

ACS Promotes Air Pollution Pseudoscience

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Major Points

1. Basics of $PM_{2.5}$ & Premature Death Claims
2. Problems with Epidemiology of $PM_{2.5}$ Deaths
3. ACS CPS II & $PM_{2.5}$ Death Claims Since 1995
4. Reanalysis of CPS II: NO $PM_{2.5}$ or SO_4 Deaths
5. Reject ACS AP Results Based on 'Secret Data'
6. End 'Secret Science' & Reassess EPA NAAQS

Fine Particulate Matter (PM_{2.5}) Defined By Size ($\leq 2.5 \mu\text{m}$ Diameter), Not Composition

PM_{2.5} is mainly from combustion sources (forest fires, diesel engines, manufacturing)--up to 30% in CA is from China

US EPA established the 1997 Annual National Ambient Air Quality Standard (NAAQS) for PM_{2.5} as $15 \mu\text{g}/\text{m}^3$, lowered to $12 \mu\text{g}/\text{m}^3$ in 2012, based largely on “secret science” epidemiology from ACS

The PM_{2.5} NAAQS has been used to justify many EPA regulations that have multi-billion dollar economic impacts in US: State Implementation Plans, Air Quality Management Plans, EPA Clean Power Plan, CARB Truck and Bus Regulation, etc.

Average US Adult Now Inhales About One Gram of PM_{2.5} in 80 Years

Amount of Air Inhaled by an Adult Breathing at Rest:
~ 10,000 liters/day ~ 292 M m³/80 years

PM_{2.5} Inhaled at original NAAQS level of 15 µg/m³:
~4.38 grams/80 years = 0.88 teaspoons/80 years

PM_{2.5} Inhaled at Average 2015 Exposure:
~0.5 US Ambient Exposure of 8.4 µg/m³
~1.2 grams/80 years

PM_{2.5} Inhaled from 100 Cigarettes ~ 4.0 grams

Benefit of EPA PM_{2.5} Regulations Based on Claim of 'PM_{2.5} Premature Deaths' and Assumed \$10 Million 'Value of Statistical Life' for Each Death

EPA claim that PM_{2.5} *causes* 'premature deaths' is based on invalid evidence that the relative risk (RR) between PM_{2.5} and total mortality is greater than 1.0 in US epidemiologic cohort studies

EPA uses unjustified and exaggerated assumptions to claim that the 'value of statistical life (VLS)' is \$10 million for each 'premature death'

Problems with 'PM_{2.5} Premature Deaths'

1) 'Secret Science' Invalidated by Reanalysis:

ACS CPS II PM_{2.5} studies invalidated by objective reanalysis

2) No Etiologic Mechanism:

No experimental proof that 1 gm or 5 gm of PM_{2.5} causes death

3) Weak Epidemiologic Risk:

Tiny positive relative risks do not prove that PM_{2.5} causes death

4) Geographic & Temporal Variation:

Small and declining PM_{2.5}-mortality risk throughout US

5) Ecological Fallacy:

PM_{2.5} monitors exaggerate actual human exposure

6) Confounding Variables:

