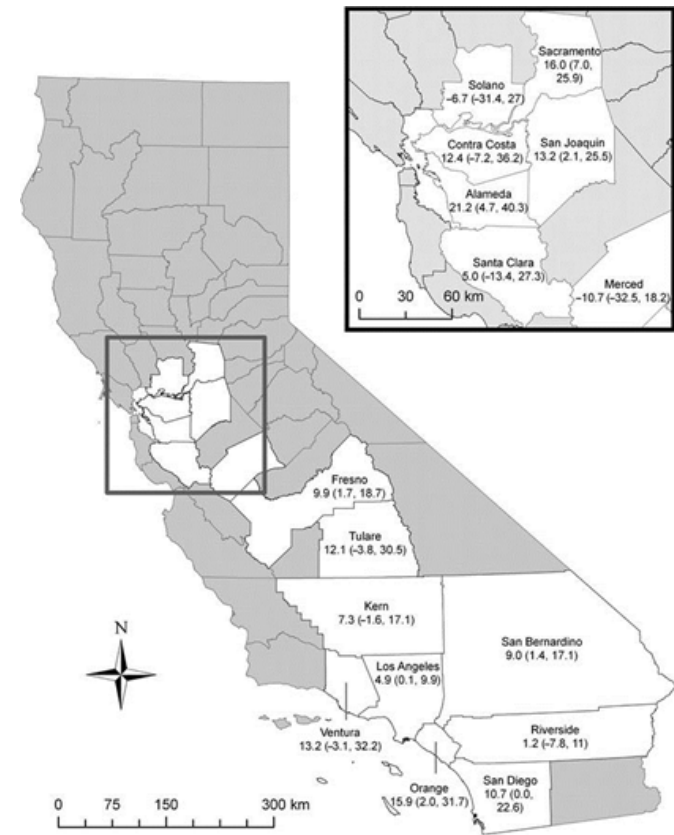


Impact of Climate Change on Women's Health/Pregnancy

Marya G. Zlatnik, MD, MMS
Professor, Maternal Fetal Medicine & Program in Reproductive Health & the Environment, UCSF
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Dadvand P, Basagaña X, Sartini C, et al. Climate Extremes and the Length of Gestation. *Environmental Health Perspectives*. 2011;119(10):1449-1453. doi:10.1289/ehp.1003241.



Questions:

- (1) course/session they are running or preparing to teach
 - Life Cycle lecture on pregnancy complications
 - WHE elective
 - OB/GYN residents
 - MFM fellowship



Questions:

