

# The 1918–1919 influenza epidemic in New Zealand: end of the century reflections

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The influenza epidemic from 1918–1919 caused an estimated 9,000 deaths among New Zealanders, and disproportionately affected Māori. The current *NZMJ* features two articles that remind us of aspects of the impact of the disease that are not necessarily captured in traditional burden of disease estimates. The articles also highlight steps that need to be considered when preparing for future influenza pandemics. This editorial will reflect briefly on the implications of the articles of Dr Wilson and colleagues, and Dr Nowlan and colleagues, with regards to: identifying vulnerable populations, availability of influenza vaccination, vaccination failure and strategies for improving vaccination effectiveness, priorities for infection control, and health system response to future pandemics.

The paper by Dr Wilson and colleagues estimates the effect of the 1918–1919 influenza pandemic on birth rates through an examination of New Zealand year books, birth records and marriage certificates.<sup>1</sup> They estimate an 8.8% reduction in Māori birth rates and a 6.7% reduction in birth rates of non-Māori New Zealanders that they attribute primarily to embryonic and fetal loss due to influenza infection in pregnancy. Dr Mary Nowlan and colleagues report on the 5<sup>th</sup> New Zealand Influenza Symposium, held in Auckland in May 2019.<sup>2</sup> Their particular focus is on the vulnerable population at the other end of the life spectrum: the elderly. While influenza affects all age groups, the influenza-associated mortality rate in those over the age of 75 was more than 10 times the overall rate at 55–99 per 100,000 individuals. In addition, the authors

highlight that for many older people, catastrophic disability and loss of independence are of greater concern even than death. They summarise evidence that vaccination of the elderly is a key strategy for reducing influenza morbidity and mortality in the elderly group. Unfortunately, as the influenza vaccine has relatively low efficacy in the elderly, further work is needed to improve effectiveness: through ring protection of vulnerable individuals, and in the longer term through a more efficacious vaccine.

The Ministry of Health funds influenza vaccination for all people above the age of 65 years, and for younger people who have one of a number of medical conditions.<sup>3</sup> Adults with chronic respiratory disease including asthma, diabetes or chronic renal disease and pregnant women are among the groups for whom influenza vaccine is recommended and funded. Dr Wilson's article serves as a reminder of the particular vulnerability of pregnant women to influenza, and the imperative to increase vaccination coverage in this group. In addition, although not funded, there are other people who will benefit from and are recommended to receive influenza vaccine, including those aged under five years, and those in close contact with people at high risk of influenza morbidity. Dr Nowlan's article serves as a reminder of how the community benefits from the vaccination of these community groups.

The goals of the New Zealand immunisation strategy is to vaccinate 75% of the population aged 65 years or older, improve influenza immunisation coverage for people aged under 65 years with certain

medical conditions, and pregnant women, improve influenza immunisation uptake for healthcare workers and vaccinate 80% of healthcare workers against influenza annually. Overall, their aim is to distribute more than 1.2 million influenza vaccine doses annually and protect more than 25% of the community.<sup>3</sup> In 2017 the vaccination was taken up by 25% of the population. The proportion of older New Zealanders who were vaccinated was, at 45%, higher than the overall population but concerning low given the vulnerability of this age group.<sup>3</sup> Strategies to increase vaccine uptake are highlighted in Dr Nowlan's article, particularly better use of social media. In addition, recently published literature from California by Dr Roger and colleagues highlighted a high frequency of misconceptions about adverse effects of influenza vaccine, and invulnerability to influenza among healthcare students.<sup>4</sup> The low vaccine uptake and recent literature highlight that more work is needed at a policy level and by individual health practitioners to improve vaccine uptake.

Even if the influenza vaccine is taken up more widely, the efficacy is not 100%, and is lowest among the elderly. Dr Nowlan and colleagues report that influenza vaccine effectiveness was as low as 23% in Australia among the elderly during 2017. This reduced efficacy is due to a combination of inaccurate antibody production, declining barrier immune defences and waning cell-mediated immunity. In addition, influenza antigenic drift can render vaccinations ineffective, as happened in 2012 when the H3N2 strain underwent antigen drift between vaccine development and influenza affecting New Zealand.<sup>5</sup> Such low vaccine effectiveness is an incentive for continued investment into vaccine development. However, Nowlan and colleagues report that even with vaccine effectiveness of 25%, there is positive cost-benefit gains from influenza vaccination on the elderly, and should be part of a package of care for frail people including advice on exercise, nutrition, smoking cessation and treatment of comorbidities. The data around vaccine effectiveness also reminds us that as health practitioners we need to keep an open

mind towards the diagnosis of influenza with appropriate symptoms even in a vaccinated patient.

In addition to vaccination and management of fragility in the elderly, public health interventions are crucial for infection control. As a reminder, the world can be thankful for the strict public health interventions Singapore imposed during the SARS epidemic. Singapore essentially managed to control SARS even though a vaccination was not available to assist control efforts. The spread of a new pandemic, for example avian influenza strains such as H5N1 or H7N9, is possible.<sup>6,7</sup> Infection control strategies including the closing of schools and kindergartens, the isolation of healthcare professionals or managing infectious but not life-threateningly ill patients outside hospital (eg, in large tents or rented buildings) have all been used to augment infection control strategies. In New Zealand we have a good track record of a fast public health response, and uptake by front line healthcare professionals. Public health strategies will remain vital for managing future pandemics, and New Zealand has an influenza pandemic plan.<sup>8</sup>

Even with robust strategies for managing non-life threatening infections in the community or dedicated facilities, a large number of frail people with comorbidities will need to be admitted to hospitals for advanced care. Infection control measures such as hand hygiene, surgical masks, the avoidance of nebulisers and meticulous cleaning practices are part of the strategy to reduce nosocomial transmission.<sup>9</sup> However, with limited single rooms in New Zealand hospitals, hospital-acquired influenza remains a serious concern. Rapid influenza testing and cohorting of infected patients will play a key role in infection control in limiting nosocomial transmission. It is part of our role as health professionals to advocate for our patients, including advocating for appropriate healthcare facilities. While we have certainly made a lot of progress over the last 100 years, the real test—the next pandemic—is still to come. Let's hope we will fare better.

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Nil.

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