

**Summary Minutes of the
U.S. Environmental Protection Agency Science Advisory Board
Environmental Economics Advisory Committee
Public Teleconference
June 17, 2016**

Date and Time: Thursday, June 17, 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. Reed Johnson
Dr. Matthew Kotchen
Dr. Matthew Neidell
Dr. James Opaluch
Dr. Andrew Plantinga
Dr. Richard Ready
Dr. Kerry Smith
Dr. Stephen Swallow
Dr. George Van Houtven
Dr. JunJie Wu

EPA Science Advisory Board (SAB) Staff:

Dr. Thomas Armitage, Designated Federal Officer

EPA Representatives:

Dr. Chris Dockins, EPA National Center for Environmental Economics
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:

Sandy Germann, U.S. EPA
Maria Hegstad, Risk Policy Report
Lindsey Jones, Texas Commission on Environmental Quality
John Norman, ExxonMobil Biomedical Sciences
Amanda Thomas, U.S. Office of Management and Budget

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 web site on the page for the Committee's meeting held the previous day (June 16, 2016). 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 Information about the EPA White Paper, *Valuing Mortality Risk for Policy Assessment: a Meta-analytic Approach* provided by EPA at the request of the Committee,⁵ individual comments from Committee members on the draft (5-5-16) report,⁶ and a section-by-Section compilation of member comments on the draft (5-5-16) report.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 noted that the Committee would take a break at approximately 3:00 pm (Eastern Time) and if members of the public wanted to provide brief clarifying comments they should notify him by email at armitage.thomas@epa.gov before the break. 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 asked members to refer to the compilation of Committee members' comments on the draft report. She indicated that it would be helpful to use this compilation to focus the discussion. She noted that some of the comments provided revisions that could probably be incorporated without much discussion, and she asked members to raise the points that should be discussed on the teleconference. She indicated that the Committee would begin by continuing the discussion of Section 3.1.4 (the response to Charge Question 2).

Section 3.1.4 – Response to Charge Question 2

The Committee continued its discussion of the draft response to Charge Question 2. Members discussed whether the draft report should recommend that the EPA provide a rationale for excluding various categories of studies from the VSL analysis. The Committee also discussed valuation of morbidity. A member suggested that the EPA review the available literature to determine how morbidity and mortality valuation could be combined. A member commented that research was needed address valuation of morbidity in the analysis.

The Committee discussed proposed clarifications in the response to Charge Question 2. Members discussed the quality of data needed for the analysis. A member commented that the Census of Fatal Occupational Injuries represented the quality of data that should be used in EPA's analysis, but he noted that studies providing higher quality data could also be used. Committee members discussed the studies cited in the Committee's draft report and whether they should be included in the EPA's analysis. A member commented that the EPA should have included these studies in the analysis. Other members commented that the draft report should recommend that the EPA consider using these studies.

The Committee discussed a number of empirical and methodological concerns about EPA's analysis. In particular, a member expressed concern about the transformation of the data used in the analysis. He commented that he could not endorse the VSL estimates before these methodological issues were addressed. The Committee discussed these issues at length. The Chair commented that the draft report appropriately highlighted actions the EPA could take in the short and long run to address the Committee's concerns.

A member commented that charge questions given to the Committee did not focus on important cross-cutting issues and concerns. A member commented that the Committee had been asked to review results of the EPA's current meta-model. He noted that, because of methodological concerns, he did not want to endorse the values that the EPA had developed. Another member commented that although he did not disagree with the expressions of concern about the methodology, he did not have the same level of concern. The Committee discussed how its report could be revised to express overarching concerns about the methodology.

The Chair indicated that the Committee's draft report should provide critical recommendations for actions needed to develop a VSL in the short run. She indicated that it was not necessary to indicate that the current set of values developed by the EPA were endorsed by the Committee. She asked members whether they could agree with this kind of statement. A member commented that he did not want to endorse the use of the current meta-analysis. He questioned whether the EPA's White Paper would be revised and returned to the SAB for review. The Chair indicated that the EPA would decide what should be done in response to the SAB recommendations and whether the report should again be reviewed by the SAB.

