

Performance Improvement Managers Network Webinar

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How it's defined and used in public health

RETURN ON INVESTMENT (ROI) APPROACHES AND TOOLS

Need for Continuous Improvement and Documenting Outcomes

- National focus on improving performance
 - Mandates—GPRA, ACA
 - Investments—MLC, NPHII
 - Accreditation—PHAB

- Public health facing opportunities and challenges
 - Budget battles
 - Information technology and communication advancements
 - Increased need for public health

ROI Is a Form of Evaluation/Analysis

- Program evaluation—Rossi, Lipsey, and Freeman 2004
 - Assessment of
 - ❖ Need for the program
 - ❖ Design and logic/theory
 - ❖ Fidelity of implementation
 - ❖ Outcome or impact
 - ❖ Cost and efficiency

Performance management (Turning Point)

□ Continuous use of the following integrated into the organization's core operations:

- Performance standards
- Performance measures
- Quality improvement



Outcomes Are Central to Evaluation

Identification, Data Collection, and Analysis

□ With evaluation—we compare changes at 2+ points in time in

- Knowledge
- Status
- Behavior
- Function
- Values



ROI Is a Specialized Form of Analysis

- ❑ Outcomes are monetized
 - Compares the costs of an intervention with its benefits—in financial terms
 - Yields the net return on investment—over time
 - Sensitivity analysis can be conducted—different levels of investments and their benefits

ROI Calculated

- ❑ Net benefit = Benefits – Costs

- ❑ ROI = $\frac{\text{Benefits} - \text{Costs}}{\text{Costs}}$
 - Hypothetical values
 - $\$5 = \frac{(\$400 + \$500 + \$300) - (\$150 + \$50)}{(\$150 + \$50)}$

- ❑ Or . . .

“ . . . a dollar spent on pediatric immunization is estimated to save \$5 in treating preventable illness.”

Economic Benefits and Costs Associated With Target Vaccinations

Edward P. Armstrong, PharmD, FASHP

ABSTRACT

BACKGROUND: As a therapeutic class, vaccines are generally considered to be the health care intervention that provides the best value. In the pharmacoeconomic study of vaccines, it is common for researchers to conduct their analyses from a societal perspective, including direct medical costs as well as indirect costs.

OBJECTIVE: To discuss the data elements of pharmacoeconomic analyses of vaccines and review recently published analyses of emerging vaccines.

SUMMARY: Myriad pharmacoeconomic analyses of vaccines currently in use have been conducted with varying results. A number of products, such as the diphtheria-tetanus-acellular pertussis, hepatitis B, and varicella vaccines, have been shown to be cost-effective from a societal perspective. Yet, other products, such as the pneumococcal conjugate vaccine, have demonstrated less benefit than the cost of their respective vaccination programs. In general, these analyses can be used as a starting point to frame the benefits of specific vaccines in managed care with a balanced view of the necessary societal perspectives. To date, 6 pharmacoeconomic models have evaluated vaccination against human papillomavirus, with all demonstrating some cost benefit when the vaccine was used in female patients who fell within the indicated age range.

CONCLUSIONS: In general, as a therapeutic class, vaccines are extremely cost-effective agents. In addition, they are one of the few public health interventions that may directly lower medical costs. In conducting pharmacoeconomic analyses for agents in this class, researchers must consider costs incurred at both the health system and societal levels, as well as cost savings realized through the prevention of disease.

KEYWORDS: Pharmacoeconomic, Cost, Cost-effective, Vaccine, HPV, Hepatitis
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As a therapeutic class, vaccines are generally considered to be the health care intervention that provides the best value.¹ Vaccine products are known to have provided more benefit to society than expense, and they have been estimated to save society more than \$5 for each dollar spent on most routine pediatric vaccinations.² Two vaccines that have had a remarkable impact on eliminating diseases are the polio and smallpox vaccines.³ Other serious diseases that have been prevented include diphtheria, tetanus, whooping cough, invasive *Haemophilus influenzae* type b disease, rubella, mumps, and measles. In light of the success of vaccines to date, high immunization rates remain the key for society to continue to benefit from these preventive treatments.

