotional communications (i.e., any message delivered through any channel with the intent to encourage or promote vaccination) [22]. While their review did not directly assess the impact of promotional communications on public acceptance of influenza vaccination, they found evidence that personalizing communications and having supportive health care workers could foster improved influenza vaccination uptake [22]. With respect to health care workers, Vasilevska, Ku and Fisman's [23] systematic review and meta-analysis of 37 studies – 25 of which involved seasonal influenza vaccination – found several beliefs that appeared to be consistent predictors of vaccine acceptance. Health care workers were more willing to accept vaccination if they believed the vaccines were safe, would protect them and their families, and would not cause the disease they meant to protect against. The latter was a particular concern for influenza vaccines.

Wheelock, Thomson and Sevdalis [24] focused exclusively on seasonal influenza vaccination in their effort to identify social and psychological factors underlying adult vaccination. Their review of published studies involving seasonal flu vaccination in the U.S. and the U.K. identified eight themes – primarily categories of beliefs – that were linked to seasonal influenza vaccination uptake or refusal [24]. They found recommendations from health care professionals, close relatives or friends; perceived susceptibility to influenza; and perceived effectiveness of the vaccine were three primary facilitators of seasonal flu vaccination, while lack of awareness of the recommendation, belief that vaccine was ineffective or could cause influenza, and not perceiving influenza as a health threat inhibited vaccination. They also found the KABs of health care professionals were often similar to those of the public. Finally, a recently published systematic review of 21 studies involving pregnant women and influenza (including 13 involving influenza A/H1N1 pandemic vaccination), identified lack of awareness of the recommendation, underestimation of the threat posed by seasonal flu, and concerns related to vaccine safety as KABs linked to vaccination uptake or refusal [25]. The study also found HCPs' recommendations fostered uptake but many did not recommend the vaccine to their pregnant patients.

Along with highlighting the value of systematic reviews of studies involving KABs and/or communication research, the examples above illustrate the value of doing such an assessment of the NCIRD HCSO unpublished communication research-related studies. McDonald et al., for instance, noted that the current evidence base for effective promotional communications is “fragmented and incomplete,” with more information needed to inform messages and messaging [22]. They also noted that there are few published studies designed

to obtain information that could provide the basis for evidence-based communication. Similarly, Yuen and Tarrant [25] noted that the “gray literature” (i.e., unpublished research studies) may have value for those seeking to increase seasonal influenza vaccination among targeted groups but such studies are often difficult to find or access. Thus, an important feature of this study is that it brings forth information and insights from a relatively large “gray literature” database.

2. Methods

The qualitative meta-analysis undertaken sought to accomplish three objectives: (1) to make available the key findings from a “grey literature” of 29 unpublished seasonal influenza vaccination communications research-related studies conducted over a 14-year span by the Health Communication Science Office in CDC's NCIRD; (2) to characterize the key KAB-related themes and findings from those studies, which included an influenza pandemic, expanded vaccination recommendations, and increased/new influenza vaccine options (e.g., a nasal mist vaccine, a higher dose vaccine, an intradermal vaccine, cell-based vaccine, and a quadrivalent vaccine); and (3) highlight some of the ways in which these themes and findings intersect with seasonal influenza-related promotion, communication and messaging efforts. These objectives support the broader goal—which is to assist those designing or undertaking communication, education or promotional efforts to increase seasonal influenza vaccination, including by and among health care professionals. As a recently published World Health Organization (WHO) guidance notes, active promotion and communication efforts are more likely to succeed when informed by population and stakeholder research [17]. These studies, which were designed to inform promotion, communication and messaging efforts, were undertaken between 2000 and 2013. The need to rapidly integrate findings into campaign plans and materials, ongoing communication challenges and issues, and limited resources precluded publishing findings from the individual studies.

A qualitative meta-analysis is a secondary analysis of primary qualitative and mixed methods studies [26]. It generally follows the same procedures as quantitative meta-analysis but instead of a statistical data analysis the researcher analyzes textual reports and seeks to identify major themes, including over time and across different studies [27]. In this case, the meta-analysis used the final or summary reports prepared by the contractors who undertook the studies as the basis for the analysis (e.g., the Oak Ridge Institute for Science and Education, American Institutes for Research). These reports identified key themes and findings, illustrative comments, and provided a qualitative sense of whether most, many or some of the participants held a particularly belief or perspective. Two of the authors independently focused on identifying the themes related to influenza and influenza vaccination knowledge, attitudes and beliefs.

Most of the studies were qualitative, with 13 exclusively involving focus group discussions, six exclusively involving in-depth interviews (IDIs) and four involving both in-depth interviews and focus groups. There were also seven studies that utilized survey research, including one that involved message testing. Table 1 provides the report titles and year, communication research method(s), and target audience(s) involved in the research. An

"identifier" assigned to each study is also provided in Table 1, with this identifier used in the research syntheses shown in the tables found in Section 3.

As Table 1 indicates, the research encompassed a range of target populations/audiences. Fifteen of studies included participants from different public or consumer targeted audiences, with ten involving adults 50 years old and older; seven involved parents, primarily mothers; five involved people with chronic medical conditions that put them at risk for influenza complications; and four involved national probability surveys of adults 18 years old and older. Eight of the qualitative studies also included Hispanic American focus groups, while seven included African American focus groups. Eleven of the studies involved health care providers, with eight including physicians and six including nurses, physician assistants or other health care professionals. Across the studies, a wide range of other HCPs were included (e.g., administrative personnel, service workers, clinical workers). One study encompassed CDC employees. NCIRD HCSO studies exclusively related to 2009 H1N1 influenza vaccination were not included in the meta-analysis—though two studies that also encompassed seasonal influenza were included.

3. Results

The major themes found in the meta-analysis are shown in Table 2 for the studies involving the general public, parents and targeted sub-populations of the general public. Table 3 summarizes themes related to health care providers and professionals.

3.1. Basic but limited knowledge about influenza and influenza vaccination

Collectively, the analysis indicated that members of the public as well as HCPs had a basic understanding of influenza, including its major symptoms, its most common forms of transmission, its seasonality, and usual duration of illness. Across time and over studies, influenza was generally perceived as being different and more serious than the "common cold," and as a contagious disease primarily transmitted during colder weather months. In line with this, many perceived cold weather as potentially causing influenza—e.g., by being inadequately dressed for the cold or going into the cold with wet hair. There did not appear to be significant racial/ethnic differences with respect to how influenza illness was perceived, though African American participants often noted hospitalization and death as serious outcomes from contracting influenza.

The meta-analysis suggested that overall awareness of influenza vaccine was high but that many individuals did not believe that seasonal vaccination pertained to them. Even as the influenza vaccination recommendation in the U.S. has been broadened to encompass almost everyone, the belief it pertains to specific groups, such as people 65 years old and older, people with chronic health conditions, weakened or weaker immune systems, and young children persisted for many. The studies done in the past few years suggested that people 50 to 64 years old and people with chronic health conditions may have become more aware that they, too, should get a seasonal influenza vaccination.

3.2. Seven facilitators of influenza vaccination

The meta-analysis suggested seven factors that appeared to be linked with getting a seasonal influenza vaccination or facilitated decisions to get a flu vaccination.

3.2.1. Perceived susceptibility or health threat—In comparing those who typically received seasonal flu vaccinations to those who did not (i.e., “doers” vs. “non-doers”), perceiving one's self as susceptible to influenza or believing that influenza was a significant/serious health threat was a key difference. People who were 50 years old and older and/or who had a chronic medical condition that increased the likelihood of complications from flu generally believed influenza to be a significant health threat and sought vaccination as a way to reduce either the threat or the severity of influenza illness. Similarly, even parents who stated they were personally unconcerned about influenza indicated they had their children vaccinated.