The Committee discussed other recommendations in the draft response to Charge Question 2. In particular, members discussed two specific recommendations. One of the recommendations called upon the EPA to provide more information to allow users of the White Paper to assess potential biases, the other called for a clear indication of the types of studies other than hedonic wage or stated preferences that were available but eliminated by screening criteria. Members recommended moving these

recommendations into the response to Charge Question 1. The Chair asked the lead writer for Charge Question 2 to incorporate the changes discussed into the draft report.

Section 3.1.5 – Response to Charge Question 3

The Committee discussed the need to clarify recommendations in the draft response to Charge Question 3. A member commented that the Committee's recommendations should indicate that adjusting VSL estimates derived from hedonic and contingent valuation studies for income must be consistent with the income concept relevant to each model. He noted that in hedonic models income was endogenous and he questioned whether nonwage income should be adjusted in this case. He noted that in contingent valuation this was not the case and expected utility was held constant. Committee members agreed that the report should point out the differences between Hicksian and Marshallian measures and indicate that the issue should be addressed in the EPA's analysis.

Members discussed Appendix B in the EPA White Paper. A member commented that the EPA's weighting process was quite complex. He noted that the weights appeared to have been applied to the wrong year and the wrong population, and that EPA appeared to mix statistical benefit transfer and population weighting processes. He indicated that this issue needed to be emphasized in the body of the Committee's report and also mentioned in the executive summary. Another member commented that in order to determine how much effort to devote to weighting subpopulations, it might be useful for the EPA to determine whether there was large variation in VSL across subpopulations. Other members agreed that this point should be mentioned in the Committee's report. A member commented that the Committee's report should indicate that it is important to use standard practices for population weighting. Members further commented that the report should point out the importance of separating population weighting from benefit transfer. A number of other editorial suggestions were discussed to clarify the report

The Chair thanked the members for their comments and asked the lead writer to incorporate the changes discussed into a revised draft of the response to the charge question.

Section 3.1.6 – Response to Charge Question 4

Members commented that it was not clear how the EPA had calculated the standard error of the VSL for studies when the standard error had not been provided. Some members noted that this point had been included in the Committee's draft report. The Committee discussed whether the point should be further emphasized. The Committee then discussed and agreed upon a number of minor editorial changes to clarify the text in the response to Charge Question 4. The Chair asked the lead writer for the question to incorporate the changes discussed.

Section 3.2.1 – Response to Charge Question 5

The Committee discussed the response to Charge Question 5. Members again discussed the importance of differences between Hicksian and Marshallian measures and how this issue should be addressed in the Committee's report. A member commented that he was not sure differences would be small. Another member commented that the EPA should use a theoretical model to show when differences could be large. Another member commented that the Committee's report should indicate that the EPA had mixed two concepts and that more research was needed to decide how to aggregate these measures. Some members noted that differences between these types of measures might be inconsequential. A member

commented that the Committee's report should clearly state that revealed preferences reflect willingness to accept and stated preferences reflect willingness to pay.

The Committee discussed whether its draft report should state that the EPA's methodology was consistent with standard practices. A member commented that new protocols had been used to measure consistent effect size and that the protocols were not clearly described and justified in the White Paper. He indicated that the Committee's report should not state that the methodology was consistent with standard practices. Another member commented that it appeared EPA had selected the best practices for use in the analysis. He noted that the agency had tried to address issues that were often ignored in meta-analyses. Another member pointed out differences in the databases used for the analysis. He noted that the EPA had extracted a good comprehensive data set and had taken differences into account. A member reiterated his comments that the methodological advancements applied were not clearly justified, and that a number of issues did not seem to be adequately addressed. He indicated that there was not clear discussion of the income measure in the White Paper. The Committee further discussed whether there should be an adjustment of the VSL for income. Some members commented that the income adjustment in the White Paper was not appropriate but conversion of the VSL to inflation adjusted dollars was appropriate. Other members commented that there did not seem to be strong evidence to justify the income adjustment. A member commented that it was important to distinguish between the effect of income growth and income elasticity of the VSL. Members commented that studies had indicated that, over the past 15 years, there had not been a change in income, so the transformation based on income did not seem to be appropriate. A member commented that, in the long term, adjustment for income should be considered. Another member commented that gross domestic product per capita was not the correct measure to use. He expressed a preference for using median household income. He also pointed out the limitations of using cross-sectional data. Members agreed that the income adjustment of the VSL was problematic and this should be pointed out in the Committee's report.

