

June 9, 2011 DRAFT FINAL REPORT

***Spatiotemporal Analysis of Air Pollution
and Mortality in California Based on the
American Cancer Society Cohort: Final Report***

Principal Investigator:
Michael Jerrett, PhD

Co-Investigators:
Richard T. Burnett, PhD
Arden Pope III, PhD
Daniel Krewski, PhD
George Thurston, ScD
George Christakos, PhD, ScD
Edward Hughes, PhD
Zev Ross, MS
Yuanli Shi, MD
Michael Thun, MD

Student and Postdoctoral Co-Investigators:
Bernardo Beckerman, MS
Michelle Catherine Turner, MS
Jason Su, PhD
Seung-Jae Lee, PhD

Prepared for:
Contract # 06-332
State of California Air Resources Board
Research Division

From: "Mike Jerrett" <Jerrett@berkeley.edu>
To: "'James E. Enstrom'" <jenstrom@ucla.edu>
Subject: RE: Request re 2011 Congress of Epidemiology Symposium
Date: Thu, 24 Feb 2011 21:11:55 -0800

Dear Dr. Enstrom: Thank you for the invitation, but I must decline because I'm already committed at this time. Best regards, Mike Jerrett

From: James E. Enstrom [mailto:jenstrom@ucla.edu]
Sent: Wednesday, February 23, 2011 7:30 PM
To: Michael L. Jerrett
Subject: Request re 2011 Congress of Epidemiology Symposium

February 23, 2011

Michael L. Jerrett, Ph.D.
Associate Professor
Environmental Health Sciences
University of California, Berkeley
jerrett@berkeley.edu

Dear Dr. Jerrett:

Because of your expertise in fine particulate air pollution (PM2.5) epidemiology, particularly your authorship of the Health Effects Institute (HEI) Research Report 140 and your participation in the February 26, 2010 CARB PM2.5 Symposium, I request your participation in my Symposium, "Ethical Aspects of Small Epidemiologic Risks," at the Third North American Congress of Epidemiology (CoE) in Montreal, Canada during June 21-24, 2011 (<http://www.epicongress2011.org/>). The preliminary abstract for this Symposium is shown below and is posted on the CoE website (<http://www.epiresearch.org/congress/sympdesc.php?i=0120>). As explained in the abstract, this Symposium will address ethical issues in epidemiology, with particular focus on one specific risk: the relationship between PM2.5 and total mortality. I will present the case that the NAAQS for PM2.5 should not be lowered, primarily because of serious ethical issues surrounding the existing PM2.5 epidemiologic evidence. Given your qualifications and the prominent use by US EPA of results from HEI Research Report 140, you are an ideal epidemiologist to present the case for US EPA's proposed lowering of the NAAQS for PM2.5 and its use of HEI Research Report 140. The Symposium will be moderated by a neutral third person, still to be selected, who has expertise in epidemiologic ethics but no involvement with PM2.5 epidemiology. The total time for the Symposium is 90 minutes and I estimate that the two major presentations will be about 30 minutes each, with the remaining 30

minutes for the moderator to make comments and lead discussion with the presenters and the audience. The exact details of the Symposium, including selection of all participants, will be worked out during the next two months.

Please let me know as soon as possible if you are willing to participate in this Symposium.

Thank you very much for your consideration.

Sincerely yours,

James E. Enstrom, Ph.D., M.P.H.

University of California, Los Angeles

<http://www.cancer.ucla.edu/>

jenstrom@ucla.edu

(310) 825-2048

and

Chair, Ethics Committee

American College of Epidemiology

<http://acepidemiology.org/cttes/index.asp>

Ethical Aspects of Small Epidemiologic Risks

Chair: James E. Enstrom

Description: Relative risks on the order of 1.2 have been used to establish “causal” relationships and to implement regulations designed to reduce the environmental exposures involved in these relationships. However, there is substantial controversy regarding the scientific validity of these relationships and the use of them for regulatory purposes. The above concerns will be applied to the relationship between fine particulate air pollution (PM2.5) and total mortality, which the US Environmental Protection Agency estimates is responsible for up to about 100,000 premature US deaths per year. This relationship has been used by the California Air Resources Board to justify expensive diesel vehicle regulations designed to reduce PM2.5 levels in California. US EPA is currently proposing a lower National Ambient Air Quality Standard for PM2.5 based on this relationship. However, there is clear geographic variation in PM2.5 mortality risk, with no significant risk in California. Thus, a single national standard seems inappropriate and the CARB diesel regulations appear unjustified. Important ethical issues, such as, misrepresentation of scientific evidence and lack of independent reanalysis of underlying data, will be discussed by speakers with divergent opinions on this relationship in order to examine this important example of the interaction between epidemiology and public policy.

