

## **National Action Plan to Prevent Healthcare-Associated Infections: Roadmap to Elimination**

### **CHAPTER 7. INFLUENZA VACCINATION OF HEALTHCARE PERSONNEL**

#### **I. Introduction**

Healthcare personnel (HCP) can acquire influenza and can transmit influenza to patients and other HCP. Many HCP provide care for, or are in frequent contact with, patients with influenza and or patients at high risk for complications of influenza, and the involvement of HCP in influenza transmission has been a long-standing concern.<sup>1,2,3</sup>

Vaccination is an effective preventive measure against influenza, and can prevent many illnesses, deaths, and losses in productivity.<sup>4</sup> HCP are considered a high priority for expanding influenza vaccine use. Achieving and sustaining high influenza vaccination coverage among HCP is intended to help protect HCP and their patients and reduce disease burden and healthcare costs. Until recently, vaccination coverage among HCP has been well below the national Healthy People 2010 target of 60%<sup>5</sup> (see Figure 2), but preliminary data suggest 62% of HCP reported receiving seasonal influenza vaccine in 2009-2010<sup>6</sup> and 63.5% received the influenza vaccine in 2010-2011<sup>7</sup>

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<sup>1</sup> Maltezou HC, Drancourt M. Nosocomial influenza in children. *Journal of Hospital Infection* 2003; 55:83-91

<sup>2</sup> Hurley JC, Flockhart S. An influenza outbreak in a regional residential facility. *Journal of Infection Prevention* 2010; 11:58-61

<sup>3</sup> Salgado CD, Farr BM, Hall KK, Hayden FG. Influenza in the acute hospital setting. *The Lancet Infectious Diseases* 2002; 2:145-155.

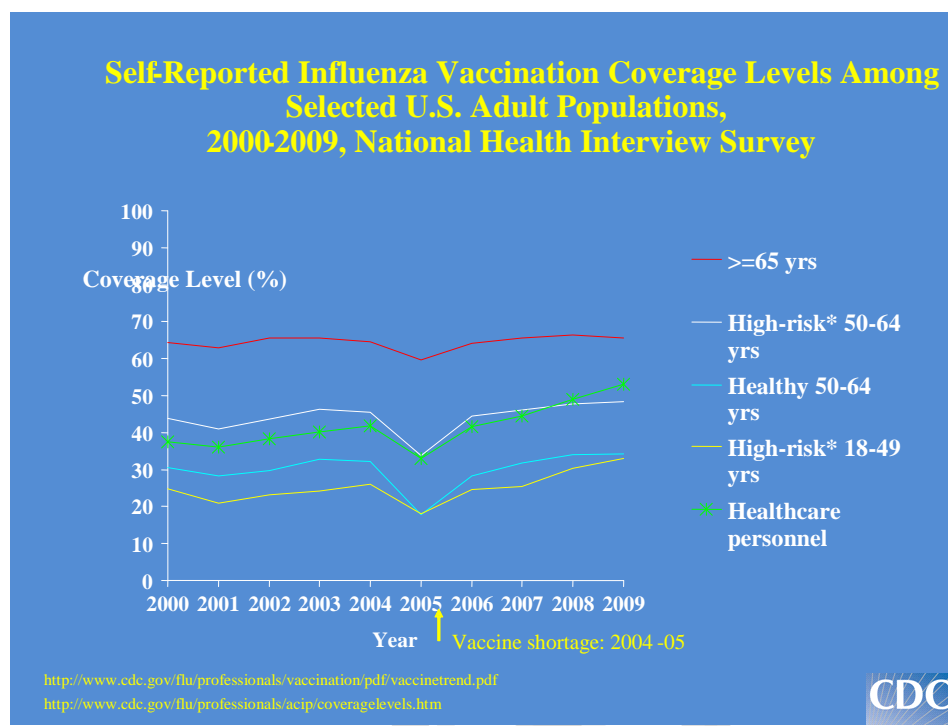
<sup>4</sup> Wilde JA, McMillan JA, Serwint J, Butta J, O’Riordan MA, Steinhoff MC. Effectiveness of influenza vaccine in health care professionals: a randomized trial. *The Journal of the American Medical Association* 1999; 281:908-913.

<sup>5</sup> Walker FJ, Singleton JA, Lu P, Wooten KG, Strikas RA. Influenza vaccination of healthcare workers in the United States, 1989-2002. *Infection Control and Hospital Epidemiology* 2006; 27:257-265.

<sup>6</sup> Centers for Disease Control and Prevention. Interim results: Influenza A (H1N1) 2009 and Monovalent Seasonal Influenza Vaccination Coverage Among Health-Care Personnel—United States August 2009- January 2010. *Morbidity and Mortality Weekly Report (MMWR)*; 59:357-362. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5912a1.htm>

<sup>7</sup> Centers for Disease Control and Prevention. Influenza Vaccination Coverage Among Health-Care Personnel – United States, 2010-2011 Influenza Season. *Morbidity and Mortality Weekly Report (MMWR)*: 60:1073-1077. Available at: [http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6032a1.htm?s\\_cid=mm6032a1\\_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6032a1.htm?s_cid=mm6032a1_w)

**Figure 2. Self-Reported Influenza Vaccination Coverage Levels Among Selected U.S. Adult Populations, 2000-2009**



Notes:

\* Adults were considered at high risk for influenza-related complications if they had ever been told by a doctor or other health professional that they had diabetes, emphysema, coronary heart disease, angina, heart attack, or other heart conditions; had a diagnosis of cancer during the previous 12 months (excluding non melanoma skin cancer); had ever been told by a doctor or other health professional that they had lymphoma, leukemia, or blood cancer; had been told by a doctor or other health professional that they had chronic bronchitis or weak or failing kidneys during the preceding 12 months; or had an asthma episode or attack during the preceding 12 months. Source: CDC.

\*\*Year indicates the year the season ended (e.g., 1995 data reflect vaccination coverage for the 1994-1995 influenza season)

\*\*\*Note that preliminary data suggest 62% of HCP reported receiving seasonal influenza vaccine in 2009-2010: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5912a1.htm#tab1>

\*\*\*\*Note that preliminary data suggest 63.5% of HCP reported receiving seasonal influenza vaccine in 2010-2011:

[http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6032a1.htm?s\\_cid=mm6032a1\\_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6032a1.htm?s_cid=mm6032a1_w)

Healthy People 2020 set a target of 90% coverage for HCP influenza vaccination.<sup>8</sup> Several challenges lie ahead in meeting this target. To identify and implement areas of strategic focus to increase immunization coverage of HCP, and to provide direction for future Departmental resources in this initiative with an overall goal of increasing influenza vaccination coverage among HCP, a federal working group, the Healthcare-Associated Infections (HAIs) Increasing Influenza Vaccination Coverage Among Health Care Personnel Working Group, has been convened. This group is identifying

<sup>8</sup> Healthy People 2020 Immunization and Infectious Disease Objectives, IID -12.9, available at: <http://healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicid=23>

approaches to reaching the proposed 90% target for Healthy People 2020 and also proposes an interim target of 70% vaccination coverage among HCP by 2015.<sup>9,10</sup>

It is important to note, while the Working Group is focused on increasing influenza vaccination of HCP, such vaccination represents only one component of a comprehensive strategy for preventing influenza transmission in healthcare settings.<sup>11</sup>

## **II. Background**

### **A. Definition of Healthcare Personnel**

For the purpose of this chapter, we have decided to utilize the Centers for Disease Control and Prevention or CDC's Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP) HCP definition due to its inclusive design and involvement of multiple stakeholders in its development. HCP refers to all paid and unpaid persons working in healthcare settings who have the potential for exposure to patients and or to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air.<sup>12</sup>

HCP might include (but are not limited to) physicians, physician assistants, nurses, nursing assistants, therapists, technicians, emergency medical service personnel, dental personnel, pharmacists, laboratory personnel, autopsy personnel, students and trainees, contractual staff not employed by the healthcare facility, and persons (e.g., clerical, dietary, house-keeping, laundry, security, maintenance, billing, and volunteers) not directly involved in patient care but potentially exposed to infectious agents that can be transmitted to and from HCP and patients.

