

# Unemployment Makes People Twice As Unhappy As Pollution



By Chuck Dinerstein — April 19, 2017



Some media outlets have claimed that air pollution will make you just as unhappy as the death of a spouse. While the quick joke will be that it depends on the spouse, it shows why economics and surveys should not be conflated with science, even by journalists who are trying to get your attention.

Predictably, outlets like *Newsweek* dutifully repeated the claim without any critical thinking. Luckily, you have us for that. The short story is that while yes, air pollution could make people surveyed as unhappy as losing a spouse, it also showed both made them half as unhappy as if they lost their job. But that won't sell anywhere near as well in British papers.

Sarah J Knight and Peter Howley, members of the University of York Environment Department, set out to make the case that environmental restrictions are worth the cost, so they did it by correlating [nitrogen dioxide and happiness](#) [1]. Ah, the power of combining the thoughts of economists with those of public health officials:

*Local environmental amenities such as clean air play a significant role in our quality of life. ... But how much value do we put on environmental features relative to other factors that affect our utility? ... in order to provide a clear rationale for environmental management and regulation, it is important to calculate how much value people attribute to environmental features*

For those who have not had the benefit of a course in economics, "utility" is the value we place on something. So the paper is about determining the value people place on clean air - basically, how

much we like regulations that lessen pollution. Nitrogen dioxide, NO<sub>2</sub>, is a component of smog and was chosen because it is found in fossil fuel emissions, like diesel vehicles in the United Kingdom. "UK levels of NO<sub>2</sub> regularly exceed legally enforced EU air quality standards." [1] That's important because diesel cars make up 34.5 percent of licensed cars in Great Britain, where gasoline prices are higher than diesel fuel.

Data on NO<sub>2</sub> concentrations has been cataloged by small geographic areas, with a population of one to three thousand people and 400 to 1200 homes. The authors then layered demographic and socioeconomic data for the same geographic areas. Finally, they placed a layer of survey data from those areas which included the question, 'How dissatisfied or satisfied are you with life overall?' Respondents were given a 7 point scale of options, from completely satisfied to completely unsatisfied.

And with the beauty of math, the authors just plug all those numbers into their model and:

$$LS_{ijt} = \beta_0 + \beta_1 N_{jt} + L_{jt}'\beta_2 + X_{it}'\beta_3 + \beta_4 T_t + \varepsilon_{ijt}$$

THIS METHODOLOGY ISN'T AS BAD AS IT LOOKS. IT'S WORSE.

Now, here resulted a typical media [headline](#) [2]: "Diesel fumes can make people feel just as bad as a partner's death, study says"

### **Pollution Actually Has Little To Do With Life Satisfaction**

The study found, "NO<sub>2</sub> is significantly and negatively related to life satisfaction (p<0.001). ... a 10 ?g/m<sup>3</sup> increase in annual average NO<sub>2</sub> levels ... is associated with a 0.07 decrease in life satisfaction [using that 1 to 7 scale]

Let me translate: NO<sub>2</sub> was significantly (let's not get started on misuse of p-values) and negatively related to life satisfaction in their survey results— but among all the factors considered it accounted for *only 0.7% of life satisfaction*. That's trivial. So they decided to make this a bit more attention-grabbing and accomplished it with this paragraph in the discussion:

*"To help put these findings into perspective, we compared this effect size to that of many other widely studied determinants of subjective well-being using standardised coefficients. Our standardised coefficients suggest that the substantive magnitude of the relationship between NO<sub>2</sub> and life satisfaction is comparable to that of many 'big hitting' life events. For example, the estimated disutility effect from NO<sub>2</sub> is equivalent to that of being separated or widowed when compared to being single, and approximately half that of being unemployed when compared to being employed."*

The information on all those other variables is only buried deep within the paper, so what really accounts for "life satisfaction"?

**Your age when asked.** And **your health.** That was anywhere from 10 to 21 more times important (depending on how good your health was). And lots of other variables, being **married, separated, divorced, widowed, unemployed, retired**, even **having a long commute** all contributed as much or more to life satisfaction.

Given their data set the headline could just as well have been

### **Unemployment Makes People Feel Twice As Bad As The Death Of A Spouse**

So here is the bottom line: The math was technically correct but what they did with it - taking a layer of smog and putting just one response to a survey question over top of it - was a fishing expedition.

It is not fake science; it is not science at all. It is an economic exercise that tells us that when given a choice, we would rather have clean air than not.

Duh.

#### **NOTE:**

[1] The mean value for NO<sub>2</sub> in England was 9.95  $\mu\text{g}/\text{m}^3$  with a maximum in London of 57.68  $\mu\text{g}/\text{m}^3$  and a minimum of 2.83  $\mu\text{g}/\text{m}^3$  in Cornwall. The EU legal limit is 40  $\mu\text{g}/\text{m}^3$ .

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#### **Links**

[1] <https://www.york.ac.uk/media/economics/documents/hedg/workingpapers/1708.pdf>

[2] <https://news.vice.com/story/diesel-fumes-can-make-people-feel-just-as-bad-as-a-partners-death-study-says>