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## Are US flu death figures more PR than science?

US data on influenza deaths are a mess. The Centers for Disease Control and Prevention (CDC) acknowledges a difference between flu death and flu associated death yet uses the terms interchangeably. Additionally, there are significant statistical incompatibilities between official estimates and national vital statistics data. Compounding these problems is a marketing of fear—a CDC communications strategy in which medical experts “predict dire outcomes” during flu seasons.

The CDC website states what has become commonly accepted and widely reported in the lay and scientific press: annually “about 36 000 [Americans] die from flu” ([www.cdc.gov/flu/about/disease.htm](http://www.cdc.gov/flu/about/disease.htm)) and “influenza/pneumonia” is the seventh leading cause of death in the United States ([www.cdc.gov/nchs/fastats/1cod.htm](http://www.cdc.gov/nchs/fastats/1cod.htm)). But why are flu and pneumonia bundled together? Is the relationship so strong or unique to warrant characterising them as a single cause of death?

David Rosenthal, director of Harvard University Health Services, said, “People don’t necessarily die, per se, of the [flu] virus—the viraemia. What they die of is a secondary pneumonia. So many of these pneumonias are not viral pneumonias but secondary [pneumonias].” But Dr Rosenthal agreed that the flu/pneumonia relationship was not unique. For instance, a recent study (*JAMA* 2004;292:1955-60) found that stomach acid suppressing drugs are associated with a higher risk of community acquired pneumonia, but such drugs and pneumonia are not compiled as a single statistic.

CDC states that the historic 1968-9 “Hong Kong flu” pandemic killed 34 000 Americans. At the same time, CDC claims 36 000 Americans annually die from flu. What is going on?

Meanwhile, according to the CDC’s National Center for Health Statistics (NCHS), “influenza and pneumonia” took 62 034 lives in 2001—61 777 of which were

attributed to pneumonia and 257 to flu, and in only 18 cases was flu virus positively identified. Between 1979 and 2002, NCHS data show an average 1348 flu deaths per year (range 257 to 3006).

The NCHS data would be compatible with CDC mortality estimates if about half of the deaths classed by the NCHS as pneumonia were actually flu initiated secondary pneumonias. But the NCHS criteria indicate otherwise: “Cause-of-death statistics are based solely on the underlying cause of death... defined by WHO as ‘the disease or injury which initiated the train of events leading directly to death.’”

In a written statement, CDC media relations responded to the diverse statistics: “Typically, influenza causes death when the infection leads to severe medical complications.” And as most such cases “are never tested for virus infection... CDC considers these [NCHS] figures to be a very substantial undercounting of the true number of deaths from influenza. Therefore, the CDC uses indirect modelling methods to estimate the number of deaths associated with influenza.”

CDC’s model calculated an average annual 36 155 deaths from influenza associated underlying respiratory and circulatory causes (*JAMA* 2003;289:179-86). Less than a quarter of these (8097) were described as flu or flu associated underlying pneumonia deaths. Thus the much publicised figure of 36 000 is not an estimate of yearly flu deaths, as widely reported in both the lay and scientific press, but an estimate—generated by a model—of flu-associated death.

William Thompson of the CDC’s National Immunization Program (NIP), and lead author of the CDC’s 2003 *JAMA* article, explained that “influenza-associated mortality” is “a statistical association between deaths and viral data available.” He said that an association does not imply an underlying cause of death: “Based on modelling, we think it’s associated. I don’t know that we would say that it’s the underlying cause of death.”

Yet this stance is incompatible with the CDC assertion that the flu kills 36 000 people a year—a misrepresentation that is yet to be publicly corrected.

Before 2003 CDC said that 20 000 influenza-associated deaths occurred each year. The new figure of 36 000 reported in the January 2003 *JAMA* paper is an estimate of influenza-associated mortality over the 1990s. Keiji Fukuda, a flu researcher and a co-author of the paper, has been quoted as offering two possible causes for this 80%

increase: “One is that the number of people older than 65 is growing larger... The second possible reason is the type of virus that predominated in the 1990s [was more virulent].”

However, the 65-plus population grew just 12% between 1990 and 2000. And if flu virus was truly more virulent over the 1990s, one would expect more deaths. But flu deaths recorded by the NCHS were on average 30% lower in the 1990s than the 1980s.

If passed, the Flu Protection Act of 2005 will revamp US flu vaccine policy. The legislation will require CDC to pay makers for vaccines unsold “through routine market mechanisms.” The bill will also require CDC to conduct a “public awareness campaign” emphasising “the safety and benefit of recommended vaccines for the public good.”

Yet this bill obscures the fact that CDC is already working in manufacturers’ interest by conducting campaigns to increase flu vaccination. At the 2004 “National Influenza Vaccine Summit,” co-sponsored by CDC and the American Medical Association, Glen Nowak, associate director for communications at the NIP, spoke on using the media to boost demand for the vaccine. One step of a “Seven-Step ‘Recipe’ for Generating Interest in, and Demand for, Flu (or any other) Vaccination” occurs when “medical experts and public health authorities publicly... state concern and alarm (and predict dire outcomes)—and urge influenza vaccination” ([www.ama-assn.org/ama1/pub/upload/mm/36/2004\\_flu\\_nowak.pdf](http://www.ama-assn.org/ama1/pub/upload/mm/36/2004_flu_nowak.pdf)). Another step entails “continued reports... that influenza is causing severe illness and/or affecting lots of people, helping foster the perception that many people are susceptible to a bad case of influenza.”

Preceding the summit, demand had been low early into the 2003 flu season. “At that point, the manufacturers were telling us that they weren’t receiving a lot of orders for vaccine for use in November or even December,” recalled Dr Nowak on National Public Radio. “It really did look like we needed to do something to encourage people to get a flu shot.”

If flu is in fact not a major cause of death, this public relations approach is surely exaggerated. Moreover, by arbitrarily linking flu with pneumonia, current data are statistically biased. Until corrected and until unbiased statistics are developed, the chances for sound discussion and public health policy are limited.

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