The Lancet Countdown on Health and Climate Change

Policy brief for the EU

NOVEMBER 2019

LANCET COUNTDOWN: TRACKING PROGRESS ON HEALTH AND CLIMATE CHANGE

CPME COMITÉ PERMANENT DES MÉDECINS EUROPÉENS
STANDING COMMITTEE OF EUROPEAN DOCTORS

Climate change and health in the European Union

Limiting the extent of global warming to well below 2°C is crucial, and remains within reach if appropriate policies are rapidly implemented.

European Union Member States are responsible for 7.4% of global greenhouse gas emissions[1], and have a pivotal role to play in the response to climate change and its impacts on populations. The latest data suggests that if little or no action is taken, temperatures may rise 3-5°C by the end of the century.[2] Such levels of warming would have unprecedented implications for the planet and the limits to adaptation may well be reached or exceeded. This underscores the importance of ambitious targets and effective international cooperation, and the need for continued EU leadership on climate mitigation and adaptation.

The EU is already responding to climate change in various ways, including with regard to financial investment (it has been suggested that 20% of the EU budget between 2014 and 2020, i.e. €180 billion, should be spent on protecting the climate[3]) regulatory policies, and support for international commitments (such as the second phase of the Kyoto protocol,[4] ending in 2020 and the 2015 Paris Agreement,[5] due to be implemented in 2020). The EU is currently working to achieve a 20% reduction in greenhouse gas emissions by 2020 relative to 1990, a 40% reduction by 2030 and an 85-90% reduction by 2050.[3] The ambition of the new von der Leyen Commission to realise the first ever EU climate law as part of the European Green Deal and achieve climate neutrality by 2050 is greater still.[6]

The Paris agreement recognises the "right to health", and also the "social, economic and environmental value of voluntary mitigation actions and their co-benefits for adaptation, health and sustainable development". Furthermore, the health benefits of meeting climate objectives substantially outweigh the costs of action.[7]

This briefing focuses on data from four themes featured in the 2019 Lancet Countdown report, namely the economic costs of air pollution, electricity generation, transport, and climate suitability for mosquito-borne disease transmission, and provides policy recommendations. The available data demonstrates the particular need for rapid action in these areas in Europe.

Key messages and recommendations

1. As part of the development of a European Green Deal, EU air quality standards should be updated aligned with WHO guidelines.

2. Boost the share of renewable energy in electricity generation to meet the 2030 target of 32% renewable energy in Europe, and phase out the use of coal and other fossil fuels. Implementation of interventions to increase the share of renewable energy in top power producing countries such as Germany, the UK, Italy, Spain, Poland, the Netherlands, France and Sweden have especially high potential for impact. In order to coordinate with similarly motivated countries, Member States can commit to join the Powering Past Coal Alliance.*

3. Prioritise active, accessible mobility for all. Promote safe walking and cycling and increase accessible mobility for all. Appropriate urban planning including low emission zones, car retrofit or replacement programs, and affordable public transport can also contribute to co-benefits for emissions reduction, air quality and physical activity.

4. Increase investment in European and national infectious disease vector control surveillance, further supporting the work conducted by the European Centre for Disease Prevention and Control (ECDC).

5. With updated nationally determined contributions due to be submitted by 2020, the EU should integrate health considerations throughout proposed interventions, with particular consideration to policies regarding coal and energy, transport, and the adaptation of health systems to respond to mosquito-borne diseases and other health threats, and step up in CO2 emissions reductions goals for 2030.

* Powering Past Coal Alliance. 'Join us'. Online resource, accessed 5 November 2019: https://poweringpastcoal.org/about/Powering_Past_Coal_Alliance_Join

Economic costs of air pollution

The most common components of air pollution include particulate matter (PM), ozone, nitrogen dioxide, and sulphur dioxide, all of which are harmful to health. PM with a diameter of less than 2.5µm is referred to as $PM_{2.5}$. When inhaled, $PM_{2.5}$ penetrates deep into the lungs and enters the bloodstream due to its small diameter.

