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Insurance reimbursements for recombinant zoster vaccine in the private sector

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Abstract

A two-dose series of the recombinant zoster vaccine (RZV, Shingrix) was licensed by the Food and Drug Administration in 2017 and recommended by the Advisory Committee on Immunization Practices in 2018 for adults in the United States age 50 years and older. Despite the health benefits of shingles vaccination, coverage has remained low, with financial barriers among healthcare providers identified as one potential factor. This study estimates the reimbursement levels for RZV among a large sample of privately insured individuals in the US from the 2018 IBM® MarketScan® Commercial Claims and Encounters database. Of 198,534 claims for an RZV dose, the mean reimbursement was $149. Most claims (83%) exceeded $140, which was the private sector vaccine price reported on the CDC vaccine price list in April 2018. These results can be useful for providers considering procuring RZV and for state immunization programs considering ways to improve vaccination coverage.

Keywords

Shingles; Herpes zoster; Recombinant zoster vaccine; Reimbursement; Private insurance

1. Introduction

Herpes zoster, or shingles, is a painful skin condition that can result following the reactivation of latent varicella-zoster virus. There were approximately 1 million episodes of herpes zoster annually in the United States (US) during the pre-herpes zoster vaccine era [1]. Two vaccines have been recommended by the Advisory Committee on Immunization Practices (ACIP) for older adults to prevent episodes of herpes zoster: the live attenuated

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

zoster vaccine (ZVL, Zostavax), which was recommended in 2008 [2], and the recombinant zoster vaccine (RZV, Shingrix), which was recommended in 2018 [3]. This study focuses on RZV only because RZV was given a preferential recommendation over ZVL [3] and, as of July 1, 2020, ZVL was no longer distributed in the US [4].

Vaccine efficacy is reportedly > 50% [5,6] for ZVL and > 90% for RZV [7]. Despite the health benefits of herpes zoster vaccination, vaccination coverage for herpes zoster remains low and varies across states. An assessment of data from 2013 to 2017 found that, among the recommended age group of ≥ 60 years, the vaccination coverage of ZVL ranged from 26 to 52%, depending on state [8]. Data from the National Health Interview Survey in 2018 found that 34.5% of respondents who were ≥ 60 years self-reported ever having received a shingles vaccine [9]. The latest coverage data from the Behavioral Risk Factor Surveillance System in 2018 indicates that, from a sample of six states, between 33 and 49% of individuals ≥ 60 years indicated they ever received a shingles, or zoster, vaccine [10].

RZV is regularly administered in both outpatient healthcare clinics and pharmacies [11,12]. Adult vaccine providers face a number of challenges to maintaining high coverage of recommended vaccinations, including financial concerns, such as receiving sufficient reimbursement from payers to cover the expenses of up-front purchase, storage, and any potential wastage of vaccine materials [13–15]. Reimbursement levels can constitute an important part of a provider's financial sustainability [15]. In a 2016 survey of US providers, 21% of providers who had stopped providing ZVL did so because of cost and reimbursement issues [16]. In the same survey, 42% of providers indicated cost was a major barrier to vaccination, whereas smaller percentages of providers indicated safety (0.3%), effectiveness (4%), and other medical issues taking precedence (5%) were perceived as major barriers. Any of these potential barriers could lead to lower vaccination coverage and to a higher burden of vaccine-preventable disease.

In addition to the impact that reimbursement rates can have on the financial decisions of healthcare providers, reimbursement rates can also impact estimates of the economic value of a vaccine. One of many components of ACIP deliberations is the consideration of economic analyses [17,18]. For the most recent herpes zoster vaccine recommendation, three economic models were reviewed and considered [19–21]. Vaccination costs can be one of the more important inputs into these economic analyses. In economic models, vaccination cost input values are determined by characteristics of the target population, data availability, and the analytic perspective (e.g., patient, provider, healthcare sector, societal). Sources for these values can potentially include reimbursement rates from payers [15,22], such as insurance companies or government programs like Medicare and Medicaid, and publicly reported prices of vaccines [23].

This study aims to calculate reimbursement rates for RZV from a large sample of US adults with private insurance, with the objective of quantifying reimbursement rates across the US and any differences across states. These results can support public health decision-making and vaccination coverage objectives in at least three ways: (1) increase awareness among providers of reimbursement levels, which can highlight the business case for offering vaccinations and therefore potentially lead to better and more widespread access to vaccines;

(2) identify states with relatively lower reimbursement rates, which can serve as evidence for policy makers and public health officials considering additional interventions to incentivize providers to engage in RZV vaccination; and (3) these estimates can be incorporated into models that estimate the economic value of vaccines, particularly for analyses conducted at the health care sector and societal perspectives, which may also in turn inform broader vaccine policy decision-makers such as the ACIP.

