

The Lancet Countdown on Health and Climate Change

Policy brief for Germany

DECEMBER 2020



HelmholtzZentrum münchen
German Research Center for Environmental Health



POTSDAM INSTITUTE FOR
CLIMATE IMPACT RESEARCH

Introduction

Climate change projections reveal unacceptably high and potentially catastrophic risks to health, including those due to extreme weather events, rising temperatures and the spread of infectious diseases. Conversely, tackling these challenges may pose the greatest opportunity to protect public health.¹

Germany has made commitments to address mitigation of and adaptation to global warming in recent years, including the Paris Agreement (committed together with all other EU Member States),² the Climate Change Mitigation Plan 2050³ and the German Climate Adaptation Strategy.⁴ In 2019, the German Medical Association and leading academic institutions called attention to the links between climate change and human health and the urgent need for action.⁵ In the months since, the Federal Ministry of Health has established a dedicated department on health protection and sustainability responsible for climate-related matters; the federal conference of health ministers has for the first time released a resolution on climate change and health; in this resolution the ministers clearly state, that the health sector has to deal with the new challenges and take comprehensive climate change mitigation as well as adaptation measures, leading by example; numerous training formats have been set up at universities; and publication of articles and special issues on climate change and health in medical magazines has substantially increased. In October 2020, the European Parliament voted to further tighten the climate change mitigation targets, committing to reduce greenhouse gas emissions by at least 60 % by 2030.⁶

Meanwhile, cardiovascular disease, cancer, diabetes and other non-communicable diseases (NCDs) are estimated to account for 91%

of all deaths in Germany.⁷ Climate change and NCDs share two systemic drivers: the current food system, which is extremely energy-intensive and largely supported by fossil fuel use, promoting over-consumption of processed, energy-dense and often animal-based foods; and fossil-fuel based transport systems, promoting physical inactivity and exacerbating exposure to air and noise pollution. Policies which address these challenges synergistically have the potential to yield co-benefits for environmental sustainability and public health, with considerable cost savings.⁸

These factors are underpinned by the environments in which people live, with the majority of the German population inhabiting cities. While unsustainable cities negatively impact human and environmental health, urban settings offer immense transformative power through implementation of co-benefit interventions.

In 2020, the global COVID-19 pandemic has demonstrated the complex relationship between people, planet and economy, highlighting the need for a healthy and sustainable recovery.⁹ As Germany considers stimulus funding, investments should be allocated taking into account environmental and public health impacts alongside economic sustainability in order to secure a healthier, fairer, and greener world, avoiding unnecessary harm now and in future.⁹

Within the context of a pathway to recovery from the COVID-19 pandemic, this policy brief focusses on three core issues: food systems, transport systems, and sustainable cities. For each of these areas, a priority recommendation is indicated, together with more detailed guiding interventions.

Recommendations

1

In the aftermath of the COVID-19 pandemic, implement ‘triple win’ policies which preserve the climate, protect public health, and promote economic sustainability: Climate, health, and economic objectives are not only mutually reinforcing but mutually dependent, and should be considered in the next phases of national COVID-19 recovery planning and the updated EU Nationally Determined Contribution (NDC) to the Paris Agreement. These policies will define societies for decades to come.

2

Implement nutrition policies which promote and support healthy and sustainable diets: Unhealthy diets are a leading risk factor for disease and premature death. Current food production and consumption systems are not only harming human health, but are also responsible for approximately a quarter of global greenhouse gas emissions. Priority measures to support healthy and sustainable diets include the implementation of dietary guidelines and nutrition standards that focus both on health and sustainability; binding marketing regulations in order to protect children; and improvement of nutrition education.

3

Create environments that foster active transport and other forms of physical activity at all levels: The transport sector is responsible for around a quarter of Europe’s greenhouse gas emissions and is the main cause of air pollution in urban settings. It is also a key determinant of physical activity levels. Active transport can be facilitated through investment in walking and cycling infrastructure and through promotion of active commuting to work and schools. This can reduce greenhouse gas emissions and air pollution and increase physical activity, with multiple health co-benefits.

4

Leverage the enormous potential of cities to drive the required transformative changes towards sustainability: Urban settings are prime determinants of health. Local policies can transform urban environments and yield health co-benefits while simultaneously advancing social, economic and environmental development. Conducting integrated environment and health impact assessments and including health professionals in multisectoral development processes are necessary for the creation of healthy and sustainable urban areas.

