

**U.S. Environmental Protection Agency
Science Advisory Board**

**Summary Minutes for the Public Teleconference held on:
May 20, 2020**

Meeting Participants:

Chartered Science Advisory Board (SAB) Members

Dr. Michael Honeycutt, Chair
Dr. Rodney Andrews
Dr. Hugh A. Barton
Dr. Barbara Beck
Dr. Deborah Hall Bennett
Dr. Frederick Bernthal
Dr. Bob Blanz
Dr. Joel G. Burken
Dr. Janice E. Chambers
Dr. John R. Christy
Dr. Samuel Cohen
Dr. Louis Anthony (Tony) Cox, Jr.
Dr. Alison C. Cullen
Dr. Otto C. Doering III
Dr. Susan P. Felter
Dr. Joseph A. Gardella
Dr. John Guckenheimer
Dr. Margaret M. MacDonell
Dr. Robert E. Mace
Dr. Clyde F. Martin
Dr. Sue Marty
Mr. Robert W. Merritt,
Dr. Larry Monroe
Dr. Thomas F. Parkerton
Dr. Robert Phalen
Dr. Kenneth M. Portier
Dr. Robert Puls
Dr. Tara L. Sabo-Attwood
Dr. Mara Seeley
Dr. Anne Smith
Dr. Richard Smith
Dr. Jay Turner
Dr. Brant Ulsh
Dr. Donald van der Vaart

Ms. Carrie Vollmer-Sanders
Dr. Kimberly White
Dr. Mark Wiesner
Dr. Peter J. Wilcoxen
Dr. Richard A. Williams
Dr. S. Stanley Young

Science Advisory Board COVID-19 Review Panel

Dr. Michael Honeycutt, Chair
Dr. Craig Adams
Dr. Hugh A. Barton
Dr. Deborah Hall Bennett
Dr. Harvey Clewell
Dr. Alison C. Cullen
Dr. Jacqueline Hughes-Oliver
Dr. Michael Jayjock
Dr. Wayne Landis
Dr. Mark W. LeChevallier
Dr. Robert Phalen
Dr. Tara L. Sabo-Attwood
Dr. Richard Sakaji
Dr. Mara Seeley
Dr. June Weintraub
Dr. Mark Weisner
Dr. Lloyd Wilson

SAB Liaisons

Dr. Paul Gilman, EPA Board of Scientific Counselors

SAB Staff Office

Dr. Thomas Armitage, Designated Federal Officer (DFO) for the Chartered SAB
Dr. Zaida Figueroa, Designated Federal Officer (DFO) for the SAB COVID-19 Review Panel
Mr. Thomas Brennan, SAB Staff Office Director

Other Attendees

See Attachment A.

Meeting Summary:

Convene the meeting

The Chartered Science Advisory Board (SAB) held a public teleconference on May 20, 2020. Dr. Thomas Armitage, DFO for the Chartered SAB, convened the teleconference at approximately 1:00 pm (Eastern Time) and noted that the SAB was meeting by teleconference to

discuss the SAB Draft Report on EPA's Research Needs to Address the Environmental and Human Health Impacts of COVID-19. Dr. Armitage provided introductory remarks in his capacity as DFO. He stated that the SAB is an independent Federal Advisory Committee chartered under the Federal Advisory Committee Act (FACA). He indicated that the SAB is empowered by law to provide scientific and technical advice to the EPA Administrator. Dr. Armitage noted that summary minutes of the teleconference would be prepared and certified by the SAB Chair following the meeting. He also and noted the SAB's compliance with ethics requirements.

Dr. Armitage indicated that all meeting materials were available on the SAB website. Meeting materials included SAB roster,¹ the SAB COVID-19 Review Panel roster,² and meeting agenda.³ Dr. Armitage noted that six sets of written public comments were received, posted on the SAB website, and made available to SAB members.⁴ Dr. Armitage also indicated that public access to the meeting had been provided through a telephone line. Dr. Armitage proceeded with a roll call of the Board and the SAB COVID-19 Review Panel members and then turned the meeting over to Dr. Michael Honeycutt, Chair of the SAB.

