

Widespread school closures needed to stop strain on hospitals during epidemics

February 2 2011



This is Dr. Thomas House of the University of Warwick. Credit: University of Warwick

Selective schools closures has been considered as a means of reducing transmission between children and hence reducing the number of cases at the peak of an epidemic but new research led by researchers at the University of Warwick shows that limited school closures are ineffective and that only significant widespread school closures would have real effect on the spread of a epidemic and the strain placed on hospital intensive care units.

Dr Thomas House from the University of Warwick's Mathematics Institute, and the University's Complexity Science research group said:

"[Influenza](#) potentially places an extreme burden on local health services.

This was observed in both the 2009-10 swine-flu pandemic and this year's seasonal 'flu outbreak. Our work uses mathematical models to assess how school closures reduce the burden on particular hospitals. Although sustained national closures of schools can be very effective, they are costly and disruptive, and can even prevent parents in the health service from responding to any epidemic. We find in the worst cases, that short duration, localised closures cannot fully prevent some hospitals exceeding capacity. This means, when facing the threat of a severe pandemic, a coordinated and possibly extended period of school closures may be necessary."

The researchers found that even with broadly optimistic assumptions about school closures the proportion of hospitals above capacity in their intensive care units cannot be brought to zero and only achieves its lowest value of 12 per cent when there is a coordinated closure of at least 30 per cent of all English schools. In fact if less optimistic (but more realistic) assumptions are made about the timing and selection of closures there is no significant difference on the strain put on intensive care units until at least 50 per cent of all English schools are closed.

"Our work supports the decision not to close schools as a control measure during the 2009/10 swine 'flu pandemic," said Dr House. "If a pandemic is serious enough to require measures like school closures, then they need to be well timed and large scale to have much effect."

The Warwick research team appealed for more public help to create even bigger data sets to help future modeling of these problems that could help inform decision making in future epidemics. "The results in this work rely on existing information about local schools and hospitals, and yet tell us a lot about our ability to control pandemics. Yet, if we wish to devise more refined control methods, we need far more information about people's contact patterns and the behaviour of 'flu in the UK," said University of Warwick researcher Professor Matt Keeling.

"Anyone can help with this by filling in the survey at our website www.contactsurvey.org, and by registering symptoms with our colleagues at www.flusurvey.org.uk."

More information: The new research has just been published in *Proceedings of the Royal Society B* and is entitled "Modelling the impact of local reactive school closures on critical care provision during an influenza pandemic" by T. House, M. Baguelin, A. J. van Hoek, P. J. White, Z. Sadique, K. Eames, J. M. Read, N. Hens, A. Melegaro, W. J. Edmunds, M. J. Keeling. rspb.royalsocietypublishing.org/...b.2010.2688.abstract

Provided by University of Warwick

Citation: Widespread school closures needed to stop strain on hospitals during epidemics (2011, February 2) retrieved 30 April 2024 from <https://medicalxpress.com/news/2011-02-widespread-school-closures-strain-hospitals.html>

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