

**Summary Minutes of the
U.S. Environmental Protection Agency Science Advisory Board
Environmental Economics Advisory Committee
Public Teleconference
August 5, 2016**

Date and Time: Friday, August 5, 2016, 1:00 p.m. – 5:00 p.m.

Location: By teleconference

Purpose: To discuss the Science Advisory Board (SAB) Environmental Economics Advisory Committee’s draft report on the review of the EPA’s proposed methodology for updating mortality risk valuation estimates for policy analysis.

Participants:

Members of the U.S. Environmental Protection Agency Science Advisory Board Environmental Economics Advisory Committee

(Panel roster is provided in attachment A)

Dr. Madhu Khanna
Dr. Kevin Boyle
Dr. Richard Carson
Dr. Mary Evans
Dr. Wayne Gray
Dr. Matthew Kotchen
Dr. Matthew Neidell
Dr. James Opaluch
Dr. Daniel Phaneuf
Dr. Andrew Plantinga
Dr. Richard Ready
Dr. Kerry Smith
Dr. George Van Houtven
Dr. JunJie Wu

EPA Science Advisory Board (SAB) Staff:

Dr. Thomas Armitage, Designated Federal Officer

EPA Representatives:

Dr. Al McGartland, EPA National Center for Environmental Economics
Dr. Kelly Maguire, EPA National Center for Environmental Economics
Dr. Steve Newbold, EPA National Center for Environmental Economics
Dr. Nathalie Simon, EPA National Center for Environmental Economics

Other Attendees:

Lynn Blake-Hedges, U.S. EPA/OSCPP
Leland Deck, U.S. EPA/OAR
Charmaine Hanson, U.S. EPA/OPP
Maria Hegstad, Inside EPA
Lindsey Jones, Texas Commission on Environmental Quality

Teleconference Summary:

Convene the Teleconference

Dr. Thomas Armitage, Designated Federal Officer (DFO) for the EPA Science Advisory Board (SAB) Environmental Economics Advisory Committee, convened the teleconference at 1:00 p.m. Eastern Time. He identified Committee members who were on the call. He noted that the Committee operates as part of the EPA Science Advisory Board (SAB), which is a chartered Federal Advisory Committee under the Federal Advisory Committee Act (FACA) and is empowered by law to provide advice to the EPA Administrator. He stated that the teleconference was a continuation of the Committee's meeting held the previous day. He stated that summary minutes of the teleconference would be prepared and certified by the Chair. Dr. Armitage indicated that all meeting materials were available on the SAB website page for the Committee teleconference that had been held the previous day (8-4-16). These meeting materials included: the Federal Register Notice announcing the teleconference,¹ teleconference agenda,² Committee roster,³ the Committee's draft (5-5-16) report to the EPA,⁴ the Committee's draft (7-22-16) report to the EPA,⁵ section-by-section compilation of member comments on the (5-5-16) report,⁶ and additional comments from Committee member Dr. Kerry Smith on the Committee's draft (7-22-16) report to the EPA.⁷ Dr. Armitage noted that time had been included on the agenda to hear oral public comments but no requests to speak had been received and no written public comments had been received. He also indicated that public access to the teleconference had been provided through a conference line and live audio webcast. He asked members of the public listening to the webcast to send him an email indicating that they were on-line.

Review of Agenda and Purpose of the Teleconference

Dr. Madhu Khanna, Chair of the SAB Committee, reviewed the teleconference objectives and agenda. She stated that the teleconference was a continuation of one held the previous day to discuss the Committee's draft report on the review of the EPA White Paper titled: *Valuing Mortality Risk for Policy Assessment: A Meta-Analytic Approach*.

Discussion of the Committee's Draft Report

Dr. Khanna noted that the Committee had discussed the responses to charge questions 1 through 17 on previous teleconferences. She indicated that the Committee would discuss the letter to the Administrator and executive summary on this teleconference. She asked members to refer to the marked up draft (7-22-16) report and the compilation of members' comments on the draft (5-5-16) report. She also noted that the Committee had been sent another draft of the report that contained additional comments from a member of the Committee (Dr. Smith).

