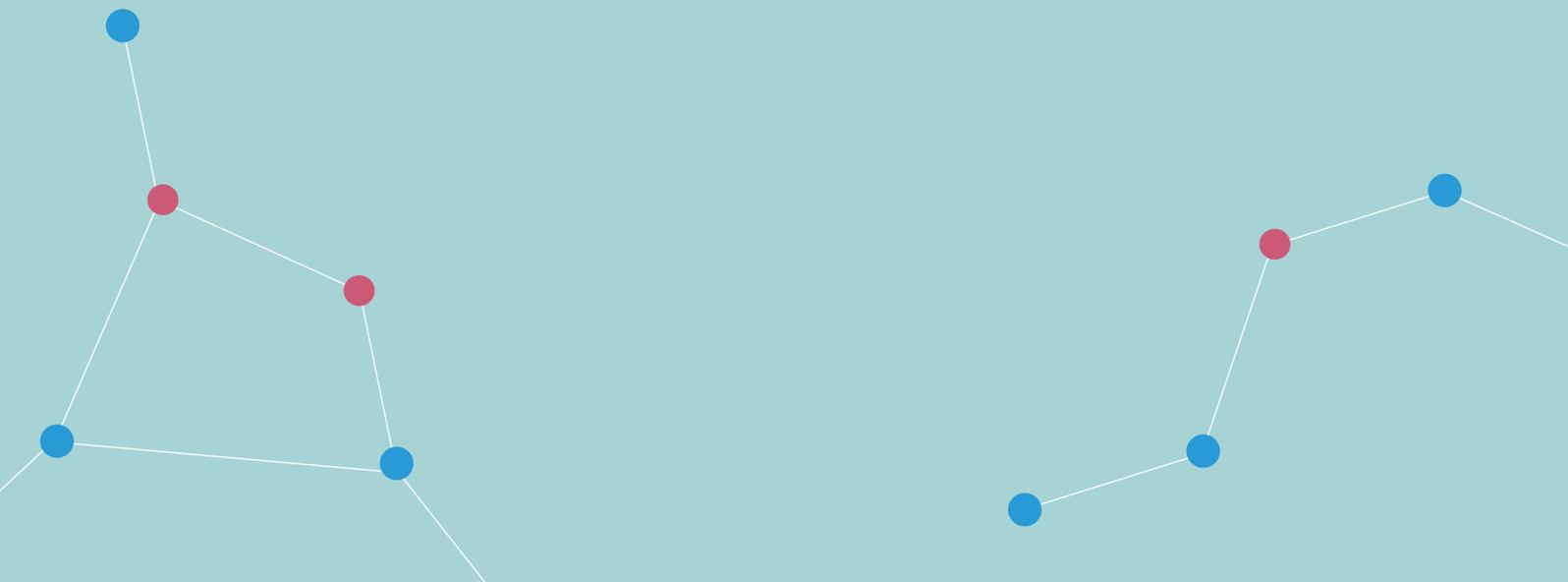


Royal College
of Physicians

Lancet Countdown 2017 Report: Briefing for UK Policymakers

31st October, 2017



Introduction

This briefing, launched in parallel with the 2017 Lancet Countdown report,¹ focuses on the links between health and climate change, and their implications for the UK's political commitments. It has been developed in conjunction with the Royal College of Physicians, London, and focuses on implications for policymakers in 4 key areas:

- Health impacts of air pollution in the UK and policy responses
- Decarbonisation of the UK's electricity system
- Sustainable and active transport
- Health impacts of extreme weather and climate adaptation in the UK

Acknowledgements

The concept of this brief was developed by the Lancet Countdown on Health and Climate Change. The brief was written by Isobel Braithwaite. Critical review and edits were provided by Jenny Isherwood (RCP), Toby Hillman (RCP), Andrew Goddard (RCP), Nick Watts (Lancet Countdown) and Nicola Wheeler (Lancet Countdown).

Strategic Partners

THE LANCET



About the Lancet Countdown

The Lancet Countdown: Tracking Progress on Health and Climate Change is a global, interdisciplinary research collaboration between 24 academic institutions and inter-governmental organisations. It monitors progress on the relationships between health and climate, and their implications for national governments, reporting annually. It was launched following the 2015 Lancet Commission on Health and Climate Change,³ which concluded that, left unmitigated, climate change will undermine 50 years of public health gains, whilst responding to it could represent “the greatest global health opportunity of the 21st century”.

The 2017 report presents data on the indicators selected following a consultation process in 2016. These span 5 domains, from impacts and adaptation to mitigation, and the economics and politics of climate action.

About The Royal College of Physicians

The Royal College of Physicians (RCP) plays a leading role in the delivery of high quality patient care by setting standards of medical practice and promoting clinical excellence. The RCP provides physicians in the United Kingdom and overseas with education, training and support throughout their careers. As an independent body representing almost 34,000 fellows and members worldwide, the RCP advises and works with government, the public, patients and other professions to improve health and healthcare. The RCP's primary interest is in building a health system that delivers high quality care for patients.

Lancet Countdown 2017 Report:

Briefing for UK Policymakers

Recommendation 1

Adopt a robust and comprehensive policy package to reduce air pollution across UK cities, incorporating a nationwide expansion of Clean Air Zones with adequate funding for their implementation and a clear mandate for charging zones in the most polluted cities.