Settings in which HCP may work include, but are not limited to, acute care hospitals, long-term care facilities, skilled nursing facilities, rehabilitation centers, physician's offices, urgent care centers, outpatient clinics, home health agencies, and emergency medical services. HCP include, but are not limited to, hospital and office staff, contract workers, volunteers, trainees, and other types of personnel. Thus, the types of work done, level of institutional oversight and employment mechanisms are very diverse.

### **B. Influenza Morbidity, Mortality, and Costs**

The morbidity, mortality, and economic impact from influenza each year can be substantial, as the following U.S. statistics demonstrate:

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<sup>9</sup> Influenza Vaccination of Healthcare Personnel Working Group Meeting Notes, meeting of June 4, 2010

<sup>10</sup> Influenza Vaccination of Healthcare Personnel Working Group Meeting Notes, meeting of June 4, 2010

<sup>11</sup> Centers for Disease Control and Prevention. Prevention Strategies for Seasonal Influenza in Healthcare Settings. Available at: <http://www.cdc.gov/flu/professionals/infectioncontrol/healthcaresettings.htm> Accessed October 20, 2010

<sup>12</sup> Adapted from: Pearson ML., Bridges CB, Harper SA: Influenza vaccination of health-care personnel: Recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP). *Morbidity and Mortality Weekly Report (MMWR)* 2006; 55:1-16. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5502a1.htm>

- Each year, between 5% and 20% of the population becomes ill with influenza;<sup>13</sup>
- Between 1976 and 2007, annual influenza-associated deaths have ranged from about 3,000 to about 50,000;<sup>14</sup>
- On average, about 200,000 hospitalizations due to influenza occurred each year between 1979 and 2001;<sup>15</sup> and,
- Approximately 600,000 life-years lost, 3 million days of hospitalization, and 30 million outpatient visits are annually attributed to influenza epidemics.<sup>16</sup>

Rates of serious illness and death resulting from influenza and its complications are increased in high-risk populations: persons over 50 years or under four years of age, and persons of any age who have underlying conditions that put them at an increased risk.<sup>17</sup>

### C. Limiting Transmission of Influenza in Healthcare Settings by Vaccination of HCP

Results of several studies indicate that higher vaccination coverage among HCP is associated with lower incidence of nosocomial influenza, influenza-like illness, or mortality during influenza season.<sup>18,19,20</sup> Such findings have led some to call for mandatory influenza vaccination of HCP,<sup>21,22,23,24, 25</sup> though others have cautioned that “there is an absence of high quality evidence to guide medical care and public health practitioners to mandate influenza vaccination for healthcare workers.”<sup>26</sup>

<sup>13</sup> Centers for Disease Control and Prevention: Questions and Answers, Seasonal Influenza. Available at: <http://www.cdc.gov/flu/about/qa/disease.htm>

<sup>14</sup> Centers for Disease Control and Prevention. Estimates of deaths associated with seasonal influenza—United States, 1976-2007. *Morbidity and Mortality Weekly Report (MMWR)* 2010;59:1057-62. Available at [http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5933a1.htm?s\\_cid=mm5933a1\\_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5933a1.htm?s_cid=mm5933a1_w)

<sup>15</sup> Thompson WW, Shay DK, Weintraub E, et al. Influenza-associated hospitalizations in the United States. *The Journal of the American Medical Association* 2004; 292:1333-40.

<sup>16</sup> Molinari NM, Ortega-Sanchez IR, Messonnier ML, et al. The annual impact of seasonal influenza in the US: measuring disease burden and costs. *Vaccine* 2007; 25:5086-5096

<sup>17</sup> Fiore AE, Uyeki T, Broder K, et al. Prevention & Control of Influenza with Vaccines - Recommendations of the Advisory Committee on Immunization Practices (ACIP) 2010. *Morbidity and Mortality Weekly Report (MMWR)* 2010; 59(RR08):1-62.

<sup>18</sup> Salgado CD, Giannetta ET, Hayden FG, Farr BM. Preventing influenza by improving the vaccine acceptance rate of clinicians. *Infection Control and Hospital Epidemiology* 2004; 25: 923-928.

<sup>19</sup> Potter J, Stott DJ, Roberts MA, et al. Influenza vaccination of health-care workers in long-term-care hospitals reduces the mortality of elderly patients. *Journal of Infectious Diseases* 1997; 175:1-6.

<sup>20</sup> Hayward AC, Harling R, Wetten S, et al. Effectiveness of an influenza vaccine programme for care home staff to prevent death, morbidity, and health service use among residents: cluster randomised controlled trial. *British Medical Journal* 2006; 333:1241-1246.

<sup>21</sup> Talbot TR, Bradley SF, Cosgrove SE, et al: SHEA position paper: Influenza vaccination of healthcare workers and vaccine allocation for healthcare workers during vaccine shortages. *Infection Control and Hospital Epidemiology* 2005; 26:882-890

<sup>22</sup> American College of Physicians (ACP). ACP policy on influenza vaccination of health care workers. [http://www.acponline.org/running\\_practice/quality\\_improvement/projects/adult\\_immunization/flu\\_hcw.pdf](http://www.acponline.org/running_practice/quality_improvement/projects/adult_immunization/flu_hcw.pdf)

<sup>23</sup> Greene LR, Cain TA, Dolan SA et al. APIC position paper: influenza immunization of healthcare personnel. Association of Professionals in Infection Control (APIC). November 2008. [http://www.apic.org/Content/NavigationMenu/PracticeGuidance/Topics/Influenza/APIC\\_Position\\_Paper\\_Influenza\\_11\\_7\\_08final\\_rev\\_ised.pdf](http://www.apic.org/Content/NavigationMenu/PracticeGuidance/Topics/Influenza/APIC_Position_Paper_Influenza_11_7_08final_rev_ised.pdf)

<sup>24</sup> National Patient Safety Foundation (NPSF). Mandatory flu vaccinations for healthcare workers. Press Release, November 18, 2009. <http://www.npsf.org/pr/pressrel/2009-11-18.php>

<sup>25</sup> Infectious Diseases Society of America (IDSA). IDSA policy on mandatory immunization of health care workers against seasonal and 2009 H1N1 influenza. Infectious Diseases Society of America (IDSA). September 30, 2009. <http://www.idsociety.org/HCWimmunization/>

<sup>26</sup> Thomas RE, Jefferson T, Lasserson TJ. Influenza vaccination for healthcare workers who work with the elderly. *Cochrane Database of Systematic Reviews* 2010, Issue 2. Art. No.: CD005187. DOI: 10.1002/14651858.CD005187.pub3.