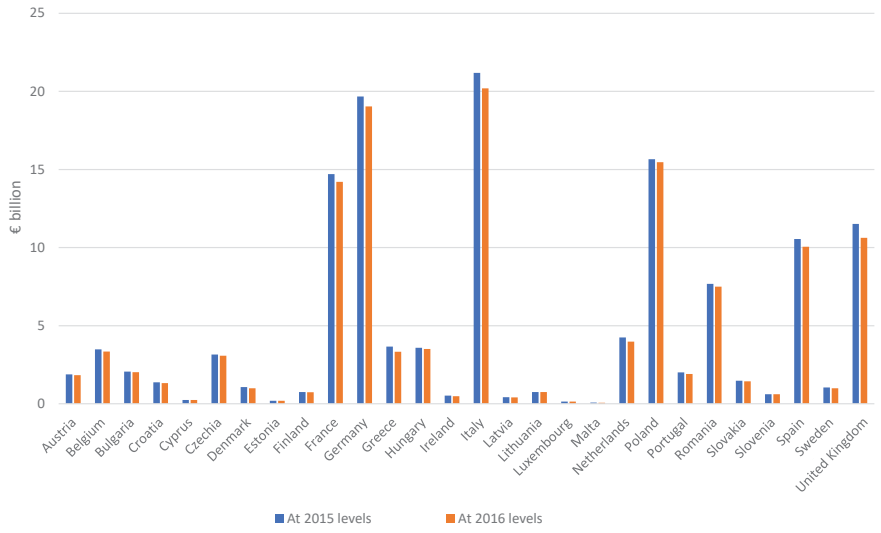
Exposure to air pollution is associated with increased mortality from cardiovascular disease, respiratory conditions, and from lung cancer, as well as adverse impacts on foetal development, and increased risk of diabetes and dementia,[8,9] and causes several million premature deaths per year.[10] Exposure to air pollution and associated health impacts can also exacerbate existing inequalities: in general, areas characterised by lower socio-economic status (e.g. higher unemployment rate, lower proportion of population with higher education, lower average household income) tend to have higher levels of pollution.[11]

Data from the 2019 Lancet Countdown report indicates that $PM_{2.5}$ exposure in the EU decreased between 2015 and 2016.[12] If $PM_{2.5}$ remained at 2016 levels rather than 2015 levels across a lifetime, the resulting increase in lifespan would lead to savings of €5.2 billion. However, even at 2016 levels of $PM_{2.5}$, the total annual average cost would still be €129 billion.

Annual total external costs of the health impacts of all forms of air pollution (rather than $PM_{2.5}$ alone) in the EU are still higher, in the range €330-940bn annually.[13] Throughout the wider World Health Organization (WHO) European Region, the annual economic cost of premature deaths household and ambient air pollution is estimated to be €1.3 trillion and the overall annual economic cost of health impacts (also taking into account morbidity), is estimated to be €1.4 trillion.[14]

There is a need for continued progress: levels of particulate matter continued to exceed the EU limit values and the WHO Air Quality Guidelines in large parts of Europe in 2016,[15] while a 2018 special report by the European Court of Auditors on the Ambient Air Quality Directive concluded that the EU's action to protect citizens from air pollution had not yet delivered the expected impact.[13]

Figure 1: Average economic cost (in billion EUR) of years of life lost calculated for anthropogenic $PM_{2.5}$ exposure in 2015 and 2016.



Interventions to address air pollution yield rapid positive effects, and furthermore carry clear co-benefits for mitigating climate change through emission reductions, thus contributing to the objectives set out in the Paris Agreement. Indeed, there are many available practical actions that simultaneously address the climate emergency, clean air, and wider health benefits. Interventions applied in the transport and energy sectors can be key to progress, as described in the following sections of this brief. Transitioning to renewable or low-carbon energy sources reduces air pollution and offers additional health benefits, while sustainable, safe and active mobility options, especially walking and cycling, both decrease emissions and increase physical activity, helping to prevent disease.

Electricity generation

Globally, power generation accounts for 38% of total energy-related CO2 emissions,[16] and represents an efficient lever to mitigate climate change. Concerningly, the 2019 Lancet Countdown report highlights that the total primary energy supply from coal increased by 1.7% from 2016 to 2018.[12] However, in 2018 45% of the growth in electricity generation globally came from renewable energy.[12] Renewable energy sources have positive benefits for health due to lower levels of both greenhouse gas and $PM_{2.5}$ emissions.

In Europe, greenhouse gas emissions have been addressed through implementation of the EU Emissions Trading Scheme[17] (ETS) since 2005. The 2019 Lancet Countdown report reveals that the share of renewable energy in total electricity generation has been increasing in the EU since the late 1990s (figure 2) and has now reached 15%. While this progress is promising, it does not yet meet the requirement set by the original Renewable Energy Directive to achieve 20% renewable energy share by 2020.[18] The revised Renewable Energy Directive establishes a binding renewable energy target for the EU of at least 32% by 2030.[19]

Nothing short of an 80% reduction in coal use from 2017 to 2050 (a 5.6% annual reduction rate) would be consistent with a 1.5°C trajectory.[12] As of September 2019, 32 national governments have committed to coal phase-out for power generation through the Powering Past Coal Alliance. Of these, 17 are EU Member States, who have declared their alignment with the commitment to phase out of unabated coal-fired electricity generation no later than 2030.[20] Two additional Member States, Hungary and Greece, also recently announced plans to phase out coal by 2030.

