

**Scientific Misconduct in Fine Particulate Matter Epidemiology by Dr. C. Arden Pope, III,
in Collaboration with Drs. Daniel Krewski, Michael Jerrett, and Richard Burnett,
with the Complete Cooperation of the American Cancer Society**

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This document presents detailed documented evidence of scientific misconduct in fine particulate matter epidemiology by Clive Arden Pope, III, Ph.D., Mary Lou Fulton Professor of Economics at Brigham Young University (<https://economics.byu.edu/Pages/Faculty/C-Arden-Pope.aspx>). This scientific misconduct has been conducted with the close collaboration of Daniel Krewski, Ph.D., Professor at the University of Ottawa Faculty of Medicine (<http://www.med.uottawa.ca/epid/eng/krewskibio.html>), Michael Jerrett, Ph.D., Professor and Chair of Environmental Health Sciences at the UC Berkeley School of Public Health (<http://ehs.sph.berkeley.edu/people/jerrett.htm>), Richard T. Burnett, Ph.D., Senior Research Scientist at Health Canada, Ottawa (<http://www.zoominfo.com/p/Rick-Burnett/52191135>). This collaboration has been made possible with the complete cooperation of the American Cancer Society during the past twenty years, involving Vice President of Epidemiology Emeritus Michael J. Thun, M.D. (<http://www.cancer.org/research/researchprograms/funding/epidemiology-cancerpreventionstudies/ourstaff/michael-j-thun>) and Vice President of Epidemiology Susan M. Gapstur, Ph.D. (<http://www.cancer.org/research/researchprograms/funding/epidemiology-cancerpreventionstudies/ourstaff/susan-m-gapstur>).

The focus here is on Dr. Pope because he is “The World’s Leading Expert on the Effects of Air Pollution on Health,” as stated at the beginning of his 64 minute February 15, 2007 lecture “Air Pollution and Health” to Sevier Citizens for Clean Air and Water in Richfield, Utah (http://wn.com/arden_pope). This lecture used a PPT presentation that was similar to the one used in his June 19, 2007 lecture to Utah Moms for Clean Air in Salt Lake City, Utah (http://www.utahmomsforcleanair.org/docs/Utah-Moms_Arden-Pope-presentation.pdf). At the beginning of his February 15, 2007 lecture Dr. Pope twice stated he was speaking “the truth the best I know it” (<http://www.scientificintegrityinstitute.org/Pope021507.pdf>). As will be shown with the evidence below, Pope did not speak the truth as he knew it then and he has gotten progressively more dishonest since 2007. The primary form of scientific misconduct committed by Dr. Pope has been falsification (not properly describing results in the research record and willful perversion of facts).

The evidence here focuses on Dr. Pope’s scientific misconduct since I published my December 15, 2005 *Inhalation Toxicology (IT)* paper “Fine Particulate Air Pollution and Total Mortality Among Elderly Californians, 1973-2002” and submitted it to the California Air Resources Board

(CARB) (http://www.arb.ca.gov/planning/gmerp/dec1plan/gmerp_comments/enstrom.pdf). In particular, the evidence relates to fine particulate matter (PM2.5) epidemiology and diesel vehicle regulations in California (<http://www.forbes.com/2010/06/08/california-diesel-regulation-pollution-opinions-columnists-henry-i-miller-james-e-enstrom.html>) and to the August 1, 2013 US House Science Committee subpoena of US Environmental Protection Agency (EPA) “secret science” data from the American Cancer Society Cancer Prevention Study II (CPS II) (<http://science.house.gov/press-release/smith-subpoenas-epa-s-secret-science>). The focus of this document is on 1) Dr. Pope’s clear and consistent pattern of dishonesty and deception regarding his research, publications, and statements on PM2.5 mortality risk in California since 2006, while he participated in research on PM2.5 mortality risk in California funded by CARB and 2) Dr. Pope’s direct involvement with CARB during 2006-2009 as a “scientific advisor” on the key report that provided the public health justification for the passage in December 2008 of draconian diesel PM2.5 regulations that have harmed countless California businessmen.