Vaccines have had an impressive impact on decreasing disease morbidity within the United States, as evidenced by the Centers for Disease Control and Prevention's annual morbidity estimates for a range of diseases both before the introduction of vaccines and their current estimates (Table 1).^{4,5} It is noted that the annual burden for these 9 diseases has either approached or exceeded a 90% reduction through the use of vaccines.^{4,5}

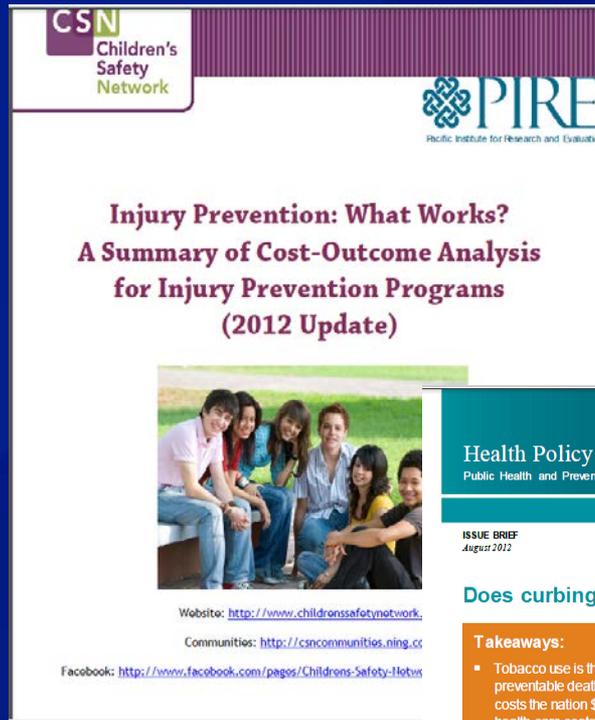
In addition to the impact of vaccines within the United States, vaccination programs have also had a worldwide effect in reducing the number of deaths from specific diseases.¹ Table 2 highlights that nearly 3 million lives have been saved globally from vaccine-preventable diseases because of increased vaccine coverage.¹ Ehreth¹ has compiled data demonstrating the

Where Has ROI Been Used in Public Health?

- ❑ Public health programs
- ❑ Aggregate public health spending
- ❑ QI projects undertaken by agencies

ROI Program Examples

- Injury prevention—a \$14 child bicycle helmet can prevent \$580 in medical expenditures on average, representing a return of \$40 for every \$1 invested.
- A call to a poison control center costs \$45; but it prevents \$320 in medical spending on average—\$6 in savings for every \$1 invested
- Tobacco prevention and control: State programs including smoke-free workplace rules and higher taxes on tobacco products consistently showed positive return on investment.
- California's efforts showed the highest ROI—\$50 in personal health care expenditures for every \$1 spent.



Health Policy Snapshot
Public Health and Prevention

Robert Wood Johnson Foundation

www.rwjf.org/healthpolicy

ISSUE BRIEF
August 2012

Does curbing tobacco use lower health care costs?

Takeaways:

- Tobacco use is the leading cause of preventable death in the United States and costs the nation \$96 billion annually in health care costs and an additional \$97 billion in lost productivity.¹
- Tobacco prevention and cessation efforts, especially well-funded and comprehensive programs, are proven to reduce tobacco use and lower associated healthcare costs, providing a strong return on investment (ROI).
- Despite revenue streams from tobacco use and high ROIs, the most successful prevention programs have been cut repeatedly over the past five years.

Overview

Over the past few years, researchers have looked at tobacco prevention and cessation programs in different states, estimated the amount of healthcare costs each program has saved, and compared that number to the cost of each program. The calculations yield a ROI ratio that highlights the need for these programs.

THE HEALTH AND ECONOMIC IMPACT OF TOBACCO USE

cataracts, peptic ulcers, adverse surgical outcomes, low bone density and reduced fertility in women, fetal deaths and pregnancy complications, and a "diminished health status" that leads to more sick days taken and more healthcare services needed. According to the Centers for Disease Control and Prevention, smoking² rates are higher among people under age 65 with Medicaid insurance (31%) and those without any health insurance (32%) than among U.S. adults overall (19%). Efforts to reduce tobacco use, especially among Medicaid participants and the uninsured, could significantly reduce healthcare spending.