Dr. Khanna indicated that, before considering the executive summary and letter to the Administrator, she wanted to the Committee to continue discussing issues that should be included in the overarching

comments section of the report, including suggestions in the comments that had been provided by Dr. Smith.

Overarching Issues

A Committee member commented that the draft report should indicate that EPA had faced a challenging task in analyzing diverse data sets. He noted that the Committee had faced a challenging task in evaluating the methods because additional explanation of some aspects of the analysis was needed. He commented that the Committee's report should identify the concerns about aspects of the EPA's analysis and indicate that the agency should continue to explore the meta-analytic approach. He noted that some needs for additional research should be identified.

Committee members commented that the Committee should carefully consider its advice concerning the issue of whether the analysis was scientifically sound. A member noted that the EPA needed an updated VSL estimate for policy analysis and he questioned how the Committee's advice would affect use of the EPA's proposed estimate. The Chair commented that the Committee's report would be reviewed by the chartered Science Advisory Board before it was transmitted to the EPA Administrator. She further noted that the agency would then decide how it should respond to the SAB findings and recommendations. She acknowledged that the VSL estimate was important because it was used for regulatory analysis.

The Committee continued to discuss concerns about the agency's approach. A member commented that he had looked at the previous SAB advice to EPA. He noted that the agency had developed an innovative approach in response to the SAB advice, but he was concerned about (1) combining a benefit-transfer strategy with the meta-analysis strategy, and (2) the use of census data from different years to weight VSL estimates.

The Chair commented that a fundamental point to be addressed in the Committee's report was whether the EPA should be encouraged to develop the meta-analytic approach. Members expressed support for the approach but indicated that transparency was needed in the assumptions that were made. Members indicated that the assumptions should be visible rather than making them part of a data screening procedure. A member agreed that the EPA should be encouraged to develop the approach but he reiterated the point that transparency was important. He indicated that, because of data limitations, the EPA had conducted some adjustments. He noted that clear justification and support was needed to show the validity of these adjustments. Another member reiterated the point that greater transparency in the assumptions was needed. Members discussed the differences between Hicksian and Marshallian consumer surplus and population weighting as examples of the need for transparency. The Chair commented that concerns about conceptual issues could be included in the overarching comments.

EPA staff provided a brief clarifying explanation of how the demographic weighting adjustment had been conducted. Members thanked EPA staff for the explanation and reiterated concerns about the weighting process. A member commented that multiple sets of weights had been used, and noted that the process was a benefit-transfer task. He expressed concern that this had been performed as an adjustment task. Members discussed the challenges associated with the use of heterogeneous estimates in the meta-analysis. Members commented that certain assumptions were necessary and should be acknowledged. A member commented that assumptions should not be embedded in a statistical summary. The Chair thanked the members for their comments and indicated that she would work with individual members of the Committee to incorporate the issues discussed into the overarching comments section of the report.

Letter to the Administrator

The Committee discussed the letter to the Administrator in the draft report. The Chair noted that some suggested changes had been included in the compilation of members' comments and that, unless further discussion of them was needed, the changes could be included in the report. Members discussed including a new paragraph in the letter to the Administrator to (1) emphasize the point that the EPA's meta-analysis was an innovative approach, and (2) highlight some of the points raised in the overarching comments. A member expressed agreement with including a new paragraph in the letter but suggested that it be brief. Another member commented that the letter should indicate that the data used in the analysis were heterogeneous and that more data were needed. Members discussed various points concerning the heterogeneity and limitations of the data. The Chair indicated that these points could be included in the report. She indicated that the new paragraph discussed would be inserted in the letter and in the executive summary, and that she would work with Dr. Smith to develop the text.

Executive Summary

The Committee discussed the executive summary in the draft report. The Chair noted that suggested changes in the executive summary had been included in the compilation of members' comments and that that these could be included in the report unless discussion was needed. A member commented that the text addressing consequentiality should be changed. He suggested that the report indicate that studies conducted before consequentiality was recognized as an important element could in fact be consequential. He indicated that he would provide text to the DFO to make this change.