3.2.2. Prevention/protection from influenza—Those who typically received a seasonal flu vaccination believed that vaccination would prevent flu or reduce the severity of the illness should they contract influenza, particularly those with chronic health conditions and people 50 years old and older. Some African American participants who received the vaccine did not believe it would prevent people from contracting influenza but made the symptoms less severe. In the case of parents, many stated they believed the vaccine would protect their children from influenza, with this especially being the case for parents of children at risk for flu complications.

3.2.3. Age and health status—Age and health status were also often associated with seasonal flu vaccination. Both vaccination rates and belief in the value/benefits of influenza vaccination increased with age and with the onset of chronic health conditions that placed one at risk for flu complications. Conversely, younger and self-reported “healthy” participants were less likely to see a need for seasonal flu vaccination.

3.2.4. Health care provider recommendation—Collectively, these studies reaffirmed the central role that health care providers, particularly physicians (including Ob/GYNs and other specialists) play when it comes to influenza vaccine acceptance. Many individuals, including parents, relied on physicians, pediatricians and specialists for information and guidance, and many cited a physician recommendation as their reason for getting themselves or their child vaccinated. However, two surveys conducted during the 2007 flu season – one a national telephone survey, the other a web-based panel – found that around 65 percent of all respondents said a physician or other health care professional *did not* discuss getting a seasonal flu shot with them. Among respondents 65 and older, about half reported having such a conversation. In addition, some studies did find that some Hispanic and African American participants believed doctors recommended unnecessary vaccinations such as influenza as a way to make a profit. None of the studies found evidence that patients or parents inquired or were interested in the flu vaccination status of their health care providers —though this was not an issue that was ever explicitly explored.

3.2.5. Experience with influenza illness—Most people who had personally experienced a severe case of influenza or knew of a family member or friend who had experienced severe influenza illness were likely to get vaccinated in subsequent years. Many said they did not want to repeat that experience, particularly those who had chronic medical conditions that may have increased the severity of their symptoms or the duration of their illness.

3.2.6. Convenience—Many individuals, particularly HCPs, noted they had gotten vaccinated, and were more likely to get vaccinated, when the vaccine was readily available, such as in their workplace, and free. Others noted that when they were not able to easily find vaccine or when they had to wait in a long line they decided against vaccination. Overall, the cost of influenza vaccination was rarely mentioned in any of the studies, including a barrier to vaccination. However, some participants in studies involving antiviral medicines, including health care providers, did note that the cost of prescription drugs was sometimes a consideration in their use.

3.2.7. Active promotion—In testing materials and messages, studies found that visible and frequent reminders, public service announcements or advertising in the media, and media news stories helped foster vaccination. People indicated that the information encountered in message testing studies was often helpful—and also often not previously known. These studies suggested that many people found having simple, easy-to-understand information about why people like themselves should receive a seasonal flu vaccination was helpful. Many people, including HCPs, desired information about vaccine safety, side effects and vaccine effectiveness – particularly information specific to their age, health status or occupation.

3.3. Six barriers or inhibitors of seasonal influenza vaccination

The themes shown in Tables 2 and 3 also suggested six barriers or inhibitors of seasonal influenza vaccination, with most of these barriers also applying to those HCPs who typically declined seasonal flu vaccination.

3.3.1. Not susceptible to serious illness/influenza is a “manageable” illness—Many who did not get a seasonal flu vaccine, and some HCPs, believed that they were not likely to experience a severe course of influenza illness and/or that influenza was a “manageable” disease. This was especially true for individuals who believed themselves or their children to be in good health or have a “strong immune system.” For these individuals, seasonal influenza vaccination was either “not necessary” or “optional.” Many acknowledged that influenza was more than a “bad cold” but simultaneously believed it was an illness of manageable duration and tolerable symptoms. These sentiments were also expressed by some HCPs, including those who recommended vaccinations for at-risk patients.

3.3.2. Flu vaccine recommendations do not apply to me—Overall, the meta-analysis indicated many did not know or believe that influenza vaccination recommendations encompassed people like themselves. “I don't think I need it” was the most commonly stated

reason by people who did not get a seasonal flu vaccination. Rather, many individuals, particularly those under age 50, perceived that flu vaccination recommendations primarily pertained to people over 65, people with weak or weakened immune systems, and young children- and it was people in those groups who needed and benefitted from vaccination. Many younger and self-reported "healthy" individuals did not believe that a much broader population needed a seasonal influenza vaccination. Some individuals with chronic conditions believed that by effectively managing their condition they did not need a seasonal flu vaccination, while some nurses believed that influenza vaccination was necessary only for "older nurses."

3.3.3. Influenza vaccines are not effective—Many people in the national surveys indicated that they did not believe the vaccine would protect them from influenza (e.g., from 1 in 5 to 1 in 3), while many individuals in the qualitative studies stated that sentiment. Parents who declined vaccination for their children also often cited vaccine ineffectiveness. The fact the flu strains in the vaccine often varied from year to year was evidence to some that the vaccine could not be very effective.

3.3.4. Fearful of concerned about, influenza vaccines—Some individuals, including those who routinely received a seasonal flu vaccination, believed the vaccine could leave them susceptible to influenza or flu-like illnesses. Others, including many African American participants, believed that flu vaccines were highly likely to cause bad side effects or adverse reactions. In all instances, these individuals believed negative consequences were more likely than positive outcomes. Others were concerned about how flu vaccines could interact with antibiotics and other prescription medicines.

3.3.5. Other measures are as or more effective than vaccination—Many who declined seasonal flu vaccination, along with some who did get vaccinated, believed that other measures were as or more effective when it came to preventing flu. In general, having or maintaining a "healthy immune system" was seen by many as the most effective way to prevent influenza. Many adults also cited their habit of not getting a seasonal flu vaccination as effective, and noted that they were "doing fine without it" or "did not want to mess with a good thing" (i.e., not getting vaccinated).

3.3.6. Personal experience with influenza or influenza vaccination—As with people who regularly got a flu vaccination, people who did not routinely get an influenza vaccination cited personal experience with influenza or influenza vaccine as a reason for declining vaccination. People who had what they characterized as a "manageable" illness often believed that their experience was typical when it came to influenza. Thus, while the illness caused discomfort and notable symptoms for a number of days, their ability to fight through it left many confident they could handle future bouts of influenza.

4. Evolution and challenges in the realm of health care providers and professionals

As Table 3 illustrates, the studies involving HCPs often found beliefs and sentiments similar to those held by the general public and public sub-populations. Health care professionals were often very knowledgeable about high-risk populations that should be vaccinated, but less likely to be aware or appreciate that they were among the high priority group—with this especially being the case in studies done before the ACIP universal vaccination recommendation (i.e., when HCPs were among the relatively few groups singled out for annual flu vaccination). Similar to many in the public, HCPs often characterized influenza as a manageable illness for healthy people and also saw seasonal flu vaccination as optional. Even though they worked in environments that put them at risk for influenza, many did not see influenza as a significant personal health threat and believed they could “handle it.” Some were also fearful the vaccine could cause them to become ill or leave them susceptible to illness.

Also notable was that some HCPs did not believe that they posed a significant influenza transmission threat to patients, including infants and children. Rather, these individuals perceived patients as the likely conduits of influenza. In line with this, some nurses and allied health professionals noted that flu vaccines were a mechanism to protect themselves from patients rather than as a means to protect patients. Only one of the studies explicitly addressed vaccine mandates (IDIFG3). In this study, hospital administrators noted none of their institutions mandated influenza vaccination, but it was noted that “vigorous efforts” appeared to increase vaccination rates. Not surprisingly, health care workers who did not get influenza vaccinations were not supportive of mandates, including because of distrust of the vaccine's safety and effectiveness and/or because of distrust of the institutions involved. A study that involved health care worker education materials found messages that focused on self, patients and families resonated best, while those that induced guilt or mentioned missing work due to illness were not well received (IDIFG2).

5. Discussion

Collectively, the 29 studies analyzed here provide a wealth of information concerning the knowledge, attitudes and beliefs of the general public, specific sub-populations within the public and health care providers and professionals when it comes to seasonal influenza vaccination.

