

A Commentary on Respiratory Diphtheria in the Time of Omicron

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About the study

Diphtheria is a potentially fatal bacterial infection most commonly caused by the toxin-producing strain of corynebacteria, *corynebacterium diphtheriae* and less frequently *corynebacterium ulcerans*. Since the introduction of vaccination programs, the incidence of diphtheria has declined significantly, globally and in Australia the disease is rare in Australia due to high vaccination coverage.

Simpson and colleagues present the first two locally acquired respiratory cases of diphtheria in children in New South Wales in 30 years, discussing challenges encountered during their public health follow up and management. These challenges highlighted the need for public health practitioners and clinicians to prepare for rare and re-emerging diseases like diphtheria the need for up-to-date guidelines, ensuring laboratory capacity, centring culturally safety in healthcare provision and the importance of addressing vaccine hesitancy. The authors' stress that culturally safe care is essential to address barriers to vaccine uptake, particularly in underserved populations, to ensure high vaccination coverage in Australia and globally [1].

Diphtheria incidence since publication

In 2022, when the two cases discussed were reported, there were 31 notified cases of diphtheria in Australia, 25 of which were from Queensland [2]. This number decreased to 12 in 2023 and as of 25th October this year, there have been 6 notified cases in 2024 [2]. Despite the decline since 2022, notable outbreaks have occurred in our Asia-Pacific region in recent years [3,4]. For instance, Pakistan has experienced a re-emergence of the disease and diphtheria cases remain high in parts of neighboring Vietnam, Papua New Guinea and Indonesia where vaccination coverage make outbreaks common low [4-6]. The concerning outbreaks among displaced Rohingya refugees in Bangladesh in 2022, which now reports zero diphtheria cases due to the exceptional efforts to reach 95% vaccination coverage among this population, serves as a reminder of the devastation the resurgence of such a severe disease can cause [7].

Disruptions to routine vaccination, such as the Diphtheria-Tetanus-Pertussis (DTP) containing vaccine, due to the Coronavirus Disease-19 (COVID-19) pandemic and low population herd immunity, were identified as contributing factors for the recent diphtheria outbreaks, observed in the region and globally. The number of children who did not receive a single dose of the DTP-containing vaccine increased from 13.9 million in 2022 to 14.5 million in 2023 [8]. The World Health Organization (WHO) notes that trends are showing the percentage of children who have received the recommended three doses of the DTP-containing vaccine has stalled at 84% and is yet to return to pre-

pandemic levels of approximately 86%, reflecting ongoing challenges with disruptions to healthcare services, logistical issues, vaccine hesitancy and inequities in service access.

Diphtheria is a very serious and urgent condition, that can be fatal or result in very serious complications and vaccination remains the safest and most effective way to prevent the disease [1,9]. Diphtheria was once one of the top 10 causes of death in Australia, before the introduction of strong vaccination programs-a key reason diphtheria is rare in Australia today [9].

However, recently, we have seen a steady decline in childhood vaccination coverage in Australia from 2020 to 2023, the initial decline was pandemic-related, however vaccination coverage has continued to decline after pandemic-related restrictions were lifted and is yet to return to pre-pandemic levels [10,11].

Australia saw a re-emergence of respiratory diphtheria cases, with the sporadic outbreaks observed in 2022, linked to international travel and individuals who were under-vaccinated [1,9]. The two respiratory diphtheria cases presented in the article reflect a wider re-emergence of vaccine-preventable diseases, contributed to by declining vaccination rates globally and locally in Australia [8]. Given the recent declines observed in vaccination coverage, both globally and locally, there is potential for future sporadic outbreaks in Australia.

Since the article's publication, efforts to address preparedness gaps have led to updated guidelines that clarify processes, including outlining laboratory testing procedures to help reduce diagnostic delays [12]. As the authors note, addressing such gaps are essential for timely diagnosis and effective public health management in future cases. However, the most important part of ensuring preparedness for re-emerging diseases and ensuring our system, especially in less-resourced regional areas, is prepared to handle sporadic outbreaks is to restore vaccination coverage to pre-pandemic levels. The public health challenges presented in the article, including managing rare diseases like diphtheria, highlight the continuous effort needed to sustain high vaccination rates and maintain preparedness.