Purpose of the Teleconference and Review of the Agenda

Dr. Honeycutt welcomed SAB members, EPA Staff, and others to the teleconference. Dr. Honeycutt noted that the objective of this teleconference was for the Chartered SAB to discuss the draft report titled "*Technical Review of EPA's Identification of Research Needs to Address the Environmental and Human Health Impacts of COVID-19*" and conduct a quality review to determine whether further SAB review of the draft report was needed. Dr. Honeycutt reviewed the agenda and indicated that the Board members would have a few days to submit additional comments to the DFO, if needed. Dr. Honeycutt also thanked members of the public for their written comments.

Remarks from the EPA Office of Research and Development

Dr. Honeycutt then invited Mr. David Dunlap, Deputy Assistant Administrator for Science Policy in the Office of Research and Development (on behalf of Dr. Jennifer Orme-Zavaleta, Principal Deputy Assistant Administrator for Science and EPA Science Advisor), to provide remarks. Mr. Dunlap thanked SAB members for their thoughtful and expedited review and emphasized EPA's research goals and objectives and the Agency's role in the fulfillment of its statutes amid the COVID-19 pandemic. Mr. Dunlap also requested clarification from the Board on the prioritization of EPA's research categories as well as the SAB's research recommendations.

Discussion of SAB Draft Report on EPA Research Needs to Address the Environmental and Human Health Impacts of COVID-19

Dr. Honeycutt provided opening remarks about the development and timeline of the draft report. He mentioned that the SAB COVID-19 Review Panel met for the first time on April 30, 2020 and developed the draft report in less than two weeks. Dr. Honeycutt also noted that the Panel members were present to answer any questions about their work.

Dr. Honeycutt acknowledged that due time constraints, he was going to lead the Board through the discussion of the ten EPA research categories listed in the draft report. He requested that the members provide the highlights of their comments and follow up with written responses and edits.

1. Research Category: Environmental Disinfection

The Board discussed Section 2.1 of the SAB draft report and noted that the recommendation in lines 21-24 (page 3) needed to be clarified. In particular, members discussed the report text addressing devices, mode of disinfection, and type of surfaces and properties. The Board also discussed the recommendation in lines 35-39 (page 3) concerning the need for research on the use of nano-silver or nano-copper or other modifications to disinfect fabric and high-contact surfaces. Members noted that additional clarification was needed in the report text.

Members suggested clarification of the text on page 4 referring to research on nano silver and the COVID-19 virus. Members agreed to add a description of fogging application mechanisms. Members noted that public comments had been received indicating that two methods of application should be decoupled because they are inherently different (i.e., fogging and/or electrostatic spraying). The Board also discussed and recommended a research area related to the fate and transport of the nanoparticles in the environment. Members provided additional references.

Members also suggested clarifications in lines 7-24 (page 6) concerning the guidance that the EPA could provide related to the disinfection of buildings (surfaces or vacant rooms), vehicles, or public transportation (e.g., cars, subways, trains, busses, airplanes, etc.). SAB members recommended that the EPA partner with other federal agencies in the development of cleaning guidance concerning the Agency's role (e.g., Guidance on Cleaning and Disinfection for Non-emergency Transport Vehicles) (NCIRD, 2020).^{*} Dr. Honeycutt requested that any additional editorial comments on this section be sent to the DFO for incorporation into the report.

^{*} NCIRD (National Center for Immunization and Respiratory Diseases). 2020. *Cleaning and Disinfection for Non-emergency Transport Vehicles*. <https://www.cdc.gov/coronavirus/2019-cov/community/organizations/disinfecting-transport-vehicles.html>

2. Research Category: Environmental Sample Collection Methods

The Board discussed Section 2.2 of the SAB draft report. Members suggested revision of the language about direct infection via inhalation of expelled aerosol from infected subjects. Members suggested changing the statement in the report indicating that this is a “predominant mechanism” to a statement indicating that it is “significant pathway of disease transmission for this virus.” Board members also discussed the definition of “respirable particles” and recommended changing “respirable” to “inhalable” aerosols.