Subject: Re: Request re 2011 Congress of Epidemiology Symposium
To: "James E. Enstrom" <jenstrom@ucla.edu>
From: Rick Burnett <Rick.Burnett@hc-sc.gc.ca>
Date: Fri, 18 Feb 2011 11:05:47 -0500

thank you very much for thinking of me but I am under a very heavy travel restriction currently at Health Canada and have not been approved to attend this conference!!

also, due to my job at Health Canada I would not be allowed to comment on whether regulations in another country (or even Canada) should or should not be changed

thus I must respectfully decline your kind offer

▼ "James E. Enstrom" ---2011-02-18 10:55:47 AM---February 18, 2011 Richard T. Burnett, Ph.D.

From: "James E. Enstrom" <jenstrom@ucla.edu>
To: "Richard T. Burnett" <rick.burnett@hc-sc.gc.ca>
Date: 2011-02-18 10:55 AM
Subject: Request re 2011 Congress of Epidemiology Symposium

February 18, 2011

Richard T. Burnett, Ph.D.
Environmental Health Surveillance
Health Canada, Ottawa
rick.burnett@hc-sc.gc.ca

Dear Dr. Burnett:

Because of your expertise in air pollution epidemiology and statistics and your authorship of the 2009 Health Effects Institute Research Report 140, I request your participation in my Symposium, "Ethical Aspects of Small Epidemiologic Risks," at the Third North American Congress of Epidemiology (CoE) in Montreal, Canada during June 21-24, 2011 (<http://www.epicongress2011.org/>). The preliminary abstract for this Symposium is shown below and is posted on the CoE website (<http://www.epiresearch.org/congress/sympdesc.php?i=0120>). As explained in the abstract, this Symposium will address ethical issues in epidemiology, with particular focus on one specific risk: the relationship between fine particulate air pollution (PM2.5) and total mortality. I will present the case that the NAAQS for PM2.5 should not be lowered, primarily because of serious ethical issues surrounding the existing PM2.5 epidemiologic evidence. Given your qualifications and the heavy reliance of US EPA on your HEI findings on PM2.5 and mortality, you are an ideal epidemiologist/statistician to present the case for US EPA's proposed lowering of the NAAQS for PM2.5. The Symposium will be moderated by a neutral third person, still to be selected, who has expertise in epidemiologic ethics but no involvement with PM2.5 epidemiology. The total time for the Symposium is 90

minutes and I estimate that the two major presentations will be about 30 minutes each, with the remaining 30 minutes for the moderator to make comments and lead discussion with the presenters and the audience. The exact details of the Symposium, including selection of all participants, will be worked out during the next two months.

Please let me know as soon as possible if you are willing to participate in this Symposium.

Thank you very much for your consideration.

Sincerely yours,

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University of California, Los Angeles

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From: Arden Pope <cap3@byu.edu>
To: "James E. Enstrom" <jenstrom@ucla.edu>
Date: Thu, 24 Feb 2011 09:36:03 -0700
Subject: RE: Request re 2011 Congress of Epidemiology Symposium

Dear Dr. Enstrom,

Thank you for the invitation to participate in the CoE symposium. I respectfully decline this invitation.

Arden Pope

C. Arden Pope III, PhD
Mary Lou Fulton Professor of Economics
Associate Dean, CFHSS
Brigham Young University
Provo, UT 84602

From: James E. Enstrom [mailto:jenstrom@ucla.edu]
Sent: Wednesday, February 23, 2011 8:17 PM
To: Arden Pope
Subject: Request re 2011 Congress of Epidemiology Symposium

February 23, 2011

C. Arden Pope, Ph.D.
Fulton Professor of Economics
Economics Department
Brigham Young University
cap3@byu.edu

Dear Dr. Pope:

