Effectiveness and Equity of Australian Vaccine Mandates

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In this issue of Pediatrics, Attwell et al1 assess the impact of two policy changes on childhood vaccination coverage in Australia. Conducting an interrupted time series analysis, the authors measure vaccination coverage of Australian children at 12 and 60 months at federal, state, and community levels after the implementation of (1) “No Jab, No Play” (NJNPlay), state-level policies denying unvaccinated children enrollment in preschool starting in 2014; and (2) “No Jab, No Pay” (NJNPay), a federal-level policy linking vaccination receipt to government family assistance payments enacted in 2016. This study is an important contribution to the vaccination policy literature and an intriguing study of behavioral theory and health equity.

Psychology is an essential part of vaccine intervention design. In an exhaustive review, Brewer et al2 summarized the vaccination and psychology literature in 2017, finding 3 ways researchers have leveraged psychology to increase vaccination: (1) understanding and changing thoughts and feelings about infectious diseases and vaccines via direct communication, (2) leveraging social processes and norms to alter vaccination behaviors, and (3) facilitating direct behavior change through patient reminders, clinician prompts, or sanctions and incentives. As Brewer notes, the literature is replete with studies facilitating direct behavior change, and such work has been most effective.2 Yet, many studies have been conducted in the United States in which researchers examine vaccination requirements for school entry and coverage in kindergartners.3,4 Attwell et al1 attempt to extend our understanding of interventions to facilitate direct behavior change by analyzing whether policies that restrict family federal assistance payments, as well as preschool enrollment, were associated with changes in vaccination at multiple ages.

Were they effective? Yes and no. Before the enactment of NJNPlay and NJNPay, vaccination coverage among Australian children was already decreasing at multiple age points in all states, with the exception of New South Wales. After the enactment of NJNPay, the proportion of undervaccinated children in all states decreased slightly and continued to decline. Yet, on a national level, the immediate effect and subsequent change in slope were not statistically significant. The same was true among states, with the exception of New South Wales, in which a decline was observed with NJNPlay in 2014 but no additional benefit was found with NJNPay in 2016. So, in a statistical sense, no: they did not. Yet, in a practical sense, the interventions may very well have succeeded. All states saw sustained declines in the proportion of undervaccinated children after the enactment of NJNPlay and NJNPay when vaccination coverage was already ~90%. Incremental increases in coverage are hardest to achieve at high levels.5 Thus, although the interventions did not accelerate increases in coverage, it is suggested by the continued decline at high levels that...
they may have strengthened existing nonmandatory alternatives. Countries seeking to improve vaccination coverage could use these strategies to facilitate behavior change for parents of young children in combination with existing nonmandatory alternatives.

However, as Attwell concludes, such policies should be considered carefully before widespread implementation. We believe they must also be equitable. In Australia and elsewhere, poor and minority children face numerous vaccination barriers and have lagged behind wealthier, nonminority children in coverage, independent of parental vaccine hesitancy, for decades.\textsuperscript{6–8} NJNPay and NJNPlay were not equitable behavioral levers; high-income families who did not use preschool were free from their effects. Restricting the means by which poor families access preschool and health care is ethically problematic and may contribute to skepticism of health care and government. Indeed, medical ethicists encourage lawmakers to avoid extremely restrictive policies that may promote distrust among parents.\textsuperscript{9} During a global pandemic that has highlighted disparities in health care, the importance of equity in behavioral intervention design is paramount. Unfortunately, there is already evidence of increasing distrust of health care, and of SARS-CoV-2 vaccines in particular, in minority populations in America and abroad.\textsuperscript{10} As pediatricians, public health workers, policy makers, and researchers, we must work together to identify ways to encourage vaccination that do not further disadvantage vulnerable populations.

In the meantime, we applaud this study. It is a step toward understanding how federal and state policies grounded in behavioral theory are associated with childhood vaccination outcomes, even if many of its findings were statistically insignificant. However, as pediatricians who care for children in a nationally recognized safety-net system,\textsuperscript{11} we cannot help but see inequity in NJNPlay and NJNPay. Brewer said it well: “Readers may come to [an] article looking for the magic trick that will dramatically increase vaccination uptake. None exists. Although many interventions fail, and those that work typically have small effects, this process is a normal part of science; the field is still young.”\textsuperscript{2} As we seek to increase vaccination uptake worldwide, let us move forward informed by this study, ready to design and conduct equitable interventions to protect child health and reduce vaccination disparities.

**ABBREVIATIONS**

<table>
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<tr>
<th>NJNPay: No Jab No Pay</th>
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<td>NJNPlay: No Jab No Play</td>
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**REFERENCES**

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