

# Economic Implications of Providing Flu Shots in Oregon SBHCs: A Look at the Numbers

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## Highlights

- During the 2013-14 school year, Oregon School-Based Health Centers administered 2,577 flu shots to youth ages 5-21.
- Costs for the SBHCs flu shot are generally covered by a combination of federal, private insurance and out-of-pocket dollars.
- For every \$1 spent on flu shots for youth in SBHCs, an estimated \$4.71 was gained from a combination of avoided health care costs, increased household income and additional state and federal taxes.
- 75% of the estimated benefit goes directly to families through greater income, reduced travel costs and out-of-pocket medical expenses.

## Introduction

School-Based Health Centers deliver preventive and primary care services in an accessible setting and are a very important part of the health care system for school-aged youth in Oregon. As of January 1, 2016, Oregon had 76 certified SBHCs spread across 22 counties. These SBHCs deliver important clinical preventive services, treat acute and ongoing health issues and reduce time spent out of the classroom. While we suspect that many of the services delivered by SBHCs are cost effective, little data exists that quantifies the Return on Investment (ROI) for these services. Given the large number of vaccines that SBHCs deliver each year, this project focused on the ROI of SBHCs providing flu shots to school-aged youth (ages 5-21) during the 2013-2014 school year.

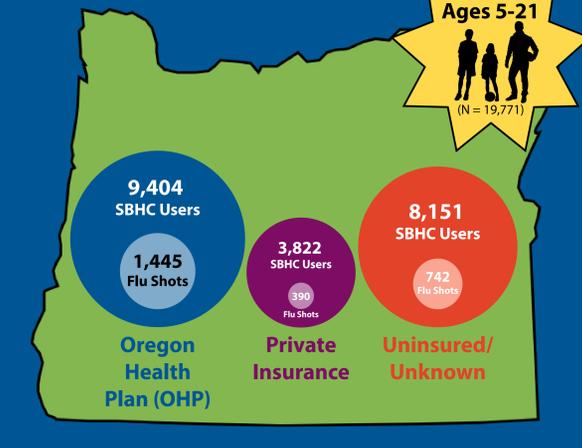
### Oregon SBHCs in 2013-2014:

- 68 Certified SBHCs in 20 counties in Oregon
- 23,797 patients in 76,666 visits
- 51% of all visits were delivered to Medicaid (OHP) recipients
- 19,771 youth ages 5-21 years in 59,841 visits

## Research Question

What is the ROI of administering influenza vaccinations to youth aged 5-21 at SBHCs in Oregon?

### SBHC Flu Shot Utilization



## Methodology

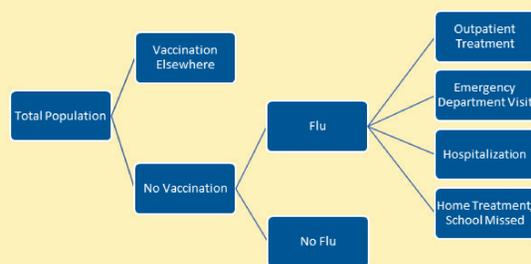
Flu vaccine data was pulled from the 2013-14 SBHC encounter data that is held by the Oregon SBHC State Program Office to determine the number of vaccines administered by age and insurance type, based on active flu vaccine CPT codes for the 2013-14 flu season. Cost for service data was estimated using published data, 2014 Medicaid Fee Schedule figures, and statistics from the state Vaccines for Children Program. When possible, data was extracted at the state level and supplemented with national figures as necessary. Non-medical costs were adjusted to 2014 dollars using standard inflation and medical costs were inflated at a rate of 4% per year.

An analytic model (Figure 1) was developed to frame the study and enumerate the categories of costs and benefits. We determined that economic benefits would accrue to the federal and state governments, as well as taxpayers, from the following outcome categories:

1. Cost savings associated with not receiving the flu shot elsewhere
2. Cost savings associated with avoided treatment of flu
3. Cost savings associated with avoided emergency department visits due to flu
4. Cost savings associated with avoided hospitalizations due to flu

These categories contain savings based on health care costs (state, federal and individual out-of-pocket) and avoided lost work time (travel time, individual income and subsequent state/federal taxes). Costs to private insurers were not included in the scope of this analysis.

Figure 1: Analytic Model of Flu Vaccination Process



## Costs

There is one category of cost associated with SBHC administration of flu shots: the cost of the influenza vaccine. For youth on Medicaid, the federal Vaccines for Children program pays the entire administration fee of \$21.96. For privately insured youth, we assumed a \$15 out-of-pocket copay; those without insurance were assumed to pay the entire \$21.96, although this cost assumption is difficult to solidly support given a lack of data.

## Benefits

Both direct and indirect benefits were calculated. Direct benefits include averted costs associated with outpatient, emergency department and hospital visits, as well as medication costs for those that get the flu. Indirect benefits include cost savings on travel expenses and additional revenue from parents not having to miss work. Benefits are outlined in Figure 2 by the category of savings they are associated with.