Food systems

Current dietary patterns in Germany imperil both human health and sustainability.^{10,11}

Poor diets are a leading risk factor for disease and premature death – due to undernutrition as well as to overweight and obesity. In Germany, approximately 11% of the preventable disease burden is attributed to dietary risk factors and 7% of direct health care costs are linked to excessive intake of saturated fat, sugar and salt.¹² Almost a quarter of the national adult population and 6% of children are living with obesity and approximately 10% of adults have type 2 diabetes. Both conditions are strongly linked to diet.

Food production is responsible for approximately a quarter of global greenhouse gas emissions, and a key driver behind biodiversity and habitat loss.¹³ Agriculture and animal husbandry are highly energy intensive. Meat production in particular is linked to exploitation of natural resources (delivering 18% of nutritional energy but consuming 83% of agricultural land),¹⁴ competing with cultivation of basic agricultural plants such as vegetables and grains. This competition contributes to unequal use of cropland per capita and thus to global inequalities and the risk of hunger in low-income countries.¹⁵ Data from the 2020 global Lancet Countdown report indicates that production of ruminant livestock (primarily cattle) accounted for 62% of agricultural emissions in Germany in 2017.¹⁶ In addition, unsustainable

consumption and production patterns also cause enormous amounts of food waste, with an average of 55kg of food waste per person annually in Germany,¹⁷ contributing to greenhouse gas emissions.

More sustainable food production technologies could spare up to 9 billion tons of greenhouse gases globally, according to the IPCC special report on climate change and land.¹⁸ Fresh food, in particular fruits and vegetables, which is produced both regionally and seasonally is generally more ecologically sustainable than produce transported by air or grown in greenhouses heated with fossil fuels.¹⁹ Innovative and bold political action is needed to create food environments which make healthy and sustainable choices attractive and accessible. Building on scientific evidence, large scale changes of dietary patterns integrating health and sustainability concerns need to be developed and implemented.²⁰ This is in line with the call for a transformation in dietary patterns in industrialized countries, especially through reduced consumption of animal products, presented in a recent flagship report on sustainable land use and land stewardship published by the German Advisory Council on Global Change (WBGU). According to the WBGU report, nutritional guidelines should be based on the guiding principles of the Planetary Health Diet (PHD) and also be recommended by the Federal Government accordingly.²¹



Fresh vegetables at Esslingen Farmers' Market

Photo: makasana photo / Shutterstock

The following measures offer health and climate co-benefits:

Food-based dietary guidelines and nutrition standards in Germany need to take into account planetary boundaries as well as physiological requirements. These should be widely implemented, especially in hospitals, care homes, schools and public institutions.^{22,23}

Binding regulations on food marketing. There is international consensus that children need to be protected from commercial marketing of unhealthy commodities. As well as driving poor nutrition,

this kind of marketing generally promotes overconsumption which is harmful to both human health and the environment.²²

Improved nutrition education. Robust nutrition knowledge and skills, taking into consideration cultural diversity, are needed to empower people to make informed dietary choices. Comprehensive nutrition education, including both health and sustainability aspects, should be provided in all types of educational settings from kindergarten to the training of health professionals.^{22,23}