Recommendation 2

The UK's recent commitment to phase-out all electricity generation from coal by 2025 could help catalyse much-needed policy change internationally. However, there is still a clear need for new policies to ensure that the Fourth and Fifth Carbon Budgets are met, and to further drive down the carbon intensity of electricity generation.

Recommendation 3

By 2020, increase investment in active transport to at least £10 per capita, as the Conservative government pledged in 2015,² and in addition, promote safer road design and use a range of policy measures to increase levels of walking, cycling and public transport use nation-wide.

Recommendation 4

Comprehensive and joined-up climate adaptation policies – at local and national levels, across sectors, and linked with international processes – will be essential to ensure that health in the UK is protected from extreme weather events as they increase in magnitude over the coming decades.

Climate change:

Health threat and opportunity

Many of the policies discussed in the following pages could, if implemented at scale, help prevent thousands of premature deaths, sickness absence and keep people healthy for longer, creating economic benefits totaling billions.⁸

The changes in weather patterns and sea level that climate change is driving – in the form of higher temperatures, heavier rainfall, more intense storms, sea level rise and droughts – all pose a major threat to health.⁴ Climate change's health effects range from impacts of extreme weather events to the less direct but no less severe impacts of repeated droughts on nutrition and livelihoods, or climate-driven migration. Those already affected by poverty or discrimination are often most vulnerable to these effects. This is a global pattern which also applies in the UK; for example, to groups such as disabled people, children in need, and homeless people.

During the two years since the 2015 Lancet Commission, the Paris Agreement negotiated at COP21⁵ has been signed by 195 UNFCCC member countries and ratified by 162 to date.⁶ This is an unprecedented step forward. However, the level of ambition of most Nationally Determined Contributions (NDCs) must be increased further to close the emissions gap and meet the agreed goal of keeping warming 'well below 2°C'.⁷

This challenge also faces the UK. As the UK's Committee on Climate Change highlights, "current emissions targets are not aimed at limiting global temperatures to as low a level as in the [Paris] Agreement, nor do they stretch as far into the future...".

However, unlocking this potential will require renewed governmental commitment to key issues at the intersection of climate and health, and increased investment in the most effective interventions.

Health impacts of air pollution in the UK and policy responses

The UK Government must act on air pollution as an urgent policy priority, as cleaner air can help prevent disease and suffering, reduce premature mortality and save billions in public money, whilst helping reduce greenhouse gas emissions. In particular, it should expand Clean Air Zones nationwide and provide adequate funding for this.

City/Town	Annual mean PM10 ($\mu\text{g}/\text{m}^3$)	Annual mean PM2.5 ($\mu\text{g}/\text{m}^3$)
Belfast	18	12
Birmingham	19	14
Bristol	18	13
Cardiff	19	14
Eastbourne	21	15
Edinburgh	14	8
Glasgow	23	16
Leeds	22	15
Liverpool	14	12
London	22	15
Manchester	18	13
Middlesbrough	20	11
Newcastle upon-Tyne	13	10
Nottingham	21	12
Oxford	21	14
Southampton	21	15
Stoke-on-Trent	20	14
York	15	12

Table 1: Particulate air pollution in selected UK cities (data from WHO air pollution database). Annual values above WHO limits are shown in red.

44 of the 51 UK cities in the WHO's 2016 ambient air pollution database⁹ exceeded the WHO's recommended limit value for particulate matter smaller than 2.5 microns (PM2.5) of $10\mu\text{g}/\text{m}^3$, whilst 13 exceed the PM10 limit ($20\mu\text{g}/\text{m}^3$). Data for a selection of the largest cities is shown in Table 1.

Although most of these cities are within the EU annual limit values (25 and $40\mu\text{g}/\text{m}^3$ for PM2.5 and PM10, respectively), the WHO's limits represent a safer threshold. Moreover, there is considerable cause for concern when considering the most polluted areas, nitrogen dioxide levels, and daily rather than annual limit values. Many urban areas in the UK regularly exceed EU air quality limits, particularly for nitrogen dioxide.¹⁰

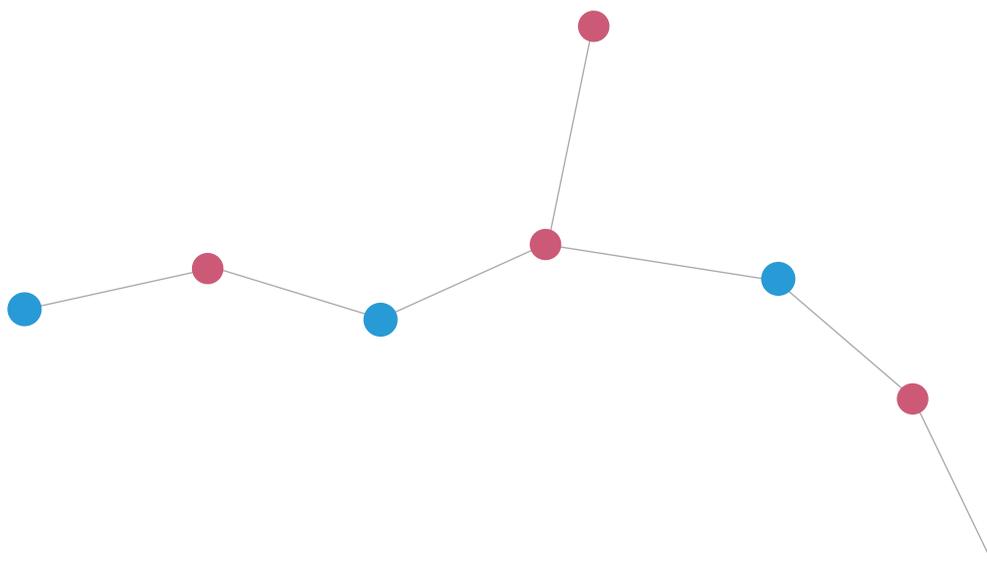
Recent analyses have found that 802 London schools¹¹ and a high proportion of London's hospitals and clinics¹² are located in highly polluted areas, potentially putting some of society's most vulnerable people at highest risk.

