

Living in polluted cities is blamed for older men's loss of brainpower

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Air pollution has been linked to the shrinkage of “white” connective tissue in men's brains MATTHEW FEARN/PA

Air pollution may take a much heavier toll on the mental abilities of men than it does on women, according to a study.

Men living in cities with high levels of pollution appear to lose their faculties for logical and verbal reasoning at a faster rate than women. For older men in the most polluted areas the loss could be equivalent to a year of education or a gap of more than 20 per cent in test scores.

Academics argue that the divide could be attributed to structural differences in the brain that leave men more vulnerable to the shrinkage of “white” connective tissue linked to air pollution. This theory has been challenged by independent scientists.

Public health researchers at Yale University in the United States and Peking University in Beijing analysed the performance of 25,485 people in China on maths and language exams conducted in 2010 and 2014. It is understood to be

the first study to examine how these scores changed in relation to both day-to-day fluctuations and long-term trends in exposure to air pollution.

It found that young men and women tended to do equally well in the cognitive tests up to the age of 30, but men tended to do notably better than women later in adulthood.

In the most polluted cities, however, the scores of older men dipped dramatically, especially on the language papers. For every extra ten units on the Air Quality Index, which measures three different kinds of pollutant and runs from zero to 500, the average man was found to lose 2.1 per cent more of his cognitive ability than a woman of the same age in the same area. The index in London ranges from single figures to almost 200. The levels in Beijing tend to range between 35 and 250.

TOXIC CONSEQUENCES

- Air pollution has been blamed for 40,000 early deaths a year in the UK and more than three million worldwide. The various particles and gases are known to irritate the lungs and exacerbate respiratory diseases. They have also been linked to a wide range of serious illnesses such as cancer and heart disease.
- A report from the London School of Economics suggested that it may be responsible for a rise in road accidents, possibly because it reduces visibility or causes itchy eyes and noses.
- In the past five years studies have shown that higher ozone levels make farm workers less productive, and that fine soot particles and carbon monoxide appear to harm teenagers' exam performance.

The research is published as a working paper on the EconStor website. Xi Chen, assistant professor of public health at Yale, who led the study, said that the impact was large enough to be economically significant. "The gender gap in active white matter is a very plausible mechanism through which air pollution may impose a gender-differentiated impact on cognitive performance," he said. "Our study might be the first step towards explaining this important phenomenon."

Barbara Maher, of Lancaster University, who worked on research showing that nanoparticles of magnetite from air pollution can find their way into the brain, said that some important questions needed to be answered. "This paper suggests some gender differences in the impacts of air pollution on brain white matter

and grey matter, but the measures of air pollution exposure are very broad-brush,” she said.

Gina Rippon, professor of cognitive neuroimaging at Aston University in Birmingham, said that the authors had misinterpreted the science of grey and white matter. “It would be interesting to know what kind of effects air pollution might be having on brain structure or function, but I do not think this paper is going to help that cause,” she said.

36 comments

Brechan Pryddach

What's this article about again ?

Mr W L Alexander

The elephant in the room is smoking. People across the world are dying like flies from smoking but meanwhile the latest fad is to fuss more about pollution. Has anyone seen a single death certificate with cause of death: pollution?

PS I agree reducing pollution is laudable but let's not get too blinkered.

HighgateGuy

Yet the Mayor of London continues to do little about this serious problem. Another tax on diesel vehicles will not have much impact - just look how ineffective the Congestion Charge has been.

Mr Mayor: Please stop faffing around and stop polluting vehicles being used.

Chris Oakley

Today's instalment in the current scare story is yet more questionable epidemiology, interpreted, it seems, according to a real scientist, by people who don't appear to know what they are talking about.

With respect to those those 40,000 early deaths that appear here yet again, can anyone at The Times point me to a robust objectively critiqued body of evidence that supports that oft quoted number?

Gramarian

So the political thickoes strike again. It was well understood at the time that China was creating the CO2 pollution but the actual threat to the UK population was dirty emissions.