Co-pollutants, etc. eliminate PM_{2.5}-mortality relationship

ACS Cancer Prevention Study (CPS II) Has Promoted PM_{2.5} Premature Deaths

1995 *AJRCCM* Article by Pope Thun

Used Selected PM_{2.5} Data and 'Secret' ACS CPS II Data

2000 HEI Reanalysis Report by Krewski Jerrett

Never Did Sensitivity CPS II Analysis Based on Best PM_{2.5} Data

2009 HEI Research Report 140 by Krewski Jerrett Pope Thun

Ignored CPS II Criticism & PM_{2.5} Risk Variation & Best PM_{2.5} Data

March 28, 2017 *Dose-Response* Article by Enstrom

NO PM_{2.5} Risk in CPS II Based on Best PM_{2.5} Data

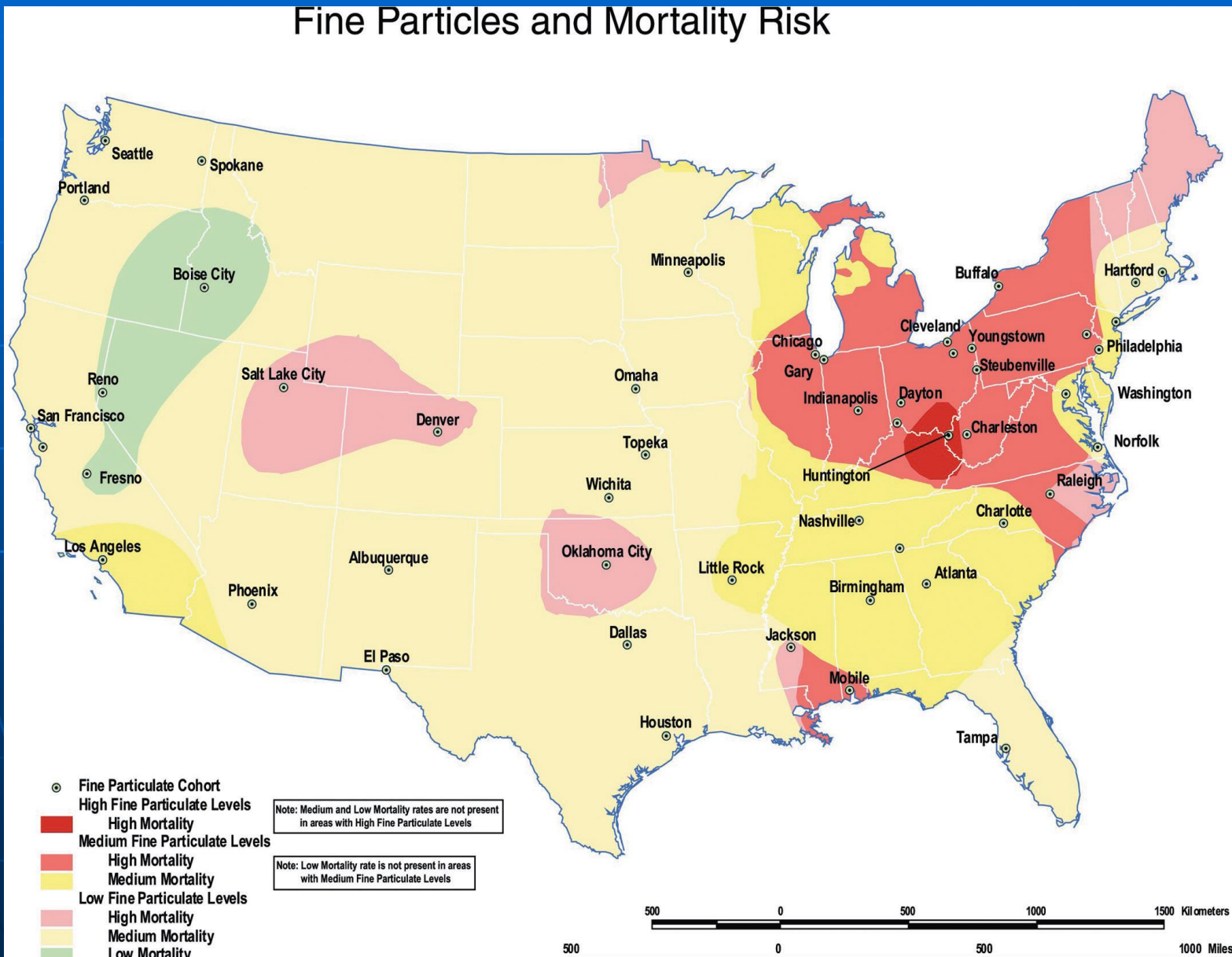
November 3, 2017 *NEJM* Submission by Enstrom

NO PM_{2.5} or SO₄ Risk in CPS II Based on Best PM_{2.5} Data ⁷

2000 Krewski HEI Reanalysis Report Figure 21

1982-1989 CPS II PM_{2.5} Mortality Risk Varies in US

Fine Particles and Mortality Risk



Enstrom 2017 Analysis of PM_{2.5} and Total Mortality During 1982-1988 in ACS CPS II Cohort: IPN=HEIDC