Air pollution contributes to many chronic health problems¹³: particularly respiratory and cardiovascular diseases, with growing evidence of effects on other diseases including stroke¹⁴ and dementia¹⁵. In the 2016 report 'Every Breath We Take',¹⁶ the RCP and RCPCH estimate that ambient air pollution causes approximately 40,000 premature deaths, over 6 million sick days, and an estimated total social cost of £22.6 billion per year.

A recent US study of over 60 million people has shown that there is no safe level of air pollution.¹⁷ This makes it even more important that the UK aims to drive down ambient levels of air pollutants as low as possible, and certainly to WHO recommended levels.

The Mayor of London's Clean Air Action Plan for London, including the T-charge for the most polluting vehicles and the Ultra-Low Emissions Zone (ULEZ), is therefore a much-needed development. However, as Table 1 shows, many cities across the UK still have harmful levels of pollution, and nationwide action is needed urgently. Of particular concern is the lack of a robust, fully-funded national strategy for delivering air quality improvements, despite warnings from both the Supreme Court and the European Commission that current policies are inadequate. There is therefore a clear need to refocus policy-makers' attention on air pollution and highlight the many health benefits of cleaner air.

Expanding Clean Air Zones nationwide offers a powerful and evidence-based set of policy levers for ensuring cleaner air in the UK's towns and cities. These should be rolled out to the 27 cities persistently breaching legal limits. Given the evidence of their effectiveness,¹⁸ a clear mandate from central government for local authorities to implement charging zones would also offer substantial air quality benefits at low cost. However, maximising Clean Air Zones' impact will require increased funding, as the £255 million 'Implementation Fund' currently committed under the plan is inadequate to the scale of the problem.



Decarbonisation of the UK's electricity system

The government's recent commitment to phase-out electricity generation from coal by 2025 is a clear example of climate leadership, which could help catalyse much-needed policy change internationally. However, new policies are needed to ensure that the Fourth and Fifth Carbon Budgets are met, and further reduce the carbon intensity of electricity generation.

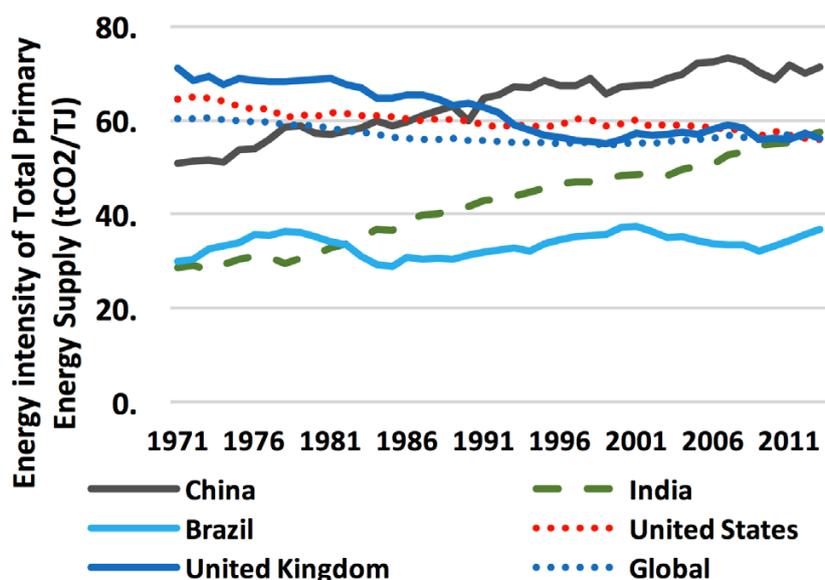


Figure 1. Energy Intensity of Electricity in Selected Countries, 1971 - 2011

The decision to move away from coal power is to be welcomed, as it can help prevent approximately 1,600 deaths each year and save the UK billions of pounds.¹⁹ The UK has a vital global leadership role to play as it phases out its own coal use.

The carbon emissions which would be locked-in by new coal plants currently being planned, particularly in Asia, could have a decisive impact on our future climate trajectory. Leadership and support from the UK government for a global coal phase-out could go a significant way towards closing the emissions gap. Other key considerations will include scaling up zero-carbon electricity as rapidly as possible, and avoiding unintended consequences including the health and environmental risks of increased biomass combustion

An important positive recent shift in the UK energy landscape is the dramatic fall in offshore wind costs - to a guaranteed price below £58 per megawatt-hour of electricity produced in 2022/23 at the latest support contract auction – which is cheaper than both new gas and nuclear.²⁰ However, despite these promising developments, the UK's energy economy is still largely fossil-based, with heating mainly supplied by gas, transport by oil, and industry by a mix of fossil fuels.