2. Methods

2.1. Study sample

This study used the 2018 IBM® MarketScan® Commercial Claims and Encounters (CCAE) Database Outpatient Services and Pharmaceutical Claims Files. The CCAE Outpatient Services and Pharmaceutical Claims Files contain de-identified, individual-level healthcare claims for individuals age 64 years or younger covered by large self-insured employers and health plans in US states. For this analysis, we included adults who were aged 50–64 years because RZV is recommended for adults ≥ 50 years of age [22].

2.2. Measures

We identified zoster vaccination claims by locating outpatient visits that included Current Procedural Terminology (CPT) codes for RZV (90750) and pharmaceutical claims that included National Drug Codes (NDCs) for RZV (58160081912, 58160082311). We only included claims from non-capitated or fee for service (FFS) health plans. The outcome variable was NETPAY, which captures the amount paid by an insurance company for the reimbursement of one dose of RZV. Because RZV is recommended in a two-dose vaccine series, we excluded patients whose records indicated three or more distinct service dates for vaccine visits for RZV (3%). We excluded unusual observations by dropping any reimbursement amounts that were greater than two standard deviations from the mean (excluding 4% of the observations). Observations were excluded from four states (Alaska, Hawaii, Rhode Island, and Vermont) with universal vaccine purchase programs, since these programs purchase adult vaccines and distribute them to participating providers at no cost [22]. Observations were also excluded from Delaware, Idaho, Mississippi, South Carolina, and Washington, D. C. because release of their information is prohibited by the IBM® MarketScan® data user agreement. Reimbursement estimates are presented in US$2018. The percentage of vaccination visits for which reimbursements were higher than the CDC-published price was also reported for the entire sample and for each state. As a secondary analysis of data without identifiers, this study did not require IRB review.

3. Results

Across all states, the total number of reimbursements in our sample was 198,534 and the mean reimbursement level for a single dose of RZV was $149, which was $9 greater than the CDC-published price of $140 from 2018 (Table 1). The majority (83%) of reimbursements exceeded the CDC-published price. Reimbursements varied across states, with the lowest mean reimbursements observed in Michigan with $132 per dose, and the highest mean reimbursements observed in South Dakota with $168 per dose. The majority of

states had 70% or more of their claims reimbursed at levels that were greater than the CDC-published price. The out-liers to this observation included Nebraska with 49%, Wisconsin with 69%, and Arkansas with 67% of reimbursements greater than the CDC-published price.

4. Discussion

This study reports private payer reimbursement levels for a single dose of RZV among adults 50–64 years in the US. Both the mean reimbursement rates and the percentage of claims exceeding the 2018 CDC-published price varied across states. To make a profit on a vaccination, the reimbursement must exceed the total costs of providing a vaccination. Costs of vaccination include the cost of acquiring the vaccine doses, storage of vaccines, costs of labor involved with vaccination counseling and administration [24], insurance and other administrative components of healthcare provider offices [25]. Reimbursements and costs of vaccination services have also been found to vary by type of healthcare provider [15,16,26]. The reported reimbursement levels in this study are from private insurance payers and can provide helpful information to adult healthcare providers considering the extent to which it is feasible to purchase, store, and provide vaccines to their patients.

Beyond the role that reimbursement levels have on the workings of healthcare practices, reimbursement levels are important to know in the context of vaccine policy and decision-making. Two economic models [20,21] that were reviewed during the recent ACIP deliberations on herpes zoster vaccines used the same assumption for the price of a dose of RZV. In particular, they used $140 which was the first CDC private sector price that appeared on the CDC vaccine price list in April 2018. However, in this study, the reimbursement rate for this vaccine in 2018 was typically higher than the value on the CDC vaccine price list. In a study that investigated reimbursement levels for several adult vaccines, prior to the introduction of RZV, the reimbursements for ZVL also exceeded the CDC vaccine price list price on 88% of claims [22]. These findings have implications for the inputs used in economic models of RZV. These implications would depend on the attributes of the target population as well as the perspective taken by the economic analysis. An important attribute of the target population would be the mixture of payers who are likely to pay or reimburse for RZV vaccinations among a given population. In a population that primarily uses private insurance, using the CDC private sector price would be an underestimate of vaccine dose cost and may then yield lower cost-effectiveness ratios than using the reimbursement rate. In the healthcare and societal perspectives, costs borne by third-party payers, such as the reimbursements for vaccines, are appropriate to include as part of direct medical costs [27]. Whereas other analytical perspectives, such as the patient perspective, may not consider reimbursement rates as part of the analysis.