Members commented that the text summarizing the response to Charge Question 1(b) should contain a brief discussion of the issue of Hicksian and Marshallian measures in hedonic wage and stated preference studies. A member recommended including text stressing the need for Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI) data merged with data from the Current Population Survey (CPS) fatality risk measures to encourage future revealed preference VSL research.

Several members indicated that the discussion of Hicksian and Marshallian measures should be included in the executive summary. The Chair commented that this could be included in the section of the executive summary that encapsulated the response to Charge Question 5.

Next Steps

The Chair reviewed the next steps for completion of the Committee's report. She indicated that the lead writers would incorporate the revisions discussed on the August 4-5 teleconferences into the responses to their assigned charge questions. Members discussed the timeframe for incorporating revisions into the report. The Chair indicated that she wanted to incorporate the revisions into the report within three weeks. She summarized the follow-up assignments (listed below):

Letter to the Administrator, Executive Summary, and Responses to Charge Questions 9 - 17

- Dr. Khanna will revise the third paragraph of the letter to the Administrator to make it consistent with the revised report. The third paragraph of the letter will briefly mention the overarching findings and recommendations. Dr. Khanna will also include any other changes needed in the letter to make it consistent with the main body of the report.

- The lead writers for the charge questions will edit the executive summary to make it consistent with the text in the main body of the report.
- Dr. Smith will incorporate revisions into the Charge Questions 9 and 10. Dr. Carson will also work with Dr. Smith to incorporate revisions into Charge Question 9. The revised report will indicate that EPA has developed a new and innovative approach, point out the concerns identified by the Committee, and provide recommendations that were discussed. The response to Charge Question 10 will also suggest that the EPA conduct a median analysis.
- Drs. Opaluch and Dr. Khanna will incorporate revisions into Charge Question 11. The revised response will indicate that in the long term, EPA should consider establishing a peer review process that would allow the use of studies and data outside of the peer-reviewed literature. The response will use the term “VSL” instead of “VRR.” The report will also indicate that the EPA should make a judgment every 5 years about whether the VSL needs to be updated. Dr. Opaluch will also provide text recommending that the EPA seek ways to explain the meaning of the term VSL. This text will be included in the report in a new overarching recommendations section.
- Dr. Ready will revise the response to Charge Question 12. The revised response will indicate that a premium for cancer mortality is justified because of the morbidity preceding it. However, the revised report will indicate that there is not enough information available at this time to know how the morbidity should be included and that more studies are needed.
- The response to Charge Question 13 does not need much revision. Edits will be incorporated by Dr. Kotchen. The response will more clearly indicate that there must be a clear theoretical foundation to support the use of estimates of income elasticity for related goods and services to infer estimates of the income elasticity of VSL (such as consumer products that can be used to reduce health risks). The recommendation on lines 39 – 42 (of the 7-22-16 draft) will be strengthened to reflect this point.
- The response to Charge Question 14 does not need much revision. Dr. Neidell will revise the response to recommend that the analysis include all of the income elasticity estimates from the stated preference studies and that standard errors be used to calculate a weighted mean.
- Dr. Carson will incorporate edits into the response to Charge Questions 15-16. The revisions will include text noting that there has not been much variation in income, and explaining the problem this poses in estimating income elasticity of VSL
- Dr. Khanna will work with Drs. Van Houtven and Johnson to revise the response to Charge Question 17. The revision will indicate that, without a theoretical or empirical justification, it is conceptually incorrect to apply income elasticity of one good to some other good, even though the goods are related in some way. The revised report will note that it may be possible to use a conceptual model of averting expenditures to show conditions under which the income elasticities of private health care products might be used as a proxy for the income elasticity of non-fatal health risks. The revised report will recommend that EPA undertake research to develop such a model.
- Drs. Khanna, Smith, and Van Houtven will develop the overarching comments section incorporating the points discussed. As discussed, the report will indicate that the EPA has developed an innovative approach and identify challenges to be addressed in implementing the

approach. The overarching comments section will also explain the limitations of the data and note the need for more transparency.