(2) Objectives on climate change included

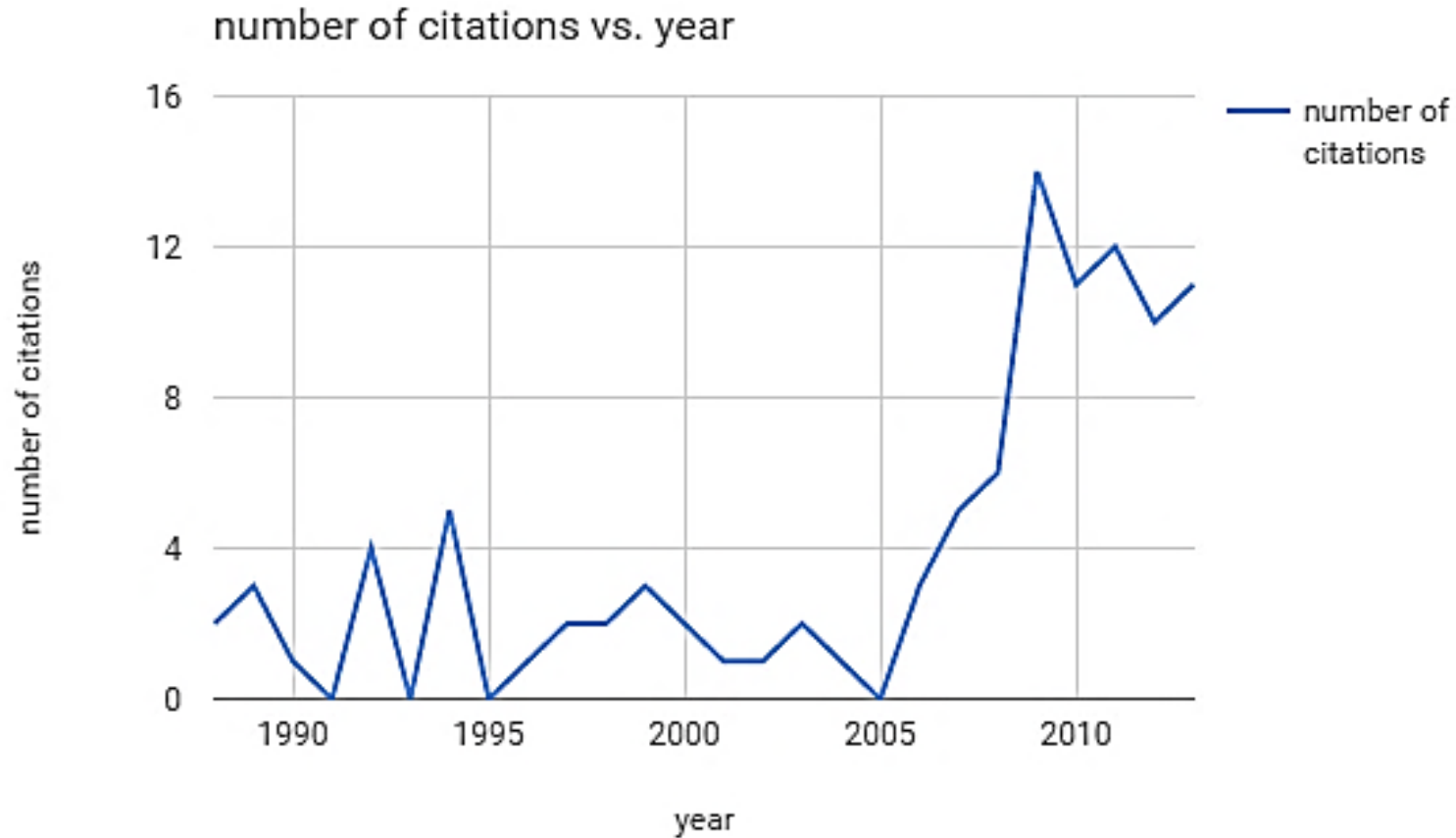
- Anything I can find relating to pregnancy
- Using pregnancy complications to highlight impact of climate change on human health

(3) how you decided/are deciding to teach this material

- Life Cycle (core curriculum): one slide
- Elective/Residents/Fellows: several slides



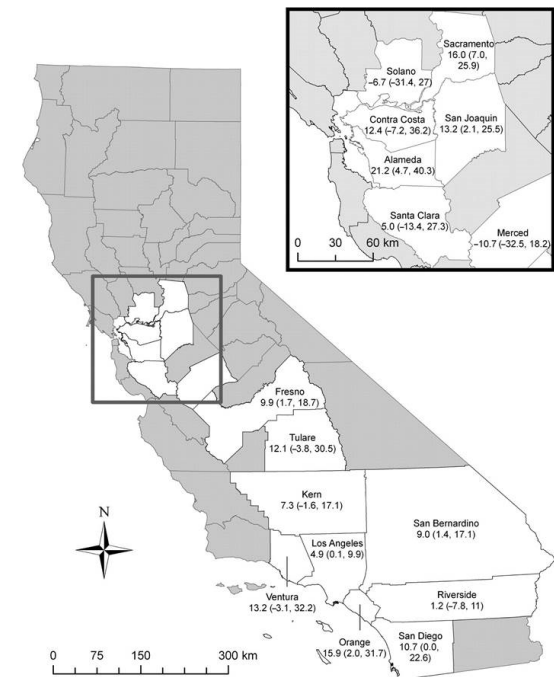
Climate Change and Pregnancy



Medline Trend, accessed 9.11.2015
<http://dan.corlan.net/medline-trend.html>

Climate Change and Pregnancy

- Extreme heat associated w/ shorter gestation
Barcelona 2001-2005
- Higher temperatures associated w/ PTB
 - Bay Area: 5-20% increase in PTB
for 10F increase in temp
 - California 2010
- ? Increase in some birth defects
 - New York



Climate Change & Pregnancy

- Increased water source salinity & preeclampsia in Bangladesh

Table 6. Association of (pre)eclampsia and/or gestational hypertension with water source.