Alan Ford

For years I was amazed that it appeared so many premature deaths were down to poor air quality, but little was said in the media. Suddenly, there now appears to be a news story every day or a new finding. It makes me think the situation has got so bad that they cannot play it down any longer. Something has to be done.

Foreversideways

It's flavour of the month, don't worry the media will move onto something else shortly.

Chris Oakley

@Alan Ford Nope. It's just that the mainstream media have latched onto it as the latest fad and producing epidemiological scare stories is ridiculously simple meaning that policy based evidence is not hard to come by.

Alan Ford

@Chris Oakley @Alan Ford @[Foreversideways](#)
So all science is wrong and should be ignored then....

Chris Oakley

@Alan Ford @Chris Oakley I didn't say that, or anything close to it. I work in science.

There is some pretty solid evidence that a lot of what is published these days is of questionable value and epidemiology is, being kind, an inexact science. I have compared its use as a generator of unrealistically precise numbers to trying to split the atom with a bread knife.

It is however an excellent tool for creating credible sounding statistics for those who do not want to think too deeply or too scientifically.

C J Delmege

@Alan Ford @Chris Oakley There is no science. Just guesswork. "May, might, probably, linked, etc". All the usual weasel words. The dramatic rise in nut allergies may also be down to air pollution....

HighRisk Mouse

Maybe there should be some sort of weighting system for city-dwelling old men's votes? A male vote in Islington, say, should be worth half of a male vote in Lincolnshire and a quarter of a female vote. Poor mental functioning combined with an unassailable belief in their superiority. You see it all the time.

anthony graham

Sounds unlikely. Suspect the conclusions of this research will be refuted at some point.

LapsedScientist

@anthony graham Sounds unlikely why - because you don't like the conclusion?

Cigarette smoking is associated with health issues (including cognitive decline), so why wouldn't air pollution be?

The male vs female element is odd, but not impossible.

Chris Oakley

@LapsedScientist @anthony graham Is it not possible that some of the effects enthusiastically attributed to cigarette smoking might actually be caused by pollution? It wasn't accounted for in any study I know of.

I have no idea what the answer to that question is but neither do the epidemiologists and other number torturers creating the headlines.

Yes, the male v female element is odd, so what a halfway decent scientist would do would be to destruction test the data and have a plausible scientific explanation for it before running to the press shouting about a half baked theory.

Sadly, scientific ethics and rigour are not fashionable at present, which is partly why so much junk appears in newspapers.

I note that a real scientist was interviewed for this piece and criticised the authors for not understanding fundamental brain biology.

Come and Go

"Men living in cities with high levels of pollution appear to lose their faculties for logical and verbal reasoning at a faster rate than women"

In what sort of city did Donald Trump spend most of his life - granted that he would deny the existence of any man-made pollution?

kenneth wheatley
So that's why I'm stupid!

Peter Parkinson

@kenneth wheatley maybe your comment answers the question, move to the country and you might get your brain back.

There should be air cleaners at the side of the road in cities and motorways, I was at University in London and drove home, when you get south of the M25 the could notice the quality of the air increase as I came down the A21 on the Tonbridge bypass.

I live in the polluted countryside between the M20 and the M26, the air can be clean and misty or on an hot day polluted.

Live by the sea but the air was dirty in Hastings I here their Bexhill bypass does not make much difference.

kenneth wheatley

@Peter Parkinson @kenneth wheatley I can see by your English that the air quality is obviously affecting you too!

I haven't started dribbling yet but suppose that will be next!

Jack Hill

As soon as I read the statements : "the loss could be equivalent to a year of education or a gap of more than 20 per cent in test scores" and "young men

and women tended to do equally well in the cognitive tests up to the age of 30, but men tended to do notably better than women later in adulthood" I knew that this report and the precis of the outcomes suggested by this research were flavoured with social virtue and probably pointless. Obviously this is simplistic media report but even so...