COMPREHENSIVE PROGRAMS HAVE THE HIGHEST ROI

California has the longest history of tobacco programming, the oldest comprehensive smoke-free workplace law, and the most money invested in tobacco control. Researchers found that the decline in smoking rates substantially reduced personal healthcare expenditures in the state. The ROI was approximately \$50 saved for every \$1 invested.⁴ Before the recent recession, the state of Washington funded a comprehensive prevention and cessation program to complement its smoke-free workplace law and high tobacco tax. Researchers narrowed the ROI calculation to include only the incidence and hospitalization data from strokes, heart disease, respiratory ailments, and the four leading types of

- http://www.childrenssafetynetwork.org/sites/childrenssafetynetwork.org/files/InjuryPreventionWhatWorks_SubstanceAbuse.pdf
- http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2012/rwjf400552

ROI Example of Aggregate Public Health Spending

- Researchers analyzed over a decade of public health spending and mortality rates
 - Estimated that for each 10 percent increase in spending there were significant decreases in
 - ❖ Infant deaths (6.9%)
 - ❖ Deaths from cardiovascular disease (3.2%)
 - ❖ Deaths from diabetes (1.4%)
 - ❖ Deaths from cancer (1.1%)

Challenges from an Agency Perspective

- ❑ An investment may take years to produce benefits
- ❑ Benefits may be difficult to link back to a specific public health programs or functions
- ❑ Benefits may accrue outside the agency
- ❑ Clinical, population health outcomes yield the largest “bang for the buck”

ROI of QI

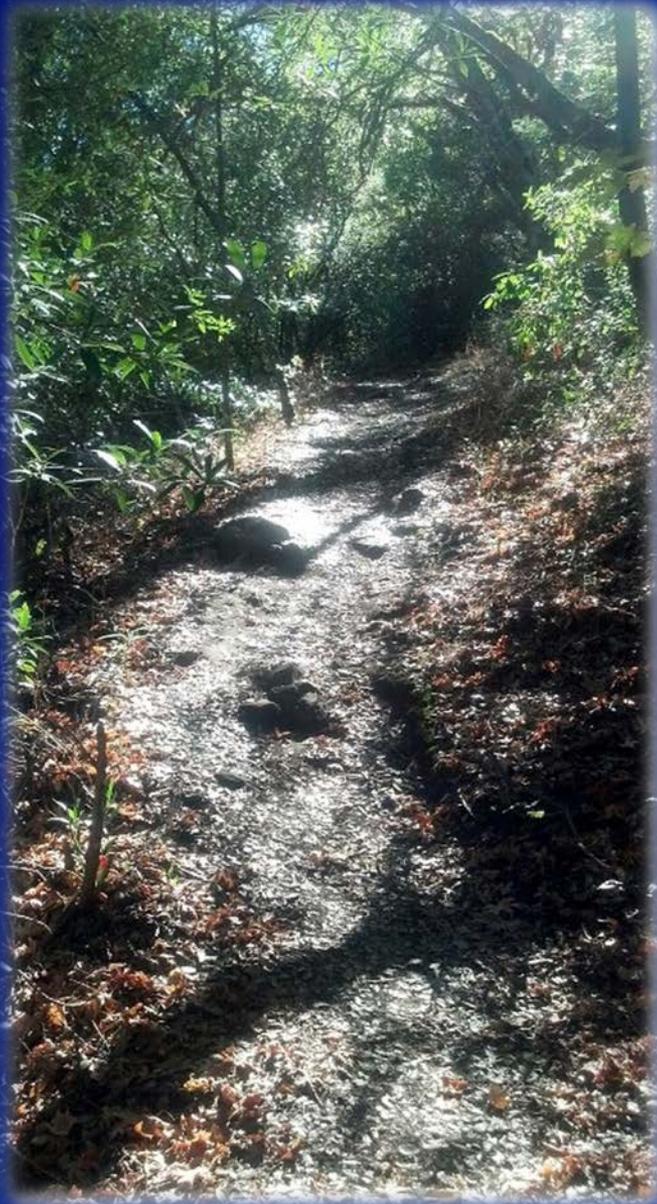


ROI of QI—Advantages and Disadvantages

- ❑ ROI is more immediate
 - Timeframe is shorter
- ❑ ROI accrues more directly to the agency
- ❑ Tends to be narrower in scope
 - Return is more modest