The recently published Clean Growth Strategy represents a positive reframing of decarbonization policy, central to which is its recognition of the economic opportunities of ambitious climate action and the benefits of aligning this with the government's industrial strategy. The commitments it includes around energy efficiency, green finance and low-carbon energy production are valuable, though steep and sustained progress is required. As such, new policies in other policy areas including agriculture and industry will need to be developed, and additional finance made available, in order to ensure that the UK meets both the Fourth and Fifth Carbon Budgets and its Paris Agreement commitments.

Figure 1 shows that the carbon intensity of electricity in the UK fell gradually from 1970 to 2014. In fact, it reduced further from 2014 to 2016, with dramatic reductions in coal use²¹, although the data used here does not extend over this period. This has partly been achieved by a reduced proportion generated by coal, whilst wind and solar generation has increased; summer 2017 saw the highest contribution of renewable energy to the National Grid to date.²²

The UK has achieved overall emissions reductions of 42% from 1990 to 2016, which is in part thanks to these reductions in the carbon intensity of electricity generation. It is also the result of improved energy efficiency and of more high-carbon manufactured goods now being imported.

However, much more rapid reductions – in the UK and globally – will be required over the coming decades if we are to meet the aims of the Paris Agreement. As a developed country with relatively high per capita emissions,²³ the UK should aim to reduce its emissions faster than poorer countries. To reap the many health benefits of decarbonisation, a joined-up approach, which provides clear signals to investors and promotes the development of a range of low-carbon energy sources, will be essential.



Sustainable and active transport

1) Progress on low-emissions vehicles

The recent commitment by the UK government to phase-out all non-electric vehicles from the transport system by 2040 is a promising move towards a low-carbon transport system, demonstrating a commitment to cleaner air and climate mitigation.

Internationally, clean fuel use in transport has been rapidly expanding, with more than 2 million electric vehicles sold between 2010 and 2016, whilst in the time since the UK's announcement, Paris, Copenhagen, Scotland and India have all set earlier deadlines for the shift to electric vehicles. As with phasing out coal, the Automated and Electric Vehicles Bill offers a valuable international role for the UK in supporting and encouraging other countries in the route towards a similar transition, particularly as its expertise grows and if it is able to achieve significant progress earlier than planned.

The Bill covers the installation of charging points in petrol stations and motorway services, and allows government to require a common set of technical and operational standards. These are prerequisites of more widespread uptake, by improving ease of access to and cross-compatibility of charging technologies.

However, many areas of the policy framework are yet to be worked out in detail. To avoid unintended adverse consequences, such as those from the UK's shift towards diesel, the Government must ensure that the additional electricity needed is generated cleanly, whilst taking account of equity considerations and the needs of vulnerable groups, such as people with disabilities.

2) Investing in active transport

Increasing active travel investment – to at least the £10 per capita pledged previously by the Conservative Government – could result in enormous health and economic savings through the health benefits of physical activity, road traffic accidents prevented, cleaner air and lower emissions.

Alongside increasing electric vehicle use, promoting more sustainable modes of travel (such as walking, cycling and public transport) through increased investment and smart policies can unlock many health opportunities and an average social return on investment of approximately £5.50 per £1 spent.²⁴

Active transport, in particular, offers a cost-effective means to tackle both obesity and physical inactivity,²⁵ which are both placing a growing strain on the NHS. For example, physical inactivity costs the NHS £1.06 billion per year directly, whilst the annual cost of lost productivity from sickness and premature death associated with it totals approximately £6.5 billion.²⁶

