

When flu viruses 'shift and drift', how many vaccines?

August 29 2009, by Marlowe Hood

The World Health Organisation's [announcement Friday](#) that the 2009 H1N1 virus has become the dominant strain of flu worldwide fits a historical pattern, but the impact on vaccine policy remains unclear, a top expert said.

"This was one of the big questions, whether we would finish up with three types of strains, or whether one would replace the others," said Nigel Dimmock, a virologist and emeritus professor at the University of Warwick.

Dimmock said it was surprising that the WHO had decided so rapidly that the pandemic strain -- which surfaced in Mexico four months ago -- had elbowed out other flu strains.

The northern hemisphere [flu season](#) has not yet begun, so the determination must have been based mainly on what has happened in southern hemisphere countries such as Australia, New Zealand, Argentina and Brazil, he said.

The WHO said in a communique: "Evidence from multiple outbreak sites demonstrates that the H1N1 pandemic virus has rapidly established itself and is now the dominant [influenza strain](#) in most parts of the world."

Human flu viruses are identified by a surface-lying protein called hemagglutinin -- the "H" of A(H1N1).

There are 16 subtypes of the "H" protein that circulate in birds and swine, but so far only three have become easily transmissible among humans.

"Flu viruses go through 'shift and drift', explained Mark Miller, an epidemiologist at the US National Institutes of Health's Fogarty International Center.

"In previous [pandemics](#) we had a shift in the type of virus that is dominant," and then a process of 'drift' and it changed slightly from year-to-year.

The deadly 1918 "Spanish flu" -- which left some 40 million dead -- was an H1 virus, and dominated unchallenged until 1956 when a new "H2" variant swept across the globe.

"It pretty much at a stroke replaced the H1N1. It is still amazing how that happened -- nobody really knows why," Dimmock said.

The same thing happened a dozen years later, when the "H3" knocked its predecessor off the world stage. This led scientists to conclude that any new pandemic strain replaces the seasonal one descended from the previous pandemic.

"But then the H1N1 reappeared in 1977, very similar to the strains circulating in the mid-1950s, and it has been co-circulating with the H3N2 up until the start of this year," Dimmock said.

It was unclear based on the WHO's statement, he added, whether people would need to vaccinate against only the new [swine flu](#) virus, or against the two strains that have been around for decades as well.

"If the pandemic [H1N1](#) has replaced the other strains, as happened in

1957 and 1968, then you don't need the old [vaccine](#)," Dimmock said by phone.

"But if they continue to co-circulate, even if it is dominant, then you are going to need a vaccine with three type-A components -- and a seasonal B."

The vaccines can be combined into a single shot, or given separately he said.

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