Water Source	Cases (n = 202)	Controls (n = 1,006)	Crude Odds ratio (OR) (95% CI)	OR Adjusted by age, parity, SES, mid-upper arm circumference (95% CI)
Rain+another ¹	10 (5.26)	234 (25.7)	1.00	1.00
Filter ²	25 (13.2)	117 (12.8)	4.99 (2.32–10.8)	5.32 (2.41–11.7)
Pond	47 (24.7)	251 (27.5)	4.38 (2.16–8.87)	5.31 (2.60–10.9)
Tube-well	108 (56.8)	310 (34.0)	8.15 (4.17–15.9)	8.30 (4.20–16.4)

1. 'Rain' has been combined with any other water source because of small numbers in the rainwater only group.

2. For brevity we refer to filtered pond water as 'filter'.

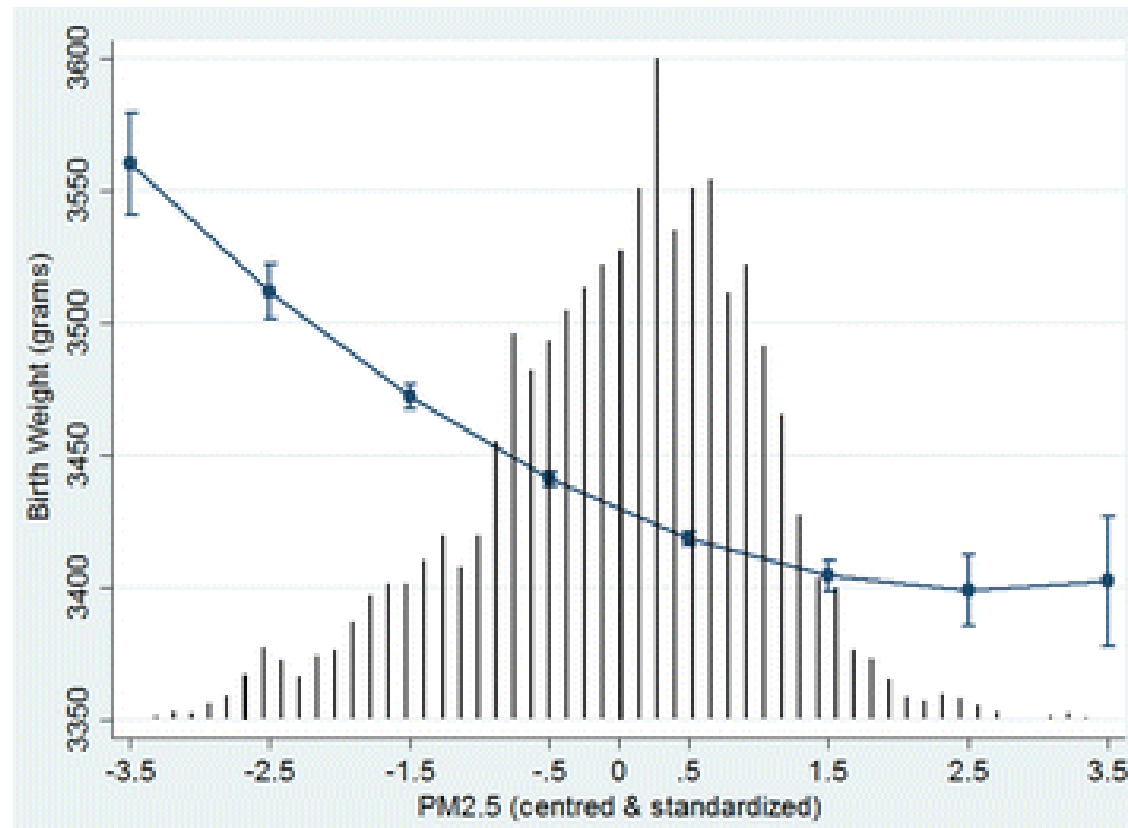
doi:10.1371/journal.pone.0108715.t006

P<0.001

Khan 2015



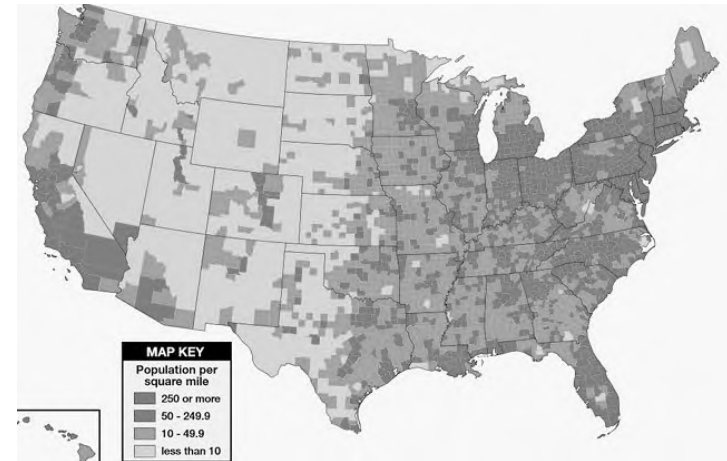
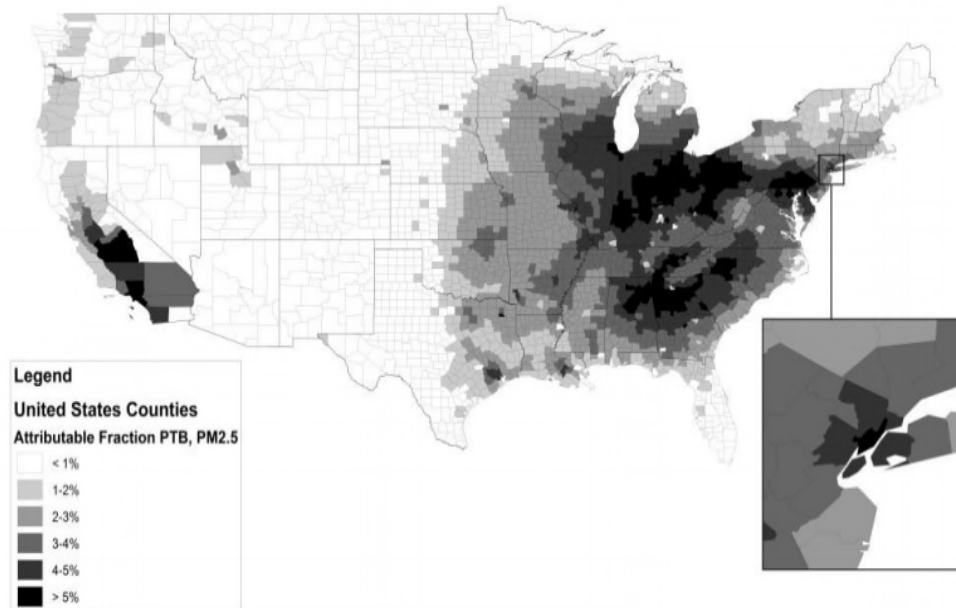
Prenatal Air Pollution: Predicted effects of PM_{2.5} on birth weight



Black vertical lines represent the frequency distribution of PM_{2.5}. Population-based retrospective cohort : singleton births in British Columbia, 2001-6. Exposure to PM_{2.5} was estimated using a national land-use regression model developed to estimate PM_{2.5} at the census street block level.