Power generation is not homogenously distributed among EU member states. Eight countries produce nearly 80% of total electricity.[12] Among them, France and Sweden use the greatest proportion of low carbon electricity generation, while the other six have a majority of fossil fuel generated electricity. While every country plays a role in international cooperation this disparity of greenhouse gases emissions by different EU Member States is notable.

Transport

A recent review estimated that $PM_{2.5}$ and ozone concentrations from transportation emissions resulted in 7.8 million years of life loss and approximately $1 trillion in health damages globally in 2015.[21] Data from the 2019 Lancet Countdown report reveals that land-based transport accounts for 37,300 premature deaths from $PM_{2.5}$ air pollution in Europe in 2016. This due to a combination of high levels of vehicle use as well as to the fact that the vast majority of energy used for transport comes from gasoline and diesel, rather than from electricity or biofuels. Biofuels combustion nonetheless also produces emissions, and electricity generated from fossil fuels rather than low-carbon sources still similarly contributes to global warming. The highest percentage of non-fossil fuel energy to power land-based transport is in Sweden (17.1%, of which all is biofuels), while the highest percentage of electricity used to power land-based transport is in Latvia (0.5%), followed by the Netherlands (0.2%).

Urban areas are disproportionally affected by air pollution and its burden on public health. In 2019 the Commission presented a Roadmap towards clean vehicles.[22] Measures including low emissions zones, which are city-specific measures to improve local air quality are increasingly being introduced across Europe and can help meet EU level mandatory air pollution limits.[23] Accessible, affordable and efficient public transport systems are better used by citizens and lead to lower levels of emissions per person. Active travel, such as walking and cycling, reduces air pollution and promotes health through increased physical activity. It is clear that many interventions can support the transition to more sustainable transport systems, including the measures outlined in the 2013 Concept for Sustainable Urban Mobility Plans.[24] Active transport modes which maximise health should be prioritised and supported by an extensive and high quality infrastructure completed by reliable public transport at city and regional level, encouraged by spatial planning.

Figure 2. Cars in evening rush hour

Climate suitability for the transmission of dengue

Climate change affects the environmental suitability for the transmission of many infectious diseases. The 2019 Lancet Countdown report suggests that in 2017 the global vectorial capacity for dengue (the ability of the mosquitos carrying the virus to cause new infections) was the second highest on record. Compared with the 1950s baseline, the global vectorial capacity for the mosquito *Aedes albopictus*, a subspecies of mosquito responsible for transmission of the dengue virus, increased by 9.8%.[12]

Vectorial capacity for the transmission of mosquito-borne diseases is also rising in Europe, increasing the likelihood of future outbreaks and a changing pattern of burden of disease. *Aedes albopictus*, also known as the Asian tiger mosquito, is now present in many countries in Europe.[25] Figure 3 depicts changes in vectorial capacity for transmission of dengue in different EU countries.[12] Dengue was once endemic throughout the world, but has been eliminated from many countries. In places where dengue is endemic, vectorial capacity offers a proxy for disease spread. In places where the virus is not endemic, a high vectorial capacity is indicative of a potentially increased of reintroduction. Vectorial capacity in Malta is by far the highest and most rapidly increasing among countries for which data was available. Vectorial capacity in Greece, Romania, Spain, Bulgaria, Italy and Croatia is lower and increasing less rapidly. In France, Austria, Czech Republic, Slovakia, Slovenia, Belgium, Netherlands and Germany, vectorial capacity is lowest and rising most gradually. It is notable that vectorial capacity of the Asian tiger mosquito to transmit dengue is nonetheless increasing in all countries for which data is available, and that warmer temperatures create favourable conditions for transmission.