Intense controversy regarding PM2.5 epidemiology dates back to Dr. Pope’s March 1, 1995 *AJRCCM* paper “Particulate Air Pollution as a Predictor of Mortality in a Prospective Study of U.S. Adults” based on ACS CPS II data with Dr. Thun of ACS Epidemiology as second author (http://www.atsjournals.org/doi/abs/10.1164/ajrccm/151.3_Pt_1.669). The initial controversy was described in the July 25, 1997 *Science* article “Showdown Over Clean Air Science” (<http://www.sciencemag.org/content/277/5325/466.full>) and the August/September 1997 *Reason* article “Polluted Science” (<http://reason.com/archives/1997/08/01/polluted-science>).

The current controversy begins with my December 15, 2005 *IT* paper and the January 1, 2006 *IT* editorial about my paper by Dr. Suresh Moolgavkar “Fine Particles and Mortality” (<http://www.scientificintegrityinstitute.org/IT010106.pdf>). These papers were cited in Dr. Pope’s June 1, 2006 *JAWMA* “Critical Review—Health effects of fine particulate air pollution: Lines that connect” (<http://www.scientificintegrityinstitute.org/PopeDockery2006.pdf>). Then, in conjunction with CARB, Dr. Pope prepared a 47-slide PPT presentation of his PM2.5 review which included my 2005 *IT* paper and the 2006 *IT* editorial, as well as my picture (<http://www.scientificintegrityinstitute.org/PopePPT2006.pdf>). My 2005 *IT* paper is the first statewide examination of PM2.5 and total mortality in California and it is still the most detailed examination of this relationship published in a peer-reviewed journal. Since his 2006 *JAWMA* paper, Dr. Pope has not properly cited the evidence on PM2.5 mortality risk in California.

On August 21, 2006 CARB scientists conducted a “Public Workshop on Updating the Methodology for Estimating Premature Death Associated with PM2.5 Exposures.” The PPT presentation for this Workshop (<http://www.arb.ca.gov/research/health/pm-mort/ws-slides.pdf>) shows Dr. Pope as a CARB advisor and “Key Steps in ARB’s Update of Methodology” and “Tentative Timeline.” However, the 2005 Enstrom paper was not shown as one of the “New studies emerged since 2002.” Joel M. Schwartz of the American Enterprise Institute testified at the Workshop and then on August 29, 2006 submitted to CARB ten pages of formal comments and three of his AEI papers, including his May 2006 paper “Air Pollution and Health: Do Popular Portrayals Reflect the Scientific Evidence?” (http://joelschwartz.com/pdfs/AirPoll_Health_EPO_0506.pdf). His formal comments stated “The discussions and handouts at the August 21 workshop indicate that CARB’s approach to evaluating the association of PM2.5 and mortality tends to omit contrary evidence and to

uncritically accept supportive evidence. This would cause CARB to overstate the magnitude and certainty of the association of air pollution and premature mortality.”

(<http://www.scientificintegrityinstitute.org/Schwartz082906.pdf>).

During the latter part of 2006, Dr. Jerrett, serving as Principle Investigator, worked with Drs. Pope, Krewski, and Burnett and six other co-Investigators on preparing the CARB Interagency Proposal No. 2624-254 "Spatiotemporal Analysis of Air Pollution and Mortality in California Based on the American Cancer Society Cohort"

(<http://www.scientificintegrityinstitute.org/Jerrett012510.pdf>). Dr. Pope was included as a consultant to be paid \$14,997, with the justification "Dr. Pope will supply expert guidance on the interpretation and analysis of statistical modeling and air pollution epidemiology."

This proposal contains the following claims that Dr. Pope knew in 2006 were dishonest:

"California currently has no statewide studies assessing mortality resulting from air pollution in the general population." (page 3); "California has no state-wide estimates of mortality to support policymaking and regulatory activities. Extension of the ACS study to address scientific uncertainties and to derive estimates specific to California will assist the Air Resources Board and others to assess the benefits of policy interventions." (page 4); "*This study will derive the first California wide estimates of mortality associated with PM2.5 exposure and other criteria co-pollutants, thus supplying policymakers with a valuable resource for deriving benefit estimates.*" (page 5). Drs. Jerrett, Krewski, and Burnett also knew in 2006 that the above claims were dishonest because they became aware of my 2005 *IT* paper in January 2006 when Dr. Krewski granted me permission to reproduce Figure 21 of the 2000 Krewski Health Effects Institute (HEI) Reanalysis Report (<http://pubs.healtheffects.org/view.php?id=6>) and use it in my June 1, 2006 *IT* response paper (<http://www.scientificintegrityinstitute.org/IT060106.pdf>).

