

INFLUENZA A(H1N1)v IN THE SOUTHERN HEMISPHERE - LESSONS TO LEARN FOR EUROPE?

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Outside the tropics, influenza infections show seasonal patterns which depend on the latitude but appear not to be influenced by longitude. The factors influencing this seasonality are not yet fully understood, but indoor crowding, lower temperatures, decreased humidity and reduced levels of sunlight are believed to influence both transmission and host susceptibility [1]. Seasonal influenza typically occurs between November and March in the northern hemisphere, and between April and September in the southern hemisphere. However, a temporal overlap of influenza activity between both hemispheres has been described [2]. In tropical regions influenza occurs year-round; it remains unclear whether tropical regions serve as reservoir for the epidemics in both hemispheres.

During seasonal epidemics, dominant strains of influenza virus are described, that may vary within a hemisphere, and in their impact on morbidity. During the 2007-08 influenza season for example, the dominant strain circulating in Europe was seasonal influenza A(H1N1), whereas in the Americas influenza A(H3N2) was dominant [3,4].

Although they occur in distinct periods of the year, influenza strains circulating in the two hemispheres are not independent of each other. This is one of the reasons why the production of the seasonal influenza includes virological information from the circulating strains in both hemispheres. The recommendations for the composition of seasonal influenza vaccines are published twice annually by the World Health Organization before the start of the season in the respective hemispheres, usually in February and September [5].

Considering the interaction of seasonal influenza activity between the northern and southern hemisphere, we can expect the virus to behave similarly in terms of attack rates, clinical spectrum of illness and risk factors for severity. This gives an opportunity to countries in the northern hemisphere to learn from experiences in the southern hemisphere and prepare accordingly.

Current influenza situation in Chile and Australia

Large parts of Chile and Australia are located in the temperate area of the southern hemisphere, with a defined influenza season and the majority of cases occurring between May to September. Both countries have an established seasonal influenza surveillance system [6,7]. Chile documents significant levels of influenza activity every two to four years, while Australia has reported a general

increase in both influenza-like illness and influenza laboratory notifications in recent years.

In the past weeks, corresponding with the start of the influenza season in the southern hemisphere, both countries experienced a steep increase in reported cases of influenza A(H1N1)v. Chile reported its first cases in mid-May: small clusters (consisting of between two and six cases) in different schools as well as three cases having travelled back from the Dominican Republic. By the end of May, 11 of the 15 administrative regions in the country had reported cases [8]. On 12 June the total number of cases was 2,335, including two deaths; the majority (66%) of infections occurred in persons 5-19 years of age, and 2% were considered severe, requiring hospitalisation [9]. In Australia, the first case of A(H1N1)v was confirmed on 8 May, three weeks later all eight jurisdictions of Australia reported laboratory confirmed cases. By 16 June, Australia reported 1,965 cases country-wide, of which 62% were from Victoria [10].

Chile and Australia responded to the first cases of influenza A(H1N1)v by implementing a 'containment' strategy. Following the rapidly evolving epidemiological situation, Chile changed to a 'mitigation' strategy by the end of May (two weeks after the first case report). Australia changed its strategy initially in the most affected state of Victoria, where a modified 'sustain' phase was implemented [11,12]. On 17 June, the country started moving into a new 'protect' phase, taking into account the less severe clinical characteristics of the current pandemic [13]. This change in strategy impacted among others the laboratory testing strategies, focusing mainly on the early detection and adequate treatment of (potentially) severe cases.

What lessons can we learn from the present situation in Chile and Australia?

As with seasonal influenza in the past years, the influenza A(H1N1)v situation in the winter period in the southern hemisphere is likely to reveal what can be expected in the winter in the northern hemisphere. Even if the season in the southern hemisphere has only started and there are only limited data on the influenza A(H1N1)v situation available, some early conclusions can be drawn already. However, it will be even more important for the northern hemisphere countries, including those in Europe, to continue monitoring the situation in the coming weeks closely, to gain further knowledge on populations most affected, risk factors for developing severe illness, changes in the virus' virulence, transmissibility, and susceptibility to anti-viral drugs, as well as the impact of pharmaceutical and non-pharmaceutical public health measures.

The current trend in the number of cases reported in Australia and Chile, which are rapidly increasing and coinciding with the influenza season, is different from what is being observed in Europe, where progression still seems to be slower and/or delayed. In Europe, influenza activity can be expected to remain on a low level during the northern summer months, whereas a steep increase, as seen currently in Australia and Chile, might be observed at the start of the influenza season in Europe around September. Both Chile and Australia rapidly moved from containment to mitigation or sustaining strategies.

The approach of the European Member States over the past few weeks has been to implement intense containment measures, including active case finding and tracing of contacts, isolation of cases and contacts, and antiviral treatment and prophylaxis. These measures were pertinent in reaction to the first appearance of the new virus in Europe. However, it is unclear if these efforts will still be sustainable in the coming winter season when the virus is likely to be widely circulating on the continent. It can be expected that countries will implement different measures depending on the national epidemiological and virological situation.

What additional information is needed to be able to respond adequately?

Studies on the effectiveness of non-pharmaceutical public health measures from the southern hemisphere will be important, even though caution is recommended when comparing to countries with different healthcare systems, population density and social structures. In addition, the behaviour of other seasonal influenza viruses in terms of co-circulation and predominance of one strain versus the other will be closely monitored. In Chile, in week 21, 90% of the circulating influenza virus detected was due to influenza A(H1N1)v and in week 22 in the United States, the proportion was 89% [14,15]. The predominance of the pandemic strain over other influenza strains is a phenomenon that has been observed in previous pandemics [16]. If this will also become true for other southern countries, the same can be expected in the northern hemisphere and public health measures, including vaccination and treatment, will need to be adapted accordingly.

Since its detection in April this year, a lot of information on the epidemiology and virology of the new influenza A(H1N1)v virus has become available, mainly from Mexico and the United States. However, this information reflected the initial spread of the virus, which may not be representative for the coming winter season. Hence, monitoring the situation in the southern winter period will help to better anticipate, and therefore prepare, for the northern winter and its influenza season. However, some of the findings might need careful interpretation and cannot necessarily be generalised for Europe. International efforts should aim at supporting countries in the southern hemisphere in their response to the pandemic, resulting in a mutual benefit: additional resources for the south, allowing in-depth and targeted investigations, and increased epidemiological understanding for the north, allowing better preparedness for the expected winter peak.

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