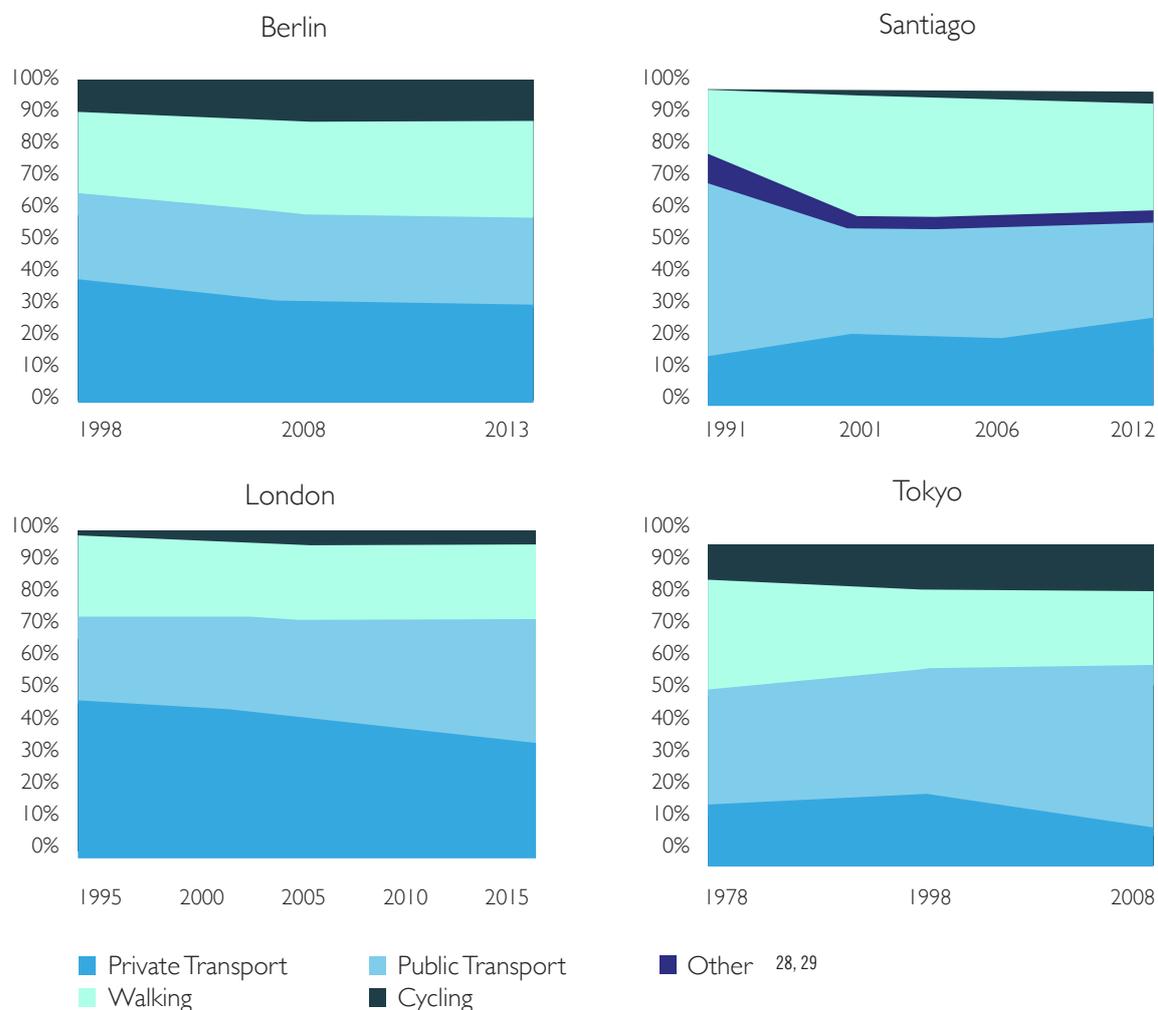


Figure 2: Trends in modal share in selected cities. (Figure created using data from the following sources: Institute for Mobility Research (2016); Transport for London (2016); and Dictuc S.A. (1992)

Road traffic accidents caused approximately 1,730 deaths and over 22,000 reported serious injuries across the UK in 2015, and were associated with an estimated cost of £35.5bn.²⁷ Reducing car use whilst increasing walking and cycling can also reduce road traffic accidents, particularly if policies are implemented with due attention to road safety.

London is currently lagging behind many world cities in terms of the proportion of journeys currently made by car, which was 38% in 2015 (Figure 2). Although this proportion has fallen since the 1990s, cycling levels have risen only slightly (to 3% of journeys) from a low baseline, whilst walking rates have remained static. Nation-wide, the UK ranks below most other EU countries for regular cycling levels.³⁰

Despite its immense public health potential, active travel investment currently represents only a tiny fraction of the £32 billion spent on transport annually.³¹ As of 2017, average UK-wide public spending on walking and cycling is £287mn per year (£4.30 per head). This is an improvement on previous years, but will fall to only £147 million by 2020 (Department for Transport).³² By contrast, in a survey of 11,000 people in 7 UK cities (the 2015 Bike Life survey³³), on average, respondents believed that £26 of the £300 or so currently spent on transport annually per person should go to cycling.

Active transport investment should be significantly increased to accelerate the modal shift, particularly for short journeys. Green public transport options are also key, particularly in rural areas, whilst facilitating remote working can help take cars off the road and improve productivity³⁴. Given the documented links between transport choices, air quality and poverty,^{35,36} improving walking and cycling environments in deprived areas, including by creating dedicated routes away from cars, can also help tackle health inequalities.

Health impacts and climate adaptation in the UK

1) Extreme weather and health

Globally, population exposure to heatwave events increased significantly from 2000 to 2016, due to both climate change and demographic factors – namely population growth, ageing and urbanization – whilst the number of floods, storms and droughts increased significantly worldwide. Combined, these factors will substantially increase exposure in the UK, particularly in the second half of this century.

Heatwaves are already affecting health in Europe: for example, the 2003 heatwave resulted in an additional 70,000 deaths across Europe³⁷, with approximately 2,000 in the UK³⁸. Additionally, the Lancet Countdown's 2017 analysis³⁹ finds that over 4 and 3.5 million additional heatwave exposure events affected vulnerable elderly individuals in 2006 and 2009, respectively. As older people are particularly vulnerable to heat, population ageing will magnify this risk. The UK's population, 29% of which is already aged over 65, will become more vulnerable to future heatwaves as the proportion over 65⁴⁰ continues to rise.

Worldwide, a 44% increase in annual weather-related disasters⁴¹ such as floods, droughts and storms (based on EM-DAT database figures⁴²) was observed in 2000-2013, compared with 1994-2000. In the UK, the number affected by weather-related disasters – mainly floods and storms – varies significantly year-on-year; for example, over 340,000 people were affected by flooding in 2007 (Figure 3).

However, future increases in both mortality and number affected by extreme weather events across Europe and in the UK are anticipated to be substantial⁴³. A recent modelling study by Forzieri et al (2017) estimated that extreme weather events (including heat and cold waves, wildfires, droughts, floods and windstorms) could affect two-thirds of Europe's population annually by 2070-2100, compared with 5% from 1981-2010, and cause 50 times the current number of deaths by the same period⁴⁴.