Costs of PTB Attributable to Air Pollution (PM2.5)



Attributable Fraction = 3.32%

Attributable Preterm Births = 15,808

Lost Economic Productivity, PM2.5-Attributable PTB = \$4.33 billion

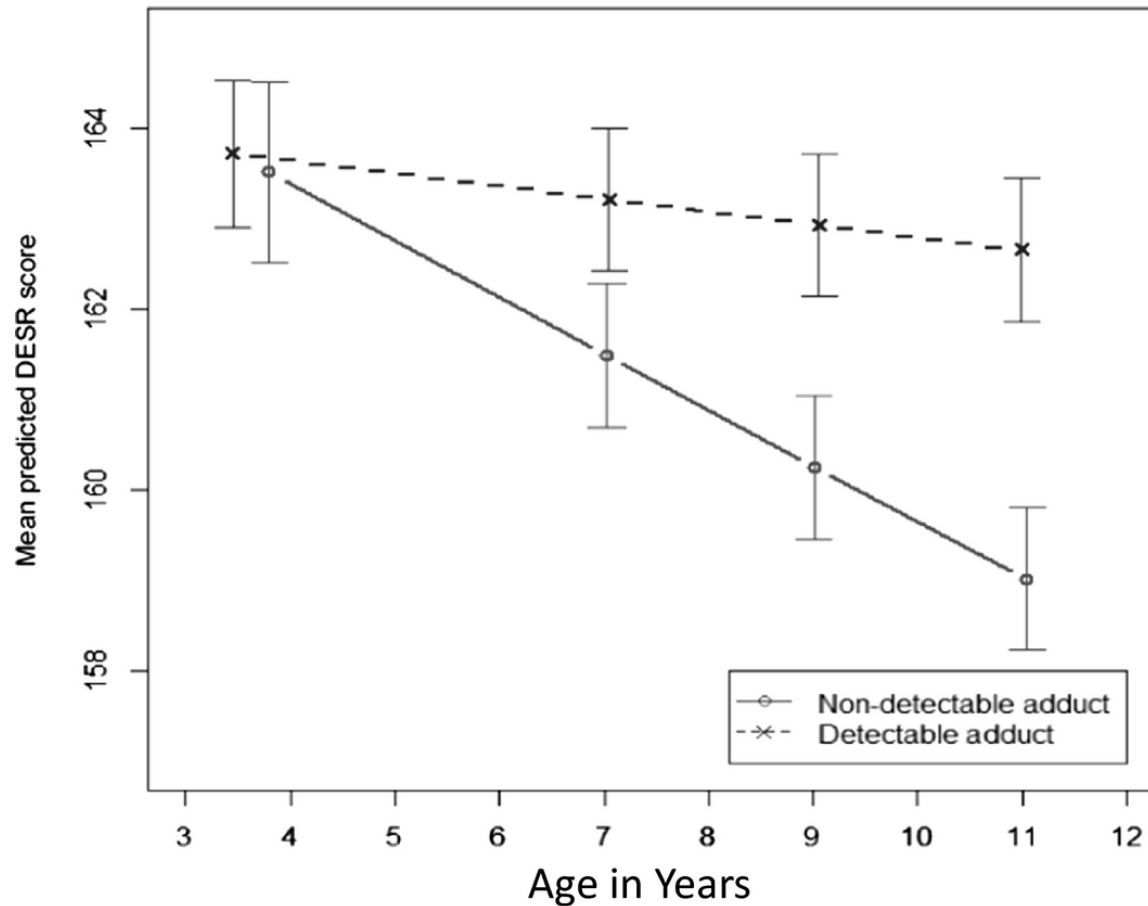
Additional Medical Care, PM2.5-Attributable PTB = \$760 million

Total Costs, PM2.5-Attributable PTB = \$5.09 billion

Trasande *EHP* 2016



Prenatal Air Pollution: Effects of exposure on self-regulatory capacities & social competence



