

Improving Pneumococcal and Herpes Zoster Vaccination Uptake: Expanding Pharmacist Privileges

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Objective: To investigate how state-authorized pharmacist immunization privileges influence pharmacist intervention effectiveness in delivering pneumococcal and herpes zoster vaccinations and assess the implications these privileges have on vaccination rates.

Study Design: Cross-sectional study of Walgreens vaccination records from August 2011 to March 2012.

Methods: A random sample of patients having a claim for influenza vaccination in the study period was selected. Vaccination uptake rates for pneumococcal disease and herpes zoster were calculated for previously unvaccinated patients at high risk for these conditions. Rates were examined by state-level pharmacist privileges.

Results: For states authorizing immunization by protocol or prescriptive authority, the 1-year pneumococcal vaccination uptake rate for previously unvaccinated, high-risk persons was 6.6%, compared with 2.5% for states requiring a prescription ($P < .0001$), and 2.8% for states with no authorization ($P < .0001$). For herpes zoster, the 1-year vaccination uptake rate was 3.3% for states authorizing per protocol/prescriptive authority, compared with 2.8% (not significant, $P < .05$) for states authorizing by prescription, and 1.0% for states with no authorization ($P < .0001$). A 148% increase of pneumococcal vaccination and a 77% increase of herpes zoster vaccination would result if all states granted pharmacists full immunization privileges.

Conclusions: This analysis demonstrates that states that offer pharmacists full immunization privileges have higher vaccination uptake rates than states with restricted or no authorization. Considering the suboptimal vaccination rates of pneumonia and shingles and the public health goals of 2020, states with limited or no immunization authorization for pharmacists should consider expanding pharmacist privileges for these vaccinations.

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Community pharmacies are uniquely positioned to increase immunization rates in the United States for vaccine-preventable diseases. A recent survey of public health leaders identified pharmacists as playing a pivotal role in vaccine administration and pandemic planning.¹ Evidence in published medical literature suggests that pharmacies have the capacity to influence previously difficult-to-reach populations.²⁻⁵ Pharmacists may be especially effective in immunizing high-risk, older adults who are more likely to utilize pharmacy services for prescription medication than the general population.⁶ Pharmacists are also able to leverage their ability to identify people with key risk factors (eg, diabetes, heart disease), encourage them to receive their Centers for Disease Control and Prevention (CDC)-recommended vaccinations, and administer the required vaccine.⁷

A major challenge to pharmacist-provided immunizations is variability in state legislation on the practice. Authority for pharmacists to administer vaccinations and the scope of that practice is defined by the Board of Pharmacy in each state, including the process by which pharmacists administer vaccines, the type of vaccines permitted, and legal patient age for vaccination. Although the scope of practice is defined by the board of pharmacy, the actions of each board are subject to legislative regulatory oversight. Consequently, the legislative process produces variability in state statutes governing pharmacy privileges, which has resulted in “considerable differences in how pharmacist-provided immunizations are delivered at the state level.”⁷

OBJECTIVES

The objectives of this study are to (1) investigate how state-authorized pharmacist immunization privileges influence pharmacist intervention effectiveness in delivering pneumococcal and herpes zoster vaccinations and (2) assess the implications these state-authorized pharmacist immunization privileges have on vaccination rates.

METHODS

This cross-sectional study analyzed vaccination records from the Walgreens pharmacy chain between August 1, 2011, and March 1, 2012. Vaccination records for influenza, pneumococcal disease, and herpes zoster offered by Walgreens during the study period were identified from pharmacy claims and information extracted from the pharmacy computer system for the purposes of the study. Type of vaccination was determined from the US Food and Drug Administration National Drug Code (NDC11).