“Fine Particulate Matter and Total Mortality in Cancer Prevention Study Cohort Reanalysis”
(<http://journals.sagepub.com/doi/10.1177/1559325817693345>)

| <u>1979-83 PM_{2.5}</u> | <u>Subjects</u> | <u>Relative Risk (95% CI)</u> |
|--|-----------------|-------------------------------|
| Fully Adjusted for 47 Counties in Continental US | | |
| IPN [Hinton] | 189,676 | 1.021 (0.984-1.058) |
| HEIDC [PM _{2.5} DC] | 189,676 | 1.023 (0.984-1.064) |
| HEI [PM _{2.5} OI MD] | 189,676 | 1.081 (1.036-1.128) |
| Fully Adjusted for Ohio Valley: 10 Cos IN,KY,OH,PA,WV | | |
| IPN | 37,290 | 1.110 (0.949-1.299) |
| HEIDC | 37,290 | 1.113 (0.945-1.311) |
| HEI | 37,290 | 1.138 (0.941-1.376) |
| Fully Adjusted for Other States: 37 Cos Not Ohio Valley | | |
| IPN | 152,386 | 0.975 (0.936-1.016) |
| HEIDC | 152,386 | 0.968 (0.925-1.012) |
| HEI | 152,386 | 1.025 (0.975-1.079) |

CA NM WV Counties with PM_{2.5} Values Used in Pope 1995, HEI 2000, HEI 2009, Enstrom 2017

| <u>State</u> | <u>ACS</u> | <u>County</u> | <u>1979-83 PM_{2.5} (µg/m³)</u> | | |
|--------------|-----------------|---------------|--|--------------|------------|
| | | | <u>IPN</u> | <u>HEIDC</u> | <u>HEI</u> |
| | <u>Div-Unit</u> | | (N=85) | (N=63-5) | (N=50-3) |
| CA | 06001 | Alameda | 14.3882 | | |
| CA | 06002 | Butte | 15.4525 | | |
| CA | 06003 | Contra Costa | 13.9197 | | |
| CA | 06004 | Fresno | 18.3731 | 10.3 | 10.3 |
| CA | 06008 | Kern | 30.8628 | | |
| CA | 06051 | Los Angeles | 28.2239 | 26.8 | 21.8 |
| CA | 06019 | Riverside | 42.0117 | | |
| CA | 06020 | San Diego | 18.9189 | 18.9 | |
| CA | 06021 | San Francisco | 16.3522 | 16.4 | 12.2 |
| CA | 06025 | Santa Barbara | 10.6277 | | |
| CA | 06026 | Santa Clara | 17.7884 | 17.8 | 12.4 |
| NM | 34201 | Bernalillo | 12.8865 | 12.9 | 9.0 |
| WV | 58117 | Ohio | 23.9840 | | [33.4] |

**PM_{2.5} and Total Mortality in US and California:
Enstrom 2017 re 1982-1988 ACS CPS II Cohort
Thurston 2016 re 2000-2009 NIH AARP Cohort**

Geographic Area Subjects Relative Risk (95% CI)

United States

Enstrom: Fully Adjusted for 1982-1988 Deaths

85 Counties 269,766 1.023 (0.997-1.049)

Enstrom: SO₄ & Fully Adjusted for 1982-1988 Deaths

55 Counties 194,729 0.990 (0.948-1.035)

Thurston: Fully Adjusted for 2000-2009 Deaths

6 States & 2 Cities 517,041 ~1.025 (1.000-1.049)

California

Enstrom: Fully Adjusted for 1982-1988 Deaths

11 Counties 60,521 0.992 (0.954-1.032)

Thurston: Fully Adjusted for 2000-2009 Deaths

58 Counties 160,209 ~1.017 (0.990-1.040)

C. Arden Pope, III, PhD, BYU Economics

(“World’s Leading Expert on the Effects of Air Pollution on Health”)

1981 PhD in Agricultural Economics from Iowa State U

“The Dynamics of Crop Yields in the U.S. Corn Belt as
Effected by Weather and Technological Progress”

