

Advancing New Technologies Against a Global Threat

Innovation in influenza vaccine development

Each year, influenza causes approximately 300,000 to 500,000 deaths worldwide and three to five million cases of severe illness. More than one billion people are infected with the influenza virus annually. Epidemics and outbreaks of influenza have the potential to cause millions of deaths worldwide. Pandemics—worldwide epidemics—generally occur about every 40 years with the last pandemic happening in 1968. The most severe influenza pandemic, in 1918, infected up to 50 percent of the world's population and caused 20 to 50 million deaths worldwide.

Another influenza pandemic is likely to occur and could cause 51 to 81 million deaths in today's interconnected world. Public-health officials worry that a pandemic may well originate in developing countries, whose governments do not yet have sufficient resources to respond. New, affordable vaccines are urgently needed to protect developing-country populations and strengthen worldwide efforts to contain an outbreak.

The rapid development, production, and distribution of pandemic influenza vaccines could potentially save millions of lives during an influenza pandemic. The current influenza vaccines are difficult to produce quickly and in large quantities, in part because most are made from embryonated chicken eggs. If an avian influenza strain is the cause of the next pandemic, the reduced availability of chicken eggs could further challenge the production of adequate supplies of vaccine.

Innovative, alternative vaccine strategies are needed that could produce much greater quantities of vaccine at a price that is affordable to the global population. PATH is collaborating with public- and private-sector partners to advance the development of promising new vaccines,



PATH (Mike Wang)

focusing on novel technologies that could more easily be used in case of an influenza pandemic.

To expand the options for vaccine production, PATH is pursuing live attenuated (egg-based or cell-based) technology and recombinant technologies (proteins and virus-like particles), which could provide better “real-time” access and be produced more affordably, thereby increasing access for people living in low- and moderate-income countries. PATH is also exploring new adjuvants, vaccine ingredients that help boost the immune response, potentially allowing vaccine supplies to stretch further.

In addition to helping with pandemic preparedness, new vaccines could also address the high burden of annual or seasonal influenza, which is not well appreciated in many parts of the world. Increasing the affordability and availability of vaccines for annual influenza could yield substantial public-health benefits.