# Supplemental Materials

## Section A. Key informant interview methods and discussion guide

The qualitative key informant interviews (n=13) were a purposive sample of individuals who would be participating in the survey. Interviews were conducted from September to November 2014. In an audio-recorded semi-structured interview, we followed the discussion guide outlined in section B. Bulleted summaries of the interviews were written and anonymized. These interview summaries were then combined and each bulleted sentence or key concept was re-grouped into thematic elements across all interviews.

## Section B. Key informant interview discussion guide

*Introductions – 2-5 minutes*

Thank the caller for taking time to talk with us.

Ask about the caller’s role with the ACIP. Possible questions include the following:

* How long have you been involved with the ACIP?
* What is your primary role with the ACIP?
* Have you ever been involved in economic evaluations for the ACIP?
* What is your main job outside of participating in the ACIP?

Provide some background information about yourself

* My studies and involvement in economic evaluations
* The work that Dr. Prosser’s research team does

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*Background/Purpose/Consent for the call – 5-7 minutes*

The CDC is working with Dr. Prosser’s research team to carry out a study that evaluates the reporting and presentation of economic evidence that is used in decision making with the ACIP. We plan to create a survey that will be sent out to ACIP Voting Members, ACIP Liaison Members, ACIP Working Group Members, and former ACIP Voting Members. To inform the development of the survey we are calling a few members of each of these groups. Our overall study has three main objectives:

1. To identify the relative value of different elements of economic evidence,
2. Evaluate preferences of ACIP and ACIP working group members in the presentation of health economics evidence, and
3. Provide information that is useful for training, providing guidance for, and presenting economic evidence to ACIP and ACIP Working Group members.

We are doing interviews of a few ACIP members or former members to inform the structure and development of our survey. Within the survey we plan to carry out a conjoint analysis. This method identifies preferences and assigns relative utility values to specific attributes of a product. For this study, it will allow us to identify the attributes of economic evidence that would maximize the utility of that evidence for ACIP members.

Your responses in this interview will be kept completely anonymous. Your participation is voluntary, and if you don’t want to answer any question in particular just say “pass” and we will move on. I expect our conversation to last about 45 minutes. There is no personal risk in participating in this interview, and the main benefit will be that you get to think about and potentially gain greater insight into the value of economic evidence and the best practices for presenting it.

Before I start asking other questions, do you have any questions for me regarding the background and purpose of our study?

Now that I have explained the background for our study and this call, do you consent to participating in the rest of the interview?

Do you consent to me recording the interview? The recordings will be deleted after we use them to write up our notes.

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What has been your experience with economic evaluations?

*Familiarity with suggestions regarding attributes of economic evidence – 5-7 minutes*

On a scale of 1-10, how familiar would you say you are with the ACIP’s Guidance for Health Economics Studies that were developed in 2007? (10 being very familiar, 1 being not at all familiar)

How much have you used these guidelines?

The guidance document lists several components of economic evidence that should be presented to the ACIP in written form. There is also a template that has been created that outlines the components of an economic evaluation that should be included in a presentation to the ACIP. The different parts of economic evidence that are outlined in these documents were shared with you in an email prior to this call.

Ask them to refer to the list they received. For the interviewer’s aid, the list is included below:

|  |  |
| --- | --- |
| Affiliations  | Health valuations and sources |
| Statements of conflict or potential conflicts of interest | Discounting approach |
| Study question | Sensitivity analysis methods |
| Perspective | Disaggregated results |
| Intervention strategies | Aggregate or summary results (ratios) |
| Target population | Sensitivity analysis results and influential variables |
| Time frame and analytic horizon | Limitations |
| Economic model and method | Relationship to other relevant studies |
| Health outcomes of interest and their reasons for selection | Discussion on how results may change with different assumptions or values |
| Inclusion of epidemiologic models | Peer review comments |
| Values and sources of cost inputs |  |

Imagine you are at an ACIP meeting (or and ACIP workgroup meeting) and someone comes and presents an economic evaluation on a vaccine for [the disease they are most familiar with]?

What parts of the presentation would be most interesting to you? (You can have the respondent refer to the list of things that a person would typically present). What are the parts of the presentation that would be most important to you?

How might this change if it were for an illness that was unfamiliar to you?

How would you gauge whether the model is trustworthy?

Other than being trustworthy, what makes a model or economic evaluation useful to you? How would you gauge this usefulness in a presentation?