Figure 2: Benefits of Flu Vaccine Administration by Oregon SBHCs

Cost Savings Associated with Receiving the Flu Shot Elsewhere	Cost Savings Associated with Outpatient Treatment of Flu
Cost of Vaccine Travel Costs Missed Work Costs Lost Tax Revenue	Cost of Provider Visit Travel Costs Missed Work Costs Lost Tax Revenue
Cost Savings Associated with ED Visit from Flu	Cost Savings Associated with Hospitalization from Flu
Cost of ED Visit Cost of Medication Travel Costs Missed Work Costs Lost Tax Revenue	Cost of Nightly Hospital Stay Travel Costs Missed Work Costs Lost Tax Revenue

Benefits varied by insurance type. Medical benefits accrued to the state for OHP recipients were estimated to be equal to the total cost of services charged to OHP. Among those with private insurance, medical benefits accrued to taxpayers were estimated to be equal to the charge or copay prices to the individual. Charges to insurance companies and insurance provider benefits accrued did not fall within the scope of this study and therefore were not analyzed. Among those who were uninsured or had unknown insurance status, medical cost benefits to the individual taxpayer were estimated as total out of pocket charges for each service. Table 1 details the cost savings per service by insurance status.

Table 1: Avoided Costs Associated with Flu Vaccine by Insurance Type

	OHP	Private*	Uninsured/Unknown
Cost of Vaccine	\$21.96	\$15.00	\$21.96
Average Nightly Hospital Cost	\$1,924.32	\$300.00	\$1,924.32
Average ED Cost	\$435.00	\$200.00	\$510.00
Cost of Provider Visit	\$77.56	\$25.00	\$115.00
Cost of Medication	\$10.14	\$15.00	\$100.00

\* Avoided costs for private insurance only include costs to the individual, not the insurer.

## Assumptions

Assumptions used in the analysis include:

- 31% of our sample population would obtain a flu shot elsewhere and 69% would remain unvaccinated for the season<sup>i</sup>.
- Of the total population, 10% of individuals would acquire the flu at some point during the season.
- 68% of parents in our sample would have to take time off of work in order to care for a child with the flu<sup>ii</sup>.
- 65% of children who get the flu would go to see a doctor for outpatient services. There is no currently available data to support an evidence-based estimate of this figure.
- 2 youth in the sample population would be hospitalized for flu<sup>iii</sup>.
- 31 youth in the sample population would visit an emergency department for reasons related to flu<sup>iv</sup>.
- Missed wages (post-tax) for parents were \$148.30/day. Parents assumed to not have paid time off for days spent caring for sick children<sup>v</sup>.
- Taxes on lost revenue were determined using standard filing for a single person with one dependent<sup>vi</sup>.

## Results

We found the 2013-2014 cost savings to the state and federal government and individuals from administering flu vaccines through the SBHCs to be \$253,999. Given that the annual cost to administer the vaccines through the SBHCs totaled to \$31,732 for OHP recipients, the calculated return on investment was \$4.24 for every \$1 invested in the program. Of this amount, savings in outpatient costs (37% of the total) and savings from the cost of receiving the shot elsewhere (31%) comprised the majority of benefits. Return on investment summary statistics by insurance status are listed in Table 2.

Table 2: Return on Investment by Insurance Type

Insurance Type	Cost	Benefits	ROI
OHP	\$31,732	\$134,662	\$4.24
Private Insurance	\$5,850	\$33,957	\$5.80
Uninsured/Unknown	\$16,294	\$85,380	\$5.24
<b>Total</b>	<b>\$53,876</b>	<b>\$253,999</b>	<b>\$4.71</b>

## Limitations and Next Steps

While this study offers a detailed analysis of the financial implications of providing flu shots in SBHCs, there are several limitations that should be noted:

1. Costs for the flu vaccine were limited to what is paid by the federal Vaccines for Children program and/or an estimated out-of-pocket cost for privately insured or uninsured children. We did not take into account the cost to the private insurer, or additional cost if the vaccine was part of a larger capitated Medicaid visit. We also did not account for any costs arising from side effects from the flu vaccine. While these are typically quite mild, there may be limited direct or indirect costs associated with side effects.
2. Probability of outcomes (spread of illness, likelihood to develop flu, hospitalization rates, etc) depend in part on the efficacy of the flu shot and the severity of the flu virus, both of which can vary moderately from year to year.
3. Estimates of benefits were derived from the most up-to-date and available data, but do not necessarily reflect the actual situations of SBHC families (e.g., estimating lost parental income based on median employment and income data for Oregon). Data on the flu is not collected at the statewide level outside of hospital admissions; statewide estimates on prevalence of flu and percent of children who see the doctor for flu were estimated from other data sources.

Now that this ROI model has been developed, the SBHC State Program Office would like to update the numbers for the 2014 and 2015 school years and provide SBHC-level estimates for sites to be able to use with their local communities. We also are planning to extend this type of analysis into other SBHC services in Oregon to bolster the available information on the economic impacts of SBHCs.



## References

- <sup>i</sup><https://public.health.oregon.gov/PreventionWellness/VaccinesImmunization/Documents/FluVacUptakeCompare.pdf>
- <sup>ii</sup>[http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS\\_12\\_5YR\\_B23007&prodType=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_12_5YR_B23007&prodType=table)
- <sup>iii</sup>Oregon Influenza Program, based on extrapolation from Portland-area data
- <sup>iv</sup>Estimates derived from extrapolation of Nationwide Emergency Department Sample (NEDS), 2014 <https://www.hcup-us.ahrq.gov/nedsoverview.jsp>
- <sup>v</sup>Bureau of Labor Statistics, 2014 [http://www.bls.gov/oes/current/oes\\_or.htm#00-0000](http://www.bls.gov/oes/current/oes_or.htm#00-0000)
- <sup>vi</sup><http://users.nber.org/~taxsim/taxsim-calc9/index.html>