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Perspective

Australia's Winter with the 2009 Pandemic Influenza A (H1N1) Virus

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When the World Health Organization declared a “public health emergency of international concern” on April 25, 2009, after the emergence in Mexico of pandemic influenza A (H1N1) virus,

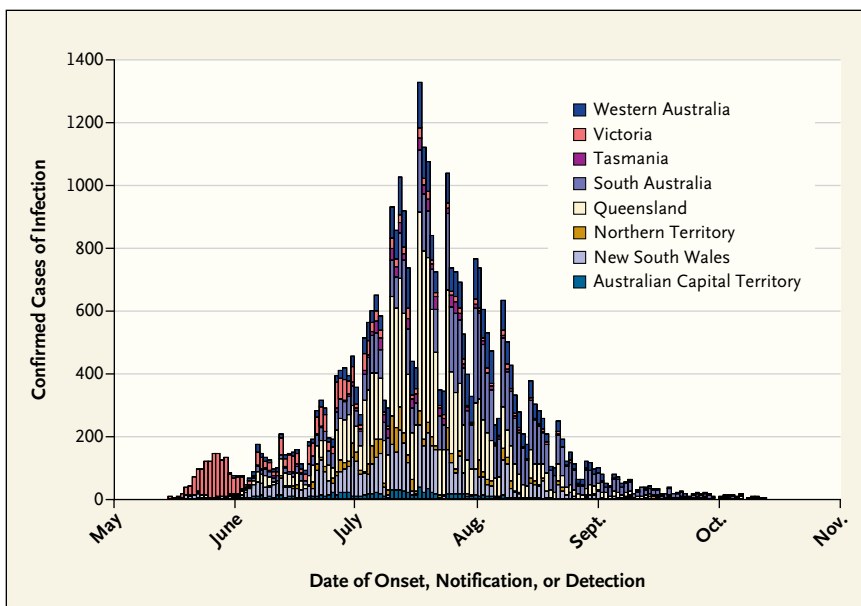
Australia activated its well-rehearsed plan for response to pandemic influenza.¹ The Australian Health Management Plan for Pandemic Influenza is a strategic outline, based on evidence and international best practices, of actions and interventions that the health care community should consider taking during a pandemic. It describes the planning assumptions, the phases of a response, and the key actions that minimize a pandemic's effects on the population and the health care community. Over the subsequent 6 weeks, the implementation of border-control measures — including requirements that travelers entering Australia declare whether

they have symptoms of influenza or have been in contact with someone with severe respiratory illness and that contacts of persons with known influenza be traced — gave the health care community time to learn more about the natural history of the new influenza strain.²

The groups that had been identified worldwide as the most vulnerable to poor outcomes were pregnant women, indigenous populations, and persons with gross obesity or serious underlying medical conditions. Australia pursued a modified version of its national plan for pandemic influenza, under which such persons and those with rapidly progressing influenza and respiratory distress were

targeted for early outpatient-based treatment with antiviral medication and careful follow-up by primary care physicians and hospitals. Additional public health mitigation measures included opening the national stockpile of antiviral medication, providing personal protective equipment to general practitioners, issuing public messages recommending self-quarantine at home for persons with influenza-like illness, and launching public-awareness campaigns aimed at reducing drop-let spread of the disease.

This first wave of 2009 pandemic influenza A (H1N1) virus infection lasted about 18 weeks in Australia, from mid-May to late September 2009 (see graph).³ Consultations for influenza-like illness in general practices and emergency departments peaked at 34 and 38 per 1000 consultations, respectively. The percentage



The Geographic Spread of the 2009 Influenza A (H1N1) Virus in Australia.

Data are from the Australian Influenza Surveillance Reports.

of clinical isolates that tested positive for influenza A peaked at 38 to 65% in the various states and territories, and the 2009 H1N1 virus accounted for 90% of influenza A isolates by week 8 (see maps). Rates of absenteeism from work and school were similar to those seen in 2007, the year in which Australia had its worst recent influenza season. The rate of hospitalizations was 23 per 100,000 population, with indigenous Australians overrepresented (16%) and about 13% of all patients who were hospitalized being admitted to intensive care units (ICUs). The highest rate of hospitalization occurred among children under 5 years of age. Boys younger than 5 years of age were hospitalized at rate of 67.9 per 100,000 population, and girls in that age group at a rate of 54.1 per 100,000 population, as compared with 51.1 per 100,000 population in this age group during previous influenza seasons. The

median length of stay was 3 days, with 19% of patients being hospitalized for more than 7 days.