The findings suggest that during a period of significant developments and changes in the influenza vaccination landscape, incremental progress was made with respect to influenza-related knowledge, attitudes and beliefs, on both the public and HCP fronts. There were indications that more members of the public who are at highest risk of complications have become aware they should receive an annual vaccination and more likely to recognize that their age and/or health conditions place them at elevated risk of complications. More parents also appear aware of flu vaccination recommendations for children and more appear to believe there is a benefit to vaccination, particularly those with younger children or children who have a health condition that places them at risk for severe illness. The studies involving

HCPs, particularly physicians, provided additional evidence of such progress as many indicated they believed in flu vaccination for those in at-risk groups and often placed emphasis on vaccinating people in those groups. Most significantly, though, the national surveys included here also suggested that more older and at-risk adults and parents are heeding the seasonal flu vaccination recommendation – though clearly at modest, rather than desired levels.

Along with evidence of progress, the meta-analysis reaffirmed many of the challenges and barriers identified in previous studies [14,22–25]—as well as provided additional evidence of the persistence of many of the cognitive barriers to seasonal influenza vaccination. Many people, both in the public/parent population and in the HCP groups, remain unconvinced of the need for seasonal influenza vaccination and unpersuaded that the benefits provided outweigh the risks and costs they associate with the vaccine. Further, and as one study noted (i.e., IDIFG3), many of those who decline seasonal influenza vaccination for themselves or their children have “defense in depth.” Often drawing upon personal experience, their expectation is that influenza will not pose a significant or serious health threat to them and should they contract it, they assume it will be a manageable illness. Not surprisingly, their expectations and assumptions also support their conclusion that they do not need seasonal flu vaccine. Such beliefs are challenging on two fronts.

One, the expectation and assumption are not unreasonable for many people, particularly healthy younger adults. While influenza is unpredictable, the percentage of people in the U.S. who contract flu each year ranges from 5 percent to 20 percent [28]. While more than 200,000 people are hospitalized each year and estimates of flu-associated deaths in the U.S. range from a low of about 3000 to a high of about 49,000 [5–7], it is likely that most people will not personally experience an unusually severe illness from influenza in a typical year. Unfortunately, the ability of one's immune system to “manage” influenza can only be known after the fact (i.e., after one has recovered) and all those who are infected with influenza can transmit it to others, including young children, people 65 and older for whom vaccination generally works less well, people with weak or weakened immune systems, chronic health conditions, and pregnant women. Thus, as the communication research studies assessed here illustrate, it is vital that promotion efforts and messages address the superficial understanding that many have regarding influenza and the role that vaccination plays in protecting more than the individual who receives the vaccine. It is equally vital that communication research be undertaken on a regular basis to determine which messages work best and whether an impact is being made on KABs and intentions.

The themes uncovered in this meta-analysis also make clear that those interested in promoting influenza vaccination need to recognize that how people make vaccination decisions is similar to how they make other health and medical decisions. Recent studies on health and medical decision making, for instance, have found that risks create feelings, and as result, even well informed patients make medical decisions or perform health behaviors that are at odds with health experts' advice [29]. In such cases, people often default to an “affect” heuristic (i.e., cognitive shortcut) where they presume that the risks are low for risks associated with things they like and that the reverse is true for things they do not like [30]. In line with this, the meta-analysis conducted here found many adults reacted positively to flu

vaccination messages that encouraged vaccination as a way to be proactive, maintain a healthy lifestyle or protect loved ones. Much of NCIRD's HCSO flu vaccination promotion has sought to do this by identifying, linking and highlighting empowerment and positive outcomes with influenza vaccination. For those who are predisposed to vaccination, this serves to reaffirm the value of prevention. For those who are disinclined to vaccination, it can help increase their awareness that flu vaccination is consistent with things they like—such as “building and maintaining a healthy immune system” or protecting family members, friends and people vulnerable from potentially serious illness.

Also in line with recent studies on health and medical decision making, this meta-analysis clearly found that people's views on disease severity, vaccine effectiveness and vaccine reactions are often more rooted in personal experience or stories from social networks rather than population-level statistics [31,32]. Thus, not surprisingly, many people responded most favorably to communication materials and messages that resonated with their life experiences (e.g., testimonials) as well as stated a preference for materials and messages tailored to their lives. As Table 2 showed, people want information that addresses their specific needs, concerns and questions—and this includes HCPs. Time and again, these studies found that members of the general public, parents, people with chronic medical conditions, HCPs and pregnant women often want information on: (1) why they are personally at risk for influenza or flu-related complications; (2) what the likely flu vaccine side effects and adverse reactions could be; (3) how likely they are to experience side effects or a serious adverse reaction; (4) how effective the vaccine is going to be; and increasingly (5) which of the various types of influenza vaccine are “the safest,” “most effective,” and “best for me”? That said, it also needs to be noted that for some people, the level or type of evidence they want may not exist—and that can and does hamper persuasion.

Finally, the meta-analysis findings not only reaffirm the central role that physicians and other HCPs play when it comes to seasonal influenza vaccination acceptance, they highlight the need for continued efforts to facilitate and assist on the patient and parent education front. One need is HCP training, particularly that which helps nurses and allied health professionals better understand the health threat posed by influenza, the ease in which influenza can be transmitted in health care settings, the vulnerability of patients in health care settings, the realities of the human immune system, how influenza vaccine interacts with the immune system, and the value of flu vaccine even if it cannot consistently provide complete protection from influenza. HCPs also need to recognize that their personal beliefs and behaviors can and do communicate to patients and parents, and if they place a low priority on vaccination it is likely their patients will as well.

It is also clear, however, that it should not be expected or assumed that HCPs, including specialists, can devote more time to patient education and conversations. As such, it is important to develop, provide and assess protocols and tools that can make patient education more effective and efficient. For example, one way NCIRD has applied the lessons learned from this research is the “SHARE” framework (Table 4) (http://www.cdc.gov/vaccines/hcp/patient-ed/adults/downloads/standards-immz-practice-recommendation.pdf). This framework takes into account many of the themes uncovered in the meta-analysis in order to foster more effective vaccine-related communication. In addition to templates like this,

consideration should be given to using new and interactive technologies to foster parent and patient education; for example, via interactive websites, tablets and smartphones or other resources in the office setting. These can help meet the need for tailored and targeted information and messages.

It is recognized that this meta-analysis has limitations. First, it should be noted that the findings from the qualitative research studies are, by nature, neither quantifiable nor generalizable to the population as a whole. It is thus not known how many or what percentages of the different populations encompassed by these studies have the knowledge, attitudes or beliefs that were identified. While national survey data do provide good estimates of influenza vaccination behavior, it would also be helpful for future studies to quantify some of the KABs uncovered here. Second, the meta-analysis here was not guided by a specific or predetermined theoretical framework. It can help to have a specific theory or theoretical framework guide a systematic review or meta-analysis [e.g., [33], which used Protection Motivation Theory as a guide]. Given the depth, breadth and scope of the communication studies undertaken here (e.g., encompassing general public, sub-populations of the public and different categories of HCPs), it was felt a broader, less restrictive approach would be more effective in uncovering recurrent themes and allowing for comparisons between public and HCPs studies. A third limitation is the influenza vaccination environment or landscape. Over the course of the 14 years in which these studies were conducted, there were flu vaccine shortages and delays, expansion of flu vaccination recommendations, an influenza pandemic, publication and publicity of studies finding relatively low flu vaccine efficacy, and the introduction of a number of new products. These developments both created the need for ongoing communication research studies (including to guide the development of materials and messages), and also made it difficult to distinguish the impact of promotional communication efforts from other factors and information sources (e.g., news stories). That said, the fact that many KABs persisted across major events suggests that it may take further breakthroughs or advances in flu vaccine technology to achieve more than incremental progress in flu vaccine uptake. Finally, despite the breadth of these studies, many important groups, such as pregnant women, were not well represented. This highlights the importance of ongoing formative research studies.