#### D. Annual Influenza Vaccine Development

Preparing for the influenza season each year is a time-critical, highly orchestrated, collaborative effort of the global health community, including disease surveillance authorities in many countries, the World Health Organization, National Institutes of Health (NIH), the Food and Drug Administration (FDA), CDC, and vaccine manufacturers. It is a year-round process that requires ongoing worldwide influenza disease surveillance, development of recommendations for immunization, selection of virus strains, and the manufacture and distribution of new vaccine.

##### *Influenza Virus*

Influenza viruses are single-stranded, helically shaped ribonucleic acid or RNA viruses of the family Orthomyxoviridae. The viruses can be divided into three types: A, B, and C. Type A influenza has subtypes that are determined by the surface antigens hemagglutinin (H) and neuraminidase (N). Of the 16 known types of hemagglutinin, three (H1, H2, and H3) are usually present in influenza viruses which most commonly infect humans. Hemagglutinin has a role in virus attachment to infected cells and fusion to the intracellular structures. Of the nine known types of neuraminidase, two (N1 and N2) are the most common in viruses which infect humans. Neuraminidase has a role in new viruses release from infected cells.<sup>27</sup>

Type A influenza causes moderate to severe illness in all age groups and infects humans and other animals. Type B influenza causes milder disease, primarily affects children, and infects only humans. Type C influenza is rarely reported as a cause of human illness and has not been associated with any epidemics.<sup>28</sup>

The nomenclature to describe the type of influenza virus is expressed in the following order: 1) virus type, 2) geographic site where it was first isolated, 3) strain number, 4) year of isolation, and 5) virus subtype.<sup>29</sup>

Because seasonal influenza is predominantly caused by two types of influenza virus, (influenza A and B), and two subtypes of influenza A, (A/H1N1, and A/H3N2) the vaccine includes a representative strain of the two A subtypes and a B virus. With the input of its Vaccines and Related Biological Products Advisory Committee, using surveillance-based forecasts about what viruses are most likely to cause illness in the coming season, FDA selects the viral strains to be used in the annual trivalent influenza vaccines. Because the influenza virus mutates, each year's vaccine virus strains are usually different from the preceding year. The manufacturing demands are tremendous because a new trivalent vaccine is manufactured every year. Influenza vaccines undergo

<sup>27</sup> Knipe, D.M., Howley, P.M., Griffin, D.E., Lamb, R.A., Martin, M.A., Roizman B & Straus, S.E., Eds (2006). *Field's Virology* (5<sup>th</sup> ed.). Philadelphia: Lippincott, Williams and Wilkins

<sup>28</sup> Centers for Disease Control and Prevention. Prevention & Control of Influenza with Vaccines — 2010–11 Recommendations of the Advisory Committee on Immunization Practices. Available at: [http://www.cdc.gov/mmwr/preview/mmwrhtml/rr59e0729a1.htm?s\\_cid=rr59e0729a1\\_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr59e0729a1.htm?s_cid=rr59e0729a1_w).

<sup>29</sup> Knipe, D.M., Howley, P.M., Griffin, D.E., Lamb, R.A., Martin, M.A., Roizman B & Straus, S.E., Eds (2006). *Field's Virology* (5<sup>th</sup> ed.). Philadelphia: Lippincott, Williams and Wilkins

the FDA review process for approval, which includes stringent manufacturing and quality oversight processes.<sup>30,31</sup>

The FDA has licensed two forms of influenza vaccine for use in the United States: the inactivated vaccine and the live attenuated vaccine. The inactivated vaccine contains inactivated, or killed, virus and is given with a needle in the arm. The nasal spray vaccine contains live viruses that are weakened, or attenuated, and is administered to the nasal mucosa with a nasal sprayer. ACIP's provides annual recommendations for the control and prevention of influenza, including use of vaccines.<sup>32</sup>

#### E. Effectiveness and Safety of Influenza Vaccine

FDA regulates vaccines for use in the United States; FDA and CDC are responsible for evaluating their safety and effectiveness, and monitoring conformity with statutory and regulatory standards for licensure and use in the United States. Working to ensure an adequate, safe, and effective supply of influenza vaccine each year is one of FDA's and CDC's highest priorities.

Because of the changing influenza viruses and the need for many months between strain determination and vaccine administration, vaccines and circulating viruses do not always match. Studies have shown that influenza vaccines are 59% to 91% effective in preventing laboratory confirmed influenza illness when closely matched to the circulating virus strains.<sup>33</sup> Even during influenza seasons during which the vaccine does not exactly match the circulating strain, studies have shown that the vaccine still may have protective effects and result in milder illness and or can prevent flu-related complications.<sup>34,35, 36,37</sup>

Vaccination of individuals 65 years of age and older not living in nursing homes reduces the likelihood of hospitalization for influenza-related complications by 30% to 70% when the vaccine is well-matched.<sup>38,39,40</sup> In this cohort, influenza vaccination also has been

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<sup>30</sup> Food and Drug Administration. Influenza Virus Vaccine Composition and Lot Release. Available at:

<http://www.fda.gov/BiologicsBloodVaccines/GuidanceComplianceRegulatoryInformation/Post-MarketActivities/LotReleases/ucm062928.htm>

<sup>31</sup> Food and Drug Administration. 2010-2011 Influenza Season Vaccine Questions and Answers.

<http://www.fda.gov/BiologicsBloodVaccines/GuidanceComplianceRegulatoryInformation/Post-MarketActivities/LotReleases/ucm220649.htm>

<sup>32</sup> Centers for Disease Control and Prevention. Prevention & Control of Influenza with Vaccines — 2010–11 Recommendations of the Advisory Committee on Immunization Practices. Available at:

[http://www.cdc.gov/mmwr/preview/mmwrhtml/rr59e0729a1.htm?s\\_cid=rr59e0729a1\\_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr59e0729a1.htm?s_cid=rr59e0729a1_w).

<sup>33</sup> Osterholm MT, Kelley NS, Sommer A & Belongia EA. Efficacy and Effectiveness of Influenza Vaccines: A Systematic Review and Meta-Analysis. *Lancet Inf Dis*. 2012; 12(1):36-44.

<sup>34</sup> Bridges CB, Thompson WW, Meltzer MI, et al. Effectiveness and cost-benefit of influenza vaccination of healthy working adults: a randomized controlled trial. *The Journal of the American Medical Association* 2000;284:1655--63.

<sup>35</sup> Heikkinen T, Ruuskanen O, Waris M, et al. Influenza vaccination in the prevention of acute otitis media in children. *American Journal of Diseases in Children* 1991;145:445-8.