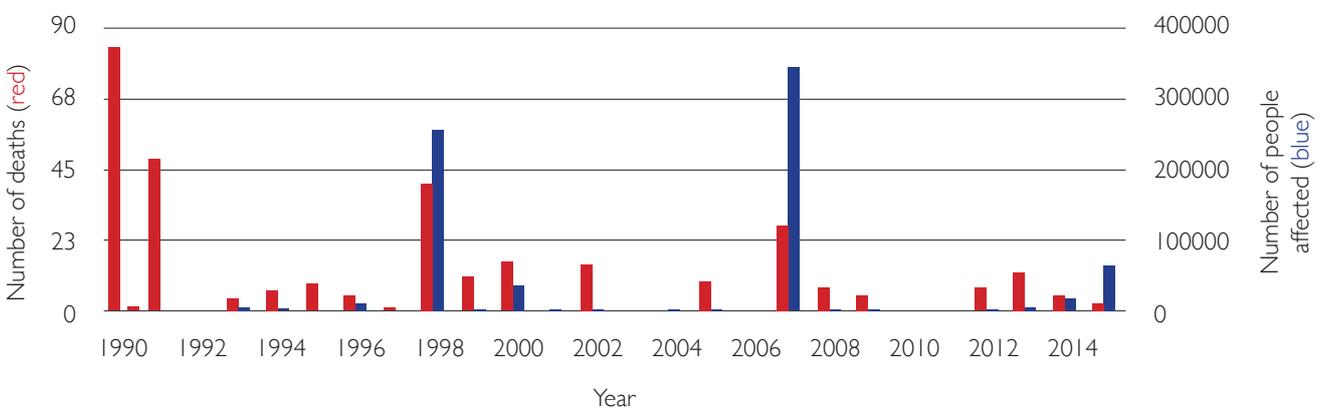
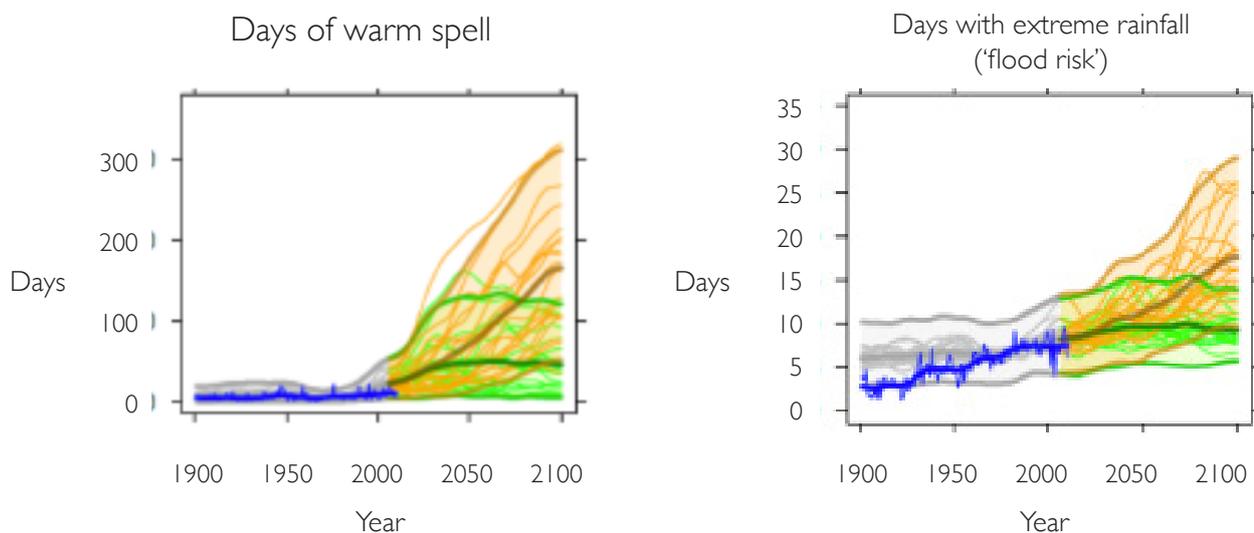


Figure 3: Deaths from and people affected by floods and storms in the UK, 1990-2015 (EM-DAT data)



Under a high emissions scenario the number of 'warm spell' days is projected to increase to 165 days on average in 2100, compared to 45 on average with low emissions.

The number of days with 20mm or more of rain in the UK could by just over 10 days on average from 1990 to 2100 in a high emissions scenario, increasing flood risk.

Note: The model projections shown here present climate hazards under a high emissions scenario. Representative Concentration Pathway 8.5 (RCP8.5) (in orange) and a low emissions scenario, (RCP2.6) (in green). A 'warm spell' is defined here as a day when maximum temperature, alongside that of at least the 6 consecutive previous days, exceeds the 90th percentile for that time of the year.

Figure 4: Graphs from the UK's WHO Country Profile showing UK-specific climate hazard projections

Figure 4 from the WHO/UNFCCC UK Climate and Health country profile – shows the increase in 'warm spell' and extreme rainfall days projected throughout this century, for high and low-emissions scenarios.⁴⁵ The project is an ongoing effort to present national information on climate-related health threats and responses.

