

Understanding influenza vaccine effectiveness in Senegal

By today's estimates, influenza causes 250,000 to 500,000 deaths and three to five million cases of severe illness each year.¹ Public health leaders also worry that a highly virulent pandemic strain could lead to more than 60 million deaths in today's highly interconnected world, mostly in the developing world.² While influenza's disease burden is believed to be considerable, it is largely overlooked in many countries—often a symptom of inadequate surveillance systems.

In temperate regions of the world, influenza occurs in seasonal patterns, but less is known about the disease in developing, tropical countries, except that it can circulate year-round, with one or more peaks occurring per year. In Senegal, for example, influenza surveillance data indicate that the disease's peak tends to coincide with the warm rainy season.³ Throughout the tropical world, available data suggest that influenza-related morbidity may be underappreciated and substantial.

Furthermore, although effective influenza vaccines have been available for decades, they have not been well-studied or used extensively in tropical developing countries, including most African countries. PATH, the Institut de Recherche pour le Développement (IRD), and the Institut Pasteur de Dakar are partnering to gain a better understanding of the influenza disease burden and influenza vaccine effectiveness in these regions so that national and global public health officials can develop optimal control strategies more easily and effectively against the disease.

Assessing effectiveness in African children

Through a cooperative agreement with the US Centers for Disease Control and Prevention and with authorization from Senegal's Ministry of Health and Medical Prevention, the partners are conducting a Phase 4, post-licensure study assessing the effectiveness of a seasonal inactivated influenza vaccine among children in Senegal. This three-year study is using vaccines that have been approved and administered in many countries, including Senegal, France, and the United States.



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Thus far, more than 9,400 children six months to ten years of age have been vaccinated from randomly selected villages in IRD's Demographic Surveillance System field site in the Fatick and Niakhar Districts of Senegal. The main objective is to determine if influenza vaccine, already proven safe and effective for children in many countries around the world, will protect children in sub-Saharan Africa.

Children from half of the villages in the study area received the influenza vaccine, while children from the other half of the villages received a comparator vaccine—inactivated polio vaccine (IPV). An advantage of using IPV as a control vaccine instead of a placebo is that IPV should boost children's immunity to polio, thus providing these children a good benefit for participating in the study.

While investigators are monitoring the effectiveness of the influenza vaccine among vaccinated children, they are also conducting surveillance to measure rates of influenza caused by circulating strains and to determine if vaccinating children, the suspected main transmitters of influenza, effectively reduces disease in the rest of the community. Demonstrating this will be important because

it would indicate that entire populations could be protected by administering fewer doses at less cost. In 2011, children will again be vaccinated with influenza vaccine formulated according to current World Health Organization recommendations.

This study is a vital step toward understanding the extent of the influenza burden in Africa and the potential of current vaccines to reduce the number of influenza-related deaths each year in the developing world. Ultimately, data generated could help public health leaders decide how to best use influenza vaccines in Senegal and in similar tropical countries.

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References

- 1 World Health Organization. Influenza (Seasonal): Fact Sheet N°211. WHO; 2009. Available at: www.who.int/mediacentre/factsheets/fs211/en/index.html. Accessed April 26, 2011.
- 2 Murray CJ, Lopez AD, Chin B, et al. Estimation of potential global pandemic influenza mortality on the basis of vital registry data from the 1918-20 pandemic: a quantitative analysis. *Lancet*. 2006;368(9554):2211-2218.
- 3 Dosseh A, Ndiaye K, Spiegel A, et al. Epidemiological and virological influenza survey in Dakar, Senegal: 1996-1998. *American Journal of Tropical Medicine and Hygiene*. 2000;62(5):639-643.



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