<sup>36</sup> Jefferson TO, Rivetti D, Di Pietrantonj C, et al. Vaccines for preventing influenza in healthy adults. *Cochrane Database Syst Rev* 2007;CD001269

<sup>37</sup> Nichol KL, Lind A, Margolis KL, et al. The effectiveness of vaccination against influenza in healthy, working adults. *The New England Journal of Medicine* 1995;333:889-93.

<sup>38</sup> Nichol KL, Wuorenma J, von Sternberg T. Benefits of influenza vaccination for low-, intermediate-, and high-risk senior citizens. *Archives of Internal Medicine* 1998;158:1769-76.

<sup>39</sup> Mullooly JP, Bennett MD, Hornbrook MC, et al. Influenza vaccination programs for elderly persons: cost-effectiveness in a health maintenance organization. *Annals of Internal Medicine* 1994;121:947--52.

shown to reduce the frequency of secondary complications and reduce the risk for influenza-related hospitalizations and death for those with and without high-risk medical conditions such as heart disease or diabetes.<sup>41,42, 43,44</sup>

Some studies have suggested that the influenza vaccine can be up to 80% effective in preventing death from influenza for individuals 65 years of age and older living in nursing homes or other long-term care facilities.<sup>45,46</sup> Vaccination can also save healthcare dollars by decreasing workforce absenteeism and use of healthcare resources.<sup>47</sup>

The most common side effects associated with the inactivated influenza vaccine, administered as an injection, include soreness, redness, tenderness, and swelling at the injection site. These reactions are transient, generally lasting one to two days. Local reactions are reported in 15% to 20% of vaccinated individuals. Fever, malaise, allergic, and neurologic reactions occur rarely.<sup>48</sup>

Live attenuated influenza vaccine (LAIV), administered as a nasal spray, is recommended for healthy, non-pregnant adults younger than 50 years of age. The most common side effects reported include cough, runny nose, nasal congestion, sore throat, and chills. No serious adverse reactions have been identified in LAIV recipients.<sup>49</sup> To reduce the theoretical risk for vaccine virus transmission, ACIP and the HICPAC recommended that HCP who receive LAIV should avoid providing care for severely immunosuppressed patients requiring a protected environment for 7 days after vaccination, and hospital visitors who have received LAIV should avoid contact with severely immunosuppressed persons in protected environments for 7 days after vaccination but should not be restricted from visiting less severely immunosuppressed patients.<sup>50</sup>

## F. Cost-Effectiveness of Influenza Vaccination

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<sup>40</sup> Nichol KL, Nordin JD, Nelson DB, et al. Effectiveness of influenza vaccine in the community-dwelling elderly. *The New England Journal of Medicine* 2007;357:1373-81.

<sup>41</sup> Mullooly JP, Bennett MD, Hornbrook MC, et al. Influenza vaccination programs for elderly persons: cost-effectiveness in a health maintenance organization. *Annals of Internal Medicine* 1994;121:947-52.

<sup>42</sup> Nichol KL, Nordin JD, Nelson DB, et al. Effectiveness of influenza vaccine in the community-dwelling elderly. *The New England Journal of Medicine* 2007;357:1373-81.

<sup>43</sup> Hak E, Nordin J, Wei F, et al. Influence of high-risk medical conditions on the effectiveness of influenza vaccination among elderly members of 3 large managed-care organizations. *Clinical Infectious Diseases* 2002;35:370-7.

<sup>44</sup> Patriarca PA, Weber JA, Parker RA, et al. Risk factors for outbreaks of influenza in nursing homes. A case-control study. *American Journal of Epidemiology* 1986;124:114-9.

<sup>45</sup> Monto AS, Hornbuckle K, Ohmit SE. Influenza vaccine effectiveness among elderly nursing home residents: a cohort study. *American Journal of Epidemiology* 2001;154:155-60.

<sup>46</sup> Jefferson T, Rivetti D, Rivetti A, et al. Efficacy and effectiveness of influenza vaccines in elderly people: a systematic review. *Lancet* 2005;366:1165-74.

<sup>47</sup> Centers for Disease Control and Prevention. Flu Vaccine Effectiveness: Questions and Answers for Health Professionals. Available at: <http://www.cdc.gov/flu/professionals/vaccination/effectivenessqa.htm>

<sup>48</sup> Vellozzi C, Burwen DR, Dobardzic A, et al. Safety of trivalent inactivated influenza vaccines in adults: background for pandemic influenza vaccine safety monitoring. *Vaccine* 2009;27:2114-20.

<sup>49</sup> Belshe RB, Gruber WC, Mendelman PM, et al. Efficacy of vaccination with live attenuated, cold-adapted, trivalent, intranasal influenza virus vaccine against a variant (A/Sydney) not contained in the vaccine. *Journal of Pediatrics* 2000;136:168-75.

<sup>50</sup> CDC. Influenza vaccination of health-care personnel: recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2006;55(No. RR-2). Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5502a1.htm>

Influenza vaccination of adults has been shown to be cost-effective by reducing both direct medical costs and indirect costs from absenteeism. Several studies demonstrated that the vaccination of adults aged less than 65 years resulted in between 13% and 44% fewer healthcare provider visits, 18% and 45% fewer lost workdays, 18% and 28% fewer days working with reduced effectiveness, and a 25% decrease in antibiotic use.<sup>51,52</sup>

### **III. Addressing HCP Vaccination Rates**

Influenza vaccination coverage among HCP has been slowly increasing since the early 1990s. However, HCP influenza vaccination coverage remained well below the Healthy People 2010 target of 60% until 2009-2010, when coverage with seasonal influenza vaccine was estimated at 62%, which may be associated with the seasonal influenza vaccine being the only available vaccine at the time that the influenza pandemic began in 2009.<sup>53</sup> There are numerous factors that have been described as influences on HCP decisions to accept or decline influenza vaccination.

#### **A. Factors Influencing Individual HCP Acceptance of Influenza Vaccination**

Reported reasons for, and barriers to, HCP acceptance of influenza vaccinations include the following:<sup>54,55</sup>

*Reasons HCP report for accepting influenza vaccination:*

- Desire for self-protection;
- Desire to protect patients;
- Desire to protect family members;
- Previous receipt of influenza vaccine;
- Perceived effectiveness of the vaccine;
- Desire to avoid missing work;
- Peer recommendation;
- Personal physician recommendation;
- Strong worksite recommendation;
- Had influenza previously;
- Belief that receiving the vaccine is a professional responsibility;
- Access to vaccination/coverage;
- Vaccinations provided free of charge; and,

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<sup>51</sup> Bridges CB, Thompson WW, Meltzer MI, et al. Effectiveness and cost-benefit of influenza vaccination of healthy working adults: a randomized controlled trial. *The Journal of the American Medical Association* 2000; 284:1655-1663

<sup>52</sup> Demicheli V, Jefferson T, Rivetti D, Deeks J. Prevention of early treatment of influenza in healthy adults. *Vaccine* 2000; 18:957-1030.

<sup>53</sup> Centers for Disease Control and Prevention. Interim results: Influenza A (H1N1) 2009 and Monovalent Seasonal Influenza Vaccination Coverage Among Health-Care Personnel—United States August 2009- January 2010. *Morbidity and Mortality Weekly Report (MMWR)* 2010; 59:357-362. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5912a1.htm>

<sup>54</sup> Hollmeyer HG, Hayden F, Poland G, Bucholz U. Influenza vaccination of health care workers in hospitals—a review of studies on attitudes and predictors. *Vaccine* 2009; 19: 3935-3944.