Because of your expertise in fine particulate air pollution (PM2.5) epidemiology, particularly your

authorship of the Health Effects Institute (HEI) Research Report 140 and your participation in the February 26, 2010 CARB PM2.5 Symposium, I request your participation in my Symposium, "Ethical Aspects of Small Epidemiologic Risks," at the Third North American Congress of Epidemiology (CoE) in Montreal, Canada during June 21-24, 2011 (<http://www.epicongress2011.org/>). The preliminary abstract for this Symposium is shown below and is posted on the CoE website (<http://www.epiresearch.org/congress/sympdesc.php?i=0120>). As explained in the abstract, this Symposium will address ethical issues in epidemiology, with particular focus on one specific risk: the relationship between PM2.5 and total mortality. I will present the case that the NAAQS for PM2.5 should not be lowered, primarily because of serious ethical issues surrounding the existing PM2.5 epidemiologic evidence. Given your qualifications and the prominent use by US EPA of results from HEI Research Report 140, you are an ideal epidemiologist to present the case for US EPA's proposed lowering of the NAAQS for PM2.5 and its use of HEI Research Report 140. The Symposium will be moderated by a neutral third person, still to be selected, who has expertise in epidemiologic ethics but no involvement with PM2.5 epidemiology. The total time for the Symposium is 90 minutes and I estimate that the two major presentations will be about 30 minutes each, with the remaining 30 minutes for the moderator to make comments and lead discussion with the presenters and the audience. The exact details of the Symposium, including selection of all participants, will be worked out during the next two months.

Please let me know as soon as possible if you are willing to participate in this Symposium.

Thank you very much for your consideration.

Sincerely yours,

James E. Enstrom, Ph.D., M.P.H.
University of California, Los Angeles
[http://www.cancer.ucla.edu/
jenstrom@ucla.edu](http://www.cancer.ucla.edu/jenstrom@ucla.edu)
(310) 825-2048

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Ethical Aspects of Small Epidemiologic Risks

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Description: Relative risks on the order of 1.2 have been used to establish "causal" relationships and to implement regulations designed to reduce the environmental exposures involved in these relationships. However, there is substantial controversy regarding the scientific validity of these relationships and the use of them for regulatory purposes. The above concerns will be applied to the relationship between

fine particulate air pollution (PM2.5) and total mortality, which the US Environmental Protection Agency estimates is responsible for up to about 100,000 premature US deaths per year. This relationship has been used by the California Air Resources Board to justify expensive diesel vehicle regulations designed to reduce PM2.5 levels in California. US EPA is currently proposing a lower National Ambient Air Quality Standard for PM2.5 based on this relationship. However, there is clear geographic variation in PM2.5 mortality risk, with no significant risk in California. Thus, a single national standard seems inappropriate and the CARB diesel regulations appear unjustified. Important ethical issues, such as, misrepresentation of scientific evidence and lack of independent reanalysis of underlying data, will be discussed by speakers with divergent opinions on this relationship in order to examine this important example of the interaction between epidemiology and public policy.

Date: Thu, 17 Feb 2011 10:55:20 -0800
To: "Daniel Krewski" <dkrewski@uottawa.ca>
From: "James E. Enstrom" <jenstrom@ucla.edu>
Subject: Request re 2011 Congress of Epidemiology Symposium
Cc: cphra@uottawa.ca

February 17, 2011

Daniel Krewski, Ph.D.
Director, McLaughlin Centre for Population Health Risk Assessment
University of Ottawa
dkrewski@uottawa.ca

Dear Dr. Krewski:

Because of your expertise in air pollution epidemiology, your lead authorship on the 2009 Health Effects Institute Research Report 140, and your attendance at the February 26, 2010 CARB PM2.5 Symposium, I request your participation in my Symposium, "Ethical Aspects of Small Epidemiologic Risks," at the Third North American Congress of Epidemiology (CoE) in Montreal, Canada during June 21-24, 2011 (<http://www.epicongress2011.org/>). The preliminary abstract for this Symposium is shown below and is posted on the CoE website (<http://www.epiresearch.org/congress/sympdesc.php?i=0120>). As explained in the abstract, this Symposium will address ethical issues in epidemiology, with particular focus on one specific risk: the relationship between fine particulate air pollution (PM2.5) and total mortality. I will present the case that the NAAQS for PM2.5 should not be lowered, primarily because of serious ethical issues surrounding the existing PM2.5 epidemiologic evidence. Given your qualifications and the heavy reliance of US EPA on your findings on PM2.5 and mortality, you are an ideal epidemiologist/statistician to present the case for US EPA's proposed lowering of the NAAQS for PM2.5. The Symposium will be moderated by a neutral third person, still to be selected, who

has expertise in epidemiologic ethics but no involvement with PM2.5 epidemiology. The total time for the Symposium is 90 minutes and I estimate that two major presentations will be about 30 minutes each, with the remaining 30 minutes for the moderator to make comments and lead discussion with the presenters and the audience. The exact details of the Symposium, including selection of all participants, will be worked out during the next two months.

Please let me know as soon as possible if you are willing to participate in this Symposium.

Thank you very much for your consideration.