The Jerrett Proposal was reviewed by CARB Research Screening Committee on December 14, 2006 (<http://www.arb.ca.gov/research/rsc/12-14-06/dec06adv.pdf>) and was approved by CARB on January 25, 2007 and it became "ARB/UCB Agreement No. 06-332," with a three-year total budget of \$749,706 (<http://www.arb.ca.gov/board/books/2007/012507/07-1-4pres.pdf>). At both of these meetings false claims were made about no prior statewide studies of PM2.5 and mortality in California. If my paper had been cited in the Jerrett Proposal, the proposal would have had to acknowledge that a very large and detailed statewide study of PM2.5 and mortality in California had already been conducted and published. My study and its null findings would have influenced the specific aims and approval of the Jerrett Proposal by the CARB Research Screening Committee and CARB members. This scientific misconduct by Dr. Jerrett, Dr. Pope, and the other co-investigators was reported in a March 24, 2010 letter to UC President Mark G. Yudof by an Ad Hoc Group of California businessmen impacted by CARB diesel regulations (<http://www.calcontrk.org/CARBdocs/letters/AdHocGroupLettertoYudofReJerrettMisconduct032410.pdf>). Dr. Pope was involved with this project until 2013, as will be explained later.

On January 25, 2007, the exact same day that the Jerrett Proposal was approved, Drs. Scott L. Zeger, Francesca Dominici, Aidan McDermott, and Jonathan M. Samet posted their Johns Hopkins University Department of Biostatistics Working Paper 133 "Mortality in the Medicare Population and Chronic Exposure to Fine Particulate Air Pollution" (<http://biostats.bepress.com/jhubiostat/paper133>). These four JHU professors were major air pollution investigators at this time, all much more respected and better known than me, and they

cited my 2005 *IT* paper as being consistent with their finding “No positive association was found between county-level PM2.5 concentration and mortality rates for the 32 urban counties in the western U.S. [California, Oregon, and Washington] in the MCAPS [Medicare Cohort for Air Pollution Studies] cohort. The lack of association for the West is largely because the Los Angeles area counties have higher PM2.5 levels than other western counties, but not higher adjusted mortality rates. . . . In our initial analyses of the MCAPS data, we confirmed the association between PM2.5 and mortality found in other studies but find substantial and unexplained geographic heterogeneity in the effect of PM2.5 across the United States.” The null findings in my 2005 *IT* paper and the “substantial and unexplained geographic heterogeneity” findings in Zeger 2007 were completely ignored by Dr. Pope in his February 15, 2007 and June 19, 2007 public lectures. A revised and expanded version of Zeger 2007 was published online August 12, 2008 (<http://www.ncbi.nlm.nih.gov/pmc/?term=10.1289/ehp.11449>).

The content of his 2007 lectures and the 2007 Jerrett Project are highly relevant to the honesty of Dr. Pope because during 2006-2009 he served as a “scientific advisor” to CARB on PM2.5 health effects. In particular, he provided scientific advice on a 2007 CARB draft report entitled “Methodology for Estimating the Premature Deaths Associated with Long-term Exposures to Fine Airborne Particulate Matter in California.” The report was distributed to six peer reviewers with an August 27, 2007 CARB cover letter and the peer review comments were returned during September-October 2007. This draft based the dose-response relationship between PM2.5 and premature deaths (total mortality) in California on the national September 21, 2006 “Expanded Expert Judgment Assessment of the Concentration-Response Relationship Between PM2.5 Exposure and Mortality” (http://www.epa.gov/ttn/ecas/regdata/Uncertainty/pm_ee_report.pdf). Drs. Pope and Krewski were two of the twelve experts used in this major PM2.5 risk assessment, constituting another conflict of interest for Dr. Pope in his role as a CARB scientific advisor.

The 2007 CARB draft report, including the comments of the six peer reviewers, was revised and released as the May 22, 2008 CARB Draft Report (<http://scientificintegrityinstitute.org/CARBPMDraft052208.pdf>). It was summarized at the May 22, 2008 CARB meeting in a PPT presentation “Revised Estimates of Premature Death Associated with PM2.5 Exposures in California,” which cited Dr. Pope as a Scientific Advisor (<http://www.arb.ca.gov/board/books/2008/052208/08-5-5pres.pdf>). Neither the report nor the PPT addressed my April 24, 2008 comments to CARB about the need to focus on California-specific evidence as the basis for estimating PM2.5-related premature deaths in California (http://www.arb.ca.gov/lists/erplan08/2-carb_enstrom_comments_on_gmerp_042208.pdf).

