Are Fine Particulates Killing Californians?

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American Statistical Association Joint Statistical Meeting
San Diego, CA
August 1, 2012

Fine Particulates ($PM_{2.5}$)

$PM_{2.5}$ is defined by particle size (≤2.5 μm in diameter) and not by chemical composition, as in the case of a gaseous air pollutant like ozone. $PM_{2.5}$ is generated mainly by combustion processes. The major sources of $PM_{2.5}$ are forest fires, agricultural dust, industrial combustion, and diesel engines and these sources vary across the US

$PM_{2.5}$ epidemiology has been used to establish the following two highly contested regulations that have had multi-billion dollar economic impacts in the United States and California:

1) 1997 US Environmental Protection Agency Annual National Ambient Air Quality Standard (NAAQS) for $PM_{2.5}$ at 15 $\mu g/m^3$
2) 2008 & 2010 California Air Resources Board Truck and Bus Regulation of Diesel Vehicles in California

"Premature Deaths" Attributed to $PM_{2.5}$

An increased relative risk [RR > 1.00], based on increase in total (all cause) mortality risk for 10 $\mu g/m^3$ increase in $PM_{2.5}$ level, is interpreted by EPA and CARB as evidence that $PM_{2.5}$ "causes" "premature deaths"

Because EPA assigns a lifetime monetary value of about $7-9 million to each "death," the health benefits of preventing these "deaths" exceed the compliance costs of the EPA and CARB regulations that are designed to reduce $PM_{2.5}$ levels and $PM_{2.5}$-related "premature deaths"

Without $PM_{2.5}$-related "premature deaths" the EPA and CARB regulations are not justified on a cost-benefit basis

Major Reasons for Lack of Proof that $PM_{2.5}$ "Causes" "Premature Deaths"

1) Small Variable Effect: the relative risk of death due to $PM_{2.5}$ is small (RR ~ 1.10), varies by time and place, and there is no consistent dose-response relationship

2) Confounding Variables: confounders, including other pollutants, often reduce $PM_{2.5}$ effect to zero (RR ~ 1.00)

3) Ecological Fallacy: $PM_{2.5}$ measurements made at selected monitoring stations are imputed to individuals

4) Variable $PM_{2.5}$: $PM_{2.5}$ is defined by specific particle size, but its composition varies greatly across the US

5) Secret Data: major $PM_{2.5}$ studies (H6CS & ACS) cannot be independently analyzed, violating Data Access Act

October 24, 2008 Final CARB "Tran Report"

(http://www.scientificintegrityinstitute.org/CARBPMFinal102408.pdf)

Conclusions for California:

18,000 Annual Premature Deaths Due to All $PM_{2.5}$
3,500 Annual Premature Deaths Due to Diesel PM

Based on US Results, Not CA-specific Results:

1) Harvard Six Cities Study (Dockery 1993, Krewski 2000, Laden 2006)—KS,MA,MO,OH,TN,WI

2) ACS CPS II Cohort (Pope 1995 , Krewski 2000, Pope 2002, Pope 2004)—nationwide results & (Jerrett 2005)—Los Angeles basin

Report Rejected Because Tran had Phony "Ph.D."
→ February 26, 2010 CARB PM Deaths Symposium

(http://www.arb.ca.gov/research/health/pm-mort/symposium_transcript_2-26-10.pdf)