Despite these limitations, the findings from this meta-analysis should provide helpful direction and guidance to those promoting and communicating about seasonal influenza vaccination. Programs can use the eight themes associated with seasonal flu vaccination in a number of ways to guide their communication strategies and efforts—from guiding communication objectives to identifying target populations to honing messages for those populations. Similarly, those seeking to persuade people or groups who are hesitant or disinclined to get a seasonal flu vaccination should find the insights surfaced here helpful. These groups will likely remain difficult to persuade, but this study's findings show the challenges that will need to be overcome in order to achieve success.

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Table 1

Communications-related research studies, Health Communication Science Office, National Center for Respiratory Diseases, U.S. CDC, 2000-2014.

Research method(s)	Study identifier and report title	Report year	Target audience(s) and methods summary
Focus Groups (FG)	**FG1**—Prevention and Treatment of Influenza in High Risk Adults	2014	Three focus groups were conducted with high-risk adults in Fort Lauderdale, FL; Chicago, IL; and Phoenix, AZ • 23 high-risk adults, averaging 46 years of age, participated • High-risk conditions included asthma, chronic obstructive pulmonary disorder (COPD); diabetes and heart disease
	FG2—Formative Research: Older Adults' Perceptions about Seasonal Influenza and Vaccine Effectiveness	2014	Nine 90-minute focus groups were conducted with adults 65 years of age and older. Focus groups were conducted at commercial market research facilities in Fort Lauderdale, Florida; Chicago, Illinois; and Phoenix, Arizona. A total of 61 adults, averaging 70 years of age participated in this study
	FG3—Focus Group Research Report: Quadrivalent Vaccine and Vaccine Effectiveness Messages	2013	Twenty focus groups—14 online and 6 in-person (Nashville, TN and Baltimore, MD). 122 participants. • Parents of children 6 months through 17 years old • At-Risk adults aged 50–64 (i.e., adults with chronic diseases) • Adults aged 65–80 years old • All participants had received a flu vaccination at least once in past five years
	FG4—Communication and Social Marketing to Promote Seasonal and Emergent Influenza Immunization for Hispanics: H1N1 and Seasonal Influenza Focus Group Final Report and Hispanic Risk Communications Model	2010	Six focus groups with Hispanic Americans aged 19–50; 51 participants. • Three groups with Hispanic parents of children 0–4 years of age in Miami, Los Angeles, and Greenville, NC • Three groups with 18–24 year-old single Hispanics in Miami, Los Angeles and Greenville, NC
Focus Groups (FG)	**FG5**—Communicating about Influenza Vaccination: Formative Research with Parents, Young Adults, Older Adults, and People with Asthma or Diabetes	2010	64 in-person focus groups of 4–6 participants each conducted in six cities: Indianapolis, IN; Baltimore, MD; Phoenix, AZ; Chicago, IL; Miami, FL; and Birmingham, AL. • 20 groups with mothers of children of similar age-0–4 years old, 5–10 years old, and 11–18 years old • 18 groups with people 25–49 years of age living with asthma and/or diabetes • 18 groups with adults aged 65–75 years of age • Six groups with young adults 19–24 years of age

Research method(s)	Study identifier and report title	Report year	Target audience(s) and methods summary
	FG6-Influenza Perception and Prevention Qualitative Research Topline Report of April 2009 Focus Group	2009	Six mini-focus groups conducted in Dallas, TX; • A total of 16 adults aged 65 years and older participated • A total of 10 mothers of 5-to 10-year-old children participated
	FG7—Seasonal and Novel H1N1 Influenza Vaccine Message Testing: Topline Report of June 2009 Focus Groups	2009	Fifteen focus groups were conducted with mothers of 5–10 year-old children in New York City, Chicago and Atlanta. 139 participants. • Five groups with African American mothers • Five groups with Caucasian mothers • Five groups with Hispanic American mothers • Eight groups had mothers with an associate's degree or less; seven groups had mothers with a bachelor's degree or more
	FG8—Materials Testing of Influenza Vaccine Education Items: Topline Report	2005	Thirty focus groups were conducted with adults aged 50–64 in Philadelphia, Chicago, Houston and Oakland. 259 participants. • 10 with African Americans, including 5 with males • 10 with Caucasian Americans, including 5 with males • 10 with Hispanic Americans, including 5 with males
	FG9—Qualitative Research on Flu Vaccine Beliefs among Parents of Children under Two	2004	Ten focus groups were conducted with parents of children under two in Atlanta and Minneapolis. 78 participants • Four groups with Caucasian parents • Three groups with African American parents • Three groups with Hispanic American parents • Half groups had household incomes above the media for their group, while half had household incomes below
Focus Groups (FG)	**FG10**—Nurses Study Focus Groups in Birmingham, AL and Detroit, MI	2003	Eight focus groups with registered nurses with at least one year of clinical experience in Birmingham, AL and Detroit, MI. 71 participants • Four groups with nurses who had received an influenza vaccination in past 14 months (i.e., “Doers”) • Four groups with nurses who had not received an influenza vaccination in past 14 months (i.e., “Non-doers”)
	FG11—Adult Immunizations Focus Groups: African-American Seniors from the Delta Counties of Mississippi	2003	Eight focus groups with African Americans aged 65 years or older in Clarksdale, Greenwood and Yazoo City, MS. 63 participants

Research method(s)	Study identifier and report title	Report year	Target audience(s) and methods summary
			• Four groups with those "likely to get a flu shot this year" • Four groups with those "unlikely to get a flu shot this year"
	FG12—Influenza Immunization Study	2000	Twenty six focus groups with adults 50 years old and older in Newark, NJ; Houston, TX; Milwaukee, WI; Atlanta, GA • All had chronic medical conditions that put them at risk for flu complications • Nine groups with Caucasian Americans • Nine groups with African Americans • Eight groups with Hispanic Americans
In-depth Interviews (IDI)	IDI1—Audience Research: Understanding the Health Care Provider Perspective	2014	In-depth interviews with 16 physicians and 12 nurse practitioners/registered nurses, all of whom were involved in the care of patients with chronic medical conditions. IDIs were conducted in the South, Midwest and West regions
	IDI2—Research-Based Flu Intervention Strategies Utilizing Travel Medicine and Aero-Clinics	2013	Audio recordings of 35 pre-travel consultations were made at 11 health care facilities throughout the Atlanta, GA, metro area. These facilities were primarily travel clinics and clinics operated by health departments. The recorded consultations involved 44 travelers and 14 health care providers (HCPs). Structured interviews were also conducted with 16 of these travelers and 10 of these HCPs
	IDI3—Influenza Immunization among CDC Employees	2008	A total of 16 one-hour individual in-depth interviews with Atlanta-based CDC employees, none of whom was involved in research or program activities involving influenza
Research method(s)	Study identifier and report title	Year	Target audience(s)
In-depth Interviews (IDI)	**IDI4**—Physicians' Perceptions of Current Vaccine Issues	2008	A total of 33 physicians – 21 pediatricians and 12 family practitioners – were interviewed individually. Each reported providing at least five infant immunizations per week. Interviews were conducted in Kirkland, WA; Austin, TX; Hollywood, FL
	IDI5—Pretesting of Spanish Influenza and Pneumococcal Immunization Materials	2003	Forty interviews with Spanish-speaking seniors aged 65 and older in Chicago, IL and San Antonio, TX. Twenty had annual incomes above $30 K per year, while twenty were below. Twenty one were male and 19 were female.
	IDI6—Interviews with Allied Health Professionals: Topline Report	2003	Nine individual in-depth interviews conducted by telephone with nurses and physician assistants in Dallas and Chicago to obtain information that could be used in the development of provider influenza vaccination patient education kit.
In-depth Interviews and Focus Groups (IDIFG)	IDIFG1—Prevention and Treatment of Influenza in High Risk Adults Summary Report	2012	Thirty-minute in-depth interviews with 35 primary care physicians and 20 focus groups with adults 21–65 years old who reported having asthma, diabetes or COPD. Research took place in Boston, MA; Houston, TX; and San Francisco, CA. 142 adults participated in the focus groups. • Ten focus groups with Caucasian American adults • Five focus groups with African American adults • Four focus groups with Hispanic American adults • One focus group with Asian American adults