A July 11, 2008 CARB teleconference was held because of my June 4, 2008 concerns stated to the CARB Chair Mary D. Nichols at her California Senate Rules Committee confirmation hearing in Sacramento (<http://scientificintegrityinstitute.org/Nichols060408.pdf>). I was very concerned that the May 22, 2008 CARB Draft Report had not properly focused on PM2.5 mortality risk in California (<http://scientificintegrityinstitute.org/AgendaSum071108.pdf>). During that teleconference I spoke directly with Drs. Pope, Jerrett, and Burnett about failure of the CARB report to properly present and use California-specific PM2.5 mortality risk evidence (<http://scientificintegrityinstitute.org/Enstrom071108.pdf>). Dr. Pope and the others evaded my repeated requests to them to clarify the Jerrett Project California PM2.5 mortality risk findings, as well as prior PM2.5 findings dating back to Figure 21 in the 2000 Krewski HEI Reanalysis Report. I stated “I’m very concerned that a number of these [CARB diesel vehicle] regulations

are going to move forward based on, well for instance, the Pope 2002 study when more studies are forth coming and I think that if there's an effort made by the ARB to slow down the regulatory process that would relieve a lot of my concerns." In response, Dr. Pope stated "That's something I wouldn't get involved with one way or the other. I'm interested in the science and I hope that the regulation is wise and uses the science in a reasonable way." (<http://scientificintegrityinstitute.org/CARB071108.pdf>). This was a disingenuous and dishonest statement by Dr. Pope because he has been clearly aware since at least 2006, when he began advising CARB, that his research and reviews on PM2.5 mortality risk were being used by CARB as public health justification for draconian diesel vehicle regulations in California.

When Pope failed to contact me, as per his comments during the teleconference, I sent him an August 20, 2008 email request asking for the same California-specific calculations that I had asked for during the teleconference (<http://www.scientificintegrityinstitute.org/Pope082008.pdf>). Pope never responded to my email request. During this period, a total of 148 pages of highly critical public comments were received by CARB regarding the May 22, 2008 Draft Staff Report (http://www.arb.ca.gov/research/health/pm-mort/pm-mort_supp.pdf). On October 24, 2008 CARB issued a Final Staff Report "Methodology for Estimating Premature Deaths Associated with Long-term Exposure to Fine Airborne Particulate Matter in California" (<http://www.scientificintegrityinstitute.org/CARBPMFinal102408.pdf>). In spite of the extensive detailed criticism that Dr. Pope must have seen, the Final Staff Report was essentially unchanged from Draft Staff Report. Both of these reports listed Dr. Pope as a Scientific Advisor and they reflect his failure to address serious criticism and null California-specific PM2.5 risk evidence.

I challenged the scientific integrity of the Final Staff Report with detailed December 10, 2008 CARB public comments regarding the proposed CARB Statewide Truck and Bus Regulation. I described six different sources showing geographic variation in PM2.5 mortality risk nationally and little or no PM2.5 mortality risk in California (http://www.arb.ca.gov/lists/truckbus08/897-carb_enstrom_comments_on_statewide_truck_regulations_121008.pdf). In spite of the massive criticism of scientific, legal, and economic aspects of the CARB Truck and Bus Regulation received from hundreds of commenters, this multi-billion dollar diesel vehicle regulation was approved by CARB on December 12, 2008 (<http://www.arb.ca.gov/newsrel/nr121208.htm>).

Although we had engaged in direct discussion and correspondence about this issue in 2008, Dr. Pope did not address the issue of geographic variation in PM2.5 mortality risk in his January 22, 2009 NEJM paper "Fine Particulate Air Pollution and Life Expectancy in the United States" (<http://www.nejm.org/doi/full/10.1056/NEJMsa0805646>). This paper made no mention of the above evidence of geographic variation in PM2.5 mortality risk dating back to 2000. I submitted a February 11, 2009 NEJM letter with specific results showing no relationship in California based on data from me and the paper. Although my letter was rejected by the NEJM on March 16, 2009, it was forwarded to Dr. Pope for comment (http://www.arb.ca.gov/lists/gmove09/1-carb_enstrom_comments_re_pm2.5_and_life_expectancy_052709.pdf).

