

Vaccine Effectiveness and Coverage Against the 2009 Pandemic Influenza in Ghana and Malawi

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The role of pandemic vaccines is to minimize clinical illnesses and deaths during a pandemic. The lessons from the 2009 pandemic influenza outbreak, however, challenge the accepted wisdom that vaccines can effectively prevent influenza transmission during a pandemic. Not only are vaccines unaffordable, they also do not arrive on time, even if countries can afford to push their way to the front of the queue. The worldwide pandemic influenza A (H1N1) pdm09 vaccine was produced and distributed to some developed countries 6 months after the initial outbreak in Mexico in April 2009.

While vaccines provide good protection against seasonal influenza strains and significantly reduce time off work, it is important to emphasize that vaccines cannot be the primary strategy to deal with pandemic influenza. Strong evidence supports the fact that vaccines do not arrive on time. For example, resource-poor countries like Ghana and Malawi received their free consignment of vaccines from the World Health Organization (WHO) in November 2010, arguably well into the post-pandemic period.¹

What is more shocking is that the target groups (children, pregnant mothers, and health workers) were only vaccinated from April 2011, 2 years after the 2009 pandemic influenza outbreak. By April 2011, when the vaccines were administered, the pandemic had abated and the cases averted would have been close to nonexistent, thus challenging the goal of pandemic vaccines to reduce serious morbidity and mortality. If a vaccine had been made available and administered in the first wave of the pandemic influenza outbreak by November 2009, for example, it would have had a very dramatic effect on cases averted. By April 2010, when the influenza activity peaked, cases averted would have been modest.

Although the WHO could not deliver vaccines on time, a more serious matter concerns the role of vaccine coverage in relation to herd immunity. Authorities in Ghana and Malawi appeared to be working on the assumption that 10% vaccine coverage would be

adequate to achieve herd immunity.¹ Key literature supports the concept that 75% to 85% vaccination coverage is required to achieve a herd immunity threshold for pandemic influenza.^{2,3} It must be clarified that achieving herd immunity cannot be a feasible objective with vaccines for 10% of the population unless large segments of the population are naturally immune. By definition, pandemic influenza is caused by a new virus against which the human population has no immunity.⁴ Thus, 10% coverage could only lean toward indirect protection in the target groups; this would constitute personal protection against the influenza strain matched to the vaccine, and not herd immunity.

There are 2 scenarios for achieving herd immunity. The first requires a large population to be vaccinated so that the causative organism cannot circulate. The second requires a combination of vaccination coverage and prevalence of natural immunity in the population so that the causative organism is stopped from circulating. According to these scenarios, by definition, Ghana and Malawi either needed a lot of vaccines for coverage or a combination of low vaccine coverage and a large population enjoying a prevalence of natural immunity.

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