Submission ID: 14784

I am Jen Shippey, I am general practitioner-I work as Dr Haine, I am a General Practitioner and partner at Upwell Health Centre. I am also a wife of a farm manager, mum of 2 young boys. I live in Wisbech. I am representing myself.

The most important point to make regarding this incinerator is that there is no safe level of particulates.

We will be exposed to particulates from the exhaust fumes from the chimneys - breathing the contaminated air, absorbing through the skin and by eating contaminated food.

But we will also be exposed to an increase in particulate matter from the increase in road vehicle emissions during the construction and day to day running of the incinerator.

A Study printed in BMJ 2019 367:l6609 analysed hospital admissions for adults over 65 during 2000-2012 in the United States.

It confirmed previously established associations between short term fine particulate matter PM2.5 concentration and respiratory, cardiovascular, Parkinson's disease, diabetes mellitus and found diseases not previously associated with PM 2.5

These diseases included septicaemia, fluid and electrolyte disorders, renal failure, infections of urinary tract, skin and subcutaneous tissue.

For each 1microgram per metre cubed increase in Pm2.5 was associated with 2050 extra hospital admissions 12 216 days in hospital and Â£24 million in care costs

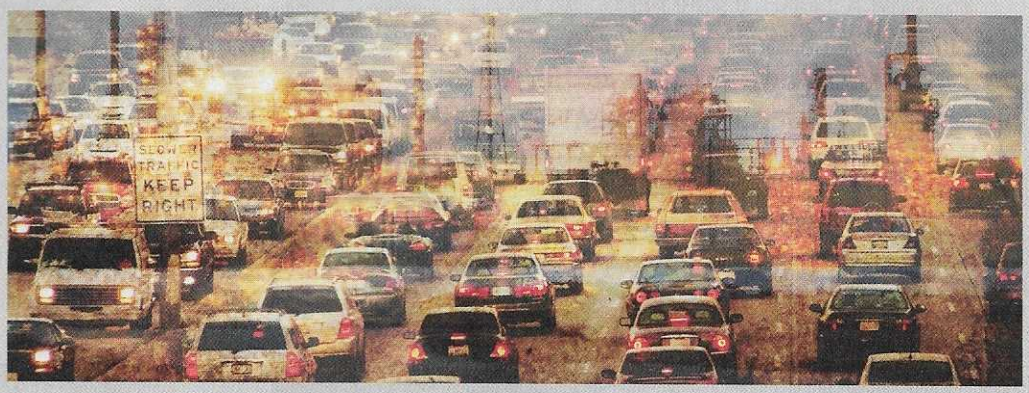
These associations remained even when the analysis was restricted to days when the PM2.5 concentration was below the world health organisation's guideline- confirming the conclusion of the author- there is no safe level of particulates.

So any release/ increase in particulates in the local atmosphere will adversely affect the health of the local and surrounding populations, increase hospital admissions and increase care costs.

We know wisbech and surrounding areas have areas of very severe deprivation and as a consequence have worse health outcomes. Is this why this location has been chosen? - Any deterioration in health outcomes will possibly be not as noticeable than in an affluent area with better health comes?

I am not prepared for my family, friends, work colleagues, patients to be exposed to this.

Ultimately- There is no safe level of particulates - This incinerator will cause increased ill health and deaths. It cannot be allowed to be built.



COMMENTARY The harder we look, the more we find

Fine particulate matter (PM) of diameter less than 2.5 microns ($PM_{2.5}$) is ubiquitous, emanating especially from transport and combustion sources. Since a seminal 1993 study showing a clear association between airborne $PM_{2.5}$ and mortality rates in six cities in the United States,[1] many attempts have been made to quantify the global annual burden of mortality due to $PM_{2.5}$—0.8 million in 2005,[2] 3.15 million in 2015,[3 4] and almost 9 million in 2018.[5] This increase reflects not a 10-fold rise in $PM_{2.5}$ exposure, but improved modelling of $PM_{2.5}$ concentrations, and use of real world exposure-response associations incorporating new data from developing nations, which has led to conclusions with increased reliability and, unfortunately, of increased mortality.

$PM_{2.5}$ has been associated with diseases of the respiratory and cardiovascular systems, with cardiovascular disease likely occurring through systemic inflammation and possibly translocation of particulate matter into the circulation.[6] Indeed, ultrafine particles (<100 nanometres in diameter) have been found in the brain and heart.[7 8]

Wei and colleagues confirmed previously established associations between short term $PM_{2.5}$ concentration and respiratory, cardiovascular, and Parkinson's disease, and diabetes mellitus, and found in addition that, through diseases not previously associated with $PM_{2.5}$, each 1 $\mu g/m^3$ increase in $PM_{2.5}$ was associated with 2050 extra hospital admissions, 12 216 days in hospital, and $31m (£24m, €28m) in care costs. These diseases included septicaemia, fluid and electrolyte disorders, renal failure, and infections of the urinary tract, skin, and subcutaneous tissue.