<sup>55</sup> The Joint Commission. Providing a Safer Environment for Health Care Personnel and Patients Through Influenza Vaccination: Strategies from Research and Practice. [http://www.jointcommission.org/assets/1/18/Flu\\_Monograph.pdf](http://www.jointcommission.org/assets/1/18/Flu_Monograph.pdf)



- Belief that the benefits of vaccination outweigh the risk of side effects.

*Reasons HCP report for declining influenza vaccination:*

- Fear of contracting influenza/influenza-like illness from the vaccine;
- Fear of vaccine side effects;
- Perceived ineffectiveness of the vaccine;
- Perceived low or no likelihood of developing influenza;
- Fear of needles;
- Insufficient time, inconvenience, or forgetting to get the vaccination;
- Reliance on homeopathic treatments;
- Belief that their own host defenses would prevent influenza;
- Lack of physician recommendation;
- Belief that other preventive measures would minimize or eliminate influenza risk;
- Belief that influenza is not a serious disease;
- Lack of free vaccinations; and,
- Belief that the vaccine is not necessary for individuals younger than 65 years of age.

## B. Strategies for Improving HCP Vaccination Rates

Employers of HCP should use evidence-based approaches to maximize vaccination rates. In general, multi-component interventions are shown to be the most effective, especially when HCP influenza vaccination is perceived to be a facility leadership priority and sufficient resources are made available to support the intervention.<sup>56</sup> The following strategies are recommended by ACIP and HICPAC.<sup>57</sup>

### *Education and Campaigns*

- Educational programs that emphasize the benefits of HCP vaccination for staff and patients; and,
- Organized campaigns that promote vaccination, using a variety of media including emails, newsletters, posters, wearable stickers, and other modalities.

### *Role Models*

- Vaccination of senior medical staff, hospital executives, or opinion leaders.

### *Improved Access*

- Making vaccine readily available at congregate areas (e.g., clinics), during conferences, or use of mobile carts;
- Making vaccine available on all work shifts;

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<sup>56</sup> Hirsch P, Davey V, Hodgson M. Influenza vaccination in health care: results of a 4-year campaign. *Infect Control Hosp Epidemiol* 2011;32:444-8

<sup>57</sup> Centers for Disease Control and Prevention. Influenza vaccination of health-care personnel: recommendations of the Health-Care Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP). *Morbidity and Mortality Weekly Report (MMWR)* 2006; 55:1-16. Available at: <http://www.cdc.gov/mmwr/pdf/rr/rr5502.pdf>

- Provision of incentives; and,
- Provision of vaccine at no charge.

#### *Measurement and Feedback*

- Posting of vaccination coverage levels in different areas of a healthcare facility;
- Monitoring vaccination coverage by facility area (e.g., ward or unit) or occupational group;
- Use of HCP influenza vaccination coverage as a healthcare quality measure in states that mandate public reporting of HAIs; and,
- Use of signed declination statements from HCP who refuse vaccination.

#### *Legislation and Regulation*

- Nine states (CA, IL, ME, MD, MA, NE, OK, RI, and TN) have “offer” laws for influenza vaccination of HCP, meaning that vaccine must be offered to HCP by healthcare facilities, though individual HCP may decline vaccination;<sup>58</sup>
- Two states (Alabama and New Hampshire) have “ensure” laws for influenza vaccination of HCP, meaning that vaccination of non-immune HCP is mandatory in the absence of a specified exemption or refusal; and,
- Additionally, numerous hospitals and other healthcare facilities have established policies requiring mandatory influenza vaccination of their HCP.<sup>59</sup>

Although mandatory influenza vaccination for HCP has been successfully implemented in numerous facilities, there are ethical and legal considerations with this approach.<sup>60</sup>

The HAI Increasing Influenza Vaccination Coverage Among Healthcare Personnel Working Group was formed in 2009 to address the apparent failure to achieve the Healthy People 2010 target for influenza vaccination of HCP. Subsequently, interim results have reported that an estimated 62% coverage of HCP with seasonal influenza vaccine,<sup>61</sup> suggesting that the 2010 target may have been met. Nevertheless, the Working Group can play an important role in helping to promote increased influenza vaccination of HCP to help achieve the Healthy People 2020 target of 90% coverage.

Working Group tasks include:

- Develop, synthesize, and or enhance evidence and tools for improving influenza vaccination of HCP;
- Enroll stakeholders in the initiative to improve influenza vaccination coverage among HCP; and,

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<sup>58</sup> This information was last updated September 2011. For additional information as well as any updated information on state influenza immunization laws for HCP, please see:

<http://www2a.cdc.gov/nip/StateVaccApp/statevaccsApp/AdministrationbyVaccine.asp?Vaccinetmp=Influenza>

<sup>59</sup> For additional information regarding healthcare facilities’ influenza vaccine policies, please see:

<http://www.immunize.org/honor%2Droll/>

<sup>60</sup> The Joint Commission. Providing a Safer Environment for Health Care Personnel and Patients Through Influenza Vaccination: Strategies from Research and Practice. [http://www.jointcommission.org/assets/1/18/Flu\\_Monograph.pdf](http://www.jointcommission.org/assets/1/18/Flu_Monograph.pdf)

<sup>61</sup> Centers for Disease Control and Prevention. Interim results: Influenza A (H1N1) 2009 and Monovalent Seasonal Influenza Vaccination Coverage Among Health-Care Personnel—United States August 2009- January 2010. *Morbidity and Mortality Weekly Report (MMWR)* 2010; 59:357-362. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5912a1.htm>

- Enhance and/or develop quality standards for influenza vaccination of HCP.

By implementing the above activities and the inaugural project discussed later in this chapter, the Working Group aims to not only increase awareness of the importance of influenza vaccination for HCP and patients, but also to make progress toward meeting the national Healthy People 2020 target of 90% for influenza vaccination coverage of HCP.

#### **IV. Measurement of Influenza Vaccination among Healthcare Personnel**

The National Health Interview Survey (NHIS) is the primary data source for national influenza vaccination coverage estimates for HCP. NHIS has been used to track progress toward the Healthy People 2010, target for influenza vaccine coverage goals for HCP, and will continue to track vaccination rates for Healthy People 2020. The NHIS—a nationally representative survey of the civilian non-institutionalized household population of the United States, conducted throughout the year from January through December—uses in-person interviews to collect information on health and healthcare for all eligible members of the sampled households. Information on adult vaccinations is self-reported by one randomly sampled adult within a family, except in rare cases when the selected adult is physically or mentally incapable of responding. Results from the in-person interviews are published annually in the National Center for Health Statistics Health E-Stat.<sup>62</sup>

Because of NHIS methods, data are reliable but cannot be available in real-time during in influenza season. For this reason, during the 2009-2010 influenza vaccination campaign, CDC used both NHIS and a nationally representative internet panel survey of HCP to assess influenza vaccination coverage. Interim results from the internet panel surveys have been published in the *Morbidity and Mortality Weekly Report (MMWR)*.<sup>63</sup> Two national sample surveys of healthcare personnel will supplement NHIS data in the 2010-2011 influenza season.