Risk factors for pneumococcal infection were determined from the Advisory Committee on Immunization Practices (ACIP) of the CDC (**Table 1**).⁸ Risk factors for herpes zoster infection were defined as patients aged 60 years or greater, as identified by the ACIP.⁹

A random sample of 53,000 patients was selected from all patients having a pharmacy claim for influenza vaccination during the study period. For these patients, their Vaccination Administration Record (VAR), a mandatory form which is completed by the patient and the pharmacist upon administration of all vaccinations, was analyzed. The Walgreens VAR form serves as a screening tool to identify relevant high-risk factors for vaccine-preventable diseases, which the pharmacist can then recommend to the patient; it also serves as a patient consent form and administrative record for vaccination. In this study, the VAR was utilized to gather a more complete vaccination history of the patient and to identify relevant high-risk factors. High-risk status for pneumococcal disease, as outlined by the previously mentioned ACIP recommendations, was determined from completed VAR forms. High-risk status for herpes zoster was determined from patient's age from pharmacy claims. Patients who indicated they previously received a vaccination for pneumococcal disease or herpes zoster were excluded from the analysis. State-level pharmacist privileges for the administration of pneumococcal and herpes zoster vaccinations were identified from American Pharmacists Association (APhA)⁷ and internal Walgreens data.

State privileges were classified into 3 levels for pneumococcal and herpes zoster vaccinations: (1) pharmacist authorized to administer vaccinations under a protocol or prescriptive authority; (2) pharmacist authorized to administer vaccinations only with a patient-specific prescription; and (3) pharmacist not authorized to administer vaccinations; however, within this classification, vaccine may be dispensed by pharmacists and administered by onsite nurses. Pharmacy claims for the state of North Dakota, which does not have a Walgreens pharmacy, were excluded from the analysis. We defined vaccination uptake rate as the proportion of previously unvaccinated, high-risk patients who subsequently received vaccination after pharmacist intervention. Rates were determined for pneumococcal disease and herpes zoster, stratified by each of the 3 state privilege categories. There were no known changes in state privileges during the study period. Patients who received a pneumococcal or herpes zoster vaccination in a state with a different pharmacist privilege level than their influenza vaccination were excluded from the analysis. The percentage of patients excluded was 0.02%. All data analysis was performed with SAS 9.2 software (SAS Institute Inc, Cary, North Carolina). Statistical significance was assessed at the $\alpha = 0.05$ level. This study was approved by Quorum IRB #26510.

RESULTS

Of the 53,000 randomly selected patients who had claims for an influenza vaccination, 46,257 (87.3%) had a complete and legible VAR form and pharmacy records (**Table 2**). The average age of the sample was 58.5 years and the sample was 42.8% male. Of the total patient population, 30.3% had 1 or more chronic conditions as indicated by their VAR form; these chronic conditions included anemia, asthma, diabetes, heart disease, kidney disease, liver disease, and lung disease. For pneumococcal disease, 30,966 (66.9%) of the patients were found to be at high risk: 22,631 (73.1%) were 65 years or older and 8335 (26.9%) were younger than 65 years and had a high-risk condition for pneumococcal disease. For herpes zoster, 27,190 (58.8%) were high-risk patients.

An assessment of pharmacist immunization authority determined that 41 states allowed pharmacists full authorization to immunize for pneumococcal disease under a protocol or prescriptive authority during the study period of August 2011 through March 2012; 36 states allowed pharmacists full authorization to immunize for herpes zoster under a protocol or prescriptive authority. For pneumococcal disease, 8 states authorized pharmacists to immunize with a patient-specific prescription and 11 states authorized for herpes zoster. Two states did not authorize any immunization privilege for pneumococcal disease and 4 states did not authorize for herpes zoster (Table 2).

The combined vaccination uptake rate for high-risk patients across all states for pneumococcal disease was 5.5%, and 2.8% for herpes zoster. For states authorizing immunization by protocol or prescriptive authority, the pneumococcal vaccination uptake rate was 6.6%, compared with 2.5% for states requiring a prescription ($P < .0001$), and 2.8% for states with no authorization ($P < .0001$). For herpes zoster, the rate was 3.3% for states authorizing per protocol or prescriptive authority, compared with 2.8% (not significant, $P < .05$) for states authorizing with a prescription, and 1.0% for states with no authorization ($P < .0001$) (Table 2).

We conducted an opportunity analysis to estimate the rates of pneumococcal disease and herpes zoster vaccinations

among influenza vaccination patients if states with restricted authority were granted full immunization privileges (Table 3). Based on the results of this study, an additional 38,071 pneumococcal vaccinations (a 148% increase) could be administered if states with limited immunization privileges were granted full vaccination privileges. An additional 15,401 herpes zoster vaccinations (a 77% increase) could also be administered if full authorization were granted.