Cited Enstrom 2005 in 2006 *JAWMA* Review, but Never Again

Ignored July 11, 2008 CARB Teleconference re Null CA Results

Ignored February 26, 2010 CARB PM_{2.5} Deaths Symposium

Ignored August 1, 2013 House Science Committee Subpoena

Omitted Null CA results from Jerrett 2013 *AJRCCM* paper

Refused Enstrom’s Invitations to June 2015 ICC-10, March

2017 ICC-12, August 2017 DDP, November 2017 AFEC

Refused to Confirm or Refute 2017 *Dose-Response* Findings

American Cancer Society Officials

(CEO Gary R. Reedy, EVP Res Otis W. Brawley, MD,
VP Epi Susan P. Gapstur, PhD, Analyst W. Ryan Diver,
Former VP Epi Michael J. Thun, MD)

Refuse to Correct CPS II Findings re PM_{2.5}

ACS Refused to Comply with 2013 House Subpoena and has provided NO Current CPS II Data for Independent Analysis

ACS Refused to Collaborate with Four Qualified Ph.D.-level PM_{2.5} Critics: Drs. Enstrom, Young, Briggs, and Malkan

ACS Has Allowed Falsification of PM_{2.5} Death Claims Based on CPS II Cohort and Will Not Correct These Claims

ACS Knows CPS II Data Is the Primary Basis for Costly EPA PM_{2.5} Regulations But Will Not Stop Misuse of CPS II Data

Health Effects Institute

(President Daniel Greenbaum & Chief Scientist Aaron Cohen)

NEVER Conducted Proper Reanalysis

HEI Selected 31-member Canadian Reanalysis Team, mainly Statisticians and Geographers, to Reanalyze US Epidemiology

2000 HEI Reanalysis Report Never Tested Sensitivity of $PM_{2.5}$ Mortality Risk in Pope 1995 with Best $PM_{2.5}$ Data & SO_4

Since 2002 HEI has Not Provided $PM_{2.5}$ Mortality Risk for 50 Cities in Pope 1995 and HEI 2000 Figure 21

HEI Has Refused to Address 2017 Evidence of NO $PM_{2.5}$ Mortality Risk Based on CPS II & EPA Human Experiments

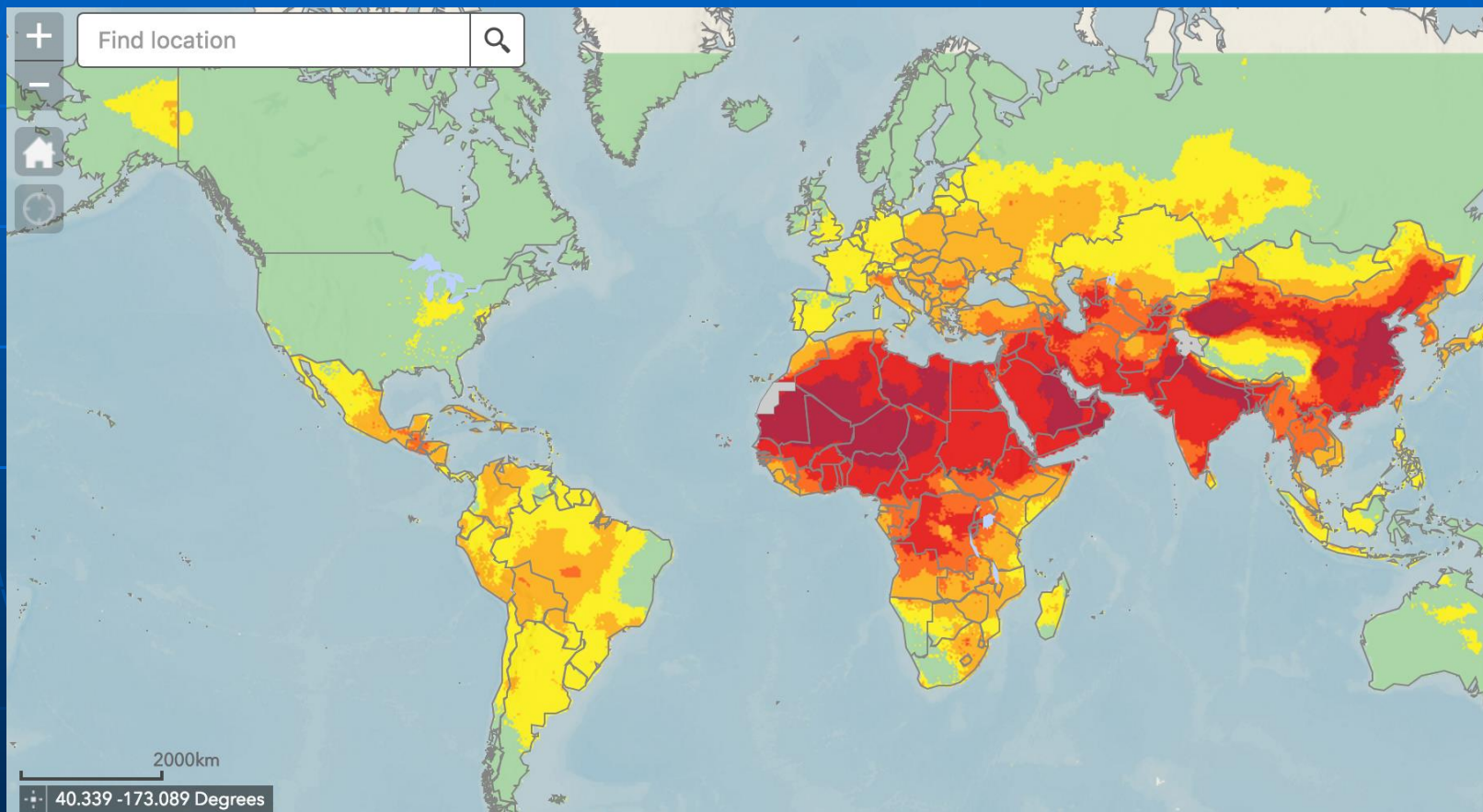
Greenbaum Accepted June 21, 2017 “nobel prize” from CARB for “sustained leadership on air pollution health science”₁₄