The Committee discussed and agreed upon other editorial changes in the response to the charge question. The Chair asked the lead writer for Charge Question 5 to incorporate the points discussed into a revised draft of the charge question response.

The Chair indicated that the Committee would next discuss the responses to Charge Questions 6 – 7. Before the Committee began this discussion, Dr. Armitage noted that no requests had been received from members of the public to provide clarifying comments.

Sections 3.3.2 – 3.2.3 – Responses to Charge Questions 6 - 7

The Chair noted that members had provided suggested editorial changes for the responses to charge questions 6 and 7. She further noted that these edits had been included in the section-by-section compilation of comments. She asked whether members wanted to discuss any of these edits or other issues concerning these charge question responses. Members did not raise any issues for discussion so the Chair indicated that the Committee would discuss the draft response to Charge Question 8.

Section 3.2.4 – Response to Charge Question 8

The Committee discussed the draft response to Charge Question 8. In particular, members discussed whether the Committee should recommend that the EPA include a time trend in the meta-analysis. A member commented that the Committee's draft report recommended that the EPA be consistent in its treatment of the time trend. He noted that the Committee report stated that the time trend should be

treated the same way in the parametric and non-parametric models. Other members commented that a time trend should not be used in the analysis.

A member commented that the application of the time trend was a benefit transfer. Another member commented that there was no evidence of a time trend. A member commented that the parametric model did include strong significant coefficients on time trend. Members discussed the idea of performing a sensitivity analysis to determine how time trend should be addressed. Members suggested looking back 10-20 years to determine the effect of including older studies in the analysis. Members agreed to revise the draft report to indicate that the EPA should not include a time trend variable in the parametric or non-parametric models but should consider a sensitivity analysis to determine whether older or newer studies had a strong influence on the average VSL.

The Chair asked the lead writer for the question to incorporate the points discussed into a revised response.

Next Steps

Dr. Khanna noted that it was time to adjourn the teleconference. She indicated that the Committee had completed the discussion of charge questions 1 – 8. Therefore, another teleconference would be held to discuss the responses to charge questions 9 – 17, the executive summary, and letter to the EPA Administrator. She indicated the DFO would ask members to send dates of availability and schedule another teleconference that would be held within the next 4 – 6 weeks. She asked the lead writers to incorporate the changes discussed on the teleconference into the question responses and send revisions to the DFO by Thursday, June 30th. She thanked Committee members for their comments and 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 stated that he would send members a summary of the revisions discussed on the teleconference and would also request dates of availability to schedule the next call. He then stated that teleconference was adjourned.

Respectfully Submitted:

/signed/

Dr. Thomas Armitage
Designated Federal Officer
Committee

Certified as Accurate:

/signed/

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, on the June 16th meeting page of the Environmental Economics Advisory Committee.

<https://yosemite.epa.gov/sab/sabproduct.nsf/MeetingCal/8A0E320AC3DF905785257F8D00748AAF?OpenDocument>

¹ Federal Register Notice announcing the teleconference

² Agenda

³ Panel Roster

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

⁵ Additional Information about the White Paper, Valuing Mortality Risk for Policy: a Meta-analytic Approach, provided by EPA (May 10, 2016) at the request of the Science Advisory Board Environmental Economics Advisory Committee

⁶ Individual Committee member comments on the 5-5-16 draft of the SAB review of EPA's proposed methodology for updating mortality risk valuation estimates for policy analysis (as of 6/2/16)

⁷ Section-by-Section Compilation of Environmental Economics Advisory Committee (EEAC) Member Comments on the Committee's Draft (5-5-16) VSL Report (As of 6/14/16)