



# Obesity Is a High Priority for Influenza Vaccination

Masoud Mardani <sup>1,\*</sup>

<sup>1</sup>Infectious Diseases and Tropical Medicine Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

\*Corresponding author: Infectious Diseases and Tropical Medicine Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran. Tel: +98-9121132678, Email: drmasoudmardani@yahoo.com

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Obesity is a serious chronic disease that has tripled worldwide between 1975 and 2016. There are more than 1.9 billion overweight and 650 million obese adults throughout the world. Furthermore, nowadays the percentage of children who are obese is constantly increasing. Moreover, obesity can have a negative effect on many systems of the body. Those individuals who are overweight or obese have an increased risk for many serious diseases such as diabetes, cardiovascular diseases, and cancers. Epidemiologic studies of influenza, in 2009, showed that obesity is a great risk factor of fatal influenza complications. Experimental studies suggest that disease severity is multifactorial and may be related to the spread of viral infections and lung repair, neutrophil extracellular trap formation of the lung metabolome, and modulation, however, this mechanism in individuals is unknown (1-3).

Furthermore, an important risk factor of developing the influenza virus infection and disease severity is obesity, therefore, the influenza vaccination in a high-risk population is a great concern and precedence. One of the strategies for influenza infection prevention is vaccination, which is an effective way of pandemic preparedness. Although it seems that in high risk groups, such as the obese and overweight population, vaccination could not provide optimal protection. Hence, due to the rising trend of obesity all over the world, vaccine efficacy should be improved (4).

In fact, obesity is a risk factor of the influenza complication such as hospitalization and mortality that has been proved for the first time at the 2009 H1N1 pandemic. During March of 2009 it was revealed that obesity is linked to avian A (H7N9) viruses. Therefore, due to today's presence of the fourth wave of A (H7N9) and given that 42 million children under the age of five and about 10% of world population are obese, understanding the effectiveness of current influenza control and prevention is highly essential.

In a recent study by Maier et al., it was found that disease severity as well as transmission of virus may be influenced by obesity (5). In symptomatic obese adults influenza A virus shedding is 42% longer than non-obese adults, in addition, there is no association with influenza B virus shedding and obesity. In adults with an obesity duration of influenza A viruses, shedding is 1.5 times, which is 5.23 days, while adults without obesity is 3.68 days (5). Therefore, this data suggests that obesity may play an important role in influenza transmission. Recent recommendation of the flu vaccination advocates the priority of flu vaccination in obese patients, and new results suggest the effectiveness of influenza vaccine and perhaps other vaccine as well. Thus, a vaccination program should be fully assessed in obese adults, for example the use of adjuvant influenza vaccine, such as MF59. High dose vaccine preparations that are designed for vaccinating individuals over 65 may be warranted for use in the obese population (4, 5).

Therefore, alternative approaches may be needed to protect obese adults from both seasonal and pandemic influenza virus infection.

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## Footnotes

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