Another data system, which will be used to assess influenza vaccination coverage of healthcare personnel at the hospital level, is CDC's National Healthcare Safety Network (NHSN), a web-based surveillance system. In August, 2011, Centers for Medicare & Medicaid Services (CMS) published a final rule requiring acute care hospitals to report HCP influenza vaccination rates through CDC's NHSN system using the measure as endorsed by the National Quality Forum (NQF), as part of the Hospital Inpatient Quality Reporting (IQR) Program, starting January 2013<sup>64</sup>. For this reporting program, acute care hospitals are subject to a 2% payment reduction if they fail to report required quality measures. Quality data reported through the Hospital IQR Program are made publicly available on the HospitalCompare.gov website.

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<sup>62</sup> Available at [http://www.cdc.gov/nchs/data/hestat/vaccine\\_coverage/vaccine\\_coverage.htm](http://www.cdc.gov/nchs/data/hestat/vaccine_coverage/vaccine_coverage.htm)

<sup>63</sup> Centers for Disease Control and Prevention. Interim results: Influenza A (H1N1) 2009 and Monovalent Seasonal Influenza Vaccination Coverage Among Health-Care Personnel—United States August 2009- January 2010. *Morbidity and Mortality Weekly Report (MMWR)* 2010; 59:357-362. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5912a1.htm>

<sup>64</sup> <http://www.gpo.gov/fdsys/pkg/FR-2011-08-18/pdf/2011-19719.pdf>

The measure under consideration for NQF endorsement<sup>65</sup> (NQF #0431) describes three categories of HCP who have worked or will be working 30 days or more during the influenza season: 1. Employees (personnel who receive a direct paycheck from the healthcare facility); 2. Licensed independent practitioners (physicians [MD, DO, MBBS], advanced practice nurses, and physician assistants who work at, but are not directly employed by, the healthcare facility); and 3. Adult students/trainees and volunteers (medical, nursing, or other health professional students, interns, medical residents, or volunteers aged 18 or older who work at, but are not directly employed by, the healthcare facility). CMS IQR will utilize the NQF-endorsed measure for their required influenza vaccination coverage reporting.

Influenza vaccination data submitted to CDC and CMS will ultimately capture regional trends on the yearly uptake of the vaccine, prophylaxis and treatment for healthcare personnel, and may be able to identify elements within yearly influenza campaigns that succeed or require improvement. Data may be further stratified by occupational groups, or facility type and size.

## **V. Coordination of Efforts: Interagency Working Group**

The U.S. Department of Health and Human Services (HHS) is strategically positioned to catalyze multi-agency integration efforts and foster close collaboration with other public entities and private sector organizations that have a stake in increasing influenza vaccination of HCP. This work depends on Department-wide collaborations which will be supported by this group. Representatives from CDC, CMS, FDA, NIH, Agency for Healthcare Research and Quality, Indian Health Service, the U.S. Department of Veterans Affairs, Occupational Safety and Health Administration (OSHA), and the Office of the Assistant Secretary for Health (OASH) in the Office of the Secretary, serve as members of this group. The working group will coordinate efforts with the Healthy People 2020 program to measure progress towards the interim HCP influenza vaccination target of 70% for 2015, as well as the HP 2020 target of 90%. HHS will continue to request that agencies monitor and report HCP influenza vaccine coverage. This will help inform efforts to align data collection systems that track immunization rates across agencies and encourage collaboration across those agencies. To identify a strategic communications strategy will continue to be priorities for this group. Initial surveys of ongoing efforts across HHS agencies allowed the Working Group to identify initial focus areas, described below.

## **VI. Working Group Goals and Tasks**

### **A. Develop, Synthesize and/or Enhance Evidence and Tools for Improving Influenza Vaccination of HCP**

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<sup>65</sup> <http://www.qualityforum.org/MeasureDetails.aspx?actid=0&SubmissionId=511#k=0431>

Many successful strategies are available for implementing influenza vaccination programs for HCP, as previously described. Toolkits can provide convenient compilations of these rationales and strategies, and provide posters and other materials to implement HCP influenza vaccination programs. Some of these include:

- Seasonal Influenza Vaccination Resources for Health Professionals;<sup>66</sup>
- American Medical Directors Association toolkit “Immunizations in the Long Term Care Setting”;<sup>67</sup>
- Association for Professionals in Infection Control and Epidemiology (APIC) “Protect your Patients, Protect Yourself”;<sup>68</sup>
- The National Foundation for Infectious Diseases Report on Best Practices, “Immunizing Healthcare Personnel against Influenza”<sup>69</sup>
- The Joint Commission’s monograph, “Providing a Safer Environment for Health Care Personnel and Patients through Influenza Vaccination: Strategies from Research and Practice”;<sup>70</sup> and,
- Many others described by the National Influenza Vaccine Summit.<sup>71</sup>

To assure the most recent data and resources are available for HCP and their supervisors for the implementation of influenza vaccination programs, the Working Group will execute the tasks below.

#### Working Group Tasks:

- Review available evidence for impact of HCP influenza vaccination, including impact on health outcomes for HCP and patients. Weigh benefits against costs and any possible harms. Identify specific settings with patient populations at highest risk of influenza-related mortality (e.g., infants, older persons, persons with respiratory illnesses), where vaccination of HCP would potentially provide the greatest benefit and review evidence for balance, documenting benefits and possible harms for patients and HCP in those settings.
- Review available evidence on the factors that affect HCP vaccination, as well as evidence-based strategies and best practices to increase vaccination rates. These include but are not limited to: recommendations or policies from medical and health organizations, state laws, improving access, educational efforts, employment mandates, and declination forms.
- Identify gaps in current knowledge about reasons HCP receive and decline influenza vaccination, and approaches to fill these gaps.

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<sup>66</sup> <http://www.cdc.gov/flu/professionals/vaccination/index.htm>

<sup>67</sup> <http://www.amda.com/resources/whatsnew2006.cfm#toolkit>

<sup>68</sup> [http://www.apic.org/Content/NavigationMenu/PracticeGuidance/Topics/Influenza/toolkit\\_contents.htm](http://www.apic.org/Content/NavigationMenu/PracticeGuidance/Topics/Influenza/toolkit_contents.htm)

<sup>69</sup> <http://www.nfid.org/HCWtoolkit/report.html>

<sup>70</sup> [http://www.jointcommission.org/assets/1/18/Flu\\_Monograph.pdf](http://www.jointcommission.org/assets/1/18/Flu_Monograph.pdf)

<sup>71</sup> [http://www.preventinfluenza.org/profs\\_workers.asp](http://www.preventinfluenza.org/profs_workers.asp)

- Examine the potential impacts policy changes, such as mandating that influenza vaccination be offered or performed, may have on influenza vaccination coverage for HCP.
- Align data collection systems that track immunization rates across and within agencies.
- Create and widely disseminate authoritative guidance, toolkits, and other materials for implementing evidence-based strategies to increase HCP vaccination rates.

