

# Seasonal Influenza Vaccination among Patients with Comorbidities in the Countries of the GCC: A Responsibility or an Option?

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Annually, influenza causes 650 000 fatalities, 3 to 5 million severe cases, and affects over 1 billion people worldwide, making it one of the world's top causes of morbidity and mortality.<sup>1</sup> The influenza pandemic is considered one of the 10 main threats facing global public health.<sup>1</sup> In addition, influenza affects 5–10% of adults and 20–30% of children worldwide.<sup>2</sup> Influenza viruses undergo continuous genetic alterations, resulting in modest antigenic changes known as 'antigenic drift', necessitating routine updates of seasonal influenza vaccines.

Influenza infections often lead to mild illnesses in most people. However, specific populations are more prone to severe illness, hospitalization, and death. Patients at higher risk for influenza complications and influenza-related hospitalizations include children, adults aged  $\geq 65$  years, pregnant women, and patients with comorbidities such as cardiovascular disease (CVD), diabetes, obesity, chronic obstructive pulmonary disease (COPD), and cerebrovascular disease.<sup>3</sup> The correlation between non-communicable diseases (NCDs) such as CVDs and diabetes, and increased severity of infection and death was also established during the COVID-19 pandemic.<sup>4</sup> The death rate of influenza and pneumonia ranges between 20.46 and 39.12 per 100 000 in Bahrain and the UAE, respectively.<sup>5</sup> Despite global guidelines recommending influenza vaccination for high-risk groups including adults

over 65 years, the global influenza vaccine uptake continues to be low with most countries having vaccination uptake rates well below the 75% recommended by the World Health Organization among this population.<sup>6</sup>

The Gulf Corporation Council (GCC) countries have a growing burden of NCDs and have the highest prevalence of diabetes and obesity worldwide.<sup>7,8</sup> The region has a sizable population that is more susceptible to severe influenza. In fact, influenza is a leading cause of hospitalizations and mortality among people with comorbidities in the GCC countries.<sup>9–11</sup>

Several studies in the GCC reported a high burden of influenza hospitalization on those living with NCDs.<sup>9–11</sup> A study in Oman reported the highest hospitalization rates among children, and adults  $\geq 65$  years had the highest death rate among influenza patients.<sup>9</sup> In addition, 35% of cases hospitalized with influenza from 2008–2013 had a chronic disease with CVDs being the most common disease reported. Chronic medical conditions were also reported in 36% of those who died.<sup>9</sup> Studies from Saudi Arabia reported the highest rates of deaths among Hajj pilgrims with influenza who had chronic conditions such as asthma, diabetes, CVDs, chronic kidney disease, and COPD.<sup>10,12</sup>

CVDs such as cerebrovascular diseases, congenital heart defect, and peripheral arterial disease, remain the leading cause of mortality worldwide representing

32% of global deaths.<sup>13</sup> In 2019, CVDs accounted for 75% of all NCD deaths in the GCC countries, and 34% of all deaths. The direct cost of treating CVD accounted for 1.8% of the cost as a share of the gross domestic product in the GCC countries (525 USD direct cost per capita).<sup>8</sup> Some of these studies reported an increase in cardiovascular events, such as acute myocardial infarctions and strokes, during or following an influenza epidemic.<sup>7,13</sup>

Diabetes mellitus (DM) is a growing, public health concern in GCC countries. In particular, type 2 DM is very common, affecting 8–22% of people between 20–79 years old.<sup>7</sup> Viral infections including influenza infections have been reported to play a role in the development of autoimmune diseases such as diabetes, rheumatic heart disease, and multiple sclerosis.<sup>14</sup> Although the role of the influenza virus has been widely described in the development of type 1 DM, this is not so with type 2 DM.<sup>15</sup> However, cases of DM complications such as hyperglycemia and ketoacidosis have been reported to increase during periods of influenza epidemics.<sup>16</sup>

Several studies in the GCC countries reported that patients with diabetes were at the highest risk of hospitalization or death after influenza infection.<sup>9–11</sup> The impaired immune system not only makes patients with diabetes more vulnerable to influenza infection but also makes them prone to secondary bacterial pneumonia further increasing the healthcare burden.

An acute respiratory infection, irrespective of severity, is the most common trigger for exacerbations of chronic airway obstructive diseases such as asthma and COPD.<sup>17</sup> Asthma and COPD, the most common chronic respiratory diseases that lead to significant morbidity and mortality among all chronic respiratory diseases, are also risk factors for the increased risk of hospitalizations and death due to influenza.<sup>18,19</sup>

The World Health Organization recommends seasonal influenza vaccination for those at the highest risk of morbidity and mortality, including adults  $\geq 65$  years and children  $\leq 5$  years old, and those with underlying medical conditions, regardless of age, such as diabetes, hypertension, HIV, asthma, and other chronic heart or lung diseases. The vast majority of countries have less than optimal vaccine coverage rates, specifically below the target coverage of 75% in adults  $\geq 65$  years.<sup>2</sup> Several large cohort studies reported reduced risk of all-cause mortality in those with CVDs, diabetes, and chronic

respiratory diseases who receive timely influenza vaccination.<sup>20</sup> Despite the importance of influenza vaccination in patients with comorbidities, limited data are available regarding the vaccine uptake rates in this group. The majority of studies in the GCC countries reported vaccination rates amongst healthcare workers and Hajj pilgrims, but very few reported these rates amongst patients with chronic diseases.<sup>21,22</sup> The scarce data available in the region show low vaccination rates amongst high-risk populations compared to global rates.<sup>22</sup>

Among Saudis with type 2 DM who were attending routine outpatient appointments in a family medicine department, the coverage of influenza vaccination reported was 47.8%.<sup>22</sup>

Despite the existence of policies recommending influenza vaccination for high-risk groups in the GCC countries, the uptake rates remain suboptimal. This suggests greater advocacy for influenza vaccination is needed as well as research to better understand the barriers to vaccination among these high-risk groups. Raising awareness and facilitating access to vaccines for high-risk groups could improve uptake rates and help reduce influenza health and economic burdens.

In summary, as the risk of influenza-related complications rises, particularly in those with underlying comorbidities, so too is the overuse of healthcare resources. Increasing influenza vaccine uptake among patients with comorbidities can be achieved by raising awareness and facilitating access to vaccination for these groups, which translates into reduced influenza burden and economic gains.

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