Responses to Charge Questions 1 - 8

The Chair again noted that on previous teleconferences the Committee had discussed the revisions to Charge Questions 1 – 8 and that revisions of responses to these questions had been incorporated into the 7-22-13 draft report. Members suggested several additional edits for these charge question responses and indicated that the executive summary should be revised to be consistent with the text in the main body of the report. The Chair summarized the follow-up assignments (listed below):

- Dr. Boyle will revise response to question 1a in both the executive summary and the body of the report to indicate that studies conducted before consequentiality became prominent could still be consequential.
- Dr. Gray will revise the response to Charge Question 1b in the executive summary and main body of the report to incorporate the revisions discussed. The issue of Hicksian willingness to pay vs. Marshallian willingness to accept will be mentioned in this part of the executive summary. Other clarifications discussed will be included.
- Dr. Khanna will incorporate any changes needed to make the response to Charge Question 1c in the executive summary consistent with the response to charge question 1c in the main body of the report.
- The DFO will schedule a call with Dr. Swallow and Dr. Smith to discuss incorporation of several revisions into the response to Charge Question 3.
- Dr. Wu will incorporate several clarifying edits into the response to Charge Question 4 and make the executive summary consistent with text in the main body of the report.
- Dr. Van Houtven will incorporate several clarifying edits into the response to Charge question 5. He will send the revised text to Dr. Smith for review. The text indicating that the “meta-analytic methods used in the white paper appear to be broadly consistent with standard and accepted practices” will be revised to indicate that using a meta-analytic approach is appropriate but the SAB has concerns about its implementation.
- The response to Charge Question 6 does not need much revision. Edits will be incorporated by Dr. Phaneuf. The text will indicate that the SAB endorses grouping studies that use the same data set.
- No revisions are needed in the response to question 7 in either the executive summary or main body of the report.
- Dr. Plantinga will incorporate several clarifying edits into the response to Charge Question 8. In particular, the text in the executive summary indicating that “the SAB supports the EPA’s conclusion that the mean of group means estimator is the preferred non-parametric method because it has the smallest estimated standard error” will be revised.

Dr. Khanna noted that it was time to adjourn the teleconference. She asked the DFO to send members the list of follow-up assignments from the teleconference and asked members to incorporate revisions into the report within three weeks. She indicated that another draft of the revised report would be sent to members for review and concurrence before it was sent to the chartered SAB for quality review. She asked members if there were further comments or questions. There were no comments or questions so she asked the DFO to adjourn the teleconference.

The DFO indicated that he would send members a summary of the revisions discussed on the teleconference. He then stated that teleconference was adjourned.

Respectfully Submitted:

Certified as Accurate:

/signed/

/signed/

Dr. Thomas Armitage
Designated Federal Officer
Committee

Dr. Madhu Khanna, Chair
SAB Environmental Economics Advisory

NOTE AND DISCLAIMER: The minutes of this public meeting reflect diverse ideas and suggestions offered by Panel members during the course of deliberations within the meeting. Such ideas, suggestions and deliberations do not necessarily reflect consensus advice from Panel members. The reader is cautioned to not rely on the minutes to represent final, approved, consensus advice and recommendations offered to the Agency. Such advice and recommendations may be found in the final advisories, commentaries, letters or reports prepared and transmitted to the EPA Administrator following the public meetings.

