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RESEARCH

Impact of pharmacists providing immunizations on adolescent influenza immunization

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ABSTRACT

Objectives: To determine if the Oregon law change in 2011 to allow pharmacists to immunize adolescents 11 to 17 years of age increased influenza immunizations or changed existing immunization venues.

Methods: With the use of Oregon's ALERT Immunization Information System (IIS), 2 measures of impact were developed. First, the change in adolescent age 11-17 influenza immunizations before (2007-2010) and after (2011-2014) the pharmacy law change was evaluated against a reference cohort (aged 7-10) not affected by the law. Community pharmacies were also compared with other types of influenza immunization sites within one of the study influenza seasons (2013-2014).

Results: From 2007 to 2014, adolescent influenza immunizations at community pharmacies increased from 36 to 6372 per year. After the 2011 pharmacy law change, adolescents aged 11 to 17 were more likely to receive an influenza immunization compared with the reference population (odds ratio, 1.21; 95% CI, 1.19-1.22). Analysis of the 2013-2014 influenza season suggests that community pharmacies immunized a different population of adolescents than other providers.

Conclusion: The 2011 change in Oregon law allowed pharmacists to increase the total of influenza immunizations given to adolescents.

The role of pharmacists in increasing adult immunization rates for seasonal influenza is well established.[1-3] However, reducing the spread of seasonal influenza disease depends not only on immunizing adults and seniors, but also on immunizing sufficient numbers of all ages. The potential for children and adolescents to act as vectors for the transmission of influenza is well established, and increasing immunization rates among adolescents as well as younger children is a promising approach to reducing the burden of influenza among vulnerable groups.[4,5] Adolescents, however, are a challenging target for an immunization that is not school required, in part owing to their low rates of non-urgent or emergency care visits to medical providers, and immunization rates for seasonal influenza among adolescents are substantially lower than for younger children.[6] The most common clinic-based approaches to immunizing adolescents include checking for needed vaccines at routine visits or scheduling immunization-only visits.[7] Recommended methods for improving immunization rates among younger child populations, such as sending reminders to parents about immunizing, whether for clinics or local health departments, have shown mixed results with adolescents; and tracking down parents with adolescents by mail or telephone to remind them about immunizations can be difficult.[8-10] Expanding the scope of pharmacists in delivering adolescent immunizations is seen as a route to improve low adolescent rates for vaccines such as seasonal influenza.[11]

As of 2014, almost all states allow pharmacists to immunize adolescents in some fashion; however, only a handful of states allow pharmacists to immunize adolescents without prescriptions or under broad protocols.[12] In 2010, Oregon pharmacy law was changed to allow pharmacists to immunize adolescents down to 11 years of age, and the administrative rules for this change went into effect at the start of 2011. Under the rule changes, an adolescent pharmacy immunization protocol was jointly developed and administered by the Oregon Board of Pharmacy and the Oregon Public Health Division. This protocol covers all vaccines recommended by the

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Key Points

Background:

- Pharmacists are playing increasing roles in immunizing adolescents.
- An open question is whether pharmacists who immunize add to the total volume of adolescent immunizations.

Findings:

- Both on a local area basis and across time, immunizing pharmacists made a significant contribution to total influenza immunizations for adolescents.

Advisory Committee on Immunization Practice (ACIP). In 2014, the pharmacy law was again amended to add children down to seven years of age, with implementation starting in January 2015. Before 2011, pharmacists in Oregon were allowed to immunize children under 18 years of age only by prescription.

Objectives

Whether an expanded scope of practice for pharmacists in adolescent immunization would add to adolescent immunization rates for seasonal influenza is presently unaddressed by the scientific literature.[13] From a health policy perspective, there is a need to confirm that pharmacists add to the total of adolescent immunizations rather than merely providing a convenience shift of venue away from other sites as clinics. The purpose of the present study was to evaluate the impact of the 2011 Oregon pharmacy law change, and to provide evidence on the impact of pharmacists providing immunizations at community pharmacies on adolescent influenza immunizations.