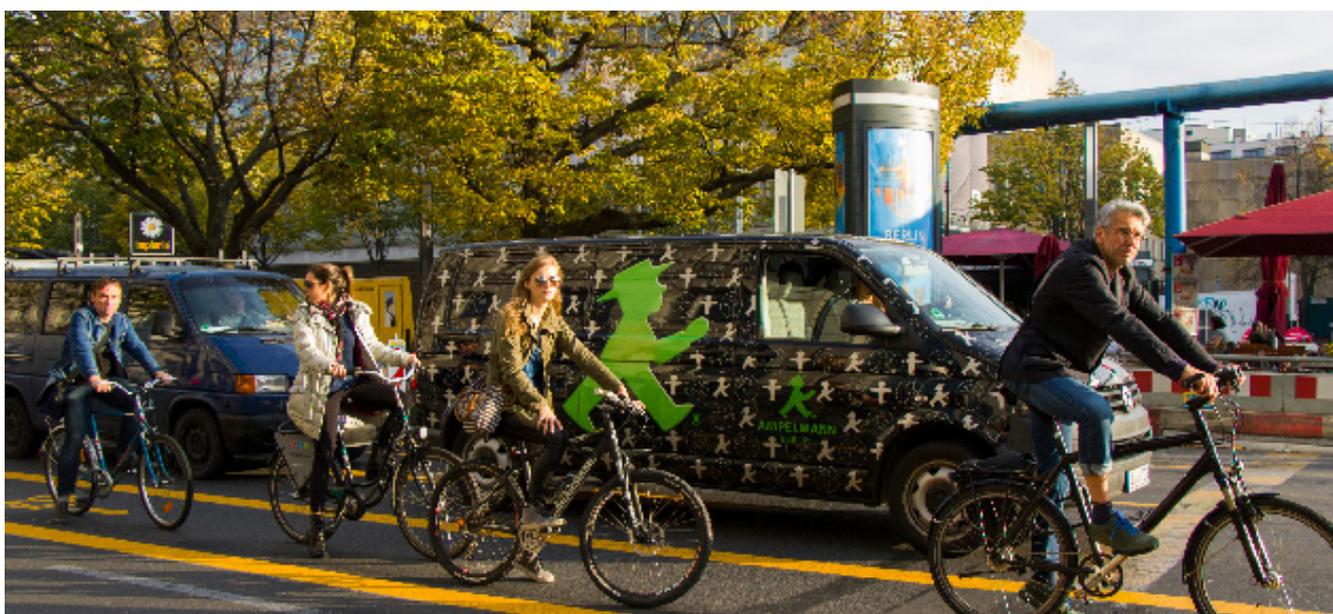
Transport and mobility

Mobility levels in the 21st century are unprecedented. However, travel is largely based on fossil-fuel driven transport structures, which contribute a quarter of the EU's carbon footprint and are the main source of air pollution in cities.²⁴

Ambient air pollution is the leading environmental risk factor in Germany. It negatively affects human health at all stages of life, from conception to old age. For some groups, namely children, the elderly and people with chronic respiratory and/or cardiovascular conditions, it is particularly harmful. Data from the Lancet Countdown indicates that 48,700 premature deaths occurred in Germany in 2018 due to PM_{2.5}* exposure, of which 42,150 premature deaths were due to anthropogenic PM_{2.5} exposure.¹⁶ Of these deaths, 15% were due to land-based transport, making land-based transport the second-leading cause of PM_{2.5} mortality nationally. Reduction in air pollutants would

lead to a decrease in respiratory, cardiovascular and cerebrovascular diseases as well as cancer - almost all organs, systems, and processes in the human body would benefit.²⁵⁻²⁷

At the same time, physical activity levels across the entire population of Germany are insufficient according to World Health Organization (WHO) recommendations.²⁰ Physical activity reduces risk of overweight and obesity, NCDs such as cardiovascular disease, diabetes mellitus type 2 and mental ill-health.²⁸ Urban green space can help to promote physical activity, as well as reducing the urban heat island effect, and confers mental health benefits. While Lancet Countdown data puts the average greenness level of German cities among the highest in the world, more work has to be done in increasing the availability of urban green space in Germany, particularly addressing the strong disparities in green space provision between cities.¹⁶



Cyclists using a bicycle lane in Berlin

Photo: Tai Dundua / Shutterstock

*PM_{2.5} refers to fine particulate matter; particles or liquid droplets in the air that have a diameter less than 2.5 micrometres across (one 400th of a millimetre). The small size of these particles enables them to penetrate deep into the lungs.

Accordingly, in Germany, levels of physical activity need to be enhanced while reducing national carbon emissions and air pollution due to transportation by:

Promotion of public transportation, cycling and walking. This includes improved networks of safe and convenient cycling lanes and parking facilities for bicycles, changes to the traffic code, attractive pedestrian zones, car-free zones or zones with traffic calming, and affordable and safe public transport to complement cycling and walking options.²⁸

Promotion of active commuting. Schools and workplaces, including hospitals, should take measures to promote active commuting, including incentivising acquisition of bicycles, providing bicycle parking, changing rooms and certification as cycling-friendly employers.^{28,29}

Ensuring access to green spaces. Green spaces are linked to increased levels of physical activity and favourable health outcomes, and help to reduce the impact of heat-waves on health through their cooling effect.^{28,29}

Sustainable and resilient cities

Healthy and sustainable urban development is central to ensuring quality of life for citizens.²⁹ Globally, cities are estimated to generate 70% of greenhouse gas emissions³⁰ and they shape the lives and health of the people who reside and work in them – in Germany, 75% of the population live in cities. City-dwellers are particularly exposed to heat and heatwaves due to the urban heat island effect, which warrants additional adaptation measures.^{18,31} They are also exposed to air pollution and traffic noise which pose a substantial burden on health and quality of life. Furthermore, sedentary lifestyles, often a result of excessive vehicle use, contribute to obesity and NCDs such as type 2 diabetes, while they also drive climate change.²⁸ Exposure to environmental risks in cities is exacerbated by socio-economic inequalities across urban populations and also for vulnerable groups including children and older people.