Some research has suggested there has been an increase in vaccine acceptance issues, decrease in vaccine confidence and an increase in vaccine hesitancy since the COVID-19 pandemic in other middle and high-income countries [13]. Significant work has been undertaken to understand the behavioral and social drivers of vaccination and create evidence-informed tools and practical guidelines to achieve high vaccine uptake and improve vaccination coverage [14]. In Australia, the National Vaccination Insights project has begun to build an evidence base of routine and systematic data on the barriers and drivers of vaccine uptake among caregivers of children and adults, essential to

to informing vaccination policies and programs to increase childhood and adult vaccination coverage [15].

Conclusion

Ensuring the system is prepared to respond to re-emerging infections, including maintaining clinical awareness, assuring guidelines are up-to-date and fit for-purpose, understanding varying capacities of laboratories, ensuring appropriate processes are followed to lessen diagnostic delays, are important to respond to rare but devastating disease like diphtheria. However, it is of the utmost importance to address declining vaccination coverage to prevent the likelihood of these outbreaks.

It is important that the public health community, clinicians, practitioners, researchers and policymakers, understand the drivers behind continued vaccination decline following the pandemic. Policies and strategies to address these declines must centre cultural safety and ensure equitable access to vaccination programs.

References

1. Simpson A, Douglas P, Draper J, Sintchenko V, Cutcher Z, et al. (2018) Respiratory diphtheria in the time of omicron. *Commun Dis Intell* 48: 1-10.
2. Australian Government Department of Health and Aged Care (2024) National Communicable Disease Surveillance Dashboard: Diphtheria. Canberra, Australia.
3. Salman M, Rana MS, Usman M, Tahir M, Muqarrab K, et al. (2024) Re-emergence of diphtheria after COVID-19 pandemic in Pakistan: Time to consider booster vaccination strategies. *J Infect* 88:106141.
4. Husada D, Hartini Y, Nuringhati KW, Tindage SG, Mustikasari RI, et al. (2024) Eleven-year report of high number of diphtheria cases in children in east java province, Indonesia. *Trop Med Infect Dis* 9:204.
5. Kitamura N, Le LT, Le TT, Nguyen HA, Edwards T, et al. (2022) The seroprevalence, waning rate, and protective duration of anti-diphtheria toxoid IgG antibody in Nha Trang, Vietnam. *Int J Infect Dis* 116:273-280.
6. Mekonnen DA, Bauri M, Pogo M, Shang M, Bettels D, et al. (2023) Use of a catch-up programme to improve routine immunization in 13 provinces of Papua New Guinea, 2020-2022. *Western Pac Surveill Response J* 14:1-6.
7. World Health Organization (2023) Situation Report: September 2023, WHO Cox's Bazar: Rohingya Emergency Crisis.
8. World Health Organization (2024) Global Childhood Immunization Levels Stalled in 2023, Leaving Many Without Life-Saving Protection.
9. Beard F, Macartney K, Winkler N (2022) Diphtheria is back in Australia: here's why, and how vaccines can prevent its spread. *The Conversation*.
10. Hull B, Hendry A, Macartney K, Beard F (2024) National Centre for Immunisation Research and Surveillance (NCIRS). Annual immunisation coverage report 2023. Sydney.
11. Beard F (2024) NCIRS Falling Childhood Vaccination Rates: Current Context and Future Strategies.
12. NSW Health (2024) Diphtheria Control Guideline.
13. Lazarus JV, White TM, Wyka K, Ratzan SC, Rabin K, et al. (2024) Influence of COVID-19 on trust in routine immunization, health information sources and pandemic preparedness in 23 countries in 2023. *Nat Med* 30:1559-1563.
14. World Health Organization (2022) Behavioural and Social Drivers of Vaccination: Tools and Practical Guidance for Achieving High Uptake. Geneva.
15. NCIRS (2024) National Vaccination Insights Project.