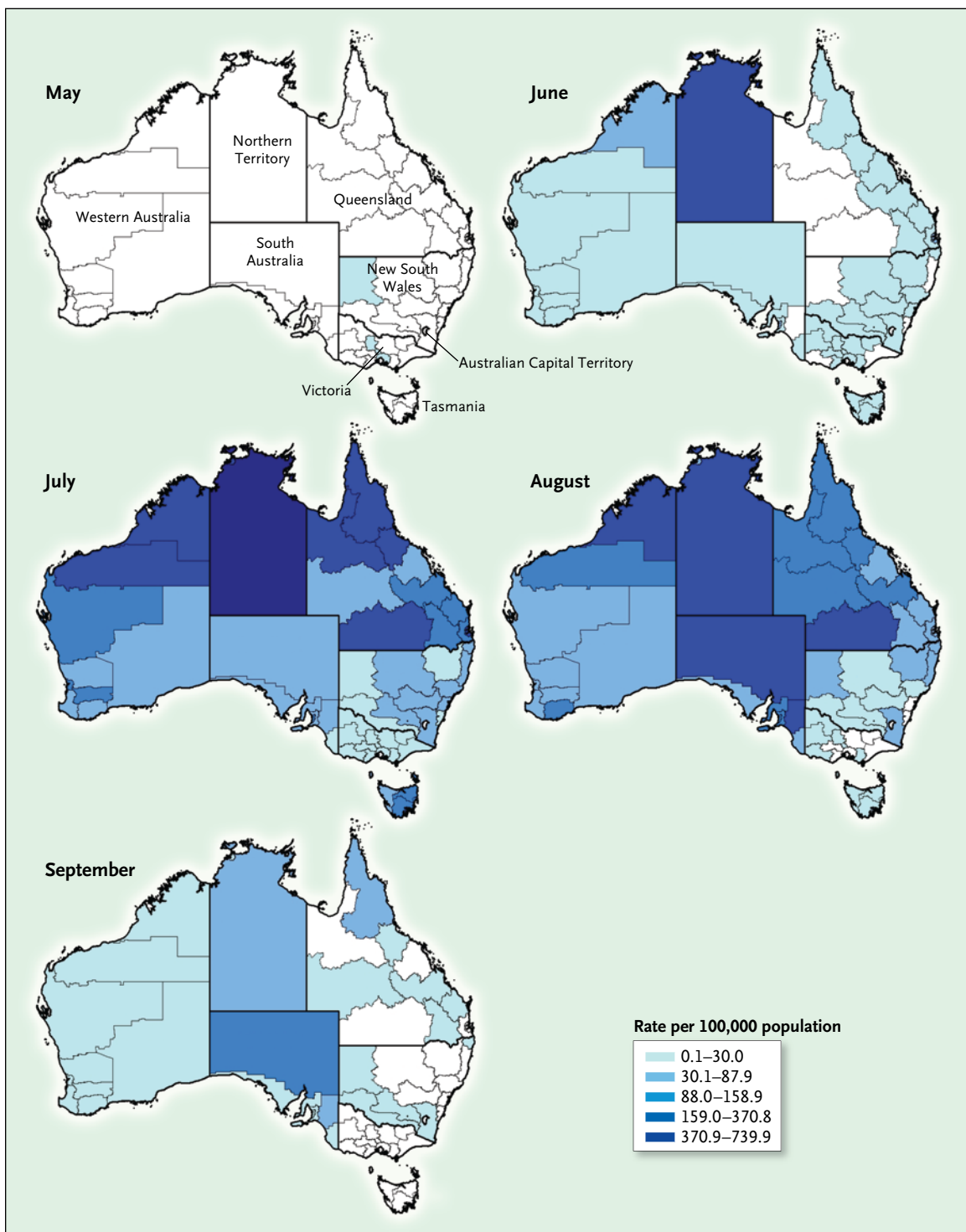
Intensive care specialists identified some patients with confirmed 2009 influenza A (H1N1) virus infection and "lung-only" single-organ failure whose lung function could not be sustained with the use of ventilators. Among these patients, extracorporeal membrane oxygenation (ECMO) was used extensively.⁴ Approximately 2.1 patients per million population were treated with ECMO, and two thirds of these patients survived.

A distinguishing feature of the epidemic was the number of people who were hospitalized in ICUs with confirmed cases of pandemic H1N1 influenza (3.5 per 100,000) and their young age (median, 42 years). According to data from influenza reports and from the Australian government, a total of 387 adults (over 20 years of age) were admitted with viral

pneumonitis resulting from influenza A, as compared with a median of only 57 adults per year admitted with viral pneumonitis from any cause between 2005 and 2008. The peak of the epidemic in Australia lasted about 3 weeks, and although the Australian health system was stressed, there was spare capacity of ECMO equipment, hospital beds, and ICU beds.

Before the 2009 H1N1 virus reached Australia, there were dire predictions that the country would see many thousands of deaths from infection with this virus. In reality, 190 deaths associated with the virus have been confirmed to date, although some additional cases may not have been documented. A broader measure of all Australian deaths resulting from influenza or pneumonia currently indicates that there have been fewer such deaths than in other influenza or winter seasons.³ However, this year the median age of the patients who died was 53 years, as compared with 83 years in previous seasons. The lower-than-expected number of deaths could reflect the success of public health mitigation measures, the use of early antiviral therapy against a sensitive virus, and the natural history of this illness, which tends to be moderate in most people rather than severe.

A national vaccination program was begun in Australia on September 30, 2009, using a monovalent, unadjuvanted 2009 influenza A (H1N1) vaccine (Panvax, CSL Biotherapies).⁵ In clinical trials of this vaccine, Australian participants had higher than expected levels of protective cross-reactive antibodies, although the implications of this finding are



The Frequency of Laboratory-Confirmed 2009 Influenza A (H1N1) Virus Infection in Australia.

Data are from the Australian Influenza Surveillance Reports and are organized according to statistical divisions defined by the Australian Bureau of Statistics; an area under the unifying influence of one or more major towns or cities constitutes a statistical division.

uncertain. It is possible that more asymptomatic infections had already occurred. This vaccination program should provide a higher level of protection for the Australian population against an anticipated second wave of infection with the virus.

Key lessons so far from this experience in an unprotected population suggest that important elements of the response were a national coordination of efforts and the use and modification of the national pandemic plan framework, focusing on persons who were most at risk. The spread of the epidemic occurred earlier in some geographic locations than in others, which created challenges (such as implementing the school

closure policy) in terms of maintaining a coordinated national approach to the epidemic. This challenge was addressed in part by holding regular meetings of the cross-jurisdictional Australian Health Protection Committee. Public messages regarding the public health response used the names of the phases of the pandemic plan, including "Delay," "Contain," and "Protect," which may have helped the public to take appropriate personal action and reduce the impact of the virus on our population.

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