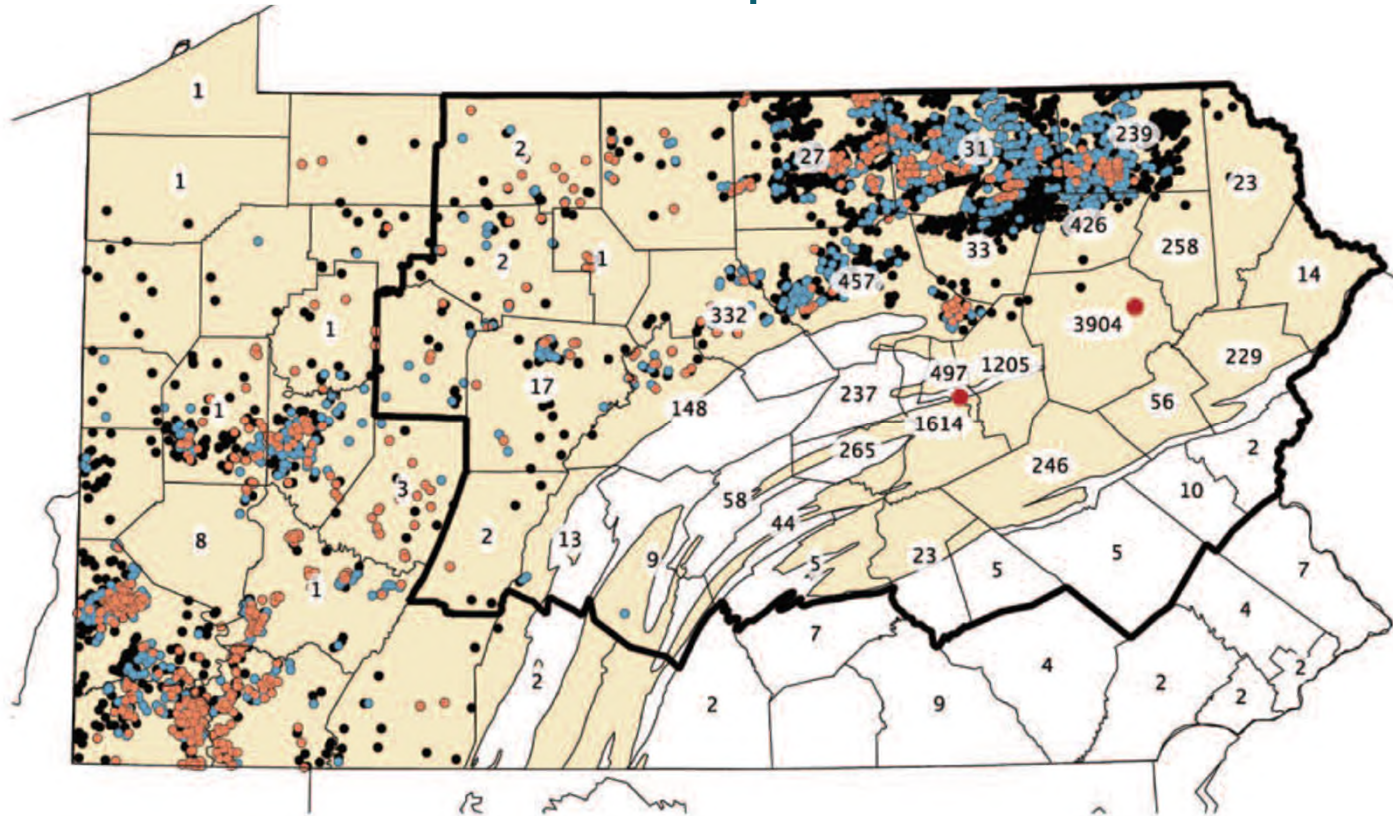
Margolis 2016, *Journal of Child Psychology and Psychiatry*,

