

Pandemic response in low-resource settings requires effective syndromic surveillance

Beverley J. Paterson,^a David N. Durrheim,^{a,b} Kate Hardie^b

^aHunter Medical Research Institute, Newcastle, NSW, Australia. ^bHunter New England Population Health, Newcastle, NSW, Australia.
Correspondence: Beverley J. Paterson, Private Bag 10, Wallsend, NSW 2287, Australia. E-mail: beverley.paterson@hnehealth.nsw.gov.au

Accepted 16 January 2013. Published Online 05 March 2013.

Keywords Pandemic, public health response, syndromic surveillance.

To the editor:

Starbuck *et al.* have identified a significant gap in any future global response to a severe influenza pandemic.¹ The threat of inadequate preparedness and limited public health responses in low-resource settings, leading to uncontrolled transmission is a real and unwelcome possibility during a pandemic. The authors recommend that detailed authoritative guidance should be developed for low-resource settings and that support should be given to governments in these settings to adapt and implement these guidelines.

However, an appropriate public health response and effective management of cases depend primarily on early detection of suspected cases. This remains a major challenge in many developing countries, but syndromic surveillance offers a potential solution in these settings. A novel and visionary system, using a simple but standardised set of symptoms, was first developed by T. Jacob John in the early 1980s in Southern India.² The system utilised a district-level disease surveillance system in a low-resource setting, to control and limit disease outbreaks through early detection. This approach was further adapted in a rural African setting with a focus on rural hospitals reporting presentations of nine core clinical syndromes, including cholera and meningitis-like disease to ensure early identification of infectious disease outbreaks.³

A similar syndromic surveillance system for outbreak detection and response has recently been implemented in Pacific Island Countries and Territories (PICTs). In 2010, PICTs agreed to develop a regional standardised, simple and sustainable event-based syndromic surveillance system to ensure compliance with IHR requirements (rapid outbreak detection, information sharing and response to outbreaks).³ Health resources vary across the region that includes a number of countries that are categorised as least developed countries (LDC).

The system is based on the early detection and reporting of four core syndromes (influenza-like illness, diarrhoea, pro-

longed fever and acute fever with rash) and the immediate reporting of unusual events. The system uses standardised case definitions and processes rather than focussing on a technology platform used to collect or analyse the data. A Pacific Outbreak Manual has been developed as an integral component of the system; to ensure that health workers have rapid access to robust and practical guidelines on the clinical and public health management of infectious disease outbreaks, including influenza-like illness, and triggers for action.⁴ This provides PICTs with authoritative guidance on appropriate response measures during a severe influenza pandemic.

A recent evaluation highlighted the need for standardised surveillance to help meet IHR obligations and to ensure early warning of infectious disease outbreaks across the Pacific.⁵ While there is variation in system implementation, it is apparent that this is a strength in a region that includes low-resource communities. Despite differences in personnel resources, medical informatics systems and processes, PICTs have productively participated in and contributed to a regional early warning system. The syndromic surveillance system expanded from six to twenty participating PICTs within 1 year, indicating a high level of acceptance of the system. While there are remaining challenges in ensuring uniform data quality, the system has proven effective in detecting outbreaks, its simplicity and the standardisation of both case definitions and responses are key elements in its usefulness. Detection of future influenza pandemics or other emerging infectious disease outbreaks in the South Pacific should be greatly assisted by this syndromic surveillance system.

Syndromic surveillance is particularly useful in settings where access to laboratory diagnosis is not timely, allowing containment measures to be implemented prior to having a definitive diagnosis. However, there are inherent limitations in a system based purely on syndromes due to the broad range of diseases that may cause certain syndromes, including influenza-like illness. To avoid exhausting public health

resources on 'syndrome noise', it is important to select syndromes carefully for their relative public health importance and to establish local thresholds for response. It is important to reach prior agreement on the number of specimens that need to be sent from a particular area for laboratory confirmation at reference laboratories, to allow syndromic surveillance to serve as an efficient early warning system for a severe influenza pandemic.

Simplified syndromic surveillance should be a priority in countries with limited public health system or technological capacity.

References

- 1 Starbuck ES, von Bernuth R, Bolles K, Koepsell J. Are we prepared to help low-resource communities cope with a severe influenza pandemic? *Influenza Other Respi Viruses*, 2012. doi: 10.1111/irv.12040. [Epub ahead of print].
- 2 John TJ, Samuel R, Balraj V, John R. Disease surveillance at district level: a model for developing countries. *Lancet* 1998; 352:58–61.
- 3 Kool JL, Paterson B, Pavlin BI, Durrheim D, Musto J, Kolbe A. Pacific-wide simplified syndromic surveillance for early warning of outbreaks. *Glob Public Health* 2012; 7:670–681.
- 4 World Health Organization and Secretariat of the Pacific Community, *Pacific outbreak manual. Version 1.0*. n.d. Available at http://www.spc.int/phs/PPHSN/Surveillance/Syndromic/Pacific_Outbreak_Manual-version-1-2.pdf (Accessed 5 January 2013).
- 5 Paterson BJ, Kool JL, Durrheim DN, Pavlin B. Sustaining surveillance: evaluating syndromic surveillance in the Pacific. *Glob Public Health* 2012; 7:682–694.