



Vaccination policies for healthcare workers in Europe



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ARTICLE INFO

Article history:

Available online 23 October 2013

Keywords:

Vaccination
Healthcare workers
Policies
Mandatory
Europe

ABSTRACT

Health-care workers (HCWs) are at increased risk for acquisition of vaccine-preventable diseases (VPDs) and vaccination is justified in order to protect them from occupational exposure and to prevent the spread of VPDs that pose a threat to susceptible patients. Review of European vaccination policies for HCWs revealed significant differences between countries in terms of recommended vaccines, implementation frame (mandatory or recommendation), target HCW groups and health-care settings. Further, the few published studies available identified indicate significant immunity gaps among HCWs against VPDs in Europe. In order to achieve higher vaccination coverage against VPDs stronger recommendations are needed. The issue of mandatory vaccination should be considered for diseases that can be transmitted to susceptible patients (influenza, measles, mumps, rubella, hepatitis B, pertussis, varicella). The acceptance of vaccinations and of mandatory vaccinations by HCWs is a challenge and appears to be VPD-specific.

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Κάλλιον το προλαμβάνειν ἢ τοθεραπεύειν.
Prevention is better than cure.
Hippocrates, Greek physician (460–377 BC)

1. Introduction

Public health policies refer to decisions, plans, and actions that are implemented in order to protect or improve the health of entire populations. In this frame, the wide implementation of childhood vaccinations during the second half of the 20th century has been one of the most successful public health policies in history, leading to the control or elimination of multiple infectious diseases [1]. Nevertheless, large epidemics of vaccine-preventable diseases (VPDs) still occur even in countries with long term-established vaccination programs, like measles epidemics in Europe and pertussis in the United States [2,3]. Not unexpectedly, health-care facilities also experience outbreaks due to VPDs, often in association with serious morbidity and even mortality among patients, disruption of health-care services, and high costs [4–10]. Susceptible health-care workers (HCWs) are at increased risk for acquisition of VPDs and at the same time may act as vehicles for the evolution of outbreaks in health-care facilities. In this context, vaccination of HCWs is justified not only by the need to protect them from

occupational exposure, but also to protect their patients, who may not develop a satisfactory immune response after they get vaccinated (e.g. immunocompromised persons), may not be eligible for vaccination (e.g. influenza vaccines are not licensed for infants <6 months old), or may be unvaccinated because of missed opportunities or anti-vaccination opinions [11]. Herein we review current vaccination policies for HCWs in Europe, focusing on measles and influenza as prototype VPDs for discussion.

2. The measles paradigm

Almost four decades after the introduction of measles vaccine in childhood vaccination programs in Europe, Europe is experiencing a decade of large-scale measles epidemics in several countries [12–16], with more than 20,000 cases and 6 related deaths notified in 34 countries of the World Health Organization European Region during the first half of 2013 alone [2]. Cases mainly involve unvaccinated persons of various backgrounds, namely Roma, religious or anthroposophic communities, unvaccinated infants (the first measles–mumps–rubella (MMR) dose is routinely given at the age of ≥ 12 months), and children and young adults whose parents had refused their routine vaccination in the past because of concerns about the safety of the MMR vaccine [17].

Nosocomial transmission and outbreaks of measles have been increasingly reported in Europe over the past years [9,18–22]. Measles is highly contagious and the generation of additional cases is facilitated by the fact that the diagnosis may be missed early because transmission may occur before rash eruption or because young physicians may not be familiar with measles. Thus,

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health-care facilities emerge as important areas for acquisition of infection, especially in countries where elimination of measles has been declared [8,9,18,23,24]. Moreover, outbreak investigations require considerable work and resources. In a health-care associated outbreak of measles that occurred in the United States in 2008, costs to contain 7 cases of measles and trace and investigate 8231 contacts in two hospitals reached US\$ 800,000 [8].

There is insufficient information on susceptibility to measles among HCWs in Europe. Measles susceptibility rates of HCWs in France, Greece, Italy, and Spain range from 6% to 17% in recent studies [22,25–31]; even higher susceptibility rates (15–23%) have been reported among medical students in Switzerland and Germany [32,33]. Most of these studies were conducted in individual hospitals and thus may not accurately reflect the population of HCWs immunity status across Europe. Nevertheless, they provide evidence that there are immunity gaps in HCWs in Europe which may facilitate measles outbreaks in health-care settings. Once infected, HCWs are at increased risk for serious morbidity, since complications occur more often during adulthood compared to school age [34]. HCWs with unsuspected measles may also expose their patients. Measles could be detrimental and cause severe complications or even death in immunocompromised patients and young infants, for whom the MMR vaccine either is contraindicated or not delivered [34].

