

Domestic travel key to distribution of flu across Australia

January 12 2018



Credit: William Brawley

New scientific research on the spread of flu across Australia has revealed that all major cities appear to experience outbreaks of flu around the same time each year, published today in *PLOS Pathogens*.

The research has also shown that commuting to work is less important than long distance domestic travel in looking at the overall spread of flu throughout Australia.

The researchers used influenza surveillance data collected between 2007-2016 from more than 2500 postcodes to map the spread of the [flu virus](#) across Australia.

The results reveal remarkable synchrony in [flu outbreaks](#) right across the country – and that outbreaks are particularly synchronous in 'big flu' years, when the [virus](#) is somewhat novel and there is little immunity in the population.

"We have shown that influenza enters Australia multiple times from the global population – this highlights the highly globalised world in which we live. It spreads almost instantaneously throughout Australia – likely driven by both highly domestically connected cities. During the 2009 swine flu pandemic for example, we found that all postcodes experienced outbreaks at the same time," said Dr. Jemma Geoghegan from the Department of Biological Sciences.

Short-range commuter transmission has not played a major role in epidemic spread due to the apparent lack of radial virus dispersal observed in Australia, but rather domestic travel accounts for this dispersal.

"The Sydney-Melbourne flight route is the third busiest flight route in the world, as well as having multiple entries from other countries from around the world. In the event of a [novel virus](#), we really need coordinated surveillance right across Australia, especially in the major centres," said Dr. Jemma Geoghegan from the Department of Biological Sciences.

This study is the first study of the spread of influenza virus across Australia, which provides a unique perspective of the spread of flu across a continent spanning tropical and temperate climates.

The data used by the researchers is laboratory confirmed, meaning that they have been confirmed to be the virus that causes the flu – many other studies use only 'influenza-like' illness data, which is estimated to be flu virus only 30 per cent of the time.

"That outbreaks of flu to reach all [major cities](#) around the same time highlights the importance of a highly coordinated public health response right across Australia, especially in the event of the emergence of a novel virus," concluded Dr. Geoghegan.

In light of the speed with which novel viruses spread, the most populous cities experience synchronised epidemics, and these observations may be used to inform prospective pandemic planning efforts both in Australia and in other highly urbanised localities.

More information: Jemma L. Geoghegan et al. Continental synchronicity of human influenza virus epidemics despite climactic variation, *PLOS Pathogens* (2018). [DOI: 10.1371/journal.ppat.1006780](https://doi.org/10.1371/journal.ppat.1006780)

Provided by Macquarie University

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