Dr. Pope has never acknowledged or addressed my null California results and my concerns about his conclusions regarding the relationship between PM2.5 and life expectancy. For instance, he failed to address any such criticism in his May 3, 2009 HEI PPT presentation on this relationship (<http://www.healtheffects.org/Slides/AnnConf2009/Pope.pdf>). Additional criticism of Pope

2009 is contained in the September 2012 paper of Goran Krstić, Ph.D., whose 2009 letter was also rejected by the NEJM. Reanalyzing Dr. Pope's publicly available data, Dr. Krstić found "The observed loss of statistical significance in the correlation between the reduction of ambient air PM2.5 concentrations and life expectancy in metropolitan areas of the United States, after removing one of the metropolitan areas [Topeka, KS] from the regression analysis, may raise concern for the policymakers in decisions regarding further reductions in permitted levels of air pollution emissions." (<http://www.ncbi.nlm.nih.gov/pubmed/23019812>). This same Pope 2009 data was reanalyzed in the August 2013 paper of Dr. S. Stanley Young, who concluded "Given the lack of effect in the West and the greater importance of other predictors, we agree with Krstić that this data set does not support the claim that decreasing PM2.5 will increase longevity." (<http://onlinelibrary.wiley.com/doi/10.1002/sam.11202/abstract>).

During 2002-2009 Dr. Pope worked with Dr. Krewski on an HEI project that resulted in the June 3, 2009 HEI Research Report 140 "Extended Follow-Up and Spatial Analysis of the American Cancer Society Study Linking Particulate Air Pollution and Mortality," which lists Dr. Pope as eighth author (<http://pubs.healtheffects.org/view.php?id=315>). HEI Health Review Committee Commentary states "Dr. Krewski's 4-year study, 'Extended Follow-Up and Spatial Analysis of the American Cancer Society Study Linking Particulate Air Pollution and Mortality,' began in May 2002. Total expenditures were \$425,000. The draft Investigators' Report from Krewski and colleagues was received for review in January 2007. A revised report, received in January 2008, was accepted for publication in June 2008." The final report results were summarized in a May 21, 2008 Krewski PPT (<http://www.scientificintegrityinstitute.org/Krewski052108.pdf>). This "spatial analysis" did not analyze or discuss the geographic variation in PM2.5 mortality risk that was found in Figures 5 and 21 of the 2000 Krewski HEI Reanalysis Report and it did not cite papers showing geographic variation like Enstrom 2005, Enstrom 2006, Zeger 2007, and Zeger 2008. As explained previously, the primary authors, including Drs. Pope, Krewski, Jerrett, and Burnett, were all well aware of evidence of national geographic variation dating back to the 2000 HEI Reanalysis Report. Yet they failed to address this issue in the 2009 HEI Research Report.

On November 16, 2009 CARB Member John B. Telles, M.D., raised serious concerns about the integrity of the October 24, 2008 CARB Final Staff Report because of the dishonesty of its lead author, Hien T. Tran (<http://www.scientificintegrityinstitute.org/Telles111609.pdf>). The dishonesty of Tran is described on a website that describes scientific and ethical misconduct by CARB (<http://killcarb.org/tranpage.html>). As a result of Dr. Telles' concerns, a February 26, 2010 CARB Symposium "Estimating Premature Deaths from Long-term Exposure to PM2.5" and organized and conducted in Sacramento. Dr. Pope and I participated, along with Drs. Krewski, Jerrett, Moolgavkar, and numerous other PM2.5 mortality risk experts (http://www.arb.ca.gov/research/health/pm-mort/pm-mort-ws_02-26-10.htm). Several dozen California businessmen adversely impacted by the CARB diesel vehicle regulations approved on December 12, 2008 were in the audience of this Symposium. Along with Dr. Telles, they were very concerned about the integrity of the October 24, 2008 CARB Final Staff Report.

At the Symposium Dr. Pope made a 52-slide PPT presentation "Overview of PM2.5-Related Mortality Studies" (<http://www.arb.ca.gov/research/health/pm-mort/pope.pdf>). On slide 50 he posed the question "Then which health studies are relevant to California?" and followed this with an accurate statement "Some of the highest quality research on the health effects of air pollution

has been conducted in California” and a false statement “The results are similar to studies from elsewhere.” His slides 48 and 49 did not accurately reflect all of the existing null California-specific results. Particularly disturbing is the fact that Dr. Pope did not present any California-specific results that should have been in the June 3, 2009 Krewski HEI Research Report. Even more disturbing is the fact that he did not present any results from the ongoing Jerrett Project described earlier. When the Jerrett Project was approved on January 25, 2007, the agreement with CARB called for the California-wide results to be available in eighteen months (July 2008).