Moreover, less direct health impacts, such as mental health sequelae, for example following floods and storms, are common and often pronounced. A cross-sectional analysis of data from the National Cohort Study of Flooding and Health found that being flooded increased the risk of several adverse mental health outcomes. Most markedly, flood victims were 6-times more at risk of both depression and anxiety and 7-times more at risk of PTSD. Risks were higher still in those who suffered disruption of domestic utilities⁴⁶ or displacement⁴⁷. These risks must not be overlooked, as those affected are likely to require additional support.

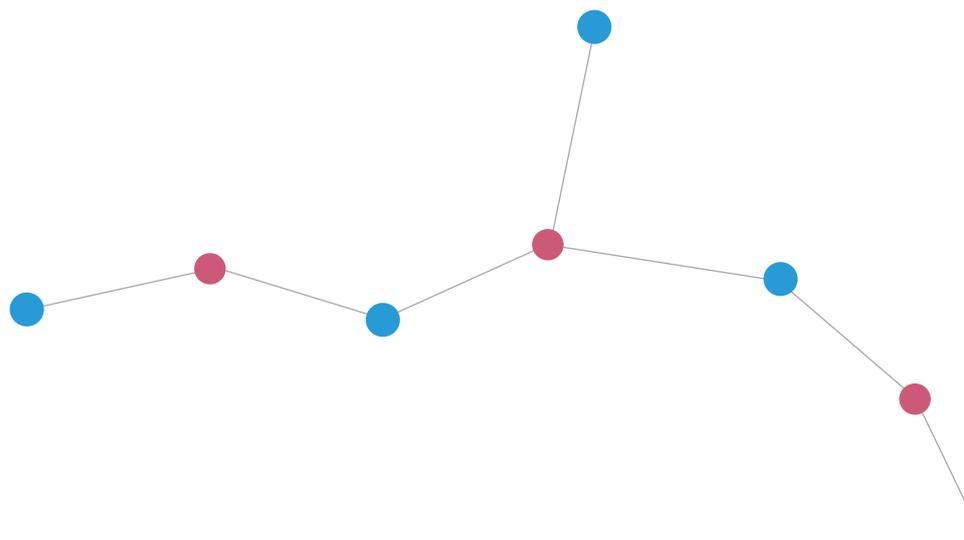
2) Adaptation for health protection

A comprehensive and joined-up policy response – at local and national levels, across sectors, and linked with international processes – will be key to ensuring that health is adequately protected from increasing exposure to extreme weather in the coming decades.

Given the projected increases in exposure outline above, there is a considerable risk that adaptive capacity could be overwhelmed later this century, without concerted and sustained adaptation efforts. Whilst mitigation is key to preventing the worst impacts, inertia in the climate system means that climatic hazards will nevertheless increase, even if emissions peak and decline rapidly.

Increased health-related adaptation spending and the early adoption of evidence-based adaptation policies are therefore essential to ensuring that the UK's health systems can withstand not only today's risks, but also those they will face in 2050 and 2100. In London, total per capita health-related adaptation spending (Indicator 4.9) was estimated at 2% of adaptation spending in 2014-15⁴⁸, of a total just under £1 billion. This is broadly similar to other comparably developed cities, with £0.96 billion spent in Paris and £1.6bn in New York.

Leadership and support from the UK government for a global coal phase-out could go a significant way towards closing the emissions gap. Other key considerations will include scaling up zero-carbon electricity as rapidly as possible, and avoiding unintended consequences including the health and environmental risks of increased biomass combustion.



Recommendations

Our key recommendations for UK policymakers are as follows:

Recommendation 1

Adopt a robust and comprehensive policy package to reduce air pollution across UK cities, incorporating a nationwide expansion of Clean Air Zones with adequate funding for their implementation and a clear mandate for charging zones in the most polluted cities. In the short term, air pollution must be brought in line with EU limit values, but with a long-term objective of reducing air pollution below WHO guideline levels.

Recommendation 2

The recent commitment to phase-out all electricity generation from coal by 2025 is a clear example of climate leadership which could help catalyse much-needed policy change internationally. However, there is still a need for new policies and investment to ensure that the Fourth and Fifth Carbon Budgets are met, and to further drive down the carbon intensity of electricity generation.

Recommendation 3

By 2020, increase investment in active transport to at least £10 per capita, as the Conservative government pledged in 2015⁴⁹, and in addition, promote safer road design and use a range of measures to increase levels of walking, cycling and public transport use nation-wide. This will help to improve health through cleaner air, reduced accidents and increased physical activity.

Recommendation 4

A comprehensive and joined-up policy response – at local and national levels, across sectors, and linked with international processes – will be essential to ensure that health in the UK is adequately protected from extreme weather events as they increase in magnitude over the coming decades. This will include ensuring that adaptation plans address short-, medium- and long-term risks to health, and increasing health-related adaptation spending.

In addition to these sector-specific recommendations, it will be vital to ensure that progress in each of these areas is not neglected as a result of the Government's focus on Brexit negotiations, and that the health and environmental protections from which UK citizens currently benefit are not eroded as a result of withdrawal.