Research method(s)	Study identifier and report title	Report year	Target audience(s) and methods summary
	IDIFG2—Formative Research: 2010 Influenza Vaccine Health Care Providers and Workers	2010	Thirty-minute in-depth interviews with 38 physicians in a range of practices, including 17 Ob/Gyns, 8 internal medicine, 4 family practice, 3 pediatricians and 6 specialists and focus group discussions with health workers, including 33 registered nurses, 7 licensed practical nurses, 35 hospital service workers and 23 allied health professionals in Hollywood, FL; Chicago, IL; San Francisco
In-depth Interviews and Focus Groups (IDIFG)	**IDIFG3**—A Qualitative Assessment of Factors Influencing Immunization of Health Care Workers	2007	Individual in-depth interviews with 12 administration personnel-people who reported themselves personally involved in decisions regarding vaccination of hospital personnel–along with IDIs or mini-focus group discussions involving 63 other clinical personnel who spent at least 50% of their time in contact with patients. Interviews and groups were conducted in New York City, Hollywood Beach, FL, Scottsdale, AZ and San Francisco, CA
	IDIFG4—Influenza and Pneumococcal Immunization: A Qualitative Assessment of the Beliefs of Physicians and Older Hispanic Americans and African Americans	2003	18 in-depth interviews with physicians, including family medicine, internal medicine, cardiology and pulmonary medicine and 18 focus groups with adults 65 years old and older, including: 10 groups with African American adults and 8 groups with Hispanic American adults. Interviews and groups were conducted in Chicago, IL; Jackson, MS; Milwaukee, WI; Rochester, NY; San Antonio, TX
Surveys(S)	**S1**—Knowledge, Attitudes and Beliefs: National Flu Survey	2012	A total of 12,082 interviews were completed for adults (9,791 from landline and 2,291 from cellular only/mainly households). The sample was a list-assisted RDD sample of both landline and cellular telephones. Interviews were conducted March 1 through March 29, 2011. Selected geographic areas were oversampled to achieve a higher representation of Hispanic, non-Hispanic black and non-Hispanic Asian. For the landline sample, selected counties were oversampled, and for the cellular phone sample, selected states were oversampled
	S2—Testing of Influenza Vaccine PSA Concepts with Mothers: Topline Report	2008	Online surveys were conducted with 102 individuals, while mall intercepts involved 101 participants. All participants were mothers of children between 6 months and 18 years old. Study included evaluating two draft public service announcements designed to promote annual influenza vaccination for children. Mall intercept interviews were conducted in Atlanta, GA; Boston, MA; St. Louis, MO; and Portland, OR
Surveys(S)	**S3**—Seasonal Influenza Survey Report—January 2007	2007	A national survey of adults 18 years and older conducted using two modalities: a random-digit-dialed (RDD) and web-based survey. A total of 1247 interviews were obtained by RDD and 1290 for Web
	S4—Seasonal Influenza Survey Report—August 2007	2007	A national survey of adults 18 years and older conducted using a web-based survey. In total, 1,614 individuals participated in the study, including a main study sample of 1,353, along with two oversamples of African (n = 1139) and Hispanic Americans (n = 122)
	S5—Childhood Influenza Immunization Survey Analytic Results for Pediatricians	2007	Telephone interviews with a random selected sample of 1200 pediatricians and 220 family practitioners
	S6—Seasonal Flu Survey: 2006–2007 Influenza Season: Logistic Regression Results: Vaccination Patterns in Households with a High-risk Member	2007	Telephone interviews with 1113 survey respondents from a national probability study. 475 respondents lived in a household with an individual(s) with a chronic medical condition

Research method(s)	Study identifier and report title	Report year	Target audience(s) and methods summary
	S7—Pediatric Influenza Survey Report	2003	A telephone administered survey completed with 251 out of 282 qualified pediatricians. Potential survey respondents were randomly chosen from the American Medical Association masterfile. All were in active practice and provided on average 5 vaccinations to at least five children less than 2 years old each week

Table 2

Major recurring themes studies involving general public and sub-populations of the public.

KAB-related recurring themes	As exemplified by…	Studies supporting theme
General public, parents and targeted sub-populations		
Members of targeted public population groups have "basic but also quite limited influenza-related knowledge" with respect to influenza and influenza vaccine	• Most recognized that influenza was different and more serious than the "common cold" • Most understood that influenza was contagious and transmitted in many ways, including coughing, sneezing, shaking hands, physical contact Patients and parents associated influenza with body aches, cough, runny nose, fever, upset stomach—but had difficulty differentiating influenza from other respiratory illnesses, including severe colds • Some recognized a link with pneumonia, but few were knowledgeable about influenza-related hospitalizations or deaths • Many adults did not appear to know there was a universal influenza vaccination recommendation (e.g., recent studies found many did not believe they were in a recommended group for vaccination) • Influenza was associated with cold weather, including being caused or triggered by being improperly dressed in cold weather or going into cold weather with wet hair	FG1, FG2, FG3, FG4, FG5, FG6, FG7, FG8, FG9, FG11, FG12, IDI1, IDI2, IDI3, IDI5, IDIFG1, IDIFG4, S1, S3, S4
People 50 years old and older often had the best knowledge of influenza and flu vaccination recommendations	• They were usually aware that seasonal influenza may lead to severe health consequences such as pneumonia or death • They perceived vaccination as the best prevention or protection against influenza People 50 and older frequently were more or most concerned about getting the flu	FG2, FG3, FG5, FG6, FG11, FG12, IDIFG4, S3, S4
Knowledge of recently available influenza vaccine formulations and antivirals was limited	• Basic information needs appear to be high for quadrivalent, high-dose and nasal spray influenza vaccines, including the differences between the vaccines and which vaccines are most appropriate People were consistently interested in information about types of vaccines and mode of vaccination (e.g., vaccination vs. spray) and if some types/modes of vaccination are more effective than others • Many had little knowledge or understanding of antivirals, including what they do and when they should be used or taken	FG1, FG2, FG3, FG4, FG6, IDIFG1
Many do not perceive influenza as a likely or significant health threat, particularly if they do not have a health condition that may place them at risk for severe illness or complications	• Many did not believe they were likely or susceptible to contracting influenza or having a severe health outcome if they did, with about half of respondents in a national survey stating they were "not very" or "not at all concerned about getting seasonal influenza" • Many believed there were deaths or cases of severe illness associated with influenza, but that those that primarily occurred among older people or people with weak/weakened immune systems • Some believed absence of influenza illness (e.g., not having flu recently or at all) was a reason to avoid vaccination (e.g., "I'm doing fine without it," or "Don't mess with a good thing")	FG1, FG2, FG3, FG4, FG5, FG7, FG9, FG10, FG11, FG12, IDI1, IDI2, IDI3, IDIFG1, IDIFG4, S3