In the presentations that you have seen or the economic evaluation reports that you have read for the ACIP, were their ever details that you felt were lacking? If so, in what parts of economic evaluations are necessary details typically lacking from a presentation? What parts are typically lacking from a report?

Are there additional components of economic evaluations that should be included in the presentations and reports? If so, which ones?

Are there aspects or components of economic evaluation that you feel are not necessary to be included in a report or presentation? If so, which ones?

(These questions are to add to or subtract from the list above. The next questions are about priorities.)

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*Overall the most important and least important information from economic evidence – 5-7 minutes*

Of the various attributes or aspects of economic evidence which ones are the least important to you? (Alternative question: In a presentation, what aspects of an economic evaluation should receive the least time and attention?)

Of the various attributes or aspects of economic evidence which ones are the most important to you? (Alternative question: In a presentation, what aspects of an economic evaluation should receive the greatest time and attention?)

How much time do you think researchers should be given to present economic evidence to the ACIP? (Potential follow-up question: What would be a sufficient amount of time?)

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*Specific attributes and attribute levels within introduction methods, results, and discussion – 15-20 minutes*

Now I would like to focus more on the most important and least important aspects of economic evaluations within the four general components of a study: the introduction, methods, results and discussion.

Introduction

What are the key features of an economic evaluation that should be presented in the introduction section to the ACIP?

Do the key features mentioned vary in quality or value depending on how they are presented? If so, then how? (This is to help understand the attribute levels)

Methods

What are the key features of an economic evaluation that should be presented in the methods section to the ACIP?

What are different ways that these key features have been presented? What presentation approaches are most useful to you?

What does a high quality, or highly useful, presentation of [name of key feature] look like to you? What does a low quality presentation of [name of key feature] look like to you?

Results

What are the key features of an economic evaluation that should be presented in the results section to the ACIP?

What are different ways that these key features have been presented? What presentation approaches are most useful to you?

What does a high quality presentation of [name of key feature] look like to you? What does a low quality presentation of [name of key feature] look like to you?

Discussion

What are the key features of an economic evaluation that should be presented in the discussion section to the ACIP?

What are different ways that these key features have been presented? What presentation approaches are most useful to you?

What does a high quality presentation of [name of key feature] entail? What does a low quality presentation of [name of key feature] entail?

*Wrap-up – 2-3 minutes*

Are there any other comments you have about how to make information from economic evaluations more useful or helpful to the ACIP?

Thank the caller for participating.

Explain, once again that the responses will be kept confidential and will only be used to inform the development of a survey which we hope to start pilot testing by the end of the summer.

If you have any questions or additional thoughts regarding this topic or study please email Dr. Lisa Prosser at lisapros@med.umich.edu or call her at 734-232-1077.

## Appendix C. Summary of findings from key informant interviews

There was consensus that all the elements in the current guidelines for health economics presentations were important; however, interviewees differed in opinion regarding which were most important. Some of the most important elements included sensitivity analyses, model inputs, model assumptions, and summary results. Many interviewees mentioned that the inputs were how they gauge the quality or trustworthiness of the model. When asked about the importance of intermediate outcomes and disaggregated results, many did not fully understand what was meant by this, but after receiving a definition they said that these types of results were valuable in portraying a more comprehensive overview of the effects of the vaccine.

Interviewees expressed a desire to see more comparisons of health economics study results to other studies. They suggested presentations be done to reconcile cost-effectiveness models for the same vaccine. Interviewees commented that in recent years, fewer presentations compared the results of the health economics study to the cost-effectiveness of previously approved vaccines. Interviewees also commented on the lack of guidance for comparing the summary results to cost-effectiveness thresholds. One interviewee suggested researching the general public’s willingness-to-pay thresholds for treating vaccine preventable illnesses so that these could be used in ACIP decision making.

Many interviewees said that sensitivity analyses could at times be very confusing. Interviewees mentioned that probabilistic sensitivity analysis was not a familiar concept for many ACIP members. Effective presentation of sensitivity analyses were described as being simple tables, charts and descriptions since these formats are already familiar to clinical and biomedical researchers.

The consensus of interviewees was that health economics presentations were important to consider, but they were only a part of the decision making process and most often not a determining factor when deciding on the coverage of vaccines. Some interviewees expressed skepticism, questioning whether health economics studies have ever impacted the ACIP’s vaccine recommendations.