Changing trends in transmission of vector-borne infectious diseases are far more complex than conveyed by examining one insect and one disease alone. While the analysis in this policy brief is based on the Asian tiger mosquito and the dengue virus, the concepts and recommendation should be more broadly considered for other mosquito-borne diseases. For example, the Asian tiger mosquito is also the vector for chikungunya and other harmful viruses.[26] Vectorial capacity for another species which transmits dengue, *Aedes aegypti,* has also increased in Europe since the 1950s – in this case by 7.2%.[12] Other mosquito-borne diseases such as West Nile Fever and malaria may similarly be more easily transmitted in Europe as temperatures rise. Interventions must therefore be implemented not only in response to dengue, but as a holistic vector-borne disease control strategy with components as described by WHO.[27] Insecticides (including those which target both adult insects and larvae) have been used in Europe in past years, but have led to resistance in regions outside Europe.[28]

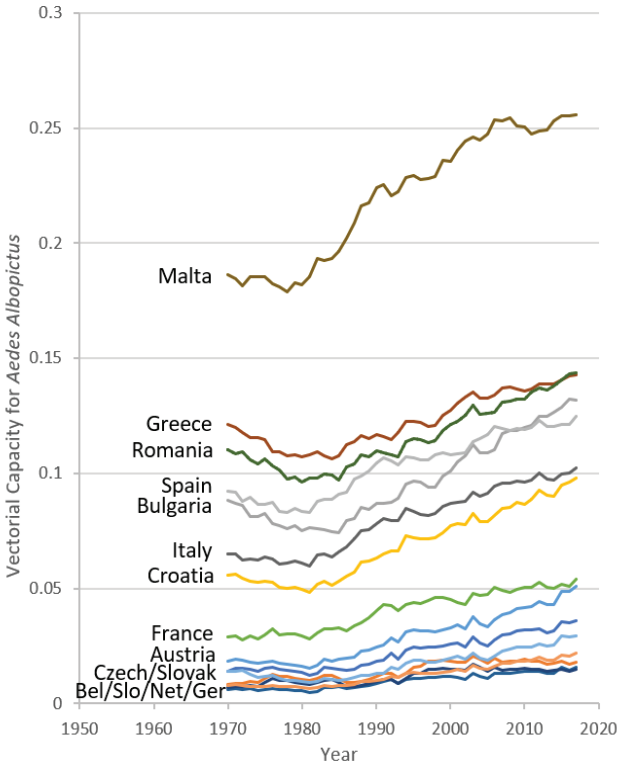


Figure 3. Evolution trends of vectorial capacity for the dengue virus carried by *Aedes Albopictus* in Europe since 1970.

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Organisations and acknowledgements

This policy brief was written by Alexis Rayapoulle, public health resident at Assistance Publique – Hôpitaux de Paris, and Helene Rossinot, MD. Review was provided by Dr Martin Balzan, Rapporteur on Environmental Health & Climate Change, and Markus Kujawa, EU Policy Adviser on behalf of CPME, and by Zoltán Massay-Kosubek, Policy Manager for Clean Air, European Public Health Alliance (EPHA). Overall guidance on behalf of the Lancet Countdown was provided by Jessica Beagley, Alice McGushin, MBBS, MScPH and Nicholas Watts MBBS.

STANDING COMMITTEE OF EUROPEAN DOCTORS (CPME)

The Standing Committee of European Doctors (Comité Permanent des Médecins Européens, CPME) represents national medical associations across Europe. CPME is committed to contributing the medical profession's point of view to EU institutions and European policy-making through pro-active cooperation on a wide range of health and healthcare related issues.

CPME notes the increasing evidence on the effects of climate change and air pollution on human health. The changing pattern of both communicable and non-communicable diseases related to climate change may result in significant public health challenges in the future. The CPME position paper on Global Warming and Health provides a reminder that medical practitioners have been aware of the adverse effect of pollution of the environment on human health since the beginning of organized society and certainly since the Hippocratic treatise "Airs, Waters and Places".*

CPME therefore fully supports and endorses the recommendations of this policy brief, and strongly encourages its national member associations, and individual physicians to continue to bring home this message for action to their national authorities in the best interest of the health and quality of life of their patients

THE LANCET COUNTDOWN

The Lancet Countdown: Tracking Progress on Health and Climate Change is an international, multi-disciplinary collaboration that exists to monitor the links between public health and climate change. It brings together 35 academic institutions and UN agencies from every continent, drawing on the expertise of climate scientists, engineers, economists, political scientists, public health professionals, and doctors. Each year, the Lancet Countdown publishes an annual assessment of the state of climate change and human health, seeking to provide decision-makers with access to high-quality evidence-based policy guidance. For the full 2019 assessment, visit www.lancetcountdown.org/2019-report .

*CPME. Global Warming and Health (CPME 2009/021 final EN/Fr), 2009. Available from: http://doc.cpme.eu:591/Adopted/2009/CPME_AD_EC_220409_021_final_EN.pdf