KAB-related recurring themes	As exemplified by…	Studies supporting theme
	• Young adults perceived influenza as a danger only to children and the elderly and assumed their immune systems could "fight off" influenza	
	• Many noted that if/when influenza was perceived to be more serious (e.g., a strain causing much disease or much serious illness) their interest in vaccination increased	
Influenza was viewed negatively but also often perceived as a manageable disease—i.e., one that brings about symptoms and causes discomfort but doesn't result in need for medical care, hospitalization or death (e.g., "you get sick for days then recover")	• Most people associated influenza with feeling bad and causing life disruptions (e.g., having to miss days of work or school), but were not particularly concerned about it	FG1, FG3, FG4, FG5, FG7, FG9, FG10, FG11, FG12, S1, IDI3, IDIFG1, IDIFG4
	• People's beliefs and perceptions of influenza severity were often based on their overall health, the condition of their immune system and previous experience with influenza.	
	• Most did not view influenza as likely to cause serious illness or harm for most people; younger and healthy people characterized influenza as a "bad cold that lasts several days"	
	• Health status and age – i.e., being younger or being 18 to 49 years old – were often associated with influenza being a manageable illness	
	• If people with chronic illnesses believed they were effectively managing their condition, they, too, often perceived influenza as a manageable illness	
Beliefs about influenza were strongly shaped and influenced by personal experience with the disease	• Many said that despite not getting vaccinated, they did not believe they had ever contracted influenza	FG2, FG3, FG5, FG7, FG8, FG9, FG10, FG11, FG12, IDI1, IDI2, IDI5, IDIFG1, IDIFG4, S4
	• The belief that vaccines can cause influenza, make one sick, or leave one susceptible to other flu-like illnesses persisted, and was often based on personal experiences or knowing of such an experience	
	• Personal experience with influenza shaped participants' beliefs regarding the severity and duration of seasonal flu	
	• Some noted that the experience of having influenza motivated them to get vaccinated in following years, while others noted that when they or a family member contracted influenza, it was a manageable or relatively mild course of illness	
	• Some noted that they knew of people who came down with a severe case of influenza	
Those who get an annual flu vaccination did so because they believed the vaccine protected them from a significant health threat and/or illness	• Many cited belief that vaccination would prevent flu or reduce flu severity as their primary motivation for vaccination	FG2, FG3, FG5, FG6, FG8, FG9, FG10, FG11, IDI1, IDI3, IDIFG1, IDIFG4, S2, S4
	• Many at-risk adults reported regularly getting an influenza vaccination to reduce their risk of contracting influenza or having severe illness	
	• Most mothers of young vaccinated children did so to protect their children from flu	
	• People who had contracted influenza often cited that experience as their reason for getting vaccinated	
	• Perception of being at increased risk for medical complications (e.g., as a result of a chronic health condition) motivated many, particularly those 60 and older	

KAB-related recurring themes	As exemplified by…	Studies supporting theme
Influenza vaccination was often perceived as recommended for, or needed by, people who were susceptible to severe illness or complications – particularly those 50 years old and older and those with weaker or weakened immune systems – or for people who needed or wanted to protect such people	• Individuals 50 and older or who had a chronic medical condition were most likely to report having received an influenza vaccination each year • Surveys found most respondents between 18 and 49 years old did not think they needed a flu vaccination • HCP and general public often knew that older people (especially 65 years old and older), people with certain medical conditions, and more recently, young children, should receive a seasonal influenza vaccination • As the recommendation has been broadened to encompass all people 6 months old and older, most still perceived influenza vaccination as recommended for, and needed by, groups listed above • Living in a household containing a chronically ill person was the strongest predictor of whether or not a study participant had received a seasonal flu vaccination	FG1, FG3, FG5, FG8, FG9, FG10, FG12, IDI2, IDI3, IDIFG4, S3, S4, S6
People who were older or who had personal experience with severe influenza had highest levels of motivation and uptake for seasonal flu vaccine	• Many who had a previous or recent experience with severe influenza said they got vaccinated because they did not want to repeat the experience • A strong predictor of vaccination was age, with many studies finding participants 65 years and older most likely to have gotten a seasonal influenza vaccination • Most people 50 years old and older reported getting an influenza vaccination each year, with many indicating that they believe the vaccine worked effectively.	FG5, FG6, FG11, IDIFG1, IDIFG4, S3, S4, S6
People with chronic health conditions had relatively high and likely growing awareness, of the health threat posed by influenza and the value of seasonal flu vaccination	• At-risk adults expressed concern about contracting flu and experiencing severe illness or flu-related medical conditions • Many with chronic conditions recognized their existing medical condition(s) could be aggravated by influenza, including more severe illness and a longer recovery time—and more appeared aware of the potential severity of influenza • Most people with chronic conditions appear to be getting a seasonal influenza vaccination (e.g., around 66% in a 2007 survey)	FG1, FG3, FG4, FG5, FG6, FG12, IDIFG1, IDIFG4, S3, S4
Even if parents had low to moderate levels of personal concern about influenza they were worried about flu affecting their children, particularly parents of at-risk children	• Many mothers believed the flu vaccine to be effective and beneficial, with most mothers of young children indicating they did or planned to have their child receive a flu vaccination • Parents believed risk for the flu varied depending on the health status and age of an individual, with children often recognized as at risk for contracting flu and missing school as a result of flu • Many believed it more important for their children to be vaccinated than themselves • Parents who had their at-risk children vaccinated were very likely to also have received a flu vaccination	FG3, FG4, FG5, FG6, FG7, FG9, S2, S3, S4, S6
A doctor or health care provider recommendation mattered—and HCPs were a trusted and relied upon source of information about influenza vaccination	• Most studies suggested or indicated a vast majority of respondents or participants believed information and advice from their doctor or other HCP mattered a lot	FG2, FG3, FG4, FG5, FG8, FG9, FG10, FG11, FG12, IDI1, IDI2, IDI5, IDIFG4, S1, S3, S4

KAB-related recurring themes	As exemplified by…	Studies supporting theme
	• Many cited a doctor's recommendation as their primary reason for influenza vaccination • Many parents and mothers cited a doctor's recommendation as primary reason for their child's flu vaccination • Even for participants who were skeptical of influenza vaccine, studies repeatedly found that most people and parents relied on their health care provider for vaccine recommendations and information • Active information seeking for influenza and influenza vaccination information was often low • Some noted that HCPs did not mention or recommend seasonal influenza vaccination—and a result, they did not get vaccinated	
Convenience and easy access to flu vaccine mattered	• Many noted that they were more likely to get the vaccine if it was easily or readily available, e.g., in the workplace, at physicians' office • Some who did not get vaccinated cited lack of easy access or inconvenience as reason • Mothers who favored in-school influenza vaccination clinics cited convenience as biggest benefit • Inability to afford the vaccine and lack of health insurance coverage were often noted as barriers • Some stated difficulty finding the vaccine dissuaded them from getting vaccination	FG2, FG4, FG5, FG6, FG7, IDI1, IDI2, IDI3, S3, S4
Active promotion of influenza vaccination and educational materials helped—and was valued by HCPs	• One of the reasons some people reported they received a flu vaccination was because they had seen or received communication about the benefits or importance of the vaccine (e.g., visual displays, radio or TV public service announcements or advertisements) • Some indicated that family members or friends convinced them to get vaccinated; others cited news stories • Many participants in studies that tested materials (e.g., fact sheets)indicated they learned things about flu vaccine recommendations, effectiveness and antivirals, that they did not previously know (e.g., that quadrivalent flu vaccine was available, that they were in a group recommended for vaccination, that antivirals could treat influenza) • In testing, Spanish-language materials helped increase knowledge and understanding of influenza and pneumococcal disease and vaccinations • Physicians and HCPs highly valued patient-education materials, particularly those that were brief, in lay person language and that include safety and benefit information	FG1, FG2, FG3, FG4, FG5, FG6, FG7, FG8, FG9, IDI1, IDI3, IDI4, IDI5, IDIFG1, IDIFG2, IDIFG4, S2
Many of those who did not get seasonal influenza vaccination did not believe they needed it	• The most often stated reason given by people who did not get a flu vaccination was “I don't think I need it” • About half of the adults in a national survey who did not get a flu vaccination for themselves or their child felt they were unlikely to get sick from influenza, with many stating they “never get the flu” or were not in a high-risk or priority group	FG2, FG4, FG5, FG7, FG8, FG12, IDIFG1, S1, S3, S4