In addition to the presentation of the studies, a common theme in the interviews was that the ACIP voting group relied significantly on the work groups to vet the inputs and structure of health economics study models. Interviewees explained that the ACIP work groups were where most of the development and validation of health economics study models take place. Many interviewees suggested that there should be better communication to the voting group about what the work group has done to vet the health economics study model.

Interviewees also suggested that the work group be involved in earlier stages of the model development. One interviewee pointed out that the involvement and role of CDC staff members and economists in the work groups varied significantly. The development of a protocol to guide how and when the work groups should involve an economist and consider health economics studies was suggested.

Suggestions for changing the current review process of health economics studies were made. These included using external reviewers that are incentivized or paid to provide a more detailed review, not review a model that had already gone through a rigorous peer review process (e.g. a published report in a peer reviewed journal), and only required the 8 week CDC review process for presentations to the voting group and not the work groups.

Finally, several aspects of health economics presentations that interviewees mentioned they struggle to understand, that they find difficult to evaluate, or that they said should receive additional guidance in the ACIP guidance document for health economics studies are outlined in Table 1. Interviewees desired to receive additional training and direction on these topics, specifically on the topic of quality adjusted life years. Many interviewees also suggested that training around health economics studies should be ongoing.

### Table 1. Summary of the aspects of health economics studies reported by interviewees as difficult to understand, evaluate, or need additional guidance.

|  |
| --- |
| **Aspects of health economics studies that are difficult understand** |
| Health valuations (e.g. quality adjusted life years or QALYs)  |
| Sensitivity analyses (e.g. tornado diagrams and probabilistic sensitivity analysis) |
| Model calibration |
| **Aspects of health economics studies that are difficult to evaluate** |
| Health valuations (e.g. QALYs)  |
| Waning immunity and duration of protection |
| Projected costs and vaccine coverage |
| Indirect effects and herd immunity |
| **Aspects of health economics studies that need additional guidance in the guidance document** |
| Waning immunity and duration of protection |
| Indirect effects and herd immunity |
| Productivity costs |
| Implementation costs |
| Process for determining outcomes of interest |
| Intermediate outcomes and disaggregated results |

## Appendix D. Survey instrument

Start of Block: Introduction

**Survey of ACIP preferences for the presentation of health economics studies**

Thank you for clicking on the link to take this survey. The purpose of this survey is to better understand the preferences of the ACIP with respect to the presentation of health economics studies. We are contacting past and present ACIP voting members, liaison members, and work group members to fill out this survey.

**This survey is important in that it will guide revisions on how health economics studies are presented to the ACIP.**

This survey will take approximately 10-20 minutes to fill out. There is no personal risk in participating in this survey. It will give you the opportunity to consider what aspects of health economics studies are most important to you. No compensation will be offered for your time. Your thoughtful responses will be a valuable contribution to making meaningful improvements in the presentation of health economics studies to the ACIP. All responses will be kept entirely confidential and no personal identifying information will be asked in this survey.

You can click on the following link to view useful definitions related this survey: link to definitions.

End of Block: Introduction

Start of Block: ACIP Experience

**astart** First, we would like to ask you about your involvement with the ACIP and experience with health economics studies.

**a1** Please indicate your current primary role with the ACIP.

* ACIP voting member
* ACIP liaison representative
* CDC employee regularly working with the ACIP
* ACIP ex officio member
* ACIP work group member (only)
* I am not currently affiliated with the ACIP or working regularly on ACIP projects
* Other (please specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**a2** How many ACIP Work Groups have you worked with over the past year?

* 0 Work Groups
* 1-2 Work Groups
* 3-4 Work Groups
* 5 or more Work Groups

**a3** Have you ever been affiliated with the ACIP?

* Yes
* No

**a4** How many years has it been since you were last affiliated with the ACIP?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**a5** In the past, what  roles have you had with the ACIP? (Select all that apply)

* ACIP Voting Member
* ACIP Liaison Representative
* ACIP Ex Officio Member
* ACIP Work Group Member
* Other (please specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**a6** Outside of the ACIP, which title best describes your primary work?

* Clinician/Medical provider
* Biomedical researcher
* Clinical researcher
* Epidemiologist
* Economist
* Other (please describe) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**a7** During your affiliation with the ACIP, how many health economics studies have you seen presented at a meeting of the full ACIP or at any of the Work Group meetings?

