

groups later in life when disease is more likely to be severe might be warranted in highly vaccinated populations such as those in universities, although often vaccine uptake in young adults is low. Those who are unvaccinated because of contraindication or who are not vaccinated as children might be at increased risk of more severe disease and complications later in life.<sup>14</sup> In Australia and other countries which administer a second dose of mumps as a tetravalent vaccine at 18 months of age, continued surveillance of mumps disease is essential for early detection of disease outbreaks.

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## Mumps outbreaks in ethnic subpopulations: what can we learn?



Mumps outbreaks are being reported with increasing frequency, particularly among teenagers and young adults.<sup>1,2</sup> Outbreaks in ethnic subpopulations are also increasing. In *The Lancet Infectious Diseases*, Virgie S Fields and colleagues<sup>3</sup> report a mumps outbreak in a highly vaccinated Marshallese community in Arkansas, USA. This mumps outbreak is the second largest in the USA since the two-dose measles, mumps, and rubella (MMR) vaccine was introduced in 1989.<sup>2</sup> High two-dose MMR coverage among cases (92% of patients aged 5–17 years) was not sufficient to prevent this outbreak. Other features associated with disease transmission were observed, including poverty, household overcrowding, high social connectivity, and mistrust of medical services. What can we learn from outbreaks in communities such as this one? In the era of vaccine-induced immunity to mumps, other strategies beyond two-dose MMR might be needed.

To our knowledge, only six studies have reported mumps outbreaks among moderately to highly

vaccinated ethnic subpopulations. These include the study by Fields and colleagues<sup>3</sup> and reports on the 2009–10 outbreak among Chuukese and Pohnpeian residents in Guam,<sup>4</sup> the 2009–10 outbreak in Orthodox Jewish communities in New York (NY, USA),<sup>5</sup> the 2007–08 and 2015–16 outbreaks among Aboriginal Australians in Western Australia,<sup>6,7</sup> and the 2017–18 outbreak among Native Hawaiian and other Pacific Islanders in Alaska.<sup>8</sup> The commonality of all six outbreaks was that patients belonged to small subpopulations, without considerable transmission into the wider community; hence, household overcrowding or other intense exposure settings have been postulated to sustain transmission. Secondary vaccine failure (waning immunity) increases susceptibility to mumps.<sup>9</sup> However, waning immunity is not the only explanation for the outbreak in the Marshallese population in Arkansas because there was no apparent increase in patient numbers with time since two-dose

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