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<sup>1</sup> Finnish Institute for Health and Welfare, Helsinki, Finland

<sup>2</sup> Norwegian Institute of Public Health, Norwegian Institute of Public Health, Oslo, Norway

Correspondence to: H Lehtomäki  
heli.lehtomaki@thl.fi

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# Phasing out fossil fuels would save millions of lives worldwide

A rapid and just transition to cleaner energy is needed

Heli Lehtomäki,<sup>1</sup> Shilpa Rao,<sup>2</sup> Otto Hänninen<sup>1</sup>

Fossil fuels are the principal driver of the climate change currently damaging human health, wellbeing, and ecosystems, and posing a threat to overall planetary health.<sup>1,2</sup> Fossil fuels are also a major source of particulate matter and ozone.<sup>3</sup> These air pollutants are responsible for a wide range of adverse health outcomes, including an estimated 6.7 million deaths globally in 2019.<sup>3</sup> However, deaths are only one part of the problem. Improved air quality would reduce the burden of several major diseases leading to healthier and longer lives, fewer patients requiring admission to hospital and other treatments, and decreasing the burden on health systems worldwide.

Accumulating evidence shows that air pollution causes systemic inflammation and oxidative stress, leading to deterioration of cardiovascular and respiratory health, and adverse effects on nervous systems, metabolism, and mental and reproductive health.<sup>4</sup> Air pollution might work as a trigger, accelerating disease progression, and worsening people's health and prognosis. Young children, pregnant women, elderly people, and people who have chronic diseases are especially susceptible to the effects of air pollution.

In a linked study, Lelieveld and colleagues (doi:10.1136/bmj-2023-077784) quantified the potential effect of fossil fuel phase-out on human lives.<sup>5</sup> They estimate that in 2019, 8.3 million (95% confidence interval 5.6 to 11.2) deaths worldwide were attributable to fine particles (PM<sub>2.5</sub>) and ozone (O<sub>3</sub>). Overall, fossil fuels were linked to 61% (5.1 million; 95% confidence interval 3.6 to 6.3) of all deaths related to PM<sub>2.5</sub> and O<sub>3</sub>. The proportion of fossil fuel related deaths from all deaths related to air pollution varied from 25% to 85% among different regions of the world. The lowest proportions (in Sub-Saharan and North Africa and the Middle East) are mainly explained by the higher proportion of deaths related to natural emissions, such as desert dust, in these regions.

Lelieveld and colleagues' estimates of fossil fuel-related deaths are larger than most previously reported values suggesting that the phasing out of fossil fuels might have a greater impact on mortality than previously thought.<sup>6,7</sup> They used a new model to quantify the associations between exposure and health outcome, which led to larger estimates.<sup>8</sup> Their model was based solely on studies of ambient air pollution whereas some earlier models included other exposures as well. Differences in the models used have been identified as one of the main factors contributing to variations in health risk assessments.<sup>9,10</sup>

Phasing out the use of fossil fuels would have health benefits far beyond reducing premature mortality.

Although numbers of attributable deaths provide an estimate of the health effects of fossil fuels, they do not account for the morbidity associated with air pollution. Quantifying the health burden using disability adjusted life years would account for loss of health, in addition to loss of life.

Clean renewable energy sources are needed to replace fossil fuels. The share of renewable energy in global electricity generation was 28% in 2020.<sup>11</sup> To get a more complete picture of the health and climate benefits of the fossil fuel phase-out, the effects of switching to alternative technologies need to be accounted for. Transition to renewable biofuels is not emission free, and while other approaches such as wind, sun, and geothermal power, remove air pollutants efficiently, they might also introduce other adverse effects on the environment and human health. These effects will need to be explored in further research.

As the 28th UN climate summit (COP28) begins on 30 November 2023, we urge country leaders to commit to an accelerated, just, and equitable phase-out of fossil fuels.<sup>12</sup> High income countries must agree to lead the way. Although climate related impacts of such a transition are evident, Lelieveld and colleagues show that such a strategy would also save lives by reducing air pollution. The benefits of fossil fuel phase-out on global health, in addition to the climate, must be recognised and play a key role in shaping discussions at COP28.

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