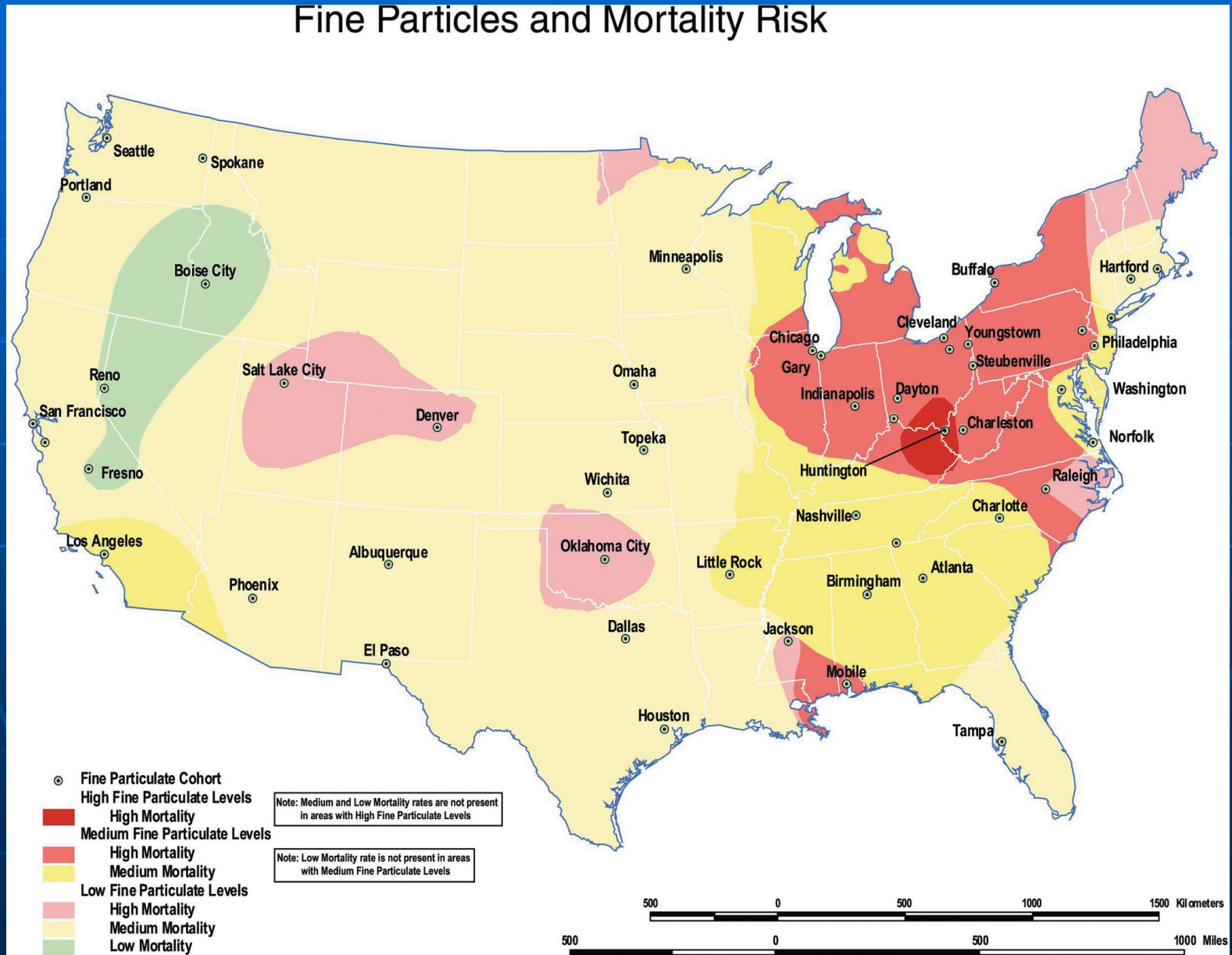
December 15, 2005 *Inhalation Toxicology* Paper by James E Enstrom

(http://www.arb.ca.gov/planning/gmerp/dec1plan/gmerp_comments/enstrom.pdf)

Major long-term $PM_{2.5}$ death study with null results: 49,975 elderly Californians in 11 counties followed during 1973-2002 in California Cancer Prevention Study (CA CPS I)

"For the initial period, 1973–1982, a small positive risk was found: RR was 1.04 (1.01–1.07) for a 10-$\mu g/m^3$ increase in $PM_{2.5}$. For the subsequent period, 1983–2002, this risk was no longer present: RR was 1.00 (0.98–1.02). For the entire follow-up period, RR was 1.01 (0.99–1.03)."

2000 Krewski Jerrett HEI Report Figure 21
1982-1989 CPS II $PM_{2.5}$ Mortality Risk <1.0 in CA



September 30, 2010 Special Analysis by Enstrom of Figures 5 and 21 in 2000 HEI Reanalysis Report

(http://scientificintegrityinstitute.org/HEIFigure5093010.pdf)

Mortality Risk (MR) during 1982-1989 in 49 cities was determined by manual analysis using Figures 5 and 21 and Appendix D (Original Request for MRs Made to HEI in 2002)

Fresno had 2nd Lowest MR of the 49 cities
Los Angeles had 5th Lowest MR of the 49 cities

MR (4 CA cities) ~ 90% MR (all 49 cities)
MR (4 CA cities) Not Related to $PM_{2.5}$ Level

August 31, 2010 Letter from Krewski to HEI President Greenbaum

(http://www.arb.ca.gov/research/health/pm-mort/HEI_Correspondence.pdf)

