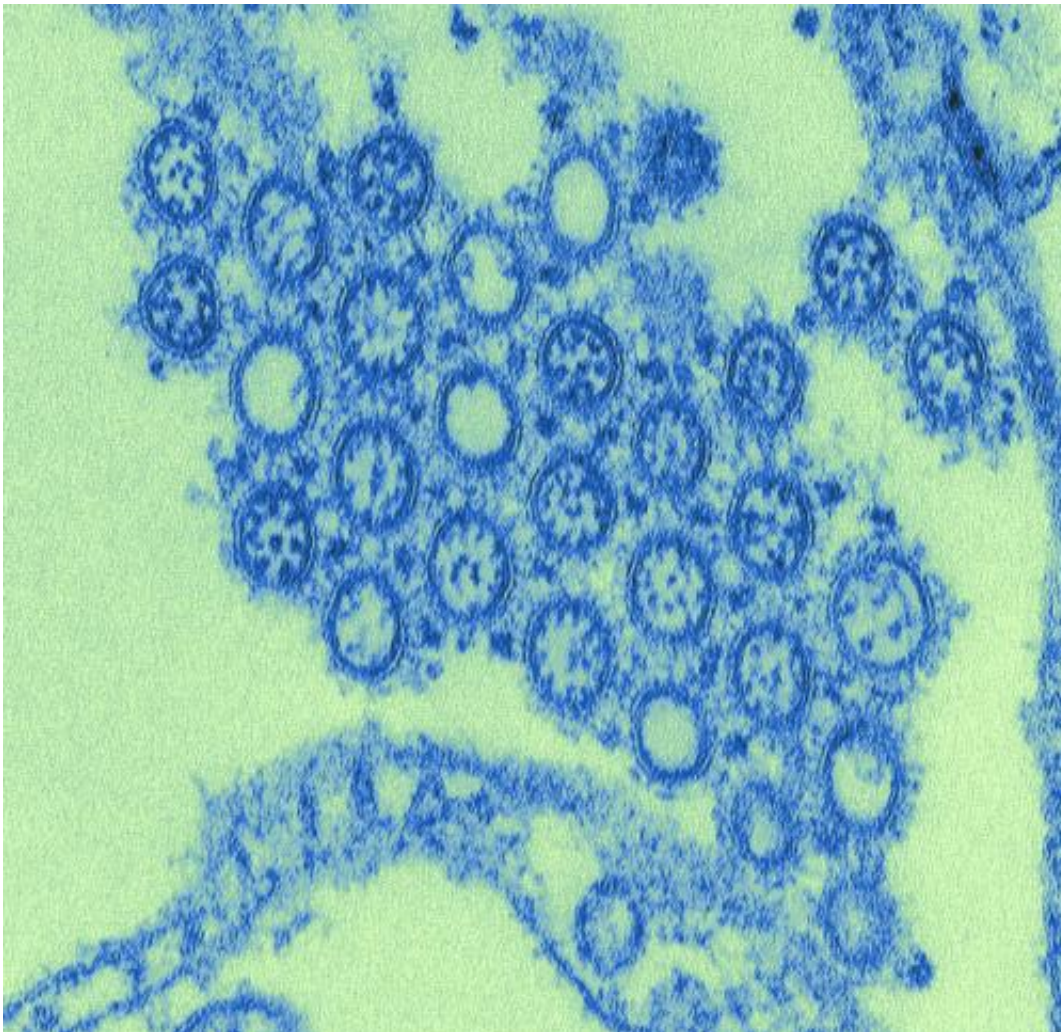


2009 pandemic flu death toll much higher than official worldwide estimates

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This is an electron micrograph showing the 2009 H1N1 virus. Credit: CDC/Cynthia Goldsmith

A research team consisting of more than 60 collaborators in 26 countries has estimated the global death toll from the 2009 outbreak of the H1N1 virus to be 10 times higher than the World Health Organization's count, which was based on laboratory-confirmed cases of this flu. The study, which appears online in *PLOS Medicine*, suggests that the pandemic virus caused up to 203,000 respiratory deaths around the world.

"This study confirms that the H1N1 virus killed many more people globally than originally believed," says lead author Lone Simonsen, PhD, a research professor in the Department of Global Health at the George Washington University School of Public Health and Health Services. "We also found that the mortality burden of this pandemic fell most heavily on younger people and those living in certain parts of the Americas."

The World Health Organization (WHO), which funded this study, had reports of 18,449 laboratory-confirmed deaths from the 2009 flu pandemic, but that is widely regarded as a low number because it is based only on people with confirmed cases of H1N1. This study shows that the actual death toll was much higher than the official count because most infected people never got an H1N1 lab test.

The low number of confirmed deaths at least initially led many to label the subsequent public health response as excessive. Yet this study shows that the H1N1 virus, although not as lethal as the infamous Spanish flu virus, still represented a formidable foe—killing many more people around the globe than the original estimates.

In order to do this study, the team obtained weekly virology data from the WHO and actual mortality data from 21 countries accounting for about 35 percent of the world's population. They used the information to estimate the number of respiratory deaths, which often occur when H1N1 gets into the lungs and causes pneumonia, in each of those 21

countries. They then used a novel statistical procedure to project those results to the rest of the countries in the world.

In addition to deaths caused by respiratory diseases, the H1N1 virus can also kill by exacerbating existing health problems. And in fact, this team found that when the H1N1 deaths due to cardiovascular disease and other causes are included, the 2009 pandemic toll might be as high as 400,000.

The team discovered that an estimated 62 to 85 percent of those who died in the 2009 pandemic were younger than age 65. That high death toll for younger people is in marked contrast to that caused by seasonal influenza, which mostly targets seniors.

The high casualty rate for people in their prime translates to a bigger burden on individuals and society as younger victims often mean more productive years of lost life, the authors said.

This study also showed a striking regional pattern as H1N1 swept through certain countries, leaving a substantial number of deaths in its wake. For example, the researchers found an almost 20-fold higher mortality rate in some countries in the Americas with Mexico, Argentina and Brazil showing the highest respiratory death rates in the world. In contrast, the toll was far lower in New Zealand, Australia and most parts of Europe.

The geographical mortality pattern in this study differs markedly from a 2012 study by the Centers for Disease Control and Prevention that estimated the impact due to the H1N1 pandemic before 2009 national vital statistics became widely available. Although that study's results led to a similar global mortality estimate, the CDC researchers came up with a very different regional map of the burden, with very heavy death counts in Africa and in Southeast Asia and lower death rates in the

Americas and Europe.

This study failed to find the same high [death toll](#) in a few measured countries in Africa and Southeast Asia but Simonsen says that very few data exist for what really happened during the pandemic in these regions. She says additional studies will need to be done in order to understand the course of the virus as it spread through low-income parts of the world. In addition, researchers must continue to study the pandemic in order to find out why some countries were so hard hit and others were mostly spared.

Why continue to study a [flu pandemic](#) that is by all accounts old news?

Whenever a new influenza virus emerges the ensuing outbreak can represent a crisis—with rapidly spreading illness and death that spreads from country to country. The 1918 Spanish influenza pandemic, for example, killed approximately 2 percent of the world population at the time or a staggering 50 million. Although the H1N1 flu did not come close to causing that high casualty rate, understanding the global impact of such a [pandemic](#) remains vitally important in order to plan and prepare for the next time a [pandemic virus](#) emerges, Simonsen says.

The study appears online November 26 in *PLOS Medicine*.

More information: www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.1001558

Provided by George Washington University

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