<http://onlinelibrary.wiley.com/doi/10.1111/jcpp.12548/full#jcpp12548-fig-0002>



Proximity to Fracking & Preterm Birth

Unconventional Natural Gas Development & Birth Outcomes in PA



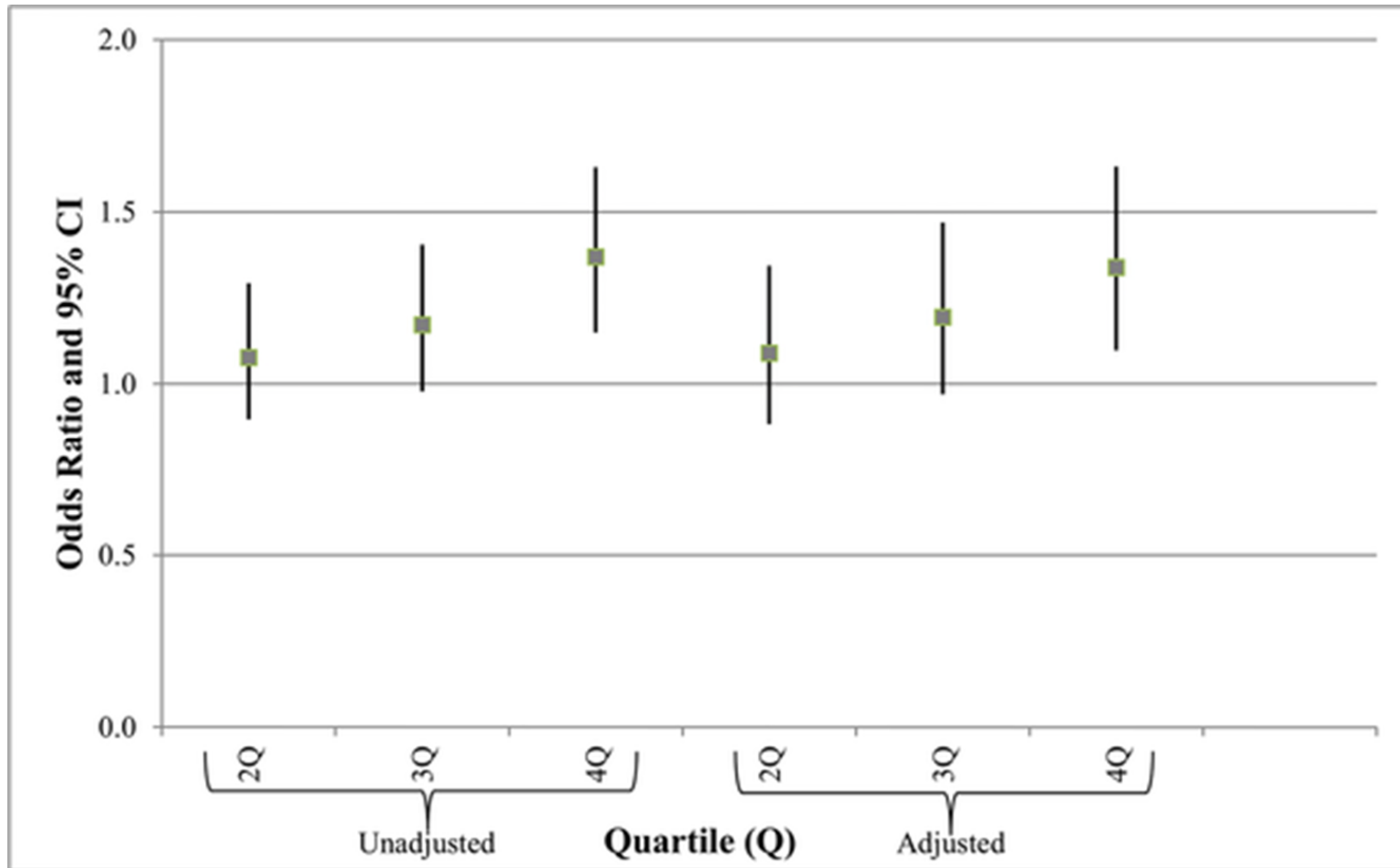
Association between unconventional natural gas development activity & preterm birth (4th quartile OR 1.4)



Proximity to Fracking & SGA

Perinatal Outcomes & Unconventional Natural Gas Operations in SW Penn.

