

Climate change already damaging health of world's children and threatens lifelong impact

****Country-level data available** [1]**

- New research from 35 global institutions published in *The Lancet* reports on extensive health damage from climate change and sets out the lifelong health consequences of rising temperatures for a child born today should the world follow a business-as-usual pathway. [2]
- As temperatures rise, infants will be vulnerable to the burden of malnutrition and rising food prices—average global yield potential of maize (-4%), winter wheat (-6%), soybean (-3%), and rice (-4%) has declined over the past 30 years.
- Children will be among the most to suffer from the rise in infectious diseases—2018 was the second most climatically suitable year on record for the spread of bacteria that cause much of diarrhoeal disease and wound infection globally.
- Throughout adolescence, the impact of air pollution will worsen—with premature deaths from outdoor air pollution (PM2.5) stagnating at 2.9 million worldwide in 2016 (over 440,000 from coal alone); total global energy supply from coal rose 1.7% from 2016 to 2018, reversing a downward trend.
- Extreme weather events will intensify into adulthood, with 152 out of 196 countries experiencing an increase in people exposed to wildfires since 2001–2004, and a record 220 million more over 65s exposed to heatwaves in 2018 compared with 2000—63 million more than in 2017.
- Pursuing the Paris Agreement pathway to limit warming to well below 2°C could allow a child born today to grow up in a world which reaches net-zero emissions by their 31st birthday—and secure a healthier future for coming generations.
- Authors call for health impact of climate change to be at forefront of the agenda at the UN Climate Conference (COP25) next month.

Climate change is already damaging the health of the world's children and is set to shape the wellbeing of an entire generation unless the world meets Paris Agreement targets to limit warming to well below 2°C, according to a major new report published in *The Lancet*.

The *Lancet* Countdown on Health and Climate Change is a comprehensive yearly analysis tracking progress across 41 key indicators, demonstrating what action to meet Paris Agreement targets—or business as usual—means for human health. The project is a collaboration between 120 experts from 35 institutions including the World Health Organisation (WHO), World Bank, University College London, and Tsinghua University.

"This year, the accelerating impacts of climate change have become clearer than ever", says Professor Hugh Montgomery, Co-Chair of The Lancet Countdown and Director of the Institute for Human Health and Performance at University College London. "The highest recorded temperatures in Western Europe and wildfires in Siberia, Queensland, and California triggered asthma, respiratory infections and heat stroke. Sea levels are now rising at an ever concerning rate. Our children recognize this Climate Emergency and demand action to protect them. We must listen, and respond."

For the world to meet its UN climate goals and protect the health of the next generation, the energy landscape will have to change drastically, and soon, the report warns. Nothing short of a 7.4% year-on-year cut in fossil CO₂ emissions from 2019 to 2050 will limit global warming to the more ambitious goal of 1.5°C.

Lifelong health impacts of business as usual

If the world follows a business-as-usual pathway, with high carbon emissions and climate change continuing at the current rate, a child born today will face a world on average over 4°C warmer by their 71st birthday, threatening their health at every stage of their lives.

“Children are particularly vulnerable to the health risks of a changing climate. Their bodies and immune systems are still developing, leaving them more susceptible to disease and environmental pollutants”, says Dr Nick Watts, Executive Director of The Lancet Countdown. “The damage done in early childhood is persistent and pervasive, with health consequences lasting for a lifetime. Without immediate action from all countries to cut greenhouse gas emissions, gains in wellbeing and life expectancy will be compromised, and climate change will come to define the health of an entire generation.”

Infants will be among the worst affected by crop failures

As temperatures rise, harvests will shrink—threatening food security and driving up food prices. When grain prices spiked in 2007–2008, for example, Egypt’s bread prices rose 37%. Over the past 30 years, global yield potential of maize (-4%), winter wheat (-6%), soybean (-3%), and rice (-4%) has fallen. Infants and small children are among the worst affected by malnutrition and related health problems such as stunted growth, weak immune systems, and long-term developmental problems.

Children will be particularly susceptible to infectious disease outbreaks

Children will be particularly susceptible to infectious diseases that rising temperatures and changing rainfall patterns will leave in their wake. Over the past 30 years, the number of climatically suitable days for *Vibrio* bacteria (that cause much of diarrhoeal disease globally) have doubled. The threat is particularly high in the Baltic (with a record high of 107 suitable days in 2018) and in Northeast USA where the sea has been warming rapidly.

Similarly, changing weather patterns are creating favourable environments for *Vibrio cholerae* bacteria, with global suitability rising almost 10% since the early 1980s—increasing the likelihood of cholera outbreaks in countries where the disease does not regularly occur.

Spurred on by climate change, dengue is the most rapidly spreading mosquito-borne viral disease in the world. Nine of the 10 most hospitable years for dengue transmission have occurred since 2000, allowing mosquitoes to invade new territories across Europe. Around half of the world’s population are now at risk.

Air quality will worsen—further damaging heart and lung health

Through adolescence and into adulthood, a child born today will be breathing more toxic air, driven by fossil fuels and made worse by rising temperatures. This is especially damaging to young people as their lungs are still developing, so polluted air takes a great toll, contributing to reduced lung function, worsening asthma, and increasing the risk of heart attacks and stroke.