George Canning said "I can prove anything with statistics except the truth". Hear hear.

I think that is a thought we should all carry at the back of our minds when reading anything in the "news".

Arclight

Yet more evidence that the cost of not doing anything about Britain's air quality disaster far outweighs the cost of tackling it.

The government should make a start by ignoring Franco-German complaints and banning the sale of new diesel vehicles immediately.

Chris Oakley

@Arclight I would prefer it if the government completely ignored ill informed authoritarians who want to ban things.

Arclight

@Chris Oakley @Arclight Yes, I'll wager you were right there alongside asbestos manufacturers' for years arguing 'nothing to see here, just some ill informed authoritarians making a fuss'.

Back in the real world there is a mountain of research linking diesels to lung disease stretching as far back as the 1950s.

Nuffin Bettatwodo

Is prolonged exposure to living with women an underrated factor in cognitive wear down rates?

At my age it is hard to ignore the impact over time of this adverse environmental hissew.

A very exhausting Government Report on this controversial topic is long overdue, but I worry endlessly that Mrs May may be too busy to give it the priority it deserves?

This is a widespread hazard over which one can't be too serious, whether a city or rural dweller.

It is already clear that anyone exposed to prolonged cohabitation, and who lives in Westminster, rather than in the countryside is already certainly mad. But we don't yet know quite how mad they are?

Iain

Can you imagine the danger to the rest of the country if the cities empty their doddering old men out into the wild, not to mention the jump in rural house prices. It may also help explain the poor cognitive reasoning of MP's, Lords and judges.

David

@Iain Yes, I think that judgement and decision-making abilities decline after the age of about 70. That's why it is a good idea to have your financial position sorted out by that age.

C J Delmege

Since air quality has improved dramatically over the decades one would expect we should all be cleverer than our predecessors. So yet another alarmist and worthless study, as the last paragraph shows.

Paul Johnson

Except the growth in diesel vehicles which unfortunately was a mistake

Iain

In comparison to a century or two of burning coal the nitrogen oxides from diesel cars are miniscule. NOx emissions are not only from diesel fuel. The use of biofuels is also misleading, generally people associate the word with greener energy sources where in fact they emit far more NOx than diesel, it's also a less efficient energy conversion so more biofuel has to be burned for the same energy release as a diesel engined vehicle.

David

@Iain I think you are really describing the characteristics of a compression-ignition internal combustion engine which has only become common during the last 100 years or so.

Orleigh Wragg

@Iain It is almost futile to take an holistic view when a bandwagon starts rolling. When we've finished demonising diesel cars, we'll start demonising electric cars because the disposal of millions of "expired" batteries will be an environmental problem, and that doesn't take into account the extra pollution from power stations which will have to increase their output to match the vehicle demand.

C J Delmege

@Orleigh Wragg @Iain Power stations which at peak times are powered by diesel generators....

Jack Townshend

@Paul Johnson

The diesel vehicles of the 50s, 60s and 70s and 80s were infinitely worse on emissions than those of today. I can remember huge clouds of black smoke whenever the diesel vehicle in front pulled off. I also see this study as worthless. Why has this only come to light now when NOx emissions and their possible effects have been known for years including when the "new" diesel cars were being promoted as "the way to go"? I await the next "scare" with baited breath.

David

@C J Delmege That may be true when it comes to burning coal during the winter months but I doubt that it is true for most other pollutants. Also, the areas and times of exposure are probably much greater today.

C J Delmege

@David @C J Delmege "Probably"? Or "probably not"?

I'm all for cleaner air, but only on the basis of solid science. Otherwise we will merely repeat the fiasco of the early noughties dash for diesel.

David

@C J Delmege @David Sorry CJD but what is the scientific basis for your comment? For mine it is that the relatively new, non-coal polluters such as diesel powered cars are widespread throughout our towns and cities and are operational 365 days a year. Hence, the areas and times of exposure to their pollutants are greater than they would have been during the era to which you refer.