ROI QI Tool—in Final Stages of Beta Testing

- ❑ Funding from Prevention and Public Health Fund, ACA
- ❑ Measures ROI for QI projects
 - Those undertaken through the National Public Health Improvement Initiative (NPHII)
- ❑ ASTHO-led workgroup provided input and guidance
 - CDC, state and local agencies, foundations, academia
- ❑ Development led by Glen Mays, University of Kentucky



- Pathways to Realizing ROI for QI
 - Reductions in standard operating costs
 - Greater efficiencies realized
 - Revenue enhancements
 - Increased cost reimbursement
 - Increased productivity of agency functions
 - Increased service encounters
 - Decreased time to produce outputs
 - Reduced cycle time process

Planning and Development Costs

| Cost Category | Pre-Implementation (Baseline) | Post-Implementation (Year 1) | Year 2 ... |
|--|-------------------------------|------------------------------|------------|
| Personnel Costs | | | |
| Non-Personal <ul style="list-style-type: none">• Contracted Services• Office Operations• Facilities/Maint/Rent• Communications• Equipment• Construction/Renovation | | | |
| Other Direct Costs | | | |
| Indirect Costs | | | |

Routine Operating Costs

| Cost Category | Pre-Implementation (Baseline) | Post-Implementation (Year 1) | Year 2 ... |
|---|----------------------------------|---------------------------------|---------------|
| Personnel Costs | | | |
| Non-Personal <ul style="list-style-type: none"> • Contracted Services • Office Operations • Facilities/Maint/Rent • Communications • Equipment • Construction/Renovation | | | |
| Other Direct Costs | | | |
| Indirect Costs | | | |

Outcomes/Outputs

| Cost Category | Pre-Implementation | Post-Implementation (Year 1) | Year 2 ... |
|---------------------------------|---------------------------|-------------------------------------|-------------------|
| Service Units Delivered | | | |
| Required Production Time | | | |
| Target Population Reach | | | |
| Other Outcomes/Outputs | | | |

Incorporates Standard Accounting Practices in ROI Calculation

❑ Amortization

- The cost of an investment should not be entirely in the first year
- Amortization rate spreads the agency's cost/investment over the useful life of the

❑ Present value

- The relative worth of a single dollar changes over time
- Accurate comparisons are made by applying a discount rate (inflation) to
 - Costs
 - Returns



How Is ROI best Used and Applied within Agencies?

- ❑ Build evaluation methods—including ROI—into program inception
- ❑ Clearly specify intended purpose and use of ROI
- ❑ Conduct ROI through a transparent process
- ❑ Conduct ROI through an inclusive process
 - Implementers and end users of the analysis

Tool Can Be Used throughout Project

- ❑ Prospectively—Planning Phase
 - How can investments be maximized?
 - What level of return is needed to justify investments?
 - Sensitivity analysis around outcomes/outputs
- ❑ Implementation Phase
 - Tracking costs, outcomes, and return
 - In real-time, as they accrue
- ❑ Retrospectively—Post Implementation
 - What was our actual return on investment?

Why ROI?

ROI is one way of measuring and communicating public health effectiveness in a manner that is particularly salient for policymakers, funders, administrators, and the general public



- Helps answer the following questions:
 - Are we making the right investments?
 - Are we becoming more efficient?
 - What bang are we getting for our buck?
 - What is our budget accomplishing?
 - Are we being good stewards?

- ROI is not always the be-all and end-all
 - It's just one evaluation tool of many
 - Should be used thoughtfully and carefully

Discussion/Q&A

All lines are open and live!

Please remember to use your mute button or *6

Thank you!
Please send comments and questions to
pimnetwork@cdc.gov

For more information please contact CDC's Office for State, Tribal, Local and Territorial Support.

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