As global CO₂ emissions from fossil fuels continue to rise (up 2.6% from 2016-2018), energy supply from coal is increasing (up 1.7% from 2016-2018), reversing a previous downward trend, while premature deaths related to PM_{2.5} remain stagnant at 2.9 million worldwide. Coal contributed to over 440,000 premature deaths from PM 2.5 in 2016, and likely over 1 million deaths when all pollutants are considered.

This might only be the tip of the iceberg, researchers say. If Europe were to experience PM_{2.5} at 2016 levels over the lifetime of the current population, economic losses and health costs of air pollution-related disease and premature death could reach €129 billion a year.

Throughout their adult lives, extreme weather events will intensify

Later in life, a child born today will face increased risk from severe floods, prolonged droughts, and wildfires. 152 out of 196 countries have experienced an increase in people exposed to wildfires since

2001-2004—with a financial toll per person 48 times larger than flooding. India alone saw an increase of more than 21 million exposures, and China around 17 million, resulting in direct deaths and respiratory illness as well as loss of homes.

As the fourth hottest year on record, 2018 saw a record-breaking 220 million more over 65s exposed to heatwaves than in 2000 (63 million more than in 2017)—with older city dwellers with chronic health conditions in Europe and the Eastern Mediterranean most vulnerable to heat-related illness such as stroke and kidney disease. Last year, Japan had 32 million heatwave exposures, equivalent to almost every person over 65 experiencing a heatwave.

More frequent and longer heatwaves will redefine global labour capacity, the report warns. In 2018, a potential 45 billion additional hours of work were lost due to extreme heat globally compared to 2000. Amid last year's prolonged heatwaves, outdoor agricultural and construction workers in southern parts of the USA lost as much as 20% of potential daylight hours during the hottest month.

Urgent action needed to protect the health of the next generation

Dr Richard Horton, Editor-in-Chief of The Lancet, called on clinical and global health communities to mobilise: *“The climate crisis is one of the greatest threats to the health of humanity today, but the world has yet to see a response from governments that matches the unprecedented scale of the challenge facing the next generation. With the full force of the Paris Agreement due to be implemented in 2020, we can't afford this level of disengagement. The clinical, global health and research community needs to come together now and challenge our international leaders to protect the imminent threat to childhood and lifelong health.”*

If the world's actions match the ambition of the Paris Agreement pathway, that limits global warming to well below 2°C, a child born in the UK today could see an end to coal use by their 6th birthday, with the growth of solar and wind energy resulting in cleaner air across the country.

In France, the last petrol and diesel cars will be sold by the time they turn 21, with cycle ways and green spaces supporting healthier more liveable cities. By their 31st birthday, a child born today could see the world reach net-zero emissions, ensuring a healthier future for coming generations from cleaner air, safer drinking water, and more nutritious food.

Despite the scale of the challenge, the report offers some reason for cautious optimism—growth in renewables accounted for 45% of total growth in power generation in 2018 (27% from wind and solar power); while use of electricity as a fuel for road transport grew by almost 21% globally from 2015 to 2016; and low-carbon electricity accounted for a third of total electricity generation in 2016.

The Lancet Countdown authors call for bold action to turn the tide on the enormous health impact of climate change in four key areas:

- 1) Delivering rapid, urgent, and complete phase-out of coal-fired power worldwide.
- 2) Ensuring high-income countries meet international climate finance commitments of US\$100 billion a year by 2020 to help low-income countries.
- 3) Increasing accessible, affordable, efficient public and active transport systems, particularly walking and cycling, such as the creation of cycle lanes and cycle hire or purchase schemes.
- 4) Making major investments in health system adaptation to ensure health damage of climate change doesn't overwhelm the capacity of emergency and health services to treat patients.

“The path that the world chooses today will irreversibly mark our children's futures”, says co-author Dr Stella Hartinger from Cayetano Heredia University, Peru. “We must listen to the millions of young people who have led the wave of school strikes for urgent action. It will take the work of 7.5 billion people currently alive to ensure that the health of a child born today isn't defined by a changing climate.”

Notes to Editors:

[1] Country-level findings across all 41 indicators are available from the Communications team on request.

[2] Following a business-as-usual pathway, based on the current global trajectory, is predicted to result in average levels of warming of 4°–7°C by the end of the century.

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For embargoed access to the full Report, please see: <http://www.thelancet-press.com/embargo/EMBARGOEDclimatecountdown.pdf>

For embargoed access to the appendix, please see: <http://www.thelancet-press.com/embargo/EMBARGOEDclimatecountdownAPPX.pdf>

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If you wish to provide a link to the report for your readers, please use the following, which will go live at 23.30 GMT Wednesday 13 November, when the embargo lifts:

[http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(19\)32596-6/fulltext](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)32596-6/fulltext)

Paris Agreement background: 195 countries are currently signed up to the Paris Climate Agreement, which is due to commence in 2020. It aims to reduce the impacts of climate change by preventing the global average temperature from increasing to 2°C above pre-industrial levels, with a view to further limit this to less than 1.5°C. However, how these targets will be achieved and funded by all countries has not yet been agreed.

Lancet Countdown background: The 2019 Report of The Lancet Countdown on health and climate change presents the latest data on 41 indicators across five domains: climate change impacts, exposures and vulnerabilities; adaptation planning and resilience for health; mitigation actions and health co-benefits; economics and finance; and public and political engagement. For more information on the Lancet Countdown see: www.lancetcountdown.org

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