KAB-related recurring themes	As exemplified by…	Studies supporting theme
	• Healthy and adults aged 18-49 often did not perceive a need for seasonal flu vaccination and/or were unaware they were included in seasonal flu vaccination recommendations • Some with chronic health conditions (e.g., heart disease, diabetes, asthma) were unaware these conditions placed them at higher risk for complications from influenza	
Many who did not get seasonal influenza vaccinations did not believe the vaccine was effective—e.g., vaccination was not seen as providing much or good protection from influenza	• A substantial number of people (e.g., from 1 in 5 to 1 in 3) in national surveys indicated they did not believe the vaccine would protect them from influenza • The fact that the vaccine strains generally changed from year to year was a cause of concern for some (e.g., “it's an educated guess when it comes to flu vaccines”) • Those who do not get seasonal influenza vaccinations for themselves or their children often had concerns about vaccine effectiveness • People 65 and older who do not get influenza vaccination often believed risks associated with the vaccine (e.g., getting sick as a result of vaccination) outweighed the benefits (e.g. protection provided)	FG1, FG2, FG3, FG5, FG7, FG8, FG9, FG10, FG12, IDI2, IDIFG1, S1, S3, S4
Many, particularly those who did not get an annual flu vaccination, were fearful of the vaccine—e.g., they believed the vaccine brings tangible or likely risks	• Many, including some who routinely get a seasonal flu vaccination, believed seasonal influenza vaccine can cause or leave them susceptible to influenza • Many were concerned that flu vaccines caused bad side effects or adverse reactions • Many believed that they had become ill or gotten influenza after receiving an influenza vaccination • Some were more afraid of the side effects of vaccine than of influenza (i.e., the disease) • A few said they were afraid of needles, while some were concerned about how flu vaccine would interact with other medicines (e.g., antibiotics, prescription medications for chronic illnesses)	FG1, FG3, FG4, FG5, FG8, FG9, FG10, FG11, FG12, IDIFG1, IDIFG4, S2, S3, S4
Parents who did not get their children vaccinated believed influenza vaccinations were not effective—and/or that vaccination did not provide much or needed protection from influenza	• Some parents were concerned about bad reactions to the vaccine or the vaccine causing the flu. • Some believed their child was not at risk for flu because he/she was around a lot of other children • Some parents, including those who were otherwise following the recommended immunization schedule perceived the influenza vaccination as “optional” or “not unnecessary” • Some mothers who did not currently have their children receive an influenza vaccination indicated they probably would once their children entered daycare or school because of increased exposure to other children and germs	FG3, FG4, FG5, FG6, FG7, FG9, S2, S3, S4
Beliefs about influenza vaccine effectiveness and safety were strongly influenced by personal experiences	• Participants who got influenza vaccinations often judged the effectiveness of the vaccine based on whether or not they got the flu that year. • People and parents who did not get seasonal influenza vaccinations frequently cited personal effectiveness (e.g., “I got vaccinated and still got sick”) or perceptions related to illness causality (e.g., “the flu vaccine made me sick”) as reasons for not getting vaccinated	FG2, FG3, FG4, FG5, FG6, FG7, FG8, FG10, FG12, IDI1, IDIFG1, IDIFG4

KAB-related recurring themes	As exemplified by…	Studies supporting theme
	• Many cited people they knew as having gotten sick or the flu shortly after getting an influenza vaccination, with some reporting people who received the vaccine came down with severe cases of influenza after receiving the vaccine • Many recollected hearing "reports" of vaccine-related adverse events	
Many, including those who get seasonal flu vaccinations, believed there were other effective ways to prevent influenza—and for some, these were more effective than vaccination	• Washing hands often, eating healthy, taking vitamins, being active, avoiding sick or ill people, using anti-bacterial wipes and disinfectants to clean surfaces, staying well rested, getting enough sleep, dressing properly for cold weather were cited by many as effective ways to prevent influenza • Mothers who were comfortable with flu vaccination for their children reported more relying more heavily on non-pharmaceutical measures such as hand washing to protect themselves and their families from influenza than on flu vaccine • Many participants reported being more "vigilant" about hand washing, use of hand sanitizers, and coughing into one's elbow during the 2009 H1N1 pandemic	FG1, FG3, FG5, FG7, FG8, FG12, IDI2, IDI3, IDIFG1, IDIFG4
Many people, including HCPs and those who received seasonal flu vaccinations, stated an interest in information on influenza vaccine efficacy, safety, side effects and adverse events	• Parents commonly indicated wanting more information about the side effects of flu vaccines, including the side effects associated with different types of influenza vaccines • Many, especially those who do not get a seasonal flu vaccination, were concerned or fearful of side effects or adverse reactions from influenza vaccines • Many HCPs, particularly nurses, want more information on vaccine efficacy and safety.	FG3, FG4, FG5, FG8, FG10, FG12, IDIFG1
Some messaging concepts and messages appeared to resonate better than others	• Many adults reacted positively to messages that stressed prevention or encouraged vaccination as a way to be proactive or have control over their health (e.g., "empowering," "flu vaccination being part of a healthy lifestyle") • People with chronic health conditions appeared to respond favorably to messages and materials that helped them understand their increased risk or why they were at risk • Messages that address misperceptions related to the influenza vaccines causing flu or flu-like symptoms may be effective (e.g., addressing why such symptoms may occur, informing people that the vaccine does not cause influenza) • Many responded favorably to messages involving the concept of getting a flu vaccination as a way to protect loved ones or community members • Messages – especially recommendations – from HCPs, were often perceived positively • Most people or parents were not aware of or did not understand the different types of influenza vaccines and were unfamiliar with flu and flu vaccine viruses and technical terms, such as "quadrivalent" or 2009 H1N1 • Parents/mothers found reminders and messages that the flu can be a lot worse than they think or that the vaccine helped protect family members were persuasive	FG2, FG3, FG5, FG7, FG8, FG9, FG10, FG12, IDI5, IDIFG1, IDIFG4, S2

KAB-related recurring themes	As exemplified by…	Studies supporting theme
	• Messages that emphasized hospitalizations and deaths increased attention but did not appear to be motivating (e.g., statistics were seen as “hype” or as not likely to happen)	

Table 3

Major Recurring Themes Studies involving Health Care Providers and Professionals.

KAB-related Recurring Themes	As exemplified by…	Studies related to theme
Health Care Providers and Professionals (HCPs)		
Influenza immunization-related knowledge and support among HCP was often highest among physicians, with members of other groups having knowledge similar to patients and parents	• There was high awareness of influenza vaccination recommendations for those who are older, have chronic health conditions or weaker immune systems and young children • Most pediatricians reported having high awareness and fairly good or very good knowledge of seasonal flu vaccination recommendations for children • Most physicians proactively offered influenza vaccination to children but some skepticism or concerns existed regarding the effectiveness of the vaccine (e.g., many noted that efficacy can and does vary depending on the vaccine's matching with circulating viruses) • Physician awareness of antivirals appears relatively high—though many have little experience prescribing them • Some physicians may not yet be aware of some groups at high risk for flu complications, such as American Indians/Alaska Natives and the morbidly obese • Physicians were supportive of universal influenza vaccination recommendation and noted it simplified office protocols	FG10, IDI1, IDI3, IDIFG1, IDIFG2, IDIFG3, IDIFG4, S5, S7
Many did not perceive influenza as a serious health threat to most members of the general population—rather, it was primarily seen as a threat to those who were older or who had health conditions that made them susceptible to medical complications or severe illness	• Physicians, including specialists, recognized that influenza can be a potentially serious illness for people 65 years old and older, who have chronic health conditions, or who have weakened immune systems but often perceived influenza as a modest or manageable illness for others • A number of physicians reported promoting influenza vaccination more aggressively to high-risk patients than other patients (e.g., reminding them throughout the year about flu vaccination) • Many physicians indicated that influenza vaccination was the patient or parent's choice and were reluctant to be “pushy” or too strong in their efforts	FG10, IDI1, IDI4, IDIFG1, IDIFG3, S7
Many did not perceive influenza as a likely or significant health threat to themselves	• It was often expressed that influenza was primarily a threat to the very young, the elderly and people with certain chronic health conditions • Many associated minimal consequences with contracting influenza (e.g., “I can handle flu,” “I'm not afraid of flu”) • Some took comfort in the fact that influenza routinely caused illness (e.g., “People get flu all the time.”)	FG10, IDI4, IDIFG3
Influenza was often perceived as a manageable disease—for both themselves and most members of the general population	• Many expressed the belief that “If you take care of yourself, you shouldn't get very sick from influenza” • Health care workers' decisions regarding flu vaccination were often based heavily on a personal risk-benefit analysis, with some noting that those with a healthy or strong immune system did not need a vaccination (e.g., “If your body is in good shape, you can heal yourself”)	FG10, IDI4, IDIFG2, IDIFG3