Members indicated that, rather than recommending EPA conduct a literature review, the Board should recommend that the Agency contact its federal counterparts and leverage the resources and activities of other agencies through networking.

SAB members commented that the discussion of methods used for surface sample collection of SARS-CoV-2 was limited. Members recommended expanding the scope of the discussion. Board members also noted that the length of time the virus survives depends on the surface and the environmental conditions. Members noted that the EPA needed methods to make those types of assessments. SAB members also noted that the discussion of collection methods should include other media, such air and water.

SAB members noted that information relevant to many of the issues in the charge questions was available in an EPA publication titled: “Biological Field and Laboratory Methods” (U.S EPA, 1973).[†]

Members indicated that, although this EPA publication could be updated, many of the statistical approaches to address the charge questions remained relevant today. Members indicated that additional references could be provided.

Board members recommended deleting the recommendation listed in lines 8-10 (page 10) of the draft report. The Board carefully discussed Section 2.2.4 and recommended deleting the list of risk assessment elements in the draft report. Members suggested adding additional text discussing the SAB’s recommendation to organize EPA’s research categories using basic risk assessment elements. Dr. Honeycutt asked that any additional editorial comments on this section be sent to the DFO for incorporation into the report.

3. Research Category: Environmental Sampling Analysis

The Board discussed Section 2.3 and members noted some areas of inconsistency with Section 2.2 (i.e., discussion about detection limits and sensitivity methods). Members discussed the need

[†] U.S. EPA. 1973. Biological Field and Laboratory Methods for Measuring the Quality of Surface Waters and Effluents. EPA-670/4-73-001. Office of Research and Development, U.S. Environmental Protection Agency. [Available at: <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=2000JIC8.PDF>]

for the EPA to conduct research at appropriate levels of viral exposure (infectious dose) and to be consistent with the environmental collection methods (Section 2.2.). Members also commented that an assessment of SARS-CoV-2 infectivity could be important when assessing risk.

SAB members recommended adding additional rationale to the report to indicate the most appropriate sample custody, preservation, transport, and storage conditions to maintain sample viability prior to analysis for SARS-CoV-2. Dr. Honeycutt requested that any additional editorial comments on this section be sent to the DFO for incorporation into the report.

4. Research Category: Environmental Stability/Persistence on Surfaces

The SAB discussed Section 2.4 of the draft report and members suggested that the National Institute of Health (NIH) be added to the list of partners. Members suggested expanding the children's environment description in lines 18-23 (page 15). Members also suggested expanding the bullet in lines 43-44 (page 15) to include the question - how long can SARS-CoV-2 remain viable on libraries, books, computers, including school-to-home risk? Dr. Honeycutt asked that any additional editorial comments on this section be sent to the DFO for incorporation into the report.

5. Research Category: Environmental Exposure

The Board discussed Section 2.5 of the draft report and members noted that the introduction was lengthy compared to the other sections of the report. Members noted that the introduction needed editing. For example, the Board recommended deleting the equations of hazard and risk and referencing the scientific information rather than summarizing each scientific paper individually. Also, the Board recommended adding clarification about the importance of inhalation of expelled aerosol from infected individuals as a significant pathway in the risk assessment of SARS-CoV-2. Board members also suggested deleting the language referring to inhalation of expelled aerosol from infected individuals as "a predominant factor."

SAB members suggested that the EPA collaborate with other groups. Members commented that this would enable the Agency to be more productive by leveraging resources, reducing redundancy and increasing EPA's research capacity. SAB members encouraged the EPA work with others to determine whether the Agency's role should be to engage in a short-term or long-term research effort.