* None
* 1-2
* 3-5
* 6 or more

**a8** Have you ever been a part of a team that has conducted a health economics study?

* Yes
* No

**a9** How familiar are you with the ACIP’s current guidance for conducting and reporting health economics studies?

* I have never read through the guidance documentation
* I have read through it but I do not remember much about the guidance
* I have read through it and I am very aware of the guidance on reporting health economics studies

**a10** Do you think that health economics studies should be discussed and presented to the ACIP?

* Yes
* No
* Do not have an opinion

**a11** As an ACIP Voting Member, for which vaccine recommendations did the results of the health economics studies influence your vote?

Type "none" if the economic evidence has never influenced your decision, else list all the instances when it did have an impact for you.

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End of Block: ACIP Experience

Start of Block: Time - ACIP Voting Group

**bstart** The next set of questions is about the amount of time spent on the presentation of health economics studies at the meeting of the full ACIP.

**b2** On average, how many minutes do you think should be spent on one health economics study presentation to the entire ACIP (not including questions and answers afterward)?

* 1-5 minutes
* 6-10 minutes
* 11-15 minutes
* 16-20 minutes
* 21+ minutes

**b3** On average, how many minutes do you think should be spent on questions and answers regarding one health economics study presentation to the entire ACIP?

* 1-5 minutes
* 6-10 minutes
* 11-15 minutes
* 16-20 minutes
* 21+ minutes

End of Block: Time - ACIP Voting Group

Start of Block: EE Attributes - Definitions

**estart** The next set of questions reviews some elements of a health economics study presentation.  These elements primarily come from the guidance document provided by the CDC for presentations of health economics studies to the ACIP work groups and voting group. In the following questions, we will ask you to choose the element of the presentation you think is most valuable or least valuable for decision making in the ACIP.   The elements are listed below. Please review the elements since they will be used throughout the rest of the survey. **You can either view the definitions of the elements by slowly hovering over the blue text or by clicking on this link which will show them in a separate window.**
 Model overview and structural assumptions

 Description of cost and health valuation inputs

 Intermediate outcomes and disaggregated results

 Summary results or cost-effectiveness ratio

 Sensitivity analysis results and methods

 Discussion of limitations to the analysis

 Relationship of the results to other relevant studies

End of Block: EE Attributes - Definitions

Start of Block: EE Attributes - BW Scaling X3

**eintro** The following 7 questions provide different subsets of three elements of health economics study presentations for you to consider.
Assume that each element is adequately presented to the ACIP.

**e1** 1. Of the three elements below, please select two: the one that is most valuable for decision making, and the one that is least valuable for decision making.

|  |  |  |
| --- | --- | --- |
| Most Valuable |  | Least Valuable |
|  | Description of cost and health valuation inputs  |  |
|  | Sensitivity analysis results and methods  |  |
|  | Model overview and structural assumptions  |  |

**e2** 2. Please select the most valuable element for decision making and the least valuable element for decision making.

|  |  |  |
| --- | --- | --- |
| Most Valuable |  | Least Valuable |
|  | Discussion of limitations to the analysis  |  |
|  | Relationship of the results to other relevant studies  |  |
|  | Description of cost and health valuation inputs  |  |

**e3** 3. Please select the most valuable element for decision making and the least valuable element for decision making.

|  |  |  |
| --- | --- | --- |
| Most Valuable |  | Least Valuable |
|  | Summary results or cost-effectiveness ratio  |  |
|  | Description of cost and health valuation inputs  |  |
|  | Intermediate outcomes and disaggregated results  |  |

**e4** 4. Please select the most valuable element for decision making and the least valuable element for decision making.

|  |  |  |
| --- | --- | --- |
| Most Valuable |  | Least Valuable |
|  | Relationship of the results to other relevant studies  |  |
|  | Intermediate outcomes and disaggregated results  |  |
|  | Sensitivity analysis results and methods  |  |

**e5** 5. Please select the most valuable element for decision making and the least valuable element for decision making.

|  |  |  |
| --- | --- | --- |
| Most Valuable |  | Least Valuable |
|  | Sensitivity analysis results and methods  |  |
|  | Discussion of limitations to the analysis  |  |
|  | Summary results or cost-effectiveness ratio  |  |

**e6** 6. Please select the most valuable element for decision making and the least valuable element for decision making.

