Swine flu pandemic of 2009 more deadly for younger adults, study finds

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As the world prepares for what may be the next pandemic strain of influenza virus, in the H7N9 bird flu, a new UC Irvine study reveals that the 2009 H1N1 swine flu pandemic was deadliest for people under the age of 65, while those 65 and over had greater immunity due to previous exposure to similar viruses.

Deaths from flu pandemics tend to skew younger than those from seasonal flu because of "antigenic recycling," or the fact that some parts of flu viruses have already made the rounds. Between 1918 and 1957, all flu viruses in circulation fell into the H1N1 category, so in 2009, older adults had some protection stemming from their prior experience with viruses of this type, said Andrew Noymer, UC Irvine associate professor of public health and the study's co-author.

"The swine flu pandemic was relatively mild in the extent to which flu-related deaths were above normal, seasonal levels," he said. "Excess death rates were highest among 25- to 64-year-olds." The findings appear in the journal *PLOS ONE*.

The bulk of pneumonia and influenza deaths typically occur in people older than 65, but when H1N1 became the dominant flu strain in 2009, the accompanying rise in pneumonia and flu deaths took place within age groups that usually have low mortality rates.

Overall, there were 53,692 pneumonia and influenza deaths in 2009, of which 2,438 were considered "excess," or above the number expected. In

2010, there were about 50,000 deaths from pneumonia and flu, of which 196 were considered excess.

Researchers obtained mortality data from the National Center for Health Statistics. Flu and pneumonia deaths between January 1959 and December 2010 were arranged by age, sex, month and underlying cause. Final numbers on flu deaths for 2009 and 2010 were released in 2012.

The 2009 pandemic was unusual not just for its excess fatalities but for the timing and age distribution of those deaths, Noymer said. October and November of that year saw the highest flu death rates in people 25 to 34 since at least 1959, when the computerized collection of population statistics began.

"The pandemic definition is based on the novelty of the virus strain and on deaths, but mortality does not need to be enormous for it to be considered a pandemic," he said. "The 2009 swine flu was an excellent example of a virus strain with relatively lenient mortality."

Noymer suggests that public health officials consider targeting pandemic vaccination campaigns to adults under age 65, who are not at the greatest risk in regular, seasonal flu outbreaks.

The Centers for Disease Control & Prevention currently recommends annual influenza vaccinations for everyone over 6 months old, but pandemic vaccines may not be available in sufficient quantities for the whole population. Focusing on certain age groups may ensure the best use of a limited resource.

The novelty of the currently emerging bird flu strain, H7N9, is noteworthy, Noymer said, as the virus has not been seen before in anyone's lifetime. Although it's too early to predict the seriousness of H7N9, it does have the potential to be severe at all ages, since no one

alive today has been previously exposed to this type of virus.

Provided by University of California, Irvine