Special Analysis of California Subjects in Krewski 2009 HEI Research Report 140 (direct result of repeated requests to HEI by Ad Hoc Trucking Group during 2010)

RR = 0.872 (0.805 – 0.944) during 1982-1989

RR = 0.960 (0.920 – 1.002) during 1982-2000

Based on 40,408 CPS II subjects in 4 CA Metro Areas (MSAs)

Jerrett Project (Begun January 2007)

(http://www.scientificintegrityinstitute.org/Jerrett012510.pdf)

Spatiotemporal Analysis of Air Pollution and Mortality in California Based on ACS CPS II Cohort

Jerrett, Burnett, Pope, Krewski, Thurston, Thun + Others

(Three-Year Budget of $750,000 from CARB and SC AQMD)

Major Progress Report, due July 2008, was not submitted, but June 25, 2008 CARB Quarterly Progress Report made NO mention of a relationship between $PM_{2.5}$ & total deaths

February 26, 2010 CARB PM Symposium Results
RR ~ 0.994 (0.965 – 1.025) during 1982-2000

These null results should have been included in the 2008 "Tran Report" but they were delayed until 2010

June 9, 2011 Jerrett Draft Final Report

Major Results for $PM_{2.5}$ and Total Mortality in CA (Figure 22)
RR = 1.08 (1.00-1.15) New "Conurbation" Model
RR = 1.002 (0.992-1.012) Nine Model Average

Critical Comments Submitted on June 9 by Drs. Enstrom, Malkan, and Dunn, and Mr. Brown

CARB Research Screening Committee Tabled Draft Report and Requested Revisions from Investigators

Additional Comments Submitted after June 9 by Drs. Enstrom, Malkan, Dunn, Lipfert, Briggs, and Fulks

Dr. Matt Briggs Posts Three Blogs Critical of Jerrett Report
(http://wmbriggs.com/blog/?p=4587)

October 28, 2011 Jerrett Final Report

(http://scientificintegrityinstitute.org/JerrettCriticism102811.pdf)

Major Results for $PM_{2.5}$ and Total Mortality in CA (Figure 22)
RR = 1.08 (1.00-1.15) New "Conurbation" Model
RR = 1.002 (0.992-1.012) Nine Model Average

CONCLUSION "We conclude that combustion-source air pollution is significantly associated with premature death in this large cohort of Californians"

Results and CONCLUSION Unchanged from June Draft & CONCLUSION Does Not Reflect Findings in the Report

CARB Research Screening Committee Approved Revised Final Report by 8-0 Vote in Spite of 53 Pages of Detailed Criticism from Six Doctoral Level Scientists

$PM_{2.5}$ & Total Mortality in California: RR (95% CI)

(http://scientificintegrityinstitute.org/Enstrom081111.pdf)

McDonnell 2000	AHSMOG (9 air sheds)	RR ~ 1.03 (0.95-1.12)	1976-1992
Krewski 2000 (reported in 2010)	CA CPS II (4 MSAs)	RR = 0.87 (0.81-0.94)	1982-1989
Enstrom 2005	CA CPS I	RR = 1.04 (1.01-1.07)	1973-1982
	(11 Cos & 25 Cos)	RR = 1.00 (0.98-1.02)	1983-2002
Zeger 2008	MCAPS "West" (CA,OR,WA)	RR = 0.99 (0.97-1.01)	2000-2005
Krewski 2010	CA CPS II (7 MSAs)	RR = 0.97 (0.92-1.02)	1982-2000
Jerrett 2010-11	CA CPS II (54 Cos, Nine Model Average)	RR = 1.00 (0.99-1.01)	1982-2000
Lipsett 2011	CA Teachers	RR = 1.01 (0.95-1.09)	2000-2005

Conclusions About $PM_{2.5}$ & Total Deaths in CA and US in ACS CPS II Cohort

Based on 2010-2011 findings and their failure to dispute my interpretation or debate me, Enstrom concludes that Pope & Thun (1995) and Krewski & Jerrett & Burnett (2000) have known since 2000 that within the ACS CPS II Cohort:

1) there is NO significant relationship between $PM_{2.5}$ and total mortality in California

&

2) there is substantial geographic variation nationally (West vs East) in the dose-response relationship between $PM_{2.5}$ and total mortality