No safe limit

Crucially for informing policy, these associations remained even when the analysis was restricted to days when the $PM_{2.5}$ concentration was below the World Health Organization's guideline of 25 $\mu g/m^3$, confirming the conclusions of other authors finding no safe lower limit for exposure to $PM_{2.5}$.[11]

Our knowledge of the health effects of PM is still lacking in many areas—notably the range of disease outcomes associated with particulates and their causality; and the effects of long term exposure, indoor exposure, and ultrafine PM. The relative effects of different PM sources, and any differences between primary PM (released from source) and secondary PM (formed by reactions of pollutant gases following release), are also poorly understood. We urgently need more epidemiological research to uncover new disease associations and to investigate newly reported associations, and toxicology research to explore potential causative mechanisms.

Associated diseases included septicaemia, fluid and electrolyte disorders, renal failure, and infections

As the burden of disease associated with pollution becomes more apparent, better awareness among health professionals and the public is needed to help prevent pollution associated disease exacerbations, and to push for policies to reduce emissions.

During the 2008 Beijing Olympics, transport and industrial restrictions substantially improved air quality, accompanied by a 46% drop in relative risk of outpatient visits for asthma.[18] Such restrictions are probably unsustainable, but progress has still been made. Thirteen years after the aforementioned seminal study on six US cities,[1] the authors re-evaluated the situation. In the intervening years, five of the six cities showed reduced $PM_{2.5}$ concentrations, and a proportionate reduction in $PM_{2.5}$ associated mortality.[19]

Clearly, there is much still to learn, but we should not mistake knowledge gaps for paucity of evidence. The sooner we act, the sooner the world's population will reap the benefits.

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Find the full version with references at [redacted]

Matthew Loxham [redacted]
Donna E Davies
Stephen T Holgate
See bmj.com for author details

Study answer and limitations

Short term exposure to $PM_{2.5}$ was associated with increased risk of hospital admission for several prevalent but rarely studied diseases such as septicaemia, fluid and electrolyte disorders, and acute and unspecified renal failure. It was also associated with hospital admissions due to cardiovascular and respiratory diseases, Parkinson's disease, diabetes, phlebitis, thrombophlebitis, and thromboembolism, consistent with previously published results. These associations remained consistent when restricted to days with a daily $PM_{2.5}$ concentration below the WHO 24 hour guideline. In addition, each 1 $\mu g/m^3$ increase in short term exposure to $PM_{2.5}$ was associated with an annual increase of 5692 hospital admissions, 32 314 days in hospital, and 634 deaths at discharge, corresponding to $100m (£78m) annual inpatient and post-acute costs and $6.6bn economic value of lives lost at discharge. The major limitation of this study was that costs incurred after discharge were not fully captured.

What this study adds This study discovered new causes, and confirmed known causes, of hospital admissions associated with short term exposure to $PM_{2.5}$, even at a concentration below the WHO air quality guideline. This study also reported substantial economic costs linked to a small increase of short term $PM_{2.5}$.

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This study was supported by the National Institutes of Health, National Cancer Institute, Health Effects Institute, and United States Environmental Protection Agency. Authors have no competing interests. No additional data available.

The health effects of fine particulate air pollution

ORIGINAL RESEARCH Time stratified, case crossover study

Short term exposure to fine particulate matter and hospital admission risks and costs in the Medicare population

