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Commentary

Welcome evidence of vaccine impact in the Pacific

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Interventions with proven efficacy can only work when they reach those who need them. Demonstrating that interventions work in practice, making the actual effort after deployment to ascertain that they do (or do not) is vital for sustainability, investment and ongoing acceptance of vaccination. In sparse, geographically dispersed, culturally diverse and distant communities such as live in the Pacific, the challenges facing disease surveillance, impact, effectiveness and safety assessments are substantial. Vaccine misinformation can spread across the vastness faster than can hard-won scientific fact. Small populations across hundreds of atolls and islands make sufficiently powered evidence scant, so well conducted analysis by a strong epidemiological team is encouraging and important for regional advocacy; and clear-cut demonstration of vaccine impact from Pacific nations is very welcome and an important contribution to policy making in the Western Pacific and South East Asia. It is for this reason that the publication by Jenney and Reyburn and colleagues in the Lancet Regional Health – Western Pacific is noteworthy [1].

Using both retrospective and then prospectively collected data at all referral hospitals in Fiji, the authors found a substantial reduction in rotavirus diarrhoea admissions and dramatic reductions in diarrhoea case fatality temporally associated with rotavirus vaccine introduction. Stable background incidence makes causal attribution to vaccine likely, though reductions in all-cause diarrhoea among age-ineligible groups suggest other interventions also contributed to the observed declines. Nationally representative data showed that monthly all-cause diarrhoea hospitalisations declined 52.3% (95% CI 27.7, 68.5). Rotavirus confirmed gastroenteritis admissions at the main referral hospital in Fiji reduced 87% (83, 90) especially amongst young infants. Most dramatic of all was an 81% (51, 94) reduction in case fatality from all-cause diarrhoea. After

adjustment and well justified imputation, outpatient burden of rotavirus gastroenteritis was also seen to decline 89% (71, 96).

Over and above the importance of rotavirus vaccination, these data further enlighten us in several ways.

The first is the importance of routine registration and hospital data systems. When registration systems are well designed at the outset and applied systematically and universally, they afford epidemiological power to evaluate impact and effectiveness of public health interventions, even amongst predefined subgroups. As more such data systems are electronic, their power can be increased by being linked to vital and vaccine registration systems. Good quality useable data are the cornerstone for effective action [4].

Second is the dramatic reduction in mortality despite a more modest reduction in all-cause diarrhoea hospitalisation. This belies the substantial contribution that rotavirus makes to severe diarrhoeal disease and death and argues convincingly for prioritising rotavirus vaccine introduction even in middle income countries [5,6].

Third, the fact that findings were consistent across ethnicities in Fiji should not be taken for granted. Health disparities by ethnicity are well recognized, and the Pacific is ethnically diverse [2]. These data provide further evidence of the inherent equity that vaccination can achieve when delivery and access systems make an effort at equitable distribution. Vaccines save lives if people have access to them. Vaccine benefits are inherently equitable, since their impact is greatest where disease burdens are high, but only if vaccine delivery and availability is itself equitable by design and in practice.

Fourth, despite impressive reductions there remains an ongoing burden of diarrhoea despite very substantial declines in rotavirus. Diarrhoea is multifactorial, and a substantial burden of other viral and bacterial aetiologies remain. It is important when introducing rotavirus vaccines to delivery nuanced messages to communities, that continue highlighting the importance of sanitation, clean wa-

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ter (a challenge in many atolls) and food handling, good nutritional practices and ensuring quality clinical care [3].

Fifth, it is also important to invest in, sustain and strengthen Pacific wide syndromic surveillance with aetiological sampling, as exists through the Pacific Public Health Surveillance Network, a collaboration of the Pacific Community and the WHO that supports syndromic and laboratory surveillance, emphasizing data driven decision making. The advantages of strong and longstanding surveillance surpass aetiological specific knowledge. Surveillance infrastructure affords opportunities to understand multiple causal pathways, and to evaluate interventions like future vaccines. Well integrated data systems reporting in real time allow vaccine acceptance and coverage to be tracked, and pockets of low coverage to be addressed before outbreaks occur, making systems predictive rather than responsive. It maintains a cadre of well-trained dedicated staff with technical and pragmatic training, and allows for more informed decision making.

The exemplary study by Jenney and Reyburn and colleagues in Fiji, can and should be replicated in the region, for diarrhoeal and other priority conditions. As we think about the next decade of vaccines, through and beyond the current pandemic, the voice of local decision makers informed by solid and reliable data together with community engagement across the life-course and universal access to health services will be important for successful implementation of vaccine programs. Ongoing investment will be needed in sustainable syndromic and laboratory surveillance linked to vital and vaccine registration, since these are the bedrock for good policy and good health for populations everywhere.

Declaration of Competing Interest

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Author Contributions

SS, OEM and NBZ conceived and discussed the ideas in the editorial. NBZ wrote the first draft which was reviewed and extensively edited by SS and OEM.

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