Although not shown by Dr. Pope, Dr. Jerrett did show in slide 12 of his Symposium presentation that the Jerrett Project found no relationship between PM2.5 and total mortality in California (RR = 1.00) (<http://www.scientificintegrityinstitute.org/JerrettTrans022610.pdf>). This null result is in exact agreement with the Enstrom 2005 result (RR =1.00). An Ad Hoc Group of California businessmen who attended February 26, 2010 CARB Symposium were interested in seeing all the California evidence, particularly the California-specific results from the 2009 HEI Research Report. They submitted a request to HEI for these results and their request yielded an August 31, 2010 HEI letter containing California-specific results calculated by Dr. Krewski as a subset of the national results in the 2009 HEI Research Report. Dr. Krewski found no PM2.5 mortality risk in California: RR = 0.87 (0.81-0.94) during 1982-1989 and RR = 0.96 (0.92-1.00) during 1982-2000 (http://www.arb.ca.gov/research/health/pm-mort/HEI_Correspondence.pdf).

The low PM2.5 mortality risk in California during 1982-1989 found by Dr. Krewski is consistent with my September 30, 2010 analysis of Figures 5 and 21 in the 2000 HEI Report (<http://www.scientificintegrityinstitute.org/HEIFigure5093010.pdf>). Based on my own analysis, Figure 5 showed PM2.5 mortality risk for 49 US cities (metropolitan areas) and Fresno, California ranked second lowest and Los Angeles, California ranked fifth lowest. Figures 5 and 21 were not mentioned in Dr. Pope’s Symposium PPT or in the 2009 HEI Report. It certainly should have been included in 2009 HEI Report if Dr. Pope had been honest in addressing Figures 5 and 21, my 2006 and 2008 submissions to CARB, and my 2008 requests to him. The null California results from the Jerrett Project could have been released in early 2008 and then incorporated into the CARB Draft Report and the CARB Final Report. Modified CARB reports that found few or no premature deaths in California due to PM2.5 would probably have changed the December 12, 2008 CARB vote on the Truck and Bus Regulation.

Because of my extensive concerns about the scientific integrity of PM2.5 epidemiology, as described above, I organized a symposium, "Ethical Aspects of Small Epidemiologic Risks," for the Third North American Congress of Epidemiology (CoE) in Montreal, Canada during June 21-24, 2011 (<http://www.epiresearch.org/archive/fall10news.pdf>). This symposium was sponsored by the American College of Epidemiology and at that time I was Chair of the ACE Ethics Committee (<http://acepidemiology.org/content/ethics>). I invited 18 experts in PM2.5 epidemiology who held views different than my own to debate me at this ethics symposium. All 18 of the experts declined my invitation, including six co-Investigators of the Jerrett Project: Drs. Jerrett, Pope, Krewski, Burnett, Thun, and Thurston (<http://www.scientificintegrityinstitute.org/COEEthics022311.pdf>). Because diverse points of view on PM2.5 epidemiology could not be presented at the Symposium, it was cancelled. This disappointing experience illustrates the difficulty of resolving ethical issues in PM2.5 epidemiology, like lack of access to underlying data and deliberate misrepresentation of results.

The June 9, 2011 Draft Jerrett Report, with Dr. Pope as the third author, presented null results from eight of the nine statistical models that they tested, adding to the single null finding presented by Dr. Jerrett on February 26, 2010. However, the Summary and Abstract of this report were heavily criticized by me and several others for stating conclusions that did not reflect the null findings in the report itself. This report was not approved and was deferred by the CARB Research Screening Committee. In spite of the criticism, the October 28, 2011 Final Jerrett Report was essentially unchanged from the June 9, 2011 Draft Jerrett Report. This led to further criticism that the final report continued to misrepresent and/or ignore its overwhelmingly null findings (<http://www.scientificintegrityinstitute.org/JerrettCriticism102811.pdf>).