Methods

The 2011 change in Oregon pharmacy law to allow pharmacists to immunize adolescent patients down to 11 years of age under a statewide protocol provided a setting for a natural experiment. Demonstrating an impact from the pharmacy law change requires not only that immunizations increased, but also that they increased more than would otherwise have been expected. Preexisting trends in increasing adolescent rates, as well as unexpected season-to-season variation in immunization seeking, need to be taken into account to make such an assessment. For the present study, one strategy for achieving such a controlled result was to determine adolescent aged 11-17 influenza immunization volumes and mean rates before and after the law change compared with another childhood group (7 to 10 years of age) as a reference. Adolescents aged 11 to 17 years, with the exception of pharmacy, tend to use the same providers as the younger group, and externalities affecting adolescent immunization seeking are also expected to be similar. The degree of change in adolescent influenza immunization attributable to the pharmacy law change can then be estimated in relation to the change observed in the younger group.

In addition, an analysis was made across local areas within a single influenza season after the pharmacy law change to evaluate the relation between adolescent influenza immunizations given at community pharmacies versus other sites across local areas within the study area. The study concept was that pharmacists are additive to the total of adolescent influenza immunizations, serving a population that would largely ignore other types of sites. For this hypothesis of an independent pharmacy effect on adolescent immunization rates, the null hypothesis was that adolescents were simply shifting venues to pharmacies from clinics, so that no separate adolescent pharmacy effect is present. This null hypothesis can be tested in the local area data by the association between pharmacy and nonpharmacy adolescent immunization volumes, controlling for the differences in area totals.

The data for this study were drawn from influenza immunizations reported to the Oregon ALERT Immunization Information System (ALERT IIS) from 2007 to 2014. The ALERT IIS is a lifespan immunization registry containing the majority of influenza immunizations given to Oregonians of all ages. For example, in each of the influenza seasons since the pharmacy law change, ALERT has received reports of more than 1.1 million influenza doses given to Oregonians per season (unpublished data, Oregon Health Authority, 2015). For the present study, ALERT IIS data were selected for the portion of Oregon in a Centers for Disease Control and Prevention (CDC)–sponsored Sentinel immunization surveillance region. The Oregon Sentinel region is 1 of 6 Sentinel surveillance regions in the United States used for tracking national immunization trends. In Oregon this region consists of Clackamas, Marion, Multnomah, Polk, Washington, and Yamhill Counties and includes the general Portland area. Evaluation metrics collected by the CDC and Oregon indicate that for the Sentinel region the ALERT IIS captured over 95% of childhood populations and immunization providers (unpublished data, Oregon Health Authority, 2015). As part of the 2011 pharmacy law change, immunizing pharmacists were required to report all pharmacy immunizations into ALERT IIS regardless of patient age. The adolescent study population here was defined as children 11 to 17 years of age in at least 1 influenza season from 2007 to 2014 and whose last known residence was in the Oregon Sentinel region. Study population residence was based on last reported residence zip code in the ALERT IIS.

For the comparison of adolescent rates before and after the law change relative to a younger reference group, the testable hypothesis in this case was that the ratio of influenza immunizations between adolescents and the younger group significantly increased. For this purpose, influenza immunizations and mean rates from 2007 to 2010 were compared with those from 2011 to 2014 across the 2 age groups. These data were displayed and tested with the use of a 2×2 table format, and immunizations within the 2 age groups were compared before and after the law change. Odds ratios (ORs) were calculated in 2 ways: first, with the use of a 2×2 table of immunization counts and the formula $OR = (a \times d)/(b \times c)$; and second, as a ratio of the mean immunization rates before and after the pharmacy law change across the 2 age groups of 11 to 17 and 7 to 10. Winpepi was used to generate OR CIs for both methods.[14]

As a secondary approach to the impact of the pharmacy law, adolescent influenza immunizations were evaluated across local areas within the Sentinel region within a single