Additional Information and Key Resources

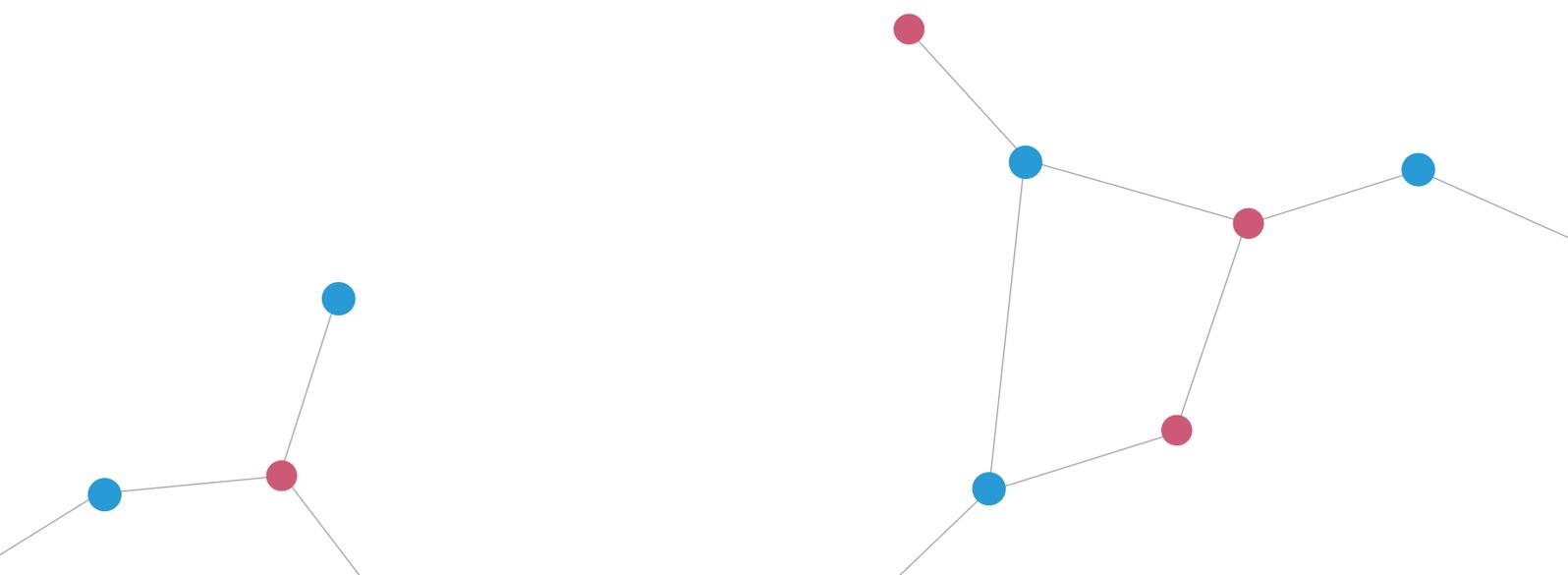
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Lancet Countdown Website: <http://www.lancetcountdown.org/>

WHO UNFCCC Climate and Health Country Profiles

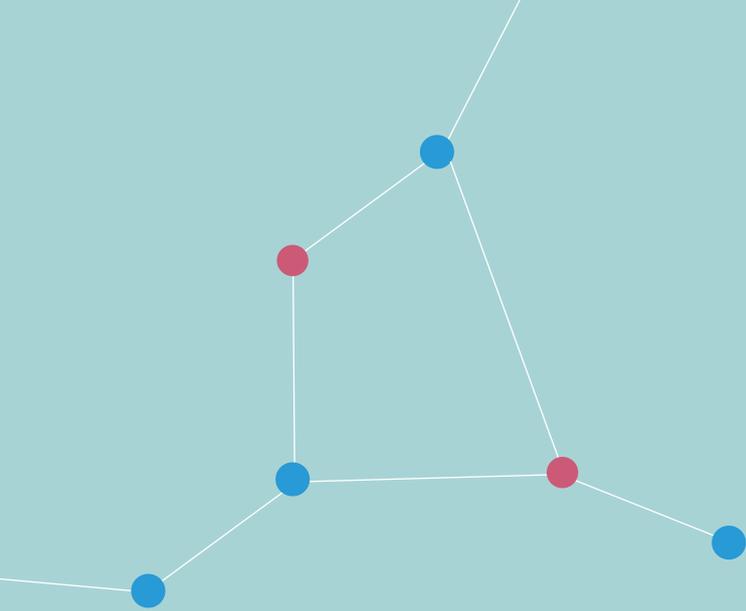
The WHO UNFCCC Climate and Health Country Profiles form the foundation of WHO's national level provision of information, and monitoring of progress in climate change and health. The climate and health country profiles, first published in 2015, are developed in collaboration with ministries of health and health determining sectors with the aim of empowering Ministers of Health to engage, advocate and act to protect health from climate change. The most recent and relevant scientific evidence from the health, environment and meteorological communities is presented to highlight country-specific climate hazards and the potential health impacts facing populations. National action on health adaptation and mitigation is reported in the profiles and opportunities to promote actions that improve health while reducing carbon emissions are presented. For more information on the WHO UNFCCC Climate and Health Country Profiles please visit the website and watch the introductory video.



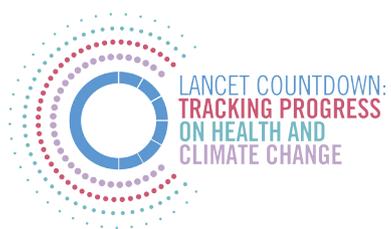
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