DISCUSSION

In this study, the aggregate vaccination uptake rate for pneumococcal vaccine was 5.5%; when analyzing those states with full privilege, the rate was 6.6%. An earlier study conducted by Taitel et al¹⁰ showed a similar periodic uptake rate of 4.9% among patients who were at high risk for pneumococcal disease. These rates compare favorably with the benchmark uptake rate of 2.9% cited in the study, which is a rate typical of traditional care delivery at physicians' offices.

Similarly, the aggregate vaccination uptake rate for herpes zoster was 2.8% and the rate for states having full privileges was 3.3%. These rates provide evidence of the unique value of the pharmacist in improving pneumococcal vaccination uptake and in meeting one of the objectives of the Healthy People 2020 campaign, which is to increase rates for vaccine-preventable diseases for those at high risk.¹¹ It is important to note that reported rates in this study are vaccination uptake rates for previously unvaccinated persons who present for influenza vaccination and are not overall adult vaccination coverage rates in the United States.

If all states would adopt legislation to authorize pharmacists to administer vaccinations under a protocol or prescriptive authority, a dramatic increase in vaccinations administered to high-risk patients for pneumococcal disease and herpes zoster

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would likely occur. In a study conducted by Steyer et al,¹² individuals 65 years and older who lived in states where pharmacists could provide vaccines had significantly higher ($P < .01$) influenza vaccine rates than individuals of this age group who resided in states where pharmacists are not authorized to provide vaccines.

This study also demonstrates the pharmacist's ability to recommend and administer other immunizations for vaccine preventable diseases in addition to influenza. The Walgreens vaccine administration record facilitates this process by giving pharmacists the ability to prescreen, identify, and administer appropriate vaccinations to their patients. This demonstrates the value that pharmacists can provide to the healthcare system. Further, payers who cover vaccinations in states with full immunization privileges could realize savings, as vaccination administration costs are less expensive in a pharmacy setting.¹³ Finally, if states adopted legislation to expand pharmacist immunization privileges for other vaccine-preventable diseases, they would realize a subsequent increase in vaccination uptake.

LIMITATIONS

A limitation of the current study was its observational design and the reliance on pharmacy claims for estimation of uptake rates. As with any non-randomized study, causality cannot be confirmed. However, the current study was an enhancement

to the previous study conducted by Taitel et al¹⁰ in that it utilized VAR forms in addition to pharmacy claims to more accurately identify high-risk status and estimate vaccination rates. Based on patient indication per the VAR form, the study was able to focus on those at high risk and in need of pneumococcal and herpes zoster vaccinations.

Another limitation to the study is that not all of the risk factors for pneumococcal disease, as specified by the ACIP, could be identified from the VAR forms. The VAR form does not capture certain risk factors for pneumococcal disease, such as being a resident of nursing homes or long-term care facilities. Furthermore, the VAR form relies upon patient self-reporting to collect information on vaccination history and high-risk conditions. Lastly, patients who receive an influenza vaccination at the study pharmacy may have subsequently received a pneumococcal or herpes zoster vaccination at another retail pharmacy chain or physician's office. Generally, the influence of these limitations would cause an underestimation of vaccination rates. Thus, these results are a conservative estimate of the potential impact of pharmacy-based immunizations.

CONCLUSION

States that offer pharmacists full immunization privileges have significantly higher vaccination uptake rates for pneumococcal disease and herpes zoster than states with restricted or no authorization. Extrapolation of these results could result in a 148% increase in uptake for pneumococcal vaccine and a 77% increase in uptake for herpes zoster vaccine. Considering the suboptimal vaccination rates of pneumonia, shingles, and other conditions and the public health goals of 2020, states with limited or no immunization authorization for pharmacists should consider expanding pharmacist privileges.

Take-Away Points

Community pharmacies can help increase immunization rates in the United States for vaccine-preventable diseases. Specifically, this study demonstrates that:

- Pharmacists can identify people with key risk factors (eg, diabetes, heart disease) for vaccine-preventable diseases, encourage them to receive their Centers for Disease Control and Prevention–recommended vaccinations, and administer the required vaccinations;
- States allowing pharmacists full immunization privileges have significantly higher vaccination uptake rates for pneumococcal disease and herpes zoster than states with restricted or no authorization;
- States with limited or no immunization authorization should be encouraged to expand pharmacist privileges for immunizations.

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