KAB-related Recurring Themes	As exemplified by…	Studies related to theme
Many health providers, especially physicians, recognized that influenza posed a potentially serious health threat to some groups, including young children	• Nearly all physicians routinely offered influenza vaccination to children who have a high risk medical condition such as asthma as well as healthy household contacts of such children • Some nurses indicated that influenza vaccinations were important for “older nurses”	IDI1, IDI3, IDIFG2, IDIFG3, S5, S6, S7
Some health care providers, including physicians, did not believe influenza was a serious health threat to most children	• Influenza was characterized as “not a concern” and influenza vaccination was seen as “optional” or “not necessary.” • Healthy, older children were seen as able to handle influenza • Some physicians characterized influenza as one of the less important childhood vaccinations	IDI4, IDIFG3
Many HCPs, particularly nurses, did not see a need for influenza vaccination for themselves	• Many HCPs cited being “already healthy” and/or “not at risk” as reasons for not getting an influenza vaccination. • HCPs expressed belief that universal recommendation would have little or no effect on their interest in seasonal influenza vaccination. • Many believed that they never had contracted influenza, so therefore it was not a threat to them. • Some clinical personnel believed they had developed strong or stronger immune systems as a result of constant exposure to a variety of germs, including influenza	FG10, IDIFG2, IDIFG3
Most physicians believed influenza vaccination to be highly effective, while many other HCPs, particularly nurses, believed influenza vaccinations were (often) not effective—and/or that vaccination did not provide much or good protection from influenza	• The majority of physicians appeared to believe that flu vaccination was effective in preventing influenza illness—with many estimating effectiveness to be quite high • Resistance to influenza vaccination was often characterized by a pronounced lack of trust in the vaccine, particularly its effectiveness • Large numbers of both clinical and service workers cited getting flu from the vaccine, side effects, allergic reactions, and being left vulnerable to other illnesses as reasons for not getting an influenza vaccination • Some nurses believed that a past influenza vaccination resulted in them being ill or getting influenza (e.g., “I did it once five years ago and got sick” or “I still got sick”) • The fact the vaccine strains may not match the circulating influenza strains engendered skepticism among some, including among physicians	FG10, IDIFG1, IDIFG2, IDIFG3, IDIFG4
Vaccinated HCPs appeared to be more knowledgeable about influenza and influenza vaccination than non-vaccinated HCPs	• Those who receive seasonal influenza vaccinations appear more aware of the potential harms that influenza can cause, the threat that influenza poses to patients, and the ways influenza is transmitted • Many unvaccinated HCPs do not appear to know that they are in a group for whom vaccination is recommended • Some unvaccinated HCPs believe they have strong or stronger immune systems because of their workplace exposure to germs and disease	FG10, IDI4, IDIFG2
Many nurses and allied health professionals were more motivated by the	• Some believed or seem to believe that they were very unlikely to transmit influenza to patients (e.g., “It's	FG10, IDIFG2, IDIFG3

KAB-related Recurring Themes	As exemplified by…	Studies related to theme
personal protection influenza vaccination may provide than by the patient protection it may provide	getting influenza from them, not giving it to them" that is motivation for vaccination) • Many HCPs noted that "you've got to take care of yourself first" or getting vaccinated was a way to protect their family members (e.g., "You don't want to bring flu home") • Service workers regularly cited lost work days and associated lost pay as an incentive for influenza vaccination	
Convenience and easy access to flu vaccine and flu vaccine-related educational materials and resources mattered	• Many HCPs noted that ease of access to the vaccine, particularly at their work places, was critical to their decision to obtain the vaccine • HCPs have limited time for patient education or lengthy conversations so education materials and resources that are easy to use are helpful	FG10, IDI1, IDI4, IDI6, IDIFG1, IDIFG3
Some HCPs were or remain unconvinced of the value and need for seasonal influenza vaccinations.	• There were a substantial number of health care workers for whom traditional education and appeals have not been effective (e.g., they did not believe they were at risk for flu, they did not believe they put patients at risk for flu) • Many HCPs, particularly nurses, believed working with sick patients and other preventive measures were as or more effective than vaccination	FG10, IDI1, IDI3, IDI6, IDIFG2, IDIFG3
HCPs believed public, sub-population and parent demand was important when it comes to providing flu vaccination	• Many HCPs believed that vaccination was the patient's choice and that greater patient awareness and knowledge about vaccines fostered interest (e.g., greater awareness led to greater demand) • Most pediatricians said that parents' asking for influenza vaccine was an important factor in providing flu vaccine to children	IDI0, IDI4, IDIFG2, IDIFG3 S7
The time available for HCPs, particularly physicians and specialists, to discuss influenza vaccination was quite limited	• Physicians and specialists noted they have competing medical priorities and other time constraints, which left little time for lengthy conversations regarding influenza vaccination • Doctors consistently noted that their time with patients with quite limited—many noted that while they recommend flu vaccination they quickly moved on if patients did not accept the advice	IDI0, IDI4, IDIFG2, IDIFG4
Some messaging concepts and messages appeared to resonate better than others	• Many believed the most effective messages were those tailored to specific patient or parent's questions, medical/health conditions, and situations • Many noted that patient materials need to be simple, concise, and easy to read and understand • Some HCPs said there was not enough detailed information focused specifically toward their profession with respect to influenza (e.g., how influenza affects HCPs, documented evidence of how the vaccine can protect them) • Physicians noted that informing patients that influenza could cause pneumonia often motivated vaccination • Many HCPs believed it important to provide or highlight information and data that illustrated the safety of the vaccine, including addressing myths and misperceptions people have about the vaccine	FG10, IDI1, IDI4, IDI6, IDIFG4

KAB-related Recurring Themes	As exemplified by…	Studies related to theme
	• Some said “active promotion” is necessary or beneficial when it comes to increasing HCPs' influenza vaccination	
More and ongoing public and patient education is needed to foster influenza vaccine demand and uptake	• Physicians noted that patient awareness affected demand for influenza vaccination and there was a need for proactive campaigns that promoted the benefits of vaccines • Many believed public and patient messages and materials needed to call attention to people at highest risk for influenza complications and that flu potentially affects many people each year • Some believed that positive, rather than negative messages, were or would be most effective with public and parents (e.g., highlighting benefits of vaccination rather than highlighting negative consequences of flu or making people feel guilt if they did not get themselves or child vaccinated), while others favored messages that put the emphasis on potential harm brought by influenza • Many noted that messages tailored to patient or parent concerns were effective–as was letting patients or parents know that the HCP had been vaccinated	IDI1, IDI4, IDIFG2

Table 4

SHARE Framework.

• **S**hare the reasons why the recommended vaccine is right for each patient based on his or her health status and risk factors
• **H**ighlight positive personal experiences with vaccination
• **A**ddress patient questions and any concerns about adult vaccines, including safety and effectiveness, in plain and understandable language
• **R**emind patients that vaccine-preventable diseases still exist in the U.S. and can be serious for them as well as for friends and family members
• **E**xplain the potential costs of getting disease, including serious health effects, time lost (missing work, activities, and family events) and financial costs