Recommendation to Take a Holistic View of the Dynamic Pathogenic Pneumococcal Environment

To the Editor—

In a recent article in this journal, Anglemyer et al reported an increase in the 19A invasive pneumococcal disease (IPD) incidence in children <5 years old after PCV10 (Synflorix, GSK) replaced PCV13 (Prevenar 13, Pfizer Inc.) in New Zealand’s national infant immunization program in 2017 [1]. The authors referred to similar increases in other PCV10-using countries and inferred a direct causal link with the PCV13-to-PCV10 switch in the immunization program. Although a rise in the 19A incidence was indeed observed in <2-year-olds in New Zealand, a similar rise was seen in 2–4-year-olds. However, based on the timing of the PCV13-to-PCV10 switch, 2–4-year-olds had most likely received either a PCV13 schedule or a mixed PCV13/PCV10 schedule. The authors reported the vaccination status of 19A cases that occurred in children <5 years old and showed that 12/18 children were fully vaccinated or up to date for their age. However, they did not report the vaccine(s) administered. It would have been valuable to show a breakdown of vaccination status by age and vaccine for the entire study period. For instance, New Zealand surveillance data showed that of 8 of the 19A breakthrough cases in fully vaccinated <5-year-olds in 2018–2019, all had received ≥1 PCV13 dose and 5 had received 3–4 PCV13 doses [2], consistent with 19A being one of the main serotypes associated with PCV13 vaccine failure [3].

Most importantly, no increase in the incidence of total IPD was observed in any age group after the PCV13-to-PCV10 switch in 2017, confirming that although differences in serotype-specific disease impact may exist, the two vaccines do not differ in their net impact on the total disease burden, as previously highlighted in several reviews and studies [4–8]. This is consistent with a recent retrospective cohort study that compared the effectiveness of PCV10 vs PCV13 against pneumonia and otitis media (OM) among cohorts immunized during the PCV transition periods in New Zealand (Paynter et al, manuscript in preparation). This study found that both PCVs were equally effective against pneumonia- and OM-related hospitalizations, although a lower risk of pneumonia and OM was associated with PCV10 during the PCV13-to-PCV10 transition period. Another retrospective cohort study in New Zealand found that both PCVs also significantly reduced clinically suspected IPD in children (Howe et al, manuscript in preparation).

As the goal of PCV programs is to reduce the incidence of serious pneumococcal disease, it is important to focus on the burden of disease in its entirety, not only disease caused by selected serotypes, which are readily replaced, sometimes with more virulent types. Diversity in the serotypes affecting children has been increasing in association with vaccine programs [9]. After the first 4 years of PCV13 use, the United Kingdom has observed rises in IPD due to some virulent non-PCV13 types and serotypes 3 and 19A. Together, these trends have mitigated the additional benefits of the higher-valent vaccine [10]. When considering the national PCV program we recommend taking a holistic view of the dynamic pathogenic pneumococcal environment.

Notes

Acknowledgments. The authors thank Modis for editorial assistance and manuscript coordination, on behalf of GSK; Natalie Denef provided writing assistance, and Stéphanie Deroo provided publication coordination support. Synflorix is a trademark of the GSK group of companies. Prevenar 13 is a trademark of Pfizer Inc.

Financial support. This work was supported by GlaxoSmithKline Biologicals SA. GlaxoSmithKline Biologicals SA took charge of all costs related to the development and publishing of this letter.

Potential conflicts of interest. P. I. and M. A G. are employed by the GSK group of companies and own shares in the GSK group of companies as part of their employee remuneration. H. P.-H. reports funding to her institution from the GSK group of companies, including for pneumococcal vaccine impact studies, and serving on expert advisory boards for the GSK group of companies. J. P. reports grants paid to her institution from the Ministry of Health, the Health Research Council and the GSK group of companies, and consulting fees from the GSK group of companies for research development account plus university overheads. The authors report no other financial or non-financial relationships and activities.

Authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

Patricia Izurieta,1 Mohammad AbdelGhany2 Janine Paynter1, and Helen Petousis-Harris2
1GSK, Wavre, Belgium; 2GSK, Cairo, Egypt; and 3University of Auckland, Auckland, New Zealand

References

1. Anglemyer A, McNeill A, Dubray K, Sonder GJB, Walls T. Invasive pneumococcal disease: concerning trends in serotype 19A notifications in New Zealand. Clin Infect Dis 2022; 76:1859–61.
2. Institute of Environmental Science and Research Ltd (ESR). Invasive pneumococcal disease in New Zealand, 2017–2019. Available at: https://surv.esr.cri.nz/PDF_surveillance/IPD/2017-2019IPDAnnualReport.pdf. Accessed 11 January 2022.
3. Munagall BA, Hoet B, Nieto Guevara J, Soumahoro IA. Systematic review of invasive pneumococcal disease vaccine failures and breakthrough with higher-valency pneumococcal conjugate vaccines in children. Expert Rev Vaccines 2021; 21:201–214.
4. Cohen O, Knoll M, O’Brien K, et al. Pneumococcal conjugate vaccine (PCV) review of impact evidence (PRIME): summary of findings from systematic review, October 2017. Available at: https://www.who.int/immunization/sage/meetings/2017/october/3 FULL_PRIME_REPORT_2017Sep26.pdf?ua=1. Accessed 8 December 2021.
5. de Oliveira LH, Camacho LAB, Coutinho ESF, et al. Impact and effectiveness of 10 and 13-valent pneumococcal conjugate vaccines on hospitalization and mortality in children aged less than 5 years in Latin American countries: a systematic review. PLoS One 2016; 11:e0166736.
6. World Health Organization. Pneumococcal conjugate vaccines in infants and children under 5 years of age: WHO position paper. February 2019. Wkly Epidemiol Rec 2019; 94:85–104.
7. Naucler P, Galanis I, Morfeldt E, Darenberg J, Örtqvist A, Henriques-Normark B. Comparison of the impact of pneumococcal conjugate vaccine 10 or pneumococcal conjugate vaccine 13 on invasive pneumococcal disease in equivalent populations. Clin Infect Dis 2017; 65:1780–9.
8. Hanquet G, Krizova P, Dalby T, et al. Serotype replacement after introduction of 10-valent and 13-valent pneumococcal conjugate vaccines in 10 countries, Europe. Emerg Infect Dis 2022; 28:137–8.
9. Løchen A, Croucher NJ, Anderson RM. Divergent serotype replacement trends and increasing diversity in pneumococcal disease in high income settings reduce the benefit of expanding vaccine valency. Sci Rep 2020; 10:18977.
10. Ladhani SN, Collins S, Djennad A, et al. Rapid increase in non-vaccine serotypes causing invasive pneumococcal disease in England and Wales, 2000–17: a prospective national observational cohort study. Lancet Infect Dis 2018; 18:441–51.

Correspondence: P. Izurieta, GSK, Avenue Fleming 20, 1300 Wavre, Belgium (patricia.s.izurieta@gsk.com).

Clinical Infectious Diseases® 2022;75(1):e1204–5
© The Author(s) 2022. Published by Oxford University Press for the Infectious Diseases Society of America. This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs licence (https://creativecommons.org/licenses/by-nc-nd/4.0/), which permits non-commercial reproduction and distribution of the work, in any medium, provided the original work is not altered or transformed in any way, and that the work is properly cited. For commercial re-use, please contact journals.permissions@oup.com
https://doi.org/10.1093/cid/ciac188