Sincerely yours,

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jenstrom@ucla.edu
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Date: Tue, 22 Feb 2011 07:48:42 -0800
To: "George D. Thurston" <gdt1@nyu.edu>
From: "James E. Enstrom" <jenstrom@ucla.edu>
Subject: Request re 2011 Congress of Epidemiology Symposium

February 22, 2011

George D. Thurston, D.Sc.
Professor of Environmental Health Science
Nelson Institute of Environmental Medicine
New York University, Tuxedo
gdt1@nyu.edu

Dear Dr. Thurston:

Because of your expertise in fine particulate air pollution (PM2.5) epidemiology, particularly your authorship of the Health Effects Institute (HEI) Research Report 140 and your participation in the February 26, 2010 CARB PM2.5 Symposium, I request your participation in my Symposium, "Ethical Aspects of Small Epidemiologic Risks," at the Third North American Congress of Epidemiology (CoE) in Montreal, Canada during June 21-24, 2011 (<http://www.epicongress2011.org/>). The preliminary abstract for this Symposium is shown below and is posted on the CoE website (<http://www.epiresearch.org/congress/sympdesc.php?i=0120>). As explained in the abstract, this Symposium will address ethical issues in epidemiology, with particular focus on one specific risk: the relationship between PM2.5 and total mortality. I will present the case that the NAAQS for PM2.5 should not be lowered, primarily because of serious ethical issues surrounding the existing PM2.5 epidemiologic evidence. Given your qualifications and the prominent use by US EPA of results from HEI Research Report 140, you are an ideal epidemiologist to present the case for US EPA's proposed lowering of the NAAQS for PM2.5 and its use of HEI Research Report 140. The Symposium will be moderated by a neutral third person, still to be selected, who has expertise in epidemiologic ethics but no involvement with PM2.5 epidemiology. The total time for the Symposium is 90 minutes and I estimate that the two major presentations will be about 30 minutes each, with the remaining 30 minutes for the moderator to make comments and lead discussion with the presenters and the audience. The exact details of the Symposium, including selection of all participants, will be worked out during the next two months.

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Subject: Re: Request re 2011 Congress of Epidemiology Symposium
From: Michael.Thun@cancer.org
To: "James E. Enstrom" <jenstrom@ucla.edu>
Date: Mon, 21 Feb 2011 16:55:37 -0500

Dear Dr. Enstrom,
Thank you for the invitation to participate in your seminar at the Third North American Congress of Epidemiology this coming June. Unfortunately I am on sabbatical in Australia and will be unable to attend the conference.

Michael Thun

-----"James E. Enstrom" <jenstrom@ucla.edu> wrote: -----

To: "Michael J. Thun" <michael.thun@cancer.org>
From: "James E. Enstrom" <jenstrom@ucla.edu>
Date: 02/22/2011 06:48AM
Subject: Request re 2011 Congress of Epidemiology Symposium

February 21, 2011

Michael J. Thun, M.D., M.S.
Vice President, Emeritus
Surveillance and Epidemiology Research
American Cancer Society
michael.thun@cancer.org

Dear Dr. Thun:

Because of your expertise in fine particulate air pollution (PM2.5) epidemiology, particularly your authorship of all the key papers involving the ACS Cancer Prevention Study (CPS II) and your co-investigator status on the CARB-funded study of PM2.5 and mortality in California, I request your participation in my Symposium, "Ethical Aspects of Small Epidemiologic Risks," at the Third North American Congress of Epidemiology (CoE) in Montreal, Canada during June 21-24, 2011 (<http://www.epicongress2011.org/>). The preliminary abstract for this Symposium is shown below and is posted on the CoE website (<http://www.epiresearch.org/congress/sympdesc.php?i=0120>). As explained in the abstract, this Symposium will address ethical issues in epidemiology, with particular focus on one specific risk: the relationship between PM2.5 and total mortality. I will present the case that the NAAQS for PM2.5 should not be lowered, primarily because of serious ethical issues surrounding the existing PM2.5 epidemiologic evidence. Given your qualifications and the prominent use by US EPA of results based on ACS CPS II, you are an ideal epidemiologist to present the case for US EPA's proposed lowering of the NAAQS for PM2.5 and for the use of the CPS II database for PM2.5 epidemiology. The Symposium will be moderated by a neutral third person, still to be selected, who has expertise in epidemiologic ethics but no involvement with PM2.5 epidemiology. The total time for the Symposium is 90 minutes and I estimate that the two major presentations will be about 30 minutes each, with the remaining 30 minutes for the moderator to make comments and lead discussion with the presenters and the audience. The exact details of the Symposium, including selection of all participants, will be worked out during the next two months.

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Thank you very much for your consideration.

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