Wei Y, Wang Y, Di Q, et al

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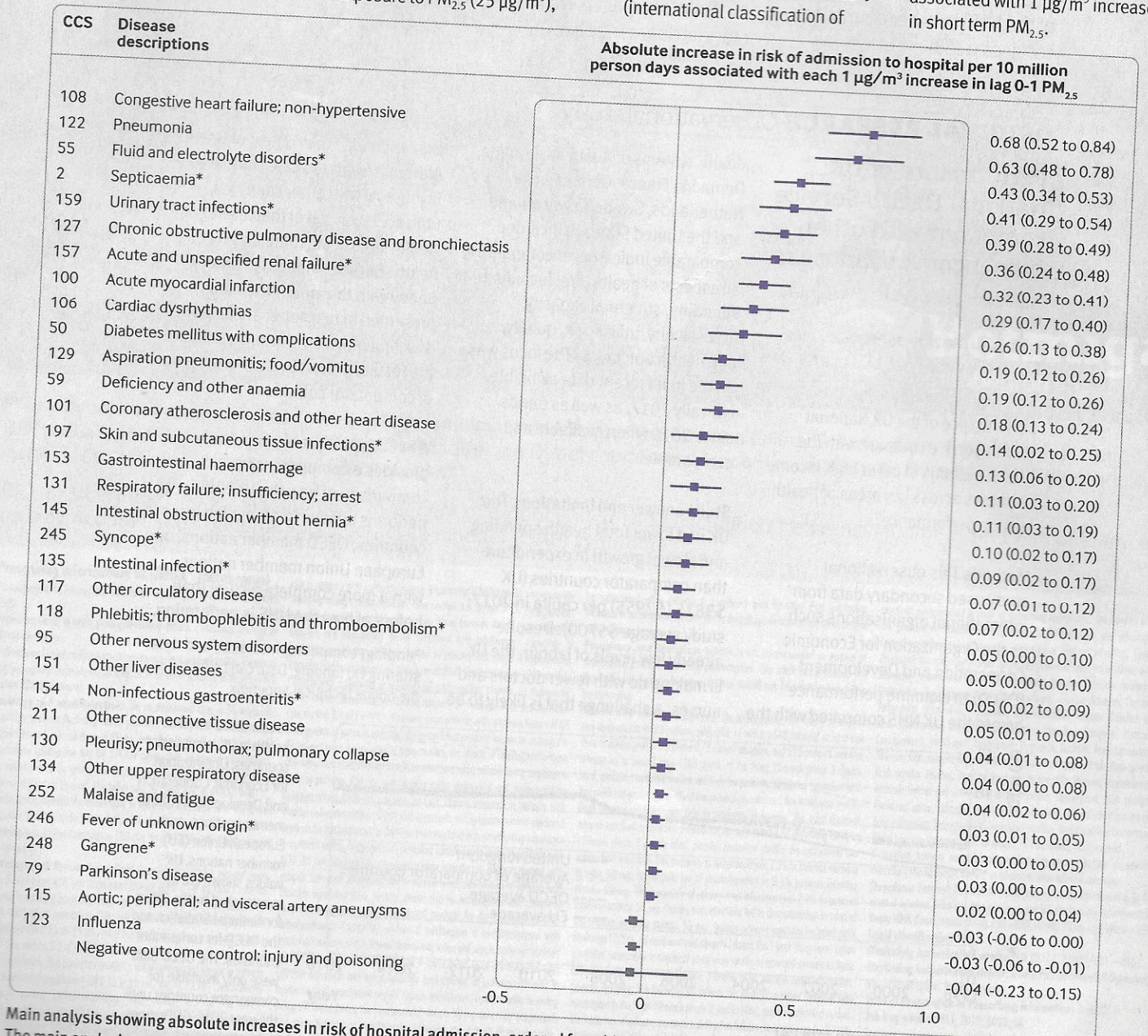
Find this at: http://dx.doi.org/10.1136/bmj.l6258

Study question Which causes of hospital admission for adults aged 65 or older are associated with short term exposure to fine particulate matter of diameter less than 2.5 microns ($PM_{2.5}$), do these associations exist at a daily concentration below the World Health Organization's air quality guideline for the 24 hour average exposure to $PM_{2.5}$ (25 μg/m^3), and what are the economic costs associated with a unit increase in short term exposure to $PM_{2.5}$?

Methods Overall, 95 277 169 Medicare inpatient claims of all fee-for-service beneficiaries aged 65 or older in the United States during 2000-12 were analysed. More than 15 000 ICD-9 (international classification of diseases, ninth revision) principal diagnosis codes at discharge were classified into 214 mutually exclusive disease groups. For each disease group, a time stratified, case crossover analysis was conducted to estimate the risk of hospital admission and the corresponding costs associated with 1 μg/m^3 increase in short term $PM_{2.5}$.



Main analysis showing absolute increases in risk of hospital admission, ordered from highest to lowest, associated with each 1 μg/m^3 increase in lag 0-1 $PM_{2.5}$. The main analysis was conducted in the case crossover study setting with lag 0-1 $PM_{2.5}$ as the exposure, adjusted for penalised splines of lag 0-1 air and dew point temperatures for each disease group. The Bonferroni correction was used to adjust 95% confidence intervals for disease groups associated with lag 0-1 $PM_{2.5}$ and negative outcome control (injury and poisoning). CCS=Clinical Classification Software code. *Newly identified disease groups