Board members suggested deleting lines 45-46 (page 19) in the draft report. Members commented research should be conducted at multiple locations within buildings to determine how exposure to SARS-CoV-2 varies as individuals move through common areas (e.g., the lobby; elevators due to individuals passing through; bathrooms; individual floors; food service areas; among others). SAB members also noted that small and medium commercial buildings should be included in the research program to inform knowledge about how building size affects

exposure. SAB Members recommended that lines 8-18 (page 20) in the draft report be clarified by adding the following text: 1) EPA should prioritize exposure assessments to identify how exposure varies among individuals on transit-related work activities (e.g., mail carrier, delivery personnel, cab drivers, medical personnel); and 2) additional research into the accuracy and utility of personal monitors is critical to implement the effectiveness of personal protective equipment and in the development of exposure assessments.

SAB members also suggested deleting lines 22-43 (page 20) in the draft report and consolidating the available scientific information about levels of air exchange in indoor spaces into one paragraph. In addition, members suggested that in the draft report EPA prioritize research that evaluates building environment and characteristics for limiting risk in schools and other buildings. Members also recommended that research be conducted to assess exposure differences depending on window ventilation, HVAC system types, e.g. Minimum Efficiency Reporting Value (MERV), and operating controls.

SAB members noted that there had already been a considerable amount of work done to educate the public about the importance of hand washing and face touching. Members noted that these activities will be important when individuals transition between settings (e.g., from home to school, to the workplace or public areas). Members recommended that the EPA pursue research with public health partners to assess the effectiveness of different types of messaging.

SAB members also recommended that the EPA evaluate the distance an infectious dose of SARS-CoV-2 aerosol can travel from an expelling source or source(s) indoors. Members suggested that this question be added to Section 2.5.4 of the draft report. Dr. Honeycutt requested that any additional editorial comments on this section be sent to the DFO for incorporation into the report.

6. Research Category: Water/Wastewater

The Board discussed Section 2.6 and members indicated that research assessing the efficacy of treatment unit processes on removing or inactivating the SARS-CoV-2 virus was needed to assure the general public that the current drinking water and wastewater treatment regulatory frameworks provide adequately public health protection from SARS-CoV-2. The members also suggested that the EPA consider initiating a parallel research study to identify a surrogate for SARS-CoV-2 to study if SARS-CoV-2 should prove to be difficult to analyze. Members indicated that, depending on the intended use, the surrogate should have characteristics and properties similar to SARS-CoV-2. Members agreed to provide references for EPA's consideration.

The Board also discussed the concept of monitoring a community's wastewater collection system to identify the beginning of an outbreak and some members indicated that they could provide additional report text on this topic. SAB members recommended deleting bullet points in lines

22-23 and 28-44 (page 25) of the draft report. Members noted that the survival and persistence (not the half-life) of the virus needed to be established (line 18, page 25).

Members also commented that the EPA should draw upon information available from organizations like the Water Research Foundation and the National Academy of Sciences before a program is established to monitor community wastewater collection systems. Dr. Honeycutt asked that any additional editorial comments on this section be sent to the DFO for incorporation into the report.

7. Research Category: Air

The Board discussed Section 2.7 and members noted that it was not clear where and/or how the research questions posed by the Agency fit into the EPA's overall decision-making/risk assessment process. Members suggested adding a clarifying statement in the introduction to Section 2.7 of the draft report to clearly indicate how the research questions fit into EPA's decision-making /risk assessment process. Members also recommended including in the draft report clarifying statements about breathing zones research. Dr. Honeycutt requested that any additional editorial comments on this section be sent to the DFO for incorporation into the report.

8. Research Categories: Environmental and Human Health Factors Affecting Transmission and Severity of COVID-19

The Board discussed Section 2.8 of the draft report. Members suggested deleting the text on lines 14-16 (page 34) that addressed air pollutants and incorporating the concept of outdoor air discussed in lines 3-4 (page 35) into the "Air" research category (Section 2.7). Members also suggested expanding the discussion on lines 23-27 (page 35) to include the list of potential susceptibility factors and then deleting lines 32-35 (page 35). Dr. Honeycutt asked that any additional editorial comments on this section be sent to the DFO for incorporation into the report.

9. Research Category: Personal Protective Equipment (PPE)

The Board discussed Section 2.9.2 of the draft report and suggested that the list of recommendations be consolidated to avoid repetition and provide greater clarity. Members also noted that the SAB recommendations for long-term studies needed clarification. Dr. Honeycutt requested that any additional editorial comments on this section be sent to the DFO for incorporation into the report.