Continuing misrepresentation of PM2.5 mortality risk in California is clearly evident in Dr. Pope's July 28, 2011 EPA Webinar PPT "Health Effects of Particulate Matter Air Pollution" (<http://www.epa.gov/burnwise/pdfs/PMHealthEffects-Pope.pdf>). He makes no mention of PM2.5 mortality risk in California found in Figure 5 and 21 from Krewski 2000, the February 26, 2010 CARB Symposium, the June 9, 2011 Jerrett Report, or the June 1, 2011 Erratum to Ostro 2009 paper, or the June 23, 2011 Lipsett 2011 paper, all of which were available before his EPA webinar (<http://www.scientificintegrityinstitute.org/Enstrom081512.pdf>).

The most recent summary of all California evidence is given in my August 1, 2012 American Statistical Association Joint Statistical Meeting 2012 PPT presentation "Are Fine Particulates Killing Californians?" (<http://www.scientificintegrityinstitute.org/ASA080112.pdf>) and in my subsequent ASA JSM 2012 Proceedings paper "Particulate Matter is Not Killing Californians" (<http://www.scientificintegrityinstitute.org/ASAS092812.pdf>). There is now overwhelming epidemiologic evidence from ten different analyses of five separate cohorts showing no relationship between PM2.5 and premature death (total mortality) in California. In spite of my many attempts since 2008, this overwhelming evidence has not yet been recognized by Dr. Pope.

The serious misuse of PM2.5 epidemiologic findings by EPA and CARB is reflected in the US House Science Committee criticism of EPA science and regulations dating back to a November 15, 2011 letter to the White House from Congressmen Andy Harris, M.D., and Paul Broun, M.D. (<http://science.house.gov/press-release/harris-and-broun-question-administration%E2%80%99s-environmental-cost-benefit-analyses>). This letter and numerous additional letters up to a July 22, 2013 letter have requested the Harvard Six Cities Study (H6CS) and ACS CPS II data used by EPA (<http://science.house.gov/press-release/committee-threatens-subpoena-epa-secret-science>). The basic issues are summarized in a July 30, 2013 Wall Street Journal commentary "The EPA's Game of Secret Science" by US House Science Committee Chairman Lamar Smith (<http://online.wsj.com/news/articles/SB10001424127887323829104578624562008231682>).

Because EPA did not comply with their prior requests, the US House Science Committee issued an August 1, 2013 subpoena on EPA to produce the "secret science" data from H6CS and ACS CPS II (<http://science.house.gov/press-release/smith-subpoenas-epa-s-secret-science>). Dr. Pope is co-author on four of the seven papers specifically cited in the subpoena. He is first author on "Pope et al. 2002. Lung Cancer, Cardiopulmonary Mortality, and Long-term Exposure to Fine Particulate Air Pollution." *Journal of the American Medical Association* 287: 1132-1141" and

“Pope et al. 2009. “Fine Particulate Air Pollution and Life Expectancy in the United States.” New England Journal of Medicine 360: 376-386.” He is third author on “Jerrett et al. 2009 “Long-term ozone exposure and mortality”, New England Journal of Medicine 360; 1085-1095” and eighth author on “Krewski et al. 2009. “Extended Follow-up and Spatial Analysis of the American Cancer Society Study Linking Particulate Air Pollution and Mortality, HEI Research Report 140, Health Effects Institute. Boston, MA.” A fifth study is “Krewski et al. 2000. ‘Reanalysis of the Harvard Six Cities Study and the American Cancer Society Study of Particulate Air Pollution and Mortality.’ Special Report to Health Effects Institute. Cambridge MA. July.” This 2000 HEI Reanalysis Report was conducted in order to check the accuracy of the highly controversial Pope 1995 paper, as described in the 1997 Science and Reason articles.

Instead of encouraging the other H6SC and ACS CPS II investigators to comply with the subpoena, Dr. Pope has made several patently false statements to the press that try to justify the investigators’ refusal to comply. However, of the 23 primary authors of the seven subpoenaed papers, only Dr. Pope has publicly challenged the appropriateness of the subpoena. The following are three of his most blatantly false public statements:

1) The August 2, 2013 Science *Insider* statement: “Economist C. Arden Pope of Brigham Young University in Provo, Utah, one of the authors on the Six Cities Study, says that turning over what Smith requests would undoubtedly violate the confidentiality agreement made with participants. ‘It’s extremely hard to give a data set that will allow you to replicate the results in these studies that doesn’t include information that then allows you—with an Internet search of obituaries—to quickly figure out who the people were,’ he says.”