Scientific & Economic Importance of $PM_{2.5}$ & Total Deaths Relationship

June 29, 2012 Federal Register Notice: 167-page Proposed Rule for "National Ambient Air Quality Standards for Particulate Matter" (http://www.epa.gov/pm/actions.html)

No Mention of Enstrom 2005 or Jerrett 2011 or Lipsett 2011

In spite of clear national geographic variation in $PM_{2.5}$ mortality risk and extensive epidemiologic and statistical problems, partially cited above, US EPA was forced by Federal ruling on environmental activists' lawsuit to issue proposed rule to lower annual $PM_{2.5}$ NAAQS from 15 $\mu g/m^3$ to 12-13 $\mu g/m^3$. The lower standard would impose multi-billion dollar compliance costs on impacted industries across the United States (http://online.wsj.com/article/SB10001424052702303822204577468371370095152.html)

Public Comments Due August 31, 2012

Jan de Leeuw, Ph.D. (Leiden U)

(http://en.wikipedia.org/wiki/Jan_de_Leeuw)
(http://cuddyvalley.org/)

Distinguished Professor and Founding Chair, UCLA Department of Statistics, 1999-2011

Fellow, Royal Statistical Society, 1984-
Fellow, American Statistical Association, 2001-
Resident of Cuddy Valley, CA (south of Bakersfield, CA)

≥557 writings in statistics, 1965-2006

Evaluation of Enstrom 2005

by Jan de Leeuw, Ph.D. on http://cuddyvalley.org/ since reading January 18, 2009 column on Enstrom by Lois Henry in *The Bakersfield Californian* (http://www.scientificintegrityinstitute.org/deLeeuw083110.pdf)

1) Check Funding Source:

"funded by the Electric Power Research Institute (EPRI). . . unclear to me what role peer review and what role the benefits of electric utilities play in their research"

2) Check Background of Supporters:

"Enstrom's defenders are either representatives of the trucking industry, right-wing libertarians, or politicians"

3) Check for Existing Consensus:

"What makes Enstrom's results problematic is the worldwide scientific consensus, which is overwhelmingly in support of serious PM-2.5 health effects."

Further Evaluation of Enstrom 2005

by Jan de Leeuw, Ph.D. on http://cuddyvalley.org/

de Leeuw stated on August 15, 2010:
"If I can find the time, I will read the Enstrom 2005 paper and see what the fuss is all about."

de Leeuw stated this extreme position on August 31, 2010:
"If public health considerations are given enough weight then a single premature death is enough to ban all diesel trucks."

de Leeuw has indicated no willingness to read Enstrom 2005 or to do his own evaluation of $PM_{2.5}$ & mortality relationship

The July 26, 2012 Enstrom offer to have de Leeuw comment at this seminar was rejected by de Leeuw

Bryan Bloom, M.B.A. (UC Berkeley)
President, Priority Moving, San Diego

(http://www.prioritymoving.com/)

December 7, 2008 Letter to Governor re CARB Diesel Regulations
"The proposed regulation of the CARB will make all my moving trucks obsolete and severely, negatively impact my company."
(http://www.arb.ca.gov/lists/truckbus08/545-carb_leter.pdf)

September 24, 2009 CARB Meeting Public Comments
Presentation of poster board showing photos of Ph.D. diploma and Thornhill University of Hien T. Tran, Lead Author of CARB Report on PM2.5 Deaths
(http://www.youtube.com/watch?v=F132uqNBspc)

November 16, 2009 Letter by CARB Member John G. Telles, M.D. on Tran Ph.D. fraud, "Tran Report," and "legitimacy of CARB itself"
(http://www.box.net/shared/iqo6aygzl2)
(http://www.youtube.com/watch?v=yUAbJ8GeLUA)

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Thornhill University

UPON THE NOMINATION OF THE COUNCIL OF THE POSTGRADUATE DIVISION
OF THE SCHOOL OF BUSINESS AND ADMINISTRATION
HEREBY CONFER UPON

Hien Thanh Tran

HAVING DEMONSTRATED ABILITY BY GENERAL SCHOLARSHIP

Magna cum Laude

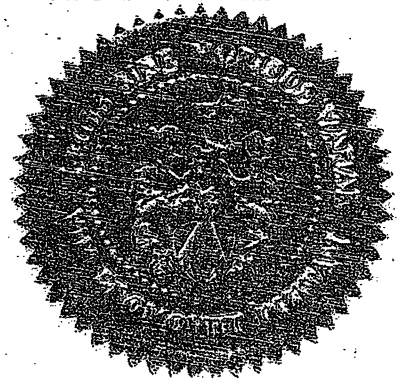
THE DEGREE

Philosophiae Doctor in Applied Statistics

WITH ALL THE RIGHTS AND PRIVILEGES THERETO PERTAINING
GIVEN THIS TWENTY-EIGHTH DAY OF JUNE IN THE YEAR
TWO THOUSAND SEVEN

