

# Direct effects of pneumococcal conjugate vaccines among children in Latin America and the Caribbean



In Latin America and the Caribbean, more than 70% of the 52 countries and territories have introduced pneumococcal conjugate vaccines (PCVs) into their national immunisation programmes for infants. More than 73 million children live in the region, and, as of 2018, about 82% had received at least three doses of PCV.<sup>1</sup> Many reports have described the benefits of PCVs in North America,<sup>2,3</sup> with recent evidence showing these findings in the Latin American and Caribbean countries.<sup>4,5</sup> In *The Lancet Infectious Diseases*, Clara Inés Agudelo and colleagues' observational study<sup>6</sup> reports data from the Sistema Regional de Vacunas (SIREVA) network. The study is substantial in size (>12 000 isolates), territory (ten countries, eight of which had been using a PCV), and time covered (about 12 years). This observational study provides evidence for the benefits of PCV programmes on reducing the burden of invasive pneumococcal diseases due to *Streptococcus pneumoniae* among children younger than 5 years in this region.

The authors examined the proportions of submitted isolates that were specific serotypes or groups of serotypes and also converted numbers of isolates to annual reporting rates from participating countries. They found that both annual reporting rates for disease caused by vaccine serotypes and the proportion of isolates submitted to SIREVA that were vaccine serotypes decreased following PCV introduction for countries using the ten-valent pneumococcal conjugate vaccine (PCV10) targeting ten serotypes (Brazil, Chile, Colombia, and Paraguay) and for countries using the 13-valent vaccine (PCV13; Argentina, Dominican Republic, Mexico, and Uruguay). The magnitude of change varied across countries; given the variation found, the surveillance programme design, and differences in immunisation programmes in the participating countries, no conclusion can be made from these data on whether programmes using PCV13 provided more benefit than programmes using PCV10.

The authors also found increases in both annual reporting rates for invasive pneumococcal diseases caused by non-vaccine serotypes and in the proportion of isolates that were non-vaccine serotypes. Note

that disease rates, rather than proportions of isolates, should be used to infer whether PCV programmes are associated with replacement disease (ie, an increase in disease caused by serotypes the vaccine does not target).<sup>7</sup> Because effective conjugate vaccines remove vaccine serotypes from circulation and therefore from isolates available for submission to surveillance programmes, the proportion of the post-vaccine isolate pool made up of non-vaccine strains will increase, even in situations in which the amount of disease caused by non-vaccine serotypes is unchanged. The annual reporting rates through SIREVA are most likely to be an underestimate of disease burden in the participating countries, as the annual reporting rates were lower than disease rates reported elsewhere.<sup>2,8</sup> The authors found modest increases in annual reporting rates for non-vaccine serotypes as a group in most but not all SIREVA countries and increases in disease caused by serotype 19A in most countries using PCV10.

The study results are important additions to the current body of evidence available in the region of Latin America and the Caribbean. A systematic review of the literature on the effect of PCVs on hospitalisation and mortality in children younger than 5 years in Latin American countries<sup>5</sup> also indicated significant effect of both PCV10 and PCV13, with no evidence of superiority for one vaccine over the other. More recently, a multi-country impact assessment estimated declines in mortality due to pneumonia in ten countries in the Latin American and Caribbean region, five of which are also included in the SIREVA study.<sup>6</sup> Most countries showed evidence of a decline in pneumonia mortality among children aged 2–59 months following PCV introduction.<sup>9</sup>

Pneumococcal disease burden remains high in adults, particularly among the elderly. As the population is ageing in several large countries in this region, the need for prevention of pneumococcal disease in older adults is increasingly important. Despite the robust evidence for direct PCV benefit among children, the available evidence remains sparse for this region on the indirect effect of PCV introduction and pneumococcal serotype distribution among the elderly. Selected countries have recently recommended PCV13 vaccination for the

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elderly population; nonetheless, if indirect effects are occurring to the extent seen elsewhere, the value of these policies might be limited.

Last but not least, it is essential to consider the still unknown extent of pneumococcal-attributable COVID-19 morbidity and mortality, particularly in older adults. As recently suggested,<sup>10</sup> this information will be important for tailoring vaccination strategies in the near future, given the heavy burden imposed by COVID-19 on health systems. The COVID-19 pandemic has already resulted in disruption of ordering and administration for infant vaccines in the USA,<sup>11</sup> an indicator that sustaining high coverage for PCV and other infant vaccines and the health benefits of these programmes will be more challenging during the COVID-19 pandemic.

We declare no competing interests.

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