(<http://news.sciencemag.org/environment/2013/08/house-panel-subpoenas-epa-air-pollution-data>)

2) The August 9, 2013 Science statement: “Thursday, Smith asserted the data would be shared with ‘various reputable entities and organizations’ and would be ‘deidentified’ so that no names would be made public. But because the six cities were small, it would be easy to quickly figure out who the participants were, according to Pope.”

(<http://www.sciencemag.org/content/341/6146/604.full.pdf>)

3) The September 7, 2013 Boston Globe statement: “C. Arden Pope III, an economics professor at Brigham Young University who also was lead author on the American Cancer Society study, said there was no attempt to hide information from Congress or the public. ‘Characterizing the ACS and Harvard Six-Cities studies as “secret science” is a misrepresentation of the truth,’ Pope said in remarks he e-mailed to the Globe. ‘We have continued to be actively involved in open, collaborative, extended analysis efforts,’ he added, ‘using the data and information in such a way that contributes to scientific understanding and that does not violate commitments to the privacy and confidentiality of research participants.’”

(<http://www.bostonglobe.com/news/nation/2013/09/06/landmark-harvard-study-health-effects-air-pollution-target-house-gop-subpoena/2K0jhfbJsZcfXqcQHc4jzL/story.html>).

The illustrate the dishonesty of Dr. Pope’s claim “it would be easy to quickly figure out who the participants were,” the first deceased H6CS subject is shown as Record 1259 of the H6CS Excel data file given to EPA in response the subpoena “[Lepeule2012_data_0713_final.xlsx](#)”:

“STU 409 0.74538 20.9 20.9 1 1 0 0 1”

Dr. Pope cannot possibly identify this H6CS subject using the information provided above. Furthermore, Dr. Pope has not engaged in meaningful collaboration with scientists other than several of the authors of the subpoenaed papers. Their refusal to comply with the subpoena is direct evidence that Dr. Pope and his colleagues have not engaged in “open, collaborative, extended analysis efforts.” The characterization of Dr. Pope’s research as “secret science” is not “a misrepresentation of the truth.”

The final and most glaring example of Dr. Pope’s dishonesty is the September 1, 2013 *AJRCCM* paper “Spatial Analysis of Air Pollution and Mortality in California” that he co-authored with Drs. Jerrett, Krewski, Burnett, and Thun and eight other Jerrett Project investigators (<http://www.atsjournals.org/doi/abs/10.1164/rccm.201303-0609OC>). This paper was published exactly one month after the subpoena was issued for the CPS II data used in the paper. The paper is highly misleading and completely ignores the overwhelming null evidence in the October 28, 2011 Jerrett Final Report (<http://www.arb.ca.gov/research/apr/past/06-332.pdf>). The positive relationship that it does report is based on a “conurbation” land use regression model that normalizes out the low death rates in the urban areas of California. This ad hoc model was not even mentioned in the original proposal. Furthermore, the paper does not cite the overwhelming null California PM2.5 mortality evidence that is summarized in my September 28, 2012 ASA JSM 2012 paper (<http://www.scientificintegrityinstitute.org/ASAS092812.pdf>). The serious flaws in the *AJRCCM* paper are discussed in detail by Dr. William Briggs in his blogs of August 6, 2013 (<http://wmbriggs.com/blog/?p=8720>) and September 11, 2013 (<http://wmbriggs.com/blog/?p=8990>). The *AJRCCM* paper and the defiance of its authors reinforces the importance of the subpoena of EPA “secret science” data and the urgent need for independent reanalysis of the ACS CPS II data that underlies this paper and the subpoenaed papers, as explained by Dr. Briggs on September 25, 2013 (<http://wmbriggs.com/blog/?p=9241>).

In conclusion, Dr. Pope, in collaboration with Drs. Krewski, Jerrett, Burnett, and Thun, has engaged in serious scientific misconduct (falsification) in his PM2.5 epidemiology research and reviews, particularly as it relates to geographic variation in PM2.5 mortality risk and lack of risk in California. The dishonest claim of Dr. Pope and his collaborators that there is a current substantial PM2.5 mortality risk in California has been used by EPA and CARB to justify draconian regulations designed to reduce alleged premature deaths in California due to PM2.5 when there is overwhelming epidemiologic evidence that these deaths do not actually exist.