Despite the resurgence of measles in Europe the past decade, currently there is no standard policy for HCW vaccination against measles in this continent [35]. With the exception of Finland where measles vaccination is mandatory for HCWs, in 14 countries (Austria, Belgium, Cyprus, France, Germany, Ireland, Italy, Lithuania, Luxembourg, Malta, Russia, Spain, Switzerland, and United Kingdom) policies pertaining to measles vaccination of all or specific categories of HCWs are voluntary; there were no vaccination policies for HCWs against measles in place in 15 European countries as of 2011 [35]. Since then, four additional countries (Estonia, Greece, Norway and The Netherlands) have issued recommendations for HCWs vaccination against measles.

Ideally, vaccines with decades' long-standing history of incorporation into routine pediatric vaccination programs in countries with efficient vaccine delivery systems should predict high vaccination coverage among HCWs. However, this is not the case for the MMR vaccine in Europe. Even in countries where recommendations for HCW vaccination against measles exist for several years (e.g. France), measles vaccine uptake by HCWs is unsatisfactory [22,30,31]. Unknown vaccination status is also frequent among HCWs [9,19,22]. A recent survey in 30 French hospitals found that only 59% of occupational physicians and 31% of chairmen of the hospital infection prevention and control committees were aware of the vaccination status of HCWs against measles in their institutions, while 17% stated that they never mentioned measles vaccination to HCWs, despite the fact that they had managed a measles outbreak in the past [36].

A recent review of 28 articles from Western Europe reporting the knowledge, attitudes and practices of HCWs about measles and MMR vaccination revealed gaps in knowledge in terms of vaccination schedules, benefits and side effects; further, inadequate knowledge among HCWs was associated with decreased vaccination coverage in the public [37]. The reasons for suboptimal vaccination rates against measles among HCWs in Europe have not been studied so far; it would be interesting to compare them with those recorded among the general public.

3. The influenza paradigm

Of all vaccines, influenza vaccines have two characteristics which render them far from ideal, namely their moderate effectiveness which may vary by influenza season [38] and the requirement

for annual administration. Nevertheless, influenza vaccination is the only massively available and easily applied means for protection against a disease which is the leading cause of VPD-associated morbidity and death in developed countries; approximately 40,000 deaths are associated with influenza in the European Union (EU) each year, while the number of the respective deaths range from 3000 to 49,000 people in the United States from the 1976–1977 to the 2006–2007 influenza season [39–41]. The rationale for HCW vaccination against influenza is to not only protect HCWs and to prevent disruption of medical services by HCW absenteeism, but also to indirectly protect vulnerable patients from contracting influenza [42]. This and presenteeism are of importance given that patients who are at increased risk for serious morbidity or a fatal outcome, namely patients with underlying conditions and patients >65 years old [39], use health-care services very often and their ability to respond to vaccines is suboptimal. Neonates and young infants admitted in neonatal units are also at increased risk in case of nosocomial influenza [43]. Evidence indicates that HCWs have a significant role in starting and continuing nosocomial influenza outbreaks [43,44]. A meta-analysis of influenza incidence in HCWs and adults working in non-health-care settings found that HCWs are at significantly higher risk for influenza infection compared with non-HCWs [45]. In addition, a systematic analysis of published outbreaks demonstrated a 38.5% total closure rate of a department in an influenza nosocomial outbreak setting [46]. The emergence of influenza viruses resistant to antiviral agents over the past decade further strengthens the role of vaccination as a forefront measure for the prevention of nosocomial influenza [47].

Annual vaccination of HCWs against seasonal influenza is recommended in 29 of 30 European countries (Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Portugal, Rumania, Russia, Slovakia, Slovenia, Spain, Switzerland, The Netherlands, United Kingdom); in Sweden there are no official recommendations for HCW vaccination [35].

Despite the fact that recommendations for HCW vaccination have been in place for almost 3 decades, voluntary policies have failed to achieve and sustain high vaccine uptake rates. In Europe influenza vaccination coverage of HCWs rarely exceeds 40% [48]. Barriers to getting vaccinated against influenza have been well studied and include among others a low perceived risk from influenza and misconceptions about vaccine safety and effectiveness [48]. Vaccine delivery on-site and free-of-charge and use of mobile teams have been associated with increased uptake rates among HCWs [48]. Gaps in HCW knowledge about influenza vaccine may impact communication to their patients and thus vaccine uptake by them, as HCWs have a dual role serving both as models for their patients but are also directly involved in their vaccination [49]. During the 2009 H1N1 pandemic, uptake of the pandemic monovalent vaccines by HCWs emerged as a major public health issue in many countries, mainly because of safety concerns [49]. It is possible that the negative attitude of HCWs toward pandemic vaccine had a negative impact on the vaccination coverage of the general public and the course of the pandemic per se. On the other hand, the 2009 pandemic accelerated the introduction of mandatory influenza vaccination of HCWs in the United States with very high vaccine uptake [50–52]. A monograph on strategies for implementing successful influenza vaccination campaigns for HCWs was published recently [53].

4. Vaccination policies for HCWs in European countries

Table 1 shows the vaccination policies for HCWs in 30 European countries, including all (27) EU Member States, as of 2011. Significant country-to-country differences exist in terms of vaccines,

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