|  |  |  |
| --- | --- | --- |
| Most Valuable |  | Least Valuable |
|  | Intermediate outcomes and disaggregated results  |  |
|  |  Model overview and structural assumptions  |  |
|  | Discussion of limitations to the analysis  |  |

**e7** 7. Please select the most valuable element for decision making and the least valuable element for decision making.

|  |  |  |
| --- | --- | --- |
| Most Valuable |  | Least Valuable |
|  |  Model overview and structural assumptions  |  |
|  | Summary results or cost-effectiveness ratio  |  |
|  | Relationship of the results to other relevant studies  |  |

End of Block: EE Attributes - BW Scaling X3

Start of Block: EE Attributes - Adequate Presentation

**e8** From your experience in the ACIP, which of the elements of a health economics study presentation are most commonly not presented adequately? (Select all that apply. If desired, the same definitions used on previous pages can be viewed again by slowly hovering over the blue text.)

* Model overview and structural assumptions
* Description of cost and health valuation inputs
* Intermediate outcomes and disaggregated results
* Summary results or cost-effectiveness ratio
* Sensitivity analysis results and methods
* Discussion of limitations to the analysis
* Relationship of the results to other relevant studies
* ⊗None - these elements are always presented adequately to the ACIP

**e9** What are some of the most common problems to understanding health economics study presentations? (Select all that apply)

* Adequate justification for analytic decisions or assumptions was not provided
* Interpretation of figures and tables was not provided
* Not enough time was spent on the details
* Technical language was not well defined or explained
* Other (please specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**e10** Do you think that review comments from the work groups on the health economic study should be presented to the ACIP voting group?

* Yes
* No
* Do not have an opinion

End of Block: EE Attributes - Adequate Presentation

Start of Block: Results Preferences

NOTE: The first 13 respondents were given this block of questions as well as the following block of questions on sensitivity analyses. However, to minimize the survey length the remaining respondents were randomly assigned to answer one or the other block of questions.

**fstart** The following questions ask about your preferences for the presentation of results. Consider the following three methods for presenting summary results:

**ftext1** **1. Text Description**   Example:
 *The cost-utility ratio for vaccinating adults with diabetes ages 20-59 is $58,762 per QALY saved*

**ftext2** **2. Figures**

Example:
 

**ftext3** **3.Tables**
 Example:



**f1** Which way of presenting the summary results do you prefer the most?

* Text description
* Figures
* Tables

**f2** Which way of presenting the summary results do you prefer the least?

* Text description
* Figures
* Tables

**f3** Which results comparisons would you like to see in a presentation of a health economics study? (Please select all that apply)

* Comparison to other studies of the same vaccine
* Comparison to other vaccines for the same illness
* Comparison to non-vaccine interventions for the same illness
* Comparison to pre-specified ranges of what would be considered as low, medium, and high incremental cost-effectiveness values
* Comparison to vaccines for other illnesses
* Comparison to non-vaccine interventions for other illnesses
* ⊗None - the results of the study should not be compared to anything else

**f4** Would you like to see an entire presentation comparing the result of one health economics study to another health economics study for the same vaccine or vaccine policy?

* Yes - always
* Yes - but only if there are large differences
* Yes - but only if there are larger differences OR if one was industry funded
* No - a slide or two would be sufficient

End of Block: Results Preferences

Start of Block: Sensitivity Analysis - Types and Ranking

**sstart** Now we would like to know your preferences for reporting sensitivity analyses. Below are 5 ways to present sensitivity analyses. We have included definitions and typical depictions of each of the analyses if you are not familiar with them. The two questions following this page will refer to these types of analyses.

**sintro1** **Cost-effectiveness acceptability curve plot** – This figure shows the probability that different vaccine alternatives (each represented by its own line) are cost-effective given different thresholds of dollars per QALY gained that decision makers are willing to pay.

Example:



**sintro2** **Cost-effectiveness plane**– This figure shows the variability of potential outcomes on a plane where the change in cost due to the program is typically along the y-axis and the change in QALYS or life-years is typically along the x-axis.

Example:



**sintro3** **Tornado diagram** – This figure shows how the results may vary from the proposed summary result (i.e. the vertical line in the middle of the graph) when each of the input parameters are at their highest or lowest potential values.

Example:



**sintro4** **Bar chart with error bars** – The height or length of the each bar in this graph can represent the cost, the QALYS, or the cost-effectiveness ratio of each scenario. The error bars for each intervention are calculated by running a series of model simulations and can be thought of as quasi-confidence intervals.

