Vaccination Policies and Disease Incidence Across the Pond: Implications for the United States

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In this issue of Pediatrics, Vaz et al report the results of their study, “Mandatory Vaccination in Europe.”1 Although this study analyzed vaccination and vaccine-preventable disease trends in Europe, the policy implications are timely and relevant to US vaccination practices given the ongoing measles outbreaks in the United States and the legislative responses playing out in state capitols across the United States.

In this study, the authors examined the associations between vaccination mandate policies and subsequent vaccination coverage and measles and pertussis incidence in 29 European countries. Stated another way, the authors wanted to know if having a stricter vaccination policy resulted in higher vaccination rates and a lower incidence of 2 highly contagious vaccine-preventable diseases.

We already know that in the United States, a stricter state-based vaccination policy leads to lower rates of nonmedical exemptions2,3 and lower rates of vaccine-preventable diseases,4,5 but before the study by Vaz et al,1 these questions had not been examined among European countries. We can think of 3 main reasons this study is highly relevant to US vaccine policy: First, it demonstrates that the impact of such policies is not country specific, offering guidance to countries throughout the world on strategies to increase or maintain high vaccination rates. Second, some of the policies used in Europe are strategies that have not been tried previously in the United States and may offer US policy makers strategies to consider. Third, and most important, vaccine-preventable diseases are a worldwide problem; they know no borders, and therefore, it is in the interest of all of us to study and understand how to best achieve high vaccination coverage throughout the world. Indeed, many US measles outbreaks in the last decade have been a result of cases imported from Europe, (most recently and visibly, the Clark County outbreak in Washington state).6

To examine these questions, the authors used data from the European Centre for Disease Prevention and Control and the World Health Organization to examine the relationship between country-level vaccination policies and measles and pertussis vaccination coverage and the annual incidence of these diseases in 29 European countries. To try to assess the specific impact of the vaccination policies, the authors used regression models to examine these associations, adjusting for numerous country-level covariates likely to have an impact on vaccination coverage or disease incidence, such as education, urbanicity, income, and age of the population. The authors found that mandatory vaccination was associated with 3.00 percentage points higher prevalence of measles vaccination (95% confidence interval [CI], 0.35–5.64) and 2.14
percentage points higher prevalence of pertussis vaccination (95% CI, 0.13–4.15) compared with countries that did not have mandatory vaccination. Mandatory vaccination was associated with decreased measles incidence in countries that did not allow nonmedical exemptions (adjusted incident rate ratio = 0.14; 95% CI, 0.05–0.36), although there was no significant association between mandatory vaccination and pertussis incidence. The authors also found that incorporating financial penalties for not vaccinating increased vaccination uptake. In countries with such policies, every €500 increase in the maximum possible penalty was associated with an increase of 0.8 percentage points for measles vaccination coverage (95% CI, 0.50–1.15; P ≤ .0001) and an increase of 1.1 percentage points for pertussis vaccination coverage (95% CI, 0.95–1.30; P ≤ .0001).

In Europe and other parts of the world, policy makers have (to varying degrees) employed financial penalties for parents who choose not to vaccinate. Policy makers in the United States have for the most part shied away from such policies. This study should make us reconsider this approach because it appears to be effective. In Hungary, for example, parents could face a financial penalty of up to ~€1600 (~$1800) if they fail to comply with vaccination requirements; this has resulted in high vaccination coverage and essentially no measles or pertussis cases. Importantly, these types of financial penalties may also be fair because it is clear that persons unvaccinated by parental choice place an unneeded financial burden on our health care system.7–9

A limitation is that this study was limited to European Union member states, Norway, and Iceland, which leaves out several European countries that have had high rates of measles in recent years (Ukraine, in particular).10 A strength of the study was adjusting for several covariates likely to impact vaccination uptake to better understand the consequences of these policies.

Although it is understandable that the authors studied measles and pertussis, both highly transmissible infections, examining pertussis is somewhat problematic: outbreaks of pertussis are multifactorial,11 with vaccine refusal having a much weaker linear relationship to pertussis outbreaks when compared with refusal of the measles vaccine, which, in the context of the United States and Europe, are almost completely attributable to parental refusal of vaccination. Thus, it is not surprising that the findings related to pertussis did not reach significance, for the most part.

It is interesting to note that the interventions in this study are all country-level policies. In contrast, the United States has no national policy for enforcing vaccination uptake (only recommendations from the Advisory Committee on Immunization Practices and professional organizations like the American Academy of Pediatrics), and enforcement of vaccination is left to individual states. It is provocative to consider a national system in the United States for vaccine mandates and enforcement.

It is unfortunate that in 2019, highly resourced regions, such as the United States and Europe, continue to struggle with health crises of their own making. The causes of vaccine hesitancy are multifactorial,12 and although the scientific and medical community can conveniently point to the small but vocal group of antivaccination activists as the cause of this health crisis, we must also consider how to best address the root causes of this pervasive movement. Perhaps, vaccine mandates and fines are 1 answer, but is it possible for us also to identify effective ways to address the growing distrust of evidence-based interventions, such as vaccination? We must strive to develop an effective national approach to prevent the resurgence of highly preventable infectious diseases, using tested, multipronged approaches that still seem to be lacking.

ABBREVIATION
CI: confidence interval

REFERENCES


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