### B. Enroll Stakeholders in the Initiative

It is important to enroll a wide range of stakeholders, including healthcare-affiliated organizations, unions and collective bargaining units, and federal, state, and local health departments to garner support for increasing HCP influenza vaccination and to provide a mechanism to share ideas and opinions and promote adoption of best practices.

Professional organizations without an explicit policy concerning influenza vaccination of HCP should be encouraged to develop a written policy supporting influenza vaccination of HCP. Many organizations, such as the American Nurses Association<sup>72</sup> and the American Medical Association,<sup>73</sup> currently recommend voluntary HCP vaccination. Several professional organizations, such as the American College of Physicians,<sup>74</sup> the Infectious Diseases Society of America,<sup>75</sup> and APIC<sup>76</sup> have put forth policy statements recommending mandatory influenza vaccination of HCP. Concerns of stakeholders potentially impacted by mandatory vaccination policies will need to be sought out and considered by the Working Group.<sup>77</sup>

### C. Enhance and/or Develop Quality Standards for Influenza Vaccination of HCP

Two CDC advisory committees, ACIP and HICPAC, recommend that all HCP be vaccinated against influenza on an annual basis. In 2006, The Joint Commission required that hospitals and long-term care facilities seeking accreditation establish a program to educate about and provide influenza vaccination to HCP. In recognition of this, HHS will continue to monitor HCP influenza vaccination across federal agencies to help inform efforts to develop standards for HCP influenza vaccination. It did not, however, go so far as to require mandatory influenza vaccination of HCP. While

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<sup>72</sup> American Nurses Association: Report to the Board of Directors on Seasonal Influenza Vaccination for Registered Nurses: <http://www.preventinfluenza.org/ANAonHCW.pdf>

<sup>73</sup> American Medical Association: Policy H-440.973, Immunization of Adults: <https://ssl3.ama-assn.org/apps/ecom/PolicyFinderForm.pl?site=www.ama-assn.org&uri=/ama1/pub/upload/mm/PolicyFinder/policyfiles/HnE/H-440.973.HTM>

<sup>74</sup> American College of Physicians: American College of Physicians Recommends Flu Vaccination for Health Care Workers: <http://www.acponline.org/pressroom/hcw.htm>

<sup>75</sup> Infectious Diseases Society of America: Pandemic and Seasonal Influenza: <http://www.idsociety.org/influenza.htm>

<sup>76</sup> Greene LR, Cain TA, Dolan SA et al. APIC position paper: influenza immunization of healthcare personnel. Association of Professionals in Infection Control (APIC). November 2008. [http://www.apic.org/Content/NavigationMenu/PracticeGuidance/Topics/Influenza/APIC\\_Position\\_Paper\\_Influenza\\_11\\_7\\_08final\\_revised.pdf](http://www.apic.org/Content/NavigationMenu/PracticeGuidance/Topics/Influenza/APIC_Position_Paper_Influenza_11_7_08final_revised.pdf)

<sup>77</sup> American College of Occupational and Environmental Medicine (ACOEM). Position Statement: Seasonal Influenza Prevention in Health Care Workers. 2006: <http://www.acoem.org/guidelines.aspx?id=5362>

OSHA has a Bloodborne Pathogens standard (§1910.1030) which includes hepatitis B vaccination for HCP as part of a worker safety regulation, they do not have a comprehensive standard that addresses occupational exposure to contact-, droplet-, and airborne-transmissible diseases. OSHA does not currently include any vaccination besides hepatitis B as part of their worker safety regulation. A recent Request for Information released by OSHA includes a section on “Vaccination and Post Exposure Prophylaxis” to explore the potential inclusion of other vaccines recommended for HCP, such as influenza, measles, mumps, & rubella or MMR, varicella, tetanus, diphtheria, pertussis, or Tdap, and meningococcal as part of their worker safety regulations.<sup>78</sup>

To increase the reach of quality standards for influenza vaccination of HCP, other steps that are being taken include:

1. The Joint Commission expanding their influenza vaccination performance standard IC.02.04.01 to:
  - Extend the standards for HCP influenza vaccination to outpatient and other healthcare settings;
  - Establish a performance measure for the percent of HCP vaccinated against influenza; and,
  - Establish a specific target for the percentage of HCP to be vaccinated against influenza.
2. CDC partnering with CMS’ Division of Hospital & Medication Measures, Quality Measures and Health Assessment Group, Office of Clinical Standards and Quality to develop and pilot test the NQF time-limited influenza vaccination measure in 234 facilities, including acute care hospitals, ambulatory surgical centers, long-term care facilities, outpatient physician practices, and renal dialysis centers. The pilot test was completed in 2011 and the revised measure is currently being reviewed by NQF.
  - a. CMS:
    - i. Is responsible for IQR.
    - ii. Published a Rule in August 2011 requiring hospital reporting of HCP influenza vaccination coverage following NQF standards, starting in January 2013, for posting on the Hospital Compare website.
  - b. CDC
    - i. Established a steering committee with representatives from CMS, the Joint Commission, and the Hospital Quality Alliance to provide guidance during the pilot of the NQF measure;
    - ii. Developed methods to collect aggregate hospital-specific and state-wide coverage levels in acute care facilities using NHSN;

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<sup>78</sup> Department of Labor, Occupational Safety and Health Administration. Infectious diseases: request for information. Federal Register 75(87): 24835-24844. May 6, 2010. Available at: [http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=FEDERAL\\_REGISTER&p\\_id=21497](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=FEDERAL_REGISTER&p_id=21497)

- iii. Identified how the data reported by acute care hospitals will be transmitted to CDC and CMS;
- iv. Revised the proposed NQF measure after pilot testing, and presented the revised measure to NQF; and
- v. Developed an analysis plan for the data to support permanent endorsement by NQF.

The Working Group suggests an interim target of 70% influenza vaccination coverage for HCP by 2015,<sup>79</sup> to mark progress toward the proposed Healthy People target of 90% by 2020.<sup>80</sup>

## **VII. Working Group Projects**

### **A. Inaugural Project**

The Working Group undertook an Inaugural Project that addressed Goal/Task A — to develop, synthesize, and/or enhance evidence and tools for improving influenza vaccination of HCP. The purpose of the project was to examine the effect that various policy changes may have on influenza vaccination coverage for HCP. The intended outcome of the project is to have a comprehensive report that identifies existing policies in each State, allowing for comparisons between and among States. Collaborations with state and local policymakers, facility leadership, workforce representatives, professional associations, patient advocates, and others was an integral component of this project and will address Goal/Task B — to enroll stakeholders in the initiative.

Initially, the project developed educational materials intended to encourage voluntary influenza vaccination of all HCP. Once reviewed by federal and state partners, the materials will be disseminated to stakeholders interested in increasing influenza vaccination coverage rates of HCP. The materials include a common definition of “healthcare personnel,” describe the strategies that facilities have implemented to encourage voluntary vaccination, and outline the current coverage rates among HCP. The materials also include a review of evidence-based practice of seasonal influenza vaccination of HCP as it relates to transmission of illness to patients (Goal/Task A) and summarize the literature that addresses the relationship between influenza vaccination of HCP and influenza disease rates among patients.