A few limitations apply to this study. The data comes from a convenience sample of 50–64-year-olds with private insurance. As a convenience sample, results may not be representative of all individuals 50–64 years of age or of all providers of RZV. Healthcare providers who primarily serve Medicare patients may be more focused on Medicare Part D for RZV reimbursements. For these providers, private insurance reimbursement rates may be a smaller factor in provider-level decision-making. Finally, CDC-published vaccine prices are used as a helpful standard of comparison for the estimated reimbursement rates, but the

actual prices paid by providers for doses of vaccine and any other costs incurred by the providers that are associated with maintaining a vaccine supply in the provider's office were not available. Other details relevant to any potential financial challenges faced by healthcare providers, such as the number of patients and the mix of different types of payers, were also not available, and so no conclusive statements of the overall profitability of providing RZV were intended.

In conclusion, we found that private insurance reimbursements for RZV averaged $149 in 2018, with substantial variation across states. For most states, the average reimbursement also exceeded the private sector price on the 2018 CDC vaccine price list. These findings have implications for the financial feasibility of adult healthcare providers to sustainably procure, store, and administer recommended vaccines and for the economic analyses of vaccines being considered for privately-insured populations.

5. Disclaimer

The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

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Table 1

Summary of private insurance reimbursements for one dose of recombinant zoster vaccine (RZV) by state[a].

State	Mean	Median	Interquartile range		N	% exceeding CDC-published price[a]
			25th	75th		
CDC-published price	140.00					
Overall	149.45	154.00	142.80	160.19	198,534	83
Alabama	150.48	156.36	140.76	157.74	3,076	89
Arizona	145.72	150.11	140.98	159.06	3,624	78
Arkansas	144.79	146.73	140.00	157.62	578	67
California	154.16	157.42	142.80	161.60	12,740	87
Colorado	133.44	156.80	140.36	163.04	4,636	76
Connecticut	144.09	143.66	142.80	156.80	2,988	83
Florida	148.46	154.00	142.80	159.18	11,848	86
Georgia	151.89	154.00	145.98	159.45	8,240	89
Illinois	153.23	158.27	142.80	171.50	6,864	85
Indiana	149.28	154.00	145.29	157.42	4,637	83
Iowa	161.89	159.45	158.50	168.00	2,740	90
Kansas	159.01	158.04	142.80	168.00	1,964	86
Kentucky	151.85	159.45	154.00	161.78	5,989	90
Louisiana	149.42	153.00	142.80	162.80	1,517	85
Maine	139.44	142.80	140.35	154.00	711	77
Maryland	146.68	142.80	142.80	157.42	2,813	86
Massachusetts	155.98	156.80	142.80	168.00	3,669	84
Michigan	132.33	142.80	137.92	156.98	7,976	71
Minnesota	153.50	159.18	145.66	167.04	6,375	83
Missouri	153.30	159.05	144.23	162.07	4,999	86
Montana	151.08	159.18	142.80	168.00	305	81
Nebraska	143.32	140.00	139.44	158.80	1,250	49
Nevada	147.40	148.00	144.55	153.77	1,259	87
New Hampshire	141.47	142.80	139.99	157.42	661	73
New Jersey	151.06	148.00	142.80	158.08	5,098	88

State	Mean	Median	Interquartile range		N	% exceeding CDC-published price[a]
			25th	75th		
New Mexico	143.50	148.00	140.36	159.18	534	78
New York	149.84	153.77	142.80	162.49	20,167	89
North Carolina	147.79	153.00	140.36	159.45	6,828	77
North Dakota	153.28	150.50	150.50	156.87	255	88
Ohio	153.05	158.17	142.80	168.00	9,762	83
Oklahoma	151.32	159.75	148.00	162.66	2,902	87
Oregon	148.64	157.23	142.80	157.67	2,498	80
Pennsylvania	151.59	155.77	142.80	163.80	7,542	84
South Dakota	167.71	159.45	145.59	193.00	402	88
Tennessee	149.82	156.80	142.00	159.75	3,680	83
Texas	150.15	153.91	141.15	160.16	18,911	79
Utah	142.55	151.20	140.04	159.18	1,415	76
Virginia	146.17	153.00	140.36	159.25	5,511	76
Washington	148.11	155.62	145.98	155.62	7,770	84
West Virginia	148.60	149.36	138.13	158.43	795	69
Wisconsin	149.27	156.56	139.92	168.00	2,860	74
Wyoming	152.14	157.92	144.55	160.44	145	80

Source: 2018 IBM® MarketScan® Commercial Claims and Encounters Database.

[b]The percentage of vaccination visits with vaccine purchase reimbursements above the 2018 CDC published private sector purchase price from the CDC vaccine price list website (https://www.cdc.gov/vaccines/programs/vfc/awardees/vaccine-management/price-list/2018/2018-04-01.html).

[a]Alaska, Hawaii, Rhode Island, and Vermont were excluded because these states have programs to purchase adult vaccines and distribute to providers at no cost. Delaware, Idaho, Mississippi, South Carolina, and Washington, D.C. were also excluded because release of their information is prohibited by the IBM® MarketScan® data user agreement.