OR: Small for Gestational Age

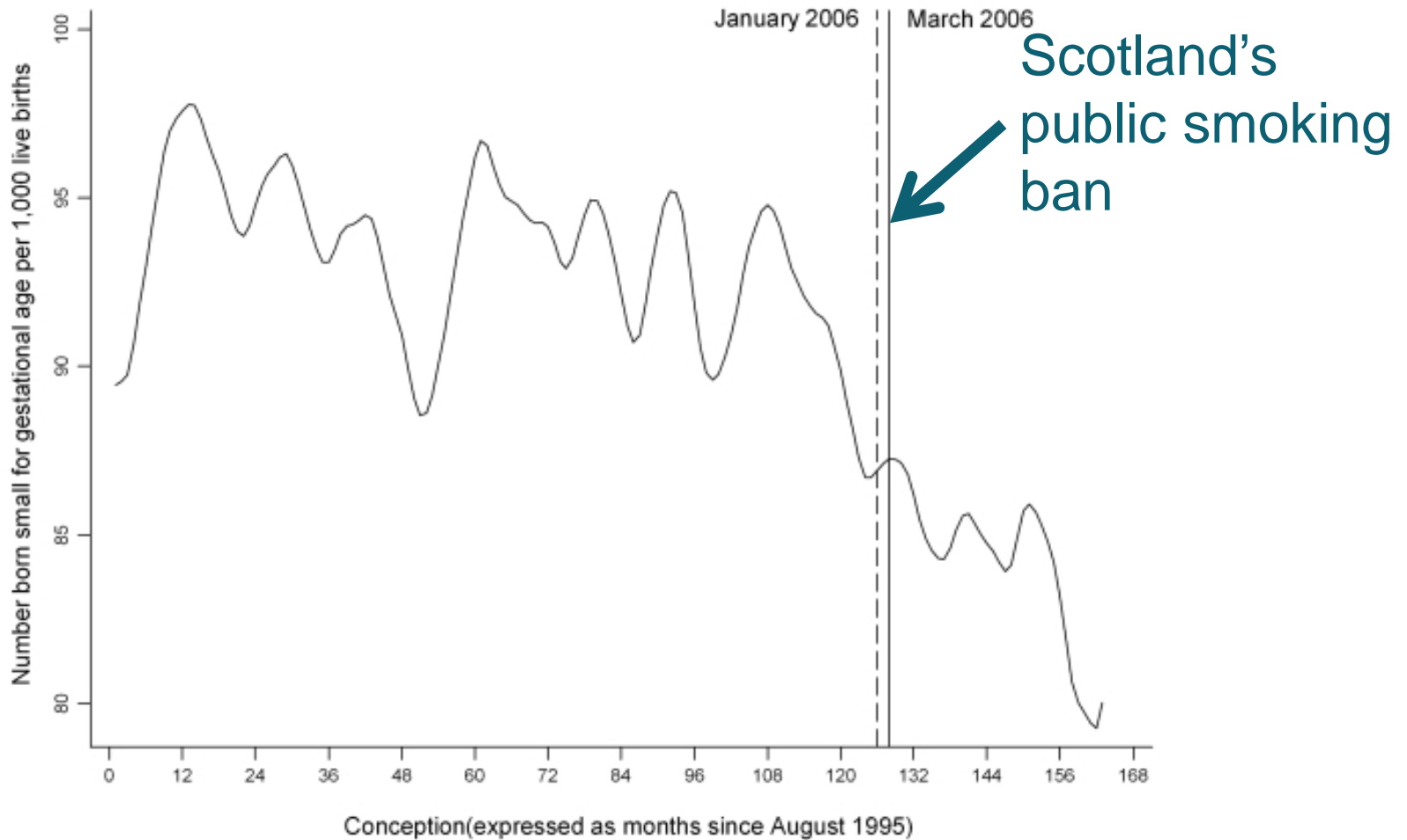


Quartiles: Inverse Distance Weighted Well Count



Societal Change is Possible: Tobacco Smoke

Small for Gestational Age



Questions:

(4) what you have learned

- Audiences vary in receptivity/interest
- New research coming out often

?s

