Pandemic flu containment measures bought valuable time, Vietnam study suggests

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Containment measures introduced in Vietnam to prevent the spread of the 2009 pandemic H1N1 influenza did not succeed in halting the virus, but may have bought health services and clinical researchers valuable time, according to research carried out at the Wellcome Trust Major Overseas Programme in Ho Chi Minh City, Vietnam.

The study also showed that patients with mild disease responded favourably in terms of viral clearance - and hence reduced transmission of the virus - to oseltamivir, the most commonly-used antiviral drug, when given in the first 3-4 days of illness.

On 27 April 2009, when the World Health Organization declared Phase 4 in response to the H1N1 influenza virus - indicating a significant increase in risk of a pandemic - the Vietnamese Ministry of Health mandated body temperature scans and symptom questionnaire screening of international travellers arriving at the airport, and in-hospital isolation of suspected cases.

Vietnam reported its first case of infection on 31 May 2009, in a Vietnamese student returning to Ho Chi Minh City from the United States five days earlier. Twelve days later on 12 June, Hanoi reported its first cases. By February 2010, there had been over 11,000 confirmed cases in the country, including 58 confirmed deaths.

Researchers from the Wellcome Trust Major Overseas Programme and Oxford University Clinical Research Unit at the Hospital for Tropical

Diseases in Vietnam analysed reports from the Ministry of Health and relevant health authorities, and clinical and laboratory data for people infected with the 2009 influenza virus A (H1N1) and isolated in hospital. The researchers used these reports to reconstruct the initial outbreak and the establishment of community transmission in Ho Chi Minh City. The results are published in the open-access journal PLoS Medicine today.

The researchers found that in the two months from 26 May to 24 July, 200 positive cases were identified through airport screening, but that around 40 pre-symptomatic - and hence undetectable - individuals would have arrived at the airport in the same period.

"We don't know how many true cases of H1N1 infection there were in Vietnam during this period, but it is clear to us from mathematical analysis that the epidemic in Ho Chi Minh City was not containable," says lead author Dr Rogier van Doorn from the University of Oxford,.

However, the study showed that the intervention strategies put in place in Ho Chi Minh City by the Vietnamese authorities - airport screening, isolation, and treatment - shortened the chances of infected individuals transmitting the virus to others. In addition, as passengers on one in six incoming flights heard announcements suggesting self-quarantine, mask wearing, and guidelines for monitoring personal health, this increased patients' likelihood of hygienic behaviour and self-reporting if they had influenza-like symptoms.

"The containment measures seemed to delay the onset of large-scale transmission by at least three weeks," says corresponding author Dr Maciej Boni, also from the University of Oxford,. "This may not sound like a lot, but in a country like Vietnam this bought valuable time for the local health services, laboratories and travel authorities to understand what was happening and start logistical preparations for the pandemic response. The pandemic was mild and no intense response was required,

but this may have just been lucky."

The authors say that it is difficult to draw conclusions from this study as to the effectiveness of similar measures being able to contain future pandemics.

"The problem is that you don't know what kind of virus you're dealing with at the moment that measures need to be installed," explains Dr van Doorn. "In hindsight one could say that too much effort was put into containment efforts for this virus, but at the time the decisions were made, they were very sensible. Active case-finding and treatment of severe cases may have been a better approach for this virus, but again, we can only see this in hindsight.

"For a different type of virus, it will depend what we turn out to be dealing with. Human H5N1 'bird flu' cases are usually very severe, but not very transmissible, so they are easy to find and contain, and our strategies of drug treatment, contact tracing, isolation, poultry vaccination seem to have made such outbreaks manageable so far."

Professor Tran Tinh Hien, Director of Clinical Research at the Oxford University Clinical Research Unit, Hospital for Tropical Diseases, believes the study highlights the success of the response of the clinical research community to the outbreak.

"One of the most important features of this work was the speed with which we were able to establish multidisciplinary clinical research studies in response to a rapidly emerging problem," he commented. "Clinical research has become increasingly complex and therefore slow. This work shows that it is possible to respond quickly, safeguard patients and learn crucial lessons for the future."