City-level risk assessments enable cities to plan and prepare to minimise the health impacts of future climate-related risks. Of seven cities surveyed, Lancet Countdown data shows that five, i.e. Bonn, Berlin, Heidelberg, Hansestadt Rostock and Greifswald had completed a city-level risk assessment in 2019.¹⁶ All five cities identified extreme heat as a leading risk.

Despite these challenges, cities can be drivers of enormous power for the required transformative changes.³² Therefore, innovative urban development presents major opportunities to improve population health, reduce greenhouse gas emissions and prepare for health risks exacerbated by climate change. Unlocking their transformative power, cities are key settings for the implementation of a diverse set of interventions to address the themes outlined throughout this policy brief.

COVID-19 recovery provides an additional window of opportunity to implement strategically selected interventions, accelerating the required transformative changes,⁹ such as setup of pop-up bicycle lanes and rapid adaptation to promote bicycle use.

Accordingly, the following interventions are recommended:

Reduce exposure to heat through urban design.³³ Counteract the urban heat island effect by strengthening urban green infrastructure such as parks, street trees and roof greening, coupled with corresponding water management measures. These interventions have proven to be cost-effective through ambient cooling and shading effects.

Establish smart zoning to create compact cities. More diverse urban land use and appropriate settlement densities promote walking and cycling, shorten commuting times and reduce traffic intensity, as well as strengthening social cohesion and improving quality of life.²⁸

Adopt integrated frameworks for urban policymaking. Plan, implement and evaluate urban policies which integrate health and sustainability such as the Urban Sustainability Framework,³⁴ city-level risk assessments, and health impact assessments underpinned by citizen participation processes.

Strengthen interdisciplinary and cross-sectoral collaboration. Multisectoral coordination including with city planners, architects, transport professionals, teachers, nutrition experts and health professionals will leverage synergies with ongoing activities and enable benefit from expertise and experience.

²Land-based transport by this definition also includes flight emissions at the point of take-off and landing

