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Influenza vaccination among Saudi Hajj pilgrims: Revealing the uptake and vaccination barriers

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ABSTRACT

Background: Hajj is the world's largest annual mass gathering that attracts two to three million Muslims from around the globe to a religious assemblage in Makkah, Saudi Arabia. The risk of acquisition and transmission of influenza among Hajj pilgrims is high. Therefore, influenza vaccination is recommended, and was monitored frequently among pilgrims from different countries. However, the vaccination uptake among Saudi pilgrims has not been assessed in recent years.

Objective: This analysis aims to evaluate influenza vaccine uptake among Saudi Hajj pilgrims, and identify the key barriers to vaccination.

Method: Data on influenza vaccination were obtained from Saudi pilgrims who took part in a large trial during the Hajj of 2013, 2014 and 2015. Pilgrims were met and recruited in Mina, Makkah during the peak period of Hajj and were asked to complete a baseline questionnaire that recorded their influenza vaccination history, including reason(s) for non-receipt of vaccine.

Results: A total of 6974 Saudi pilgrims aged between 18 and 95 (median 34) years were recruited; male to female ratio was 1:1.2. Of the total, 90.8% declared their influenza vaccination history, 51.3% of them reported receiving influenza vaccine before travel to Hajj. The vaccination rates for the years 2013, 2014 and 2015 were 21.4%, 48.2% and 58.1%, respectively ($P < 0.001$). Of 1,269 pilgrims who were at higher risk of severe disease, 54.5% received the vaccine. Lack of awareness (47.5%), reliance on natural immunity (15.8%) and being busy (15.5%) were the main reasons for non-receipt.

Conclusion: These data from a convenience sample indicate that influenza vaccine uptake among Saudi Hajj pilgrims is increasing over years but still needs further improvement. Lack of awareness and misperceptions are the main barriers. Education of Saudi pilgrims and health professionals is required to raise awareness about influenza vaccination. Further studies are needed to understand pilgrims' misperceptions.

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1. Introduction

Hajj is the largest annual mass gathering event in the world. It attracts two to three million Muslims from around the globe to Makkah, Saudi Arabia. A high proportion of Hajj attendees are from Saudi Arabia [1]. The main health hazards for pilgrims at Hajj are respiratory infections, including influenza [2–4]. It has been reported that over 90% of pilgrims develop at least one respiratory symptom before they return to their home countries [5]. In particular, the rate of laboratory-confirmed influenza among symptomatic pilgrims was observed to range between 4% and 15% [6,7]. Moreover, the risk of acquiring respiratory viral infections, including influenza, increased significantly after Hajj [6], the risk estimated to be eight times higher than that in community settings [8]. Besides, influenza poses substantial public health risk to the host country [9]. Therefore, the Saudi Ministry of Health has been recommending influenza vaccination for all Hajj pilgrims since 2005, particularly those at higher risk from influenza [10,11].

Several studies have estimated the uptake of influenza vaccine among Hajj pilgrims. These studies show that, since 2005, the vaccination rate has fluctuated widely over years [12]. Studies reported seasonal influenza vaccination rate to range from 0.7% to 100% among pilgrims, with the highest coverage in 2009, the pandemic year, when the Saudi Arabian authorities stridently stressed on vaccine receipt [13].

Studies have also shown substantial variation in vaccination rates among pilgrims from different countries. Iranian pilgrims reported satisfactory influenza vaccine uptake that generally ranged between 76% and 88% in the years between 2004 and 2010,

reaching up to 100% in 2009 [14–18]. Similarly, Australian pilgrims had an acceptable vaccine uptake ranging between 65% and 89% in the years 2011 to 2013, even though pilgrims from Australia comprise less than 1% of the total Hajj pilgrims in a given year [19,20]. The vaccination rate among Malaysian pilgrims in 2013 was reported as 65%, and the uptake among Indian pilgrims reached up to 72% in 2014 [21,22]. On the other hand, the uptake in 2005 and 2006 ranged between 27% and 37% among French and UK pilgrims [23–26]. Several studies measuring influenza vaccination rate among French pilgrims revealed vaccine uptake that fluctuated generally between 26% and 46% over the years 2006 to 2013, with extremes of up to 97% in 2009 and zero in 2013 (due to unavailability of vaccine before Hajj) [27–31]. A large study among Egyptian pilgrims (who represent about 4% of the total pilgrims) revealed low influenza vaccination rates of between 9% and 30% in the years 2012 to 2015 [32].

However, there are limited data on influenza vaccine uptake among Saudi Hajj pilgrims. Two studies assessed vaccine uptake before 2005, reporting rates of 1% and 11% in 2003 [33,34]. Two further studies examined the uptake in 2006 and 2009, reporting rates of 4% and 13.7%, respectively [25,35]. Thus, the available data from studies conducted before or around the pandemic year reveal that influenza vaccine uptake among Saudi pilgrims in the past has been lower than the average of other countries. In addition, the rate has not been assessed since the pandemic, while the need for influenza vaccination for Hajj pilgrims has been discussed recently [36–39]. Considering that between 26% and 45% of pilgrims in the last 10 years have been from Saudi Arabia [1], it is crucial to evaluate influenza vaccine uptake among these domestic

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