Carol Anderson
PRESIDENT OF THE REGENTS

John McCullagh
PRESIDENT OF THE UNIVERSITY



Jonathon Lorn
DEAN OF THE UNIVERSITY

Ronald K. Bouvert
CHANCELLOR

100001

Exhibit #4

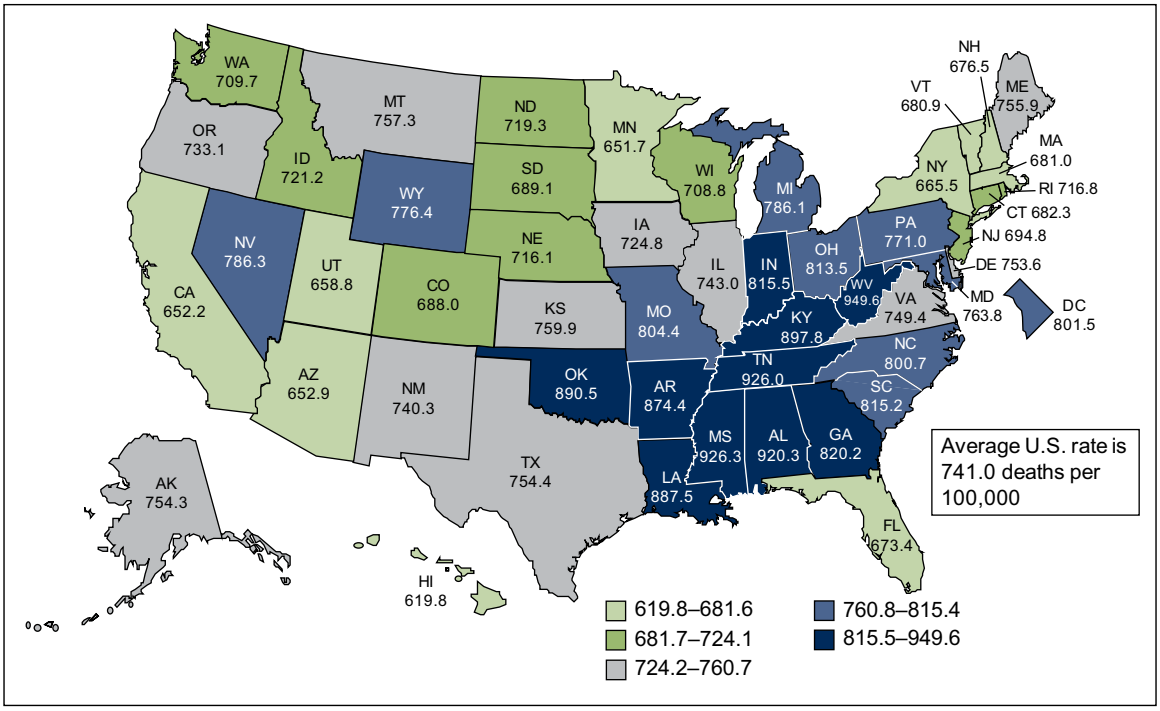
THORNHILL UNIVERSITY
TRAN'S ALMA MATER
244 MADISON AVENUE, NY

Do death rates vary by state?

States experience different risks of mortality. Hawaii has the lowest age-adjusted death rate (619.8 deaths per 100,000 population) of all the states, 16.4 percent lower than the average rate for the United States (741.0). West Virginia had the highest state age-adjusted death rate in 2009, 28.2 percent higher than the average U.S. rate.

In general, states in the Southeast region have higher rates than those in other regions of the country. Louisiana, for example, is typical of the region and has an age-adjusted death rate of 887.5 deaths per 100,000 population (3). States in other regions of the country, such as Illinois in the Midwest (743.0 deaths per 100,000 population) and Oregon in the West (733.1 deaths per 100,000 population), have rates that are more comparable with the average U.S. rate (3) (Figure 4).

Figure 4. Age-adjusted death rates, by state and the District of Columbia: United States, preliminary 2009



SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.