ATTACHMENT A: COMMITTEE ROSTER

U.S. Environmental Protection Agency Science Advisory Board Environmental Economics Advisory Committee

CHAIR

Dr. Madhu Khanna, ACES Distinguished Professor in Environmental Economics, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, Urbana, IL

MEMBERS

Dr. Kevin Boyle, Professor and Director, Program in Real Estate, Virginia Tech, Blacksburg, VA

Dr. Sylvia Brandt, Associate Professor, Department of Resource Economics, University of Massachusetts, Amherst, MA

Dr. Richard Carson, Professor, Economics, Department of Economics, University of California, San Diego, La Jolla, CA

Dr. J.R. DeShazo*, Associate Professor for Public Policy, School of Public Policy and Social Research, University of California at Los Angeles., Los Angeles, CA

Dr. Mary Evans, Associate Professor, Robert Day School of Economics and Finance, Claremont McKenna College, Claremont, CA

Dr. Wayne Gray, Professor, Department of Economics, Clark University, Worcester, MA

Dr. Timothy Haab*, Department Chair and Professor, Department of Agricultural, Environmental and Development Economics, Ohio State University, Columbus, OH

Dr. F. Reed Johnson, Senior Research Scholar, Center for Medical and Genetic Economics, Duke Clinical Research Institute, Duke University, Durham, NC

Dr. Matthew Kotchen, Associate Professor, School of Forestry and Environmental Studies, Yale University, New Haven, CT

Dr. Matthew Neidell, Associate Professor, Department of Health Policy and Management, Mailman School of Public Health, Columbia University, New York, NY

Dr. James Opaluch, Professor and Chair, Department of Environmental and Natural Resource Economics, College of the Environment and Life Sciences, University of Rhode Island, Kingston, RI

Dr. Daniel Phaneuf, Associate Professor of Agricultural and Applied Economics, Department of Agricultural and Applied Economics, University of Wisconsin-Madison, Madison, WI

*Did not participate in the review of the EPA's proposed methodology for updating mortality risk valuation estimates for policy analysis.

Dr. Andrew Plantinga, Professor, Bren School of Environmental Science and Management, University of California, Santa Barbara, Santa Barbara, CA

Dr. Richard Ready, Professor, Department of Agricultural Economics and Economics, Montana State University, Bozeman, MT

Dr. V. Kerry Smith, Emeritus Regents' Professor and Emeritus University Professor of Economics, Department of Economics, W.P Carey School of Business, Arizona State University, Tempe, AZ

Dr. Stephen Swallow, Professor, Department of Agricultural and Resource Economics, University of Connecticut, Storrs, CT

Dr. George Van Houtven, Senior Economist and Director, Ecosystem Services Research, RTI International, Research Triangle Park, NC

Dr. JunJie Wu, Emery N. Castle Professor of Resource and Rural Economics, Department of Agricultural and Resource Economics, Oregon State University, Corvallis, OR

Dr. Jinhua Zhao*, Professor, Department of Economics, Department of Agricultural, Food and Resource Economics, Michigan State University, East Lansing, MI

SCIENCE ADVISORY BOARD STAFF

Dr. Thomas Armitage, Designated Federal Officer, Science Advisory Board, U.S. Environmental Protection Agency, Washington, DC

*Did not participate in the review of the EPA's proposed methodology for updating mortality risk valuation estimates for policy analysis.

Materials Cited

The following meeting materials are available on the SAB website, www.epa.gov/SAB. Meeting materials for both the August 4th and August 5th teleconferences of the Environmental Economics Advisory Committee are on the August 4th meeting page of the SAB website.

<https://yosemite.epa.gov/sab/sabproduct.nsf/MeetingCal/97DE29B0061567E085257FE2006FD7E8?OpenDocument>

¹ Federal Register Notice.

² Agenda.

³ Committee Roster.

⁴ Draft (5-5-2016) SAB Review of EPA's Proposed Methodology for Updating Mortality Risk Valuation Estimates for Policy Analysis.

⁵ Draft (7-22-2016) SAB Review of EPA's Proposed Methodology for Updating Mortality Risk Valuation Estimates for Policy Analysis.

⁶ Section-by-Section Compilation of Environmental Economics Advisory Committee Member Comments on the Committee's Draft (5-5-16) VSL Report (As of 6/14/16).

⁷ Comments from Dr. Smith on the 7-22-16 draft Committee report on Updating Mortality Risk Valuation Estimates for Policy Analysis