The project also reviewed the legal environment surrounding requirements for influenza vaccination of HCPs, such as requirements for employers to offer vaccination to HCP, to obtain declination forms from those HCP who decline vaccination, or to mandate vaccination. Federal and state laws, individual facilities’ policies, and judicial decisions were reviewed. The findings of the environmental scan are outlined below:

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<sup>79</sup> Influenza Vaccination of Healthcare Personnel Working Group Meeting Notes, meeting of June 4, 2010

<sup>80</sup> This recommendation assumes adequate vaccination supply to cover healthcare personnel. However, we note that while vaccine supply has historically impacted the rates of vaccination in the general population, healthcare personnel are considered to be priority candidates for vaccination. See ACIP recommendations: [http://www.cdc.gov/flu/professionals/acip/flu\\_vax1011.htm#box1](http://www.cdc.gov/flu/professionals/acip/flu_vax1011.htm#box1)



- Twenty states have enacted laws that address mandatory influenza vaccination of certain categories of the health workforce.
- All the laws define the category of HCP governed by the law; however, not all states (n=14) have adopted a broad definition of HCP.
- All the laws define the health care employer that must comply with the law; although few states have included both acute care hospitals and residential care facilities (n=11 long-term care only; n=5 acute care only; n=4 both)
- More than half (n=16) of the laws require employers to “provide,” “arrange for,” “ensure,” or “offer” influenza vaccinations to HCPs.
- Most of the laws (n=15) require health care employers to allow HCPs to decline vaccination by signing a declination statement, showing the existence of a medical contraindication, or declaring that the vaccination conflicts with a religious belief.
- Few states (n=5) address how health care employers must manage the cost of vaccine purchase and administration.
- One state discusses how to treat HCPs who do not comply with the vaccination requirement.
- Half of the laws (n=10) require health care employers to use the CDC/ACIP standards as the defined standard of care when administering influenza vaccine.

Federal and state partners will be asked to review all materials, develop consensus, and make recommendations. Once this is complete, the inaugural project will disseminate authoritative, evidence-based recommendations and promotional materials for influenza vaccination of HCP.

#### B. Year Two Project

The second year project of the Working Group will focus on increasing the influenza vaccination coverage of HCP in long-term care. This project will address Goal/Task A through the development of long-term care specific tools and messages. The project is comprised of two parts: first collecting feedback from the long-term care community through a meeting which was held in Washington, DC in September 2011. This meeting brought together national stakeholders in long-term care, along with staff from local long-term care facilities, adult day care centers and home health agencies. The meeting discussed barriers to influenza vaccination of HCP in long-term care, current strategies to address these barriers and what support HHS could provide to those working in long-term care to increase influenza vaccination rates. Second, the Working Group will use the input gathered at this meeting to construct a toolkit and messaging; these materials will be distributed to long-term care providers during the 2011-2012 and 2012-2013 influenza seasons.

### **VIII. Research Gaps**

Key gaps still remain in research related the vaccination of healthcare personnel. In particular, additional epidemiologic studies are needed to improve understanding of the

link between the influenza vaccine coverage among HCP and influenza rates in facilities. Additional implementation science is also needed to better define the reasons for HCP receiving or declining the vaccine in order to develop more targeted approaches to fill these gaps. In particular, the potential role of vaccination mandates for health care worker vaccination to achieve high coverage should be explored, and as CMS reporting requirements are implemented, to assess the impact of these requirements on vaccine uptake.

## **IX. Challenges and Opportunities**

Continuing to increase influenza vaccination coverage among HCP will be a challenge requiring the Working Group to identify and work with all influential partners and stakeholders. The Healthy People 2020 national target of 90% coverage is aspirational, and will only be achieved with significant commitment from and effort by numerous stakeholders.

Additionally, rates of vaccination vary across groups and settings. For example, estimated vaccination coverage among physicians and nurses was above 60% in 2009-2010, while coverage among all other types of HCP was less than 50%. Coverage among HCP working in hospitals in 2007-2008 was over 60%, while coverage for HCP in long-term care facilities was well below 50%; though data from a CDC internet panel survey for 2010-2011 has shown this gap to have closed.<sup>81,82</sup> Controversy remains between employers and employees regarding strategies to increase vaccination rates, particularly regarding employer mandates. Based on a careful and comprehensive review of the existing evidence and with stakeholder input, the Working Group will generate recommendations about the usefulness for individual healthcare facilities to tailor strategies to their setting, workforce, and region.

Finally, the definition of HCP is still not standardized, allowing variations regarding for whom influenza vaccine would be recommended or mandated in different settings and different institutions. Several organizations such as the National Foundation for Infectious Diseases, The Joint Commission, the Society for Healthcare Epidemiology of America, and HICPAC have all recommended measurement of vaccination rates as an important component of healthcare facility influenza vaccination programs.<sup>83,84,85</sup> A

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<sup>81</sup> Strikas R, Euler G, Singleton J. Disparities in influenza vaccination rates among healthcare personnel, United States, 2007-08. March 22, 2010. Fifth Decennial International Conference on Healthcare-associated Infections, Atlanta, Georgia.

<sup>82</sup> CDC. Influenza Vaccination Coverage Among Health-Care Personnel – United States, 2010-2011 Influenza Season. *MMWR*. 2011; 60(32):1073-1077

<sup>83</sup> Pearson ML, Bridges CB, Harper SA: Influenza vaccination of health-care personnel: Recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP). *Morbidity and Mortality Weekly Report (MMWR)* 2006; 55:1-16. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5502a1.htm>

<sup>84</sup> Fiore AE, Uyeki T, Broder K, Finelli L, Euler G, et al. Prevention & Control of Influenza with Vaccines - Recommendations of the Advisory Committee on Immunization Practices (ACIP) 2010. *Morbidity and Mortality Weekly Report (MMWR)* 2010; 59(RR08):1-62.

<sup>85</sup> Improving influenza vaccination rates in health care workers: strategies to increase protection for workers and patients. National Foundation for Infectious Diseases 2004. Available at: <http://www.nfid.org/pdf/publications/hcwmnograph.pdf>

major opportunity for improvement in HCP vaccination coverage can be achieved through a standardized, comprehensive measurement system for tracking that coverage.

However implementing such a measurement system presents several challenges. A recent study conducted by Lindley et al.<sup>86</sup> found substantial variation in measurement practices among hospitals surveyed. They found that more than one-third of responding hospitals excluded certain HCP groups, such as contract staff, attending physicians, volunteers, students, and/or residents, in their influenza vaccination coverage measurements, although all of these groups are included in the ACIP/HICPAC definition of HCP. A standard definition of which groups should be included when assessing influenza vaccination coverage in healthcare facilities is needed to enable comparisons between and among different types of healthcare facilities. The final NQF-endorsed measure and CMS Rule should bring some standardization to measurement for acute care hospitals to whom the Rule currently applies; this standard may be adopted in other settings as well. With the new NQF measure and CMS reporting rule for HCP influenza vaccination coverage in acute care hospitals, new ground is being broken in working toward the HP2020 coverage goals.

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<sup>86</sup> Lindley MC, Yonek J, Ahmed F, Perz JF, Torres GW. Measurement of Influenza Vaccination Coverage among Healthcare Personnel in US Hospitals. *Infection Control and Hospital Epidemiology* 2010; 30: 150-157