RTI (h)(s) Health Solutions

August 26, 2021

Cost-Benefit Analysis of Vaccination Against Four Preventable Diseases in Older Adults: Impact of an Aging Population

Presented to the National Adult And Influenza Immunization Summit

The power of knowledge.
The value of understanding.

1

Disclosures

RTI (h)(s) Health Solutions

- The research discussed in this presentation was funded by GlaxoSmithKline Biologicals S.A.
- Justin Carrico and Sandra Talbird are employed by RTI Health Solutions, which received funding for the conduct of these studies.

RTI (h)(s) Health Solutions

gsk

2

The power of knowledge.
The value of understanding.

2

Introductions

Sandra Talbird, MSPH
Senior Director, Health Economics
RTI Health Solutions

Justin Carrico, BS
Senior Research Health Economist
RTI Health Solutions

3

Background

RTI-HS has collaborated with vaccine manufacturers to establish a consortium to pursue above-brand health economics and outcomes research initiatives.

The Summit is providing feedback to this new consortium on research priorities to improve adult vaccination.

A top research priority communicated by the Access and Provider WG is to estimate burden of illness of adult vaccine preventable diseases and the economic value of adult immunization.

4

Research Questions

RTI (h)(s) Health Solutions

- What is the economic burden of influenza, pertussis, herpes zoster, and pneumococcal disease in adults aged 50 years and older in the US?
- What is the return on investment for current and increased vaccination coverage against these four preventable diseases?
- For both research questions above, what is the impact of the US population shift towards older age groups over the next 30 years?

5

Methods: Economic Model

RTI (h)(s) Health Solutions

- A population-based, age-structured economic model was constructed to project disease and vaccination program costs over a 30-year period (2017-2046).
- Projected population estimates from the US Census Bureau were used to account for changes in the US population over time.
- Disease incidence among unvaccinated, along with vaccination coverage, efficacy, and waning was used to calculate annual disease cases.

6

Methods: Analyses

RTI (h)(s) Health Solutions

Burden of Disease Analysis

- Current estimates (as of 2017) of disease incidence, vaccine coverage, and efficacy remained constant over time.
- Clinical outcomes and costs of disease were projected over 30 years.

Cost-Benefit Analysis

- Compared outcomes over 30 years for three vaccination coverage scenarios:
  - No vaccination
  - Current vaccination coverage
  - Increased vaccination coverage
- Calculated the return on investment (expressed as a benefit-cost ratio) for current vaccination coverage and increased vaccination coverage.

7

Results: Impact of Population Aging on the Burden of Four Vaccine-Preventable Diseases

RTI (h)(s) Health Solutions

Due to population growth and the shifting age distribution over the next 30 years, annual societal burden of the four diseases is projected to increase from $35 billion to $49 billion.

$1.3 trillion in cumulative societal costs over 30 years and over 1 million deaths were projected if vaccination coverage remained at current levels.

8

Results: Cost-Benefit Analysis of Vaccination Against Four Preventable Diseases in Older Adults

RTI (h)(s) Health Solutions

Current coverage vs. no vaccination

When compared with no vaccination, current adult vaccination coverage is estimated to result in 65 million averted disease cases, $185 billion averted costs of cases and $136 billion in incremental vaccination costs.

Benefit-cost ratio = 1.4

Increased coverage vs. current coverage

Increased vaccination coverage was associated with 33 million additional averted cases and additional cost savings relative to current vaccination coverage.

Benefit-cost ratio = 1.2

A benefit-cost ratio (BCR) is the ratio of benefits of an intervention, expressed in monetary terms (e.g., cost of disease cases avoided), relative to the cost of the intervention (e.g., cost of vaccination).

9

Limitations

RTI (h)(s) Health Solutions

- The four vaccine-preventable diseases were modeled over time separately.
- Population-level mortality and vaccine coverage projections used did not account for extraordinary events (e.g., COVID-19 pandemic).
- Costs of disease cases only included acute care and did not account for the management of long-term sequelae.
- Indirect effects of vaccination, such as herd immunity and serotype replacement, were not modeled.

10

Conclusions

RTI (h)(s) Health Solutions

- Maintaining current vaccine coverage rates among older adults is projected to lead to increased burden of influenza, pertussis, herpes zoster, and pneumococcal disease.
- Efforts to further increase vaccination coverage in older adults may be warranted and economically justifiable.

11

Links to Research

RTI (h)(s) Health Solutions

- Impact of population aging on the burden of vaccine-preventable diseases among older adults in the United States

human VACCINES & IMMUNOTHERAPEUTICS

- Cost-benefit analysis of vaccination against four preventable diseases in older adults: Impact of an aging population

12

RTI-HS Contact Information

RTI (h)(s) Health Solutions

Sandra Talbird, MSPH
+1.919.541.7258
stalbird@rti.org

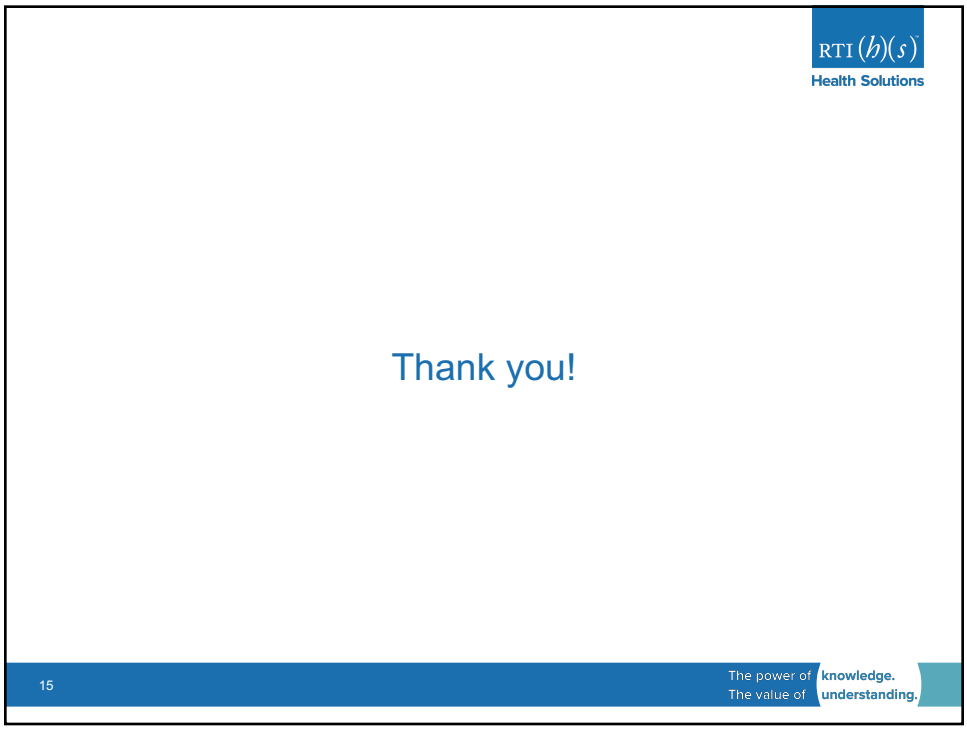
Justin Carrico, BS
+1.919.541.7207
jcarrico@rti.org

13

RTI (h)(s) Health Solutions

Questions?

14


RTI (h)(s)
Health Solutions
Thank you!
15
The power of knowledge.
The value of understanding.

15