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SARS death rate up to 43%

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SARS (Severe Acute Respiratory Syndrome) is a more dangerous disease than previously thought, epidemiologists conclude in a [paper published today](#). But this is not attributed to the mutation rate of the causative agent - it's a consequence of simple epidemiological arithmetic and a misunderstanding of the low mortality figures published by the World Health Organization (WHO).

The death rate from SARS in Hong Kong is 43% in those over 60 years old (35-52%, at 95% confidence), and 13% in the under 60s (10-17%, at 95% confidence). These are the key results of the first thorough epidemiological study of the SARS outbreak, published today (May 7, 2003) in *The Lancet* online, by Roy Anderson of [Imperial College London](#), working with colleagues in London and Hong Kong.

Mark Salter, WHO's coordinator for the clinical management of SARS, told us today that he thought "the mortality in the older age group seemed relatively appropriate, given that a lot of them have co-morbidity factors [other health problems besides SARS], but I'm a little bit surprised that the upper end for young people is as high as 17%."

[The WHO's estimates](#) of 6-10% have been much lower but, somewhat misleadingly, have referred to different quantities. "We have to remember that the paper's figures are modelling projections," Salter said. "And the figures we've quoted are actual surveillance. What we've been saying is that there have been 5000 cases reported and 500 deaths, and the death rate is the ratio. But that's not an accurate rate. I'm sure that Professor Anderson and his team have looked at it more closely, at people who have actually passed through their disease, to discharge or death."

In other words, Anderson and colleagues have analyzed the complete data to arrive at what we would commonly understand by a death rate: the chance that a person who contracts SARS will die.

The WHO figures, by contrast, simply divide the number of deaths reported up to a certain moment, by the number of reported cases at the same moment. But these deaths must arise from cases included in the case numbers some 20 or more days earlier. And, because the outbreak is growing, at the time those cases were reported the number of cases was smaller than the number being reported now. So, the denominator in the WHO calculation has always been too large to give the "true" mortality rate.

Only if the number of cases leveled off, so that there was a constant number of cases per day, and a constant number of deaths, would the WHO figures be expected to reach something like the figure calculated by Anderson and colleagues. Indeed, "We have always expected the mortality rate to rise," Salter said.

Other significant conclusions of *The Lancet* paper are that the incubation period of the disease is six days (5-8 days, at 95% confidence), and that the initial exponential growth phase of the disease in Hong Kong is now over, with a daily case rate of under 20 by April 28, 2003.

The control of the outbreak in Hong Kong is probably the result of public health policies, including: encouraging people to report to hospital rapidly after the onset of clinical symptoms; contact-tracing for

confirmed and suspected cases; quarantining, monitoring, and restricting travel of contacts; and isolation and staff-protection methods in hospitals.

Could death rates be even higher in areas of the world with less advanced health care? Not so far, Salter said. "The logical supposition would be that, in an area where there is inadequate medical service, you might see a higher death rate, particularly among those that have the more severe form of disease; but we're not seeing that at the present time."

According to Salter, "The figures at the moment don't suggest there is an ongoing problem in the rural areas of Western China and other remote regions of China, but it's not something we can sit back and relax about."

References

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