Example:



sintro5 **Table with quasi-confidence intervals**– This table lists the various key outcomes, their median or mean point values, and credible intervals around each point estimate. The intervals are calculated by running a series of model simulations and can be thought of as quasi-confidence intervals.

 Example:
 

**s1** Please select which form of presentation you prefer the most.

* **Table With Quasi-Confidence Intervals**
* **Bar Graph with Error Bars**

**s2** Please rank the following 4 ways of presenting sensitivity analyses by how valuable each is to you in the decision making process. Re-order them by dragging and dropping them into place. (1 - Most valuable for decisions, 4 - Least valuable for decisions)

\_\_\_\_\_\_ **Table With Quasi-Confidence Intervals**

\_\_\_\_\_\_ **Bar Graph with Error Bars**

\_\_\_\_\_\_ **Tornado Diagram**

\_\_\_\_\_\_ **Cost-effectiveness Plane**

\_\_\_\_\_\_ **Cost-effectiveness Acceptability Curve**

End of Block: Sensitivity Analysis - Types and Ranking

Start of Block: Respondent background

**r1** Finally, we desire to know about any remaining preferences you have for health economics studies.

**r2** How often have you reviewed supplemental reports and documentation for the presentations of economic evidence that you have heard?

* Never
* Some of the time
* Most of the time
* All of the time

**r3** How valuable to the decision making process are the supplemental reports and documentation compared to the presentation itself of health economics studies?

* Supplemental reports and documentation are MORE valuable than the presentation for determining the quality of the study
* Supplemental reports and documentation are LESS valuable than the presentation for determining the quality of the study
* Supplemental reports and documentation are EQUALLY valuable than the presentation for determining the quality of the study

**r4** How helpful would it be to have a system that produces an overall quality score of the health economics studies that are presented to the ACIP?
(1 - not at all helpful, 10 - very helpful)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

|  |  |
| --- | --- |
| How helpful? |  |

**r5** Please provide any other comments you have about the presentation of health economics studies to the ACIP.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Endtext** Thank you so much for your time and effort in filling out this survey! Your responses will provide the CDC with important information on how to improve the presentation of health economics studies to the ACIP.

End of Block: Respondent background

## Appendix D. List of definitions provided in the survey

**Definition of a Health Economics Study**

A health economics study is an analysis of the value of an intervention in terms of the additional costs and health benefits it provides when compared to the next best alternative. Health economics studies presented to the ACIP typically include one of the following three types of analyses:

1. Cost-benefit analyses - examine all potential health and economic improvements or losses in terms of money,

2. Cost-effectiveness analyses - compare the potential changes in direct and time costs to the potential improvements or losses in clinically meaningful outcomes (e.g. hospitalizations averted),

3. Cost-utility analyses - compare the potential changes in costs to potential improvements or losses in health as measured by quality adjusted life years. Cost-utility analyses are a special case of cost-effectiveness analyses.

**Definitions of Elements of a Health Economics Study**

**Model overview and structural assumptions**

The model and structural assumptions include a description of: (1) the health states included, (2) the progression of illness recovery and immunity, (3) how individuals enter, exit, or remain in the model, (4) how individuals in the model interact.

**Description of cost and health valuation inputs**

Costs may include direct medical, direct non-medical, and changes in productivity (i.e., time costs). Health utility valuations are assigned to each health state. Utilities are assigned on a scale from 0 (representing dead) and 1 (representing perfect health) and are used to determine the quality adjusted life years (QALYs) gained by the intervention.

**Intermediate outcomes and disaggregated results**

Intermediate outcomes are those that precede the key outcomes. Disaggregated results show the separate contributions of costs and the separate components of QALYs by source or health state.

**Summary results or cost-effectiveness ratio**

These are the results that answer the study question, typically the ratio of incremental costs divided by the incremental gain in QALYs.

**Sensitivity analysis results and methods**

Sensitivity analyses explore how the results change when model inputs are varied across a predefined range.

**Discussion of limitations to the analysis**

Study limitations describe the potential biases of the model due to missing evidence or characteristics of the studies used to develop model inputs.

**Relationship of the results to other relevant studies**

The results and sensitivity analysis of the study are compared to other studies that examine the same vaccine or alternative interventions for the same condition.