**May 13, 2017 *Lancet* 'Global Burden of Disease'
by HEI Aaron Cohen & BYU C. Arden Pope, III
(using flawed PM_{2.5} deaths methodology)**

Table 2. 2015 Deaths Attributed to PM_{2.5}

| <u>Country</u> | <u>Deaths</u> | <u>Death Rate</u> (per 100,000) | <u>Mean PM_{2.5}</u> ($\mu\text{g}/\text{m}^3$) |
|-----------------------|----------------------|--|---|
| USA | 88,400 | 18.5 | 8.4 |
| China | 1,108,100 | 84.3 | 58.4 |
| India | 1,090,400 | 133.5 | 74.3 |
| Pakistan | 135,100 | 136.3 | 65.0 |
| Bangladesh | 122,400 | 133.2 | 89.4 |
| World | 4,200,000 | | |

World Health Organization Map 2015 Annual Mean Ambient PM_{2.5} (μg/m³)



**March 9, 2017 US House Science Comm
September 12, 2017 US Senate Environment Comm**

H.R. 1430 & S. 1794 “Honest and Open New EPA Science Treatment (HONEST) Act”

“To prohibit the Environmental Protection Agency from proposing, finalizing, and disseminating regulations or assessments based upon science that is not transparent or reproducible.”

H.R. 1431 “EPA Science Advisory Board Reform Act”

“the scientific and technical points of view represented on and the functions to be performed by the Board are fairly balanced among the members of the Board”¹⁷

‘Scientists Who Cheat’

June 1, 2015 *New York Times* Editorial

“Cheating in scientific and academic papers is a longstanding problem, but it is hard to read recent headlines and not conclude that it has gotten worse.

The scientific community clearly needs to build a better safety net.

It can start by ensuring that scientists, especially peer reviewers, are allowed to see the underlying data of a paper, which researchers are typically reluctant to share.”

Conclusions

- 1) Strong Evidence from Two Major US Cohorts That $PM_{2.5}$ Does Not *Cause* Premature Deaths
- 2) Strong Evidence That EPA, HEI, and Lead $PM_{2.5}$ Researchers Have Falsified the $PM_{2.5}$ and Total Mortality Relationship Since 1995
- 3) H.R. 1430 (HONEST Act) and H.R. 1431 Must Be Implemented and There Must Be Complete Reassessment of EPA NAAQS per Those Laws
- 4) Aggressive Campaign Needed Against ACS & Researchers Who Conduct $PM_{2.5}$ Pseudoscience
- 5) California Waivers (Clean Air Act Section 209) Must No Longer Be Granted to Stop CARB

Elmer Gantry 1927

by Nobel Laureate Sinclair Lewis