10. Research Category: Human Health Risks of Exposure to Disinfectants

The Board discussed Section 2.10.2 of the draft report and members suggested reorganizing the recommendations and additional research questions regarding exposure to disinfectants into the following subcategories: 1) Exposure Application, 2) Exposure Post-application, 3) Health

Endpoints and 4) Safe Use Instructions. Dr. Honeycutt asked that any additional editorial comments on this section be sent to the DFO for incorporation into the report.

General Report Comments

Dr. Honeycutt asked the Board for any additional overarching comments. The Board discussed the letter to the Administrator and members suggested adding the main recommendations listed in the report, as well as the main research priorities, to the letter. One member suggested adding EPA’s *COVID-19 Science/Research Question List* table to the SAB report as an appendix for ease of reading as a standalone document. Members also discussed adding references to the final report.

Disposition of the SAB Draft Report

After the discussion of the draft report, Dr. Honeycutt asked for a motion to approve the report with the revisions discussed. A motion was made to approve the report. Members then unanimously agreed that Dr. Honeycutt, as the SAB Chair, should revise the report according to the discussion and that the revised report should be transmitted to the Administrator.

Summary and Next Steps

Dr. Honeycutt thanked SAB members for their comments. Dr. Honeycutt recapped the action items from the teleconference and reiterated that the Board had voted to have him to revise and finalize the report. Dr. Honeycutt asked Board members to send Dr. Figueroa, DFO of the SAB COVID-19 Review Panel, via e-mail any additional written edits or comments by Tuesday, May 26, 2020.

Meeting adjourned

Dr. Armitage reminded the Board members to provide their comments no later than Tuesday May 26, 2020 and then adjourned the meeting at approximately 5:00 p.m. (Eastern Time).

Respectfully Submitted:

/s/

Dr. Thomas Armitage
Designated Federal Officer
for the Chartered SAB

Certified as Accurate:

/s/

Dr. Michael Honeycutt
Chartered SAB Chair

August 19, 2020

Date

NOTE AND DISCLAIMER: The minutes of this public meeting reflect diverse ideas and suggestions offered by committee members during the course of deliberations within the meeting. Such ideas, suggestions, and deliberations do not necessarily reflect definitive consensus advice from the 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.

Materials Cited:

All meeting materials are available on the SAB website (<http://www.epa.gov/sab>) at the page for the May 20, 2020 teleconference. The direct web link is:

<https://yosemite.epa.gov/sab/sabproduct.nsf/a84bfee16cc358ad85256ccd006b0b4b/a23b03cffd4ebbd78525854c005c0c77!OpenDocument&Date=2020-05-20>

¹ SAB Roster.

² SAB COVID-19 Review Panel Roster.

³ Agenda.

⁴ Public Comments Submitted to the SAB Staff Office

Attachment A. Additional meeting attendees who requested the teleconference call-in number.

Name	Affiliation
Olivia Arends	Stepan Company
Kay Bixler	Diversity
Uni Blake	American Petroleum Institute
Bryan Bloomer	EPA
Eric Brown	Diversity, Inc.
Zachary Cikanek	PLUS Communications
Louis D'Amico	EPA
Lisa Dreillinger	
David Dunlap	EPA
Ariana Figueroa	Eenews
Maria Hegstad	Inside EPA
Sherri Hunt	EPA
Rhonda Jones	SRC, Inc.
Benjamin Kallen	Lewis-Burke Associates, LLC
Laura Kolb	EPA
Keri Lestage	Byoplanet International
William McCormick	WCM3
Gary Minsavage	ExxonMobil
Patrick Mulrooney	Lockheed Martin Corporation
Julie Narimatsu	EPA
Geena Reed	Union of Concerned Scientists
Stephanie Richards	UW-Madison
Danielle Sczesny	MG+M
Max Swetman	MGM Law Firm
Charles Trout	Badwolf Bikeworks