References

1. Watts, N. et al. Health and climate change: policy responses to protect public health. *Lancet* 386, 1861–1914 (2015).
2. United Nations. Paris Agreement. 27 (2015).
3. Federal Ministry for the Environment Nature Conservation and Nuclear Safety (BMU). Climate Action Plan 2050. Principles and goals of the German government's climate policy. (2016).
4. The Federal Government of Germany. Deutsche Anpassungsstrategie an den Klimawandel [German adaptation strategy to climate change]. (2008).
5. Matthies-Wiesler, F. et al. Policy Brief for Germany. 8 (2019).
6. Europäisches Parlament [European Parliament]. EU-Klimagesetz: Parlament will Emissionen bis 2030 um 60% reduzieren [EU-Climate law: parliament aims to reduce emissions by 60% by 2030]. Pressemitteilung [press release] (2020). Available at: <https://www.europarl.europa.eu/news/de/press-room/20201002IPR88431/eu-klimagesetz-parlament-will-emissionen-bis-2030-um-60-reduzieren>. (Accessed: 9th October 2020)
7. WHO Global Health Observatory (GHO). Country profile noncommunicable diseases: Germany. (2018). Available at: https://www.who.int/nmh/countries/deu_en.pdf?ua=1. (Accessed: 10th September 2020)
8. Haines, A. & Ebi, K. The Imperative for Climate Action to Protect Health. *N. Engl. J. Med.* 380, 263–273 (2019).
9. World Health Organization. WHO Manifesto for a healthy and green COVID-19 recovery. 5 (2020).
10. Wissenschaftlicher Beirat für Agrarpolitik [Scientific Advisory Council for Agricultural Policy] & Ernährung und gesundheitlichen Verbraucherschutz (WBAE) beim Bundesministerium für Ernährung und Landwirtschaft (BMEL) [Nutrition and Health-related Consumer Protection (WBAE) at the German Federal Ministry for Nutrition and Agriculture (BMEL)]. Politik für eine nachhaltige Ernährung. [Policies for sustainable nutrition]. (2020).
11. Willett, W., Rockström, J., Loken, B., Springmann, M. & et al. Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *Lancet* 393, 447–492 (2019).
12. Meier, T. et al. Health Care Costs Associated with an Adequate Intake of Sugars, Salt and Saturated Fat in Germany: A Health Econometrical Analysis. *PLoS One* 10, e0135990 (2015).
13. Springmann, M. et al. Options for keeping the food system within environmental limits. *Nature* 562, 519–525 (2018).
14. Poore, J. & Nemecek, T. Reducing food's environmental impacts through producers and consumers. *Science* (80-.). 360, 987–992 (2018).
15. Duro, J. A., Lauk, C., Kastner, T., Erb, K.-H. & Haberl, H. Global inequalities in food consumption, cropland demand and land-use efficiency: A decomposition analysis. *Glob. Environ. Chang.* 64, 102124 (2020).
16. Watts, N. et al. The 2020 report of The Lancet Countdown on health and climate change: responding to converging crises. (2020).
17. Welthungerhilfe. Schluss mit der Lebensmittelverschwendung [Stop wasting food]. (2020). Available at: <https://www.welthungerhilfe.de/aktuelles/blog/lebensmittelverschwendung/>. (Accessed: 29th September 2020)
18. IPCC. Climate Change and Land: An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems- Summary for Policy Makers. (2020).
19. Bayerisches Staatsministerium für Ernährung, Landwirtschaft und Forsten [Bavarian Ministry for Nutrition, A. and F. Saisonal essen, regional einkaufen [Seasonal consumption, regional production]. Available at: <https://www.stmelf.bayern.de/ernaehrung/007760/>. (Accessed: 29th September 2020)
20. Pfeifer, K. et al. Nationale Empfehlungen für Bewegung und Bewegungsförderung [National recommendations for physical activity and promotion of physical activity]. (Federal Ministry of Health, 2016).
21. German Advisory Council on Global Change (WBGU). Flagship Report: Rethinking Land in the Anthropocene (Summary). (2020).
22. Mozaffarian, D., Angell, S. Y., Lang, T. & Rivera, J. A. Role of government policy in nutrition—barriers to and opportunities for healthier eating. *BMJ* 361, k2426 (2018).
23. Schaller, K., Effertz, T., Gerlach, S., Grabfelder, M. & Müller, M. J. Prävention nichtübertragbarer Krankheiten – eine gesamtgesellschaftliche Aufgabe. Grundsatzpapier der Deutschen Allianz Nichtübertragbare Krankheiten (DANK) [Prevention of non-communicable diseases- a whole-society task; position paper of the German Alli. (2016).
24. European Commission. Communication from the Commission to the European Parliament, the Council, the European economic and social Committee and the Committee of the regions – A European Strategy for Low-Emission Mobility. COM/2016/0501 Final COM/2016/0, (2016).
25. Brook, R. D. et al. Particulate matter air pollution and cardiovascular disease: An update to the scientific statement from the American Heart Association. *Circulation* 121, 2331–2378 (2010).
26. Newby, D. E. et al. Expert position paper on air pollution and cardiovascular disease. *Eur. Heart J.* 36, 83–93 (2015).
27. Thurston, G. D. et al. A joint ERS/ATS policy statement: what constitutes an adverse health effect of air pollution? An analytical framework. *Eur. Respir. J.* 49, (2017).
28. Giles-Corti, B. et al. City planning and population health: a global challenge. *Lancet* 388, 2912–2924 (2016).
29. Habitat III. The New Urban Agenda. (2016). Available at: <http://habitat3.org/the-new-urban-agenda>.
30. UN Habitat. Global report on human settlements 2011: Cities and Climate Change. (2011).
31. WHO Regional Office for Europe. Protecting health in Europe from climate change: 2017 update. (World Health Organization, 2017).
32. German Advisory Council on Global Change (WBGU). Humanity on the Move: Unlocking the transformative power of cities. (2016).
33. Gago, E. J., Roldan, J., Pacheco-Torres, R. & Ordóñez, J. The city and urban heat islands: A review of strategies to mitigate adverse effects. *Renew. Sustain. Energy Rev.* 25, 749–58 (2013).
34. Global Platform for Sustainable Cities & World Bank. Urban Sustainability Framework. (World Bank Group, 2018).

Contributing institutions and authors

The policy brief for Germany has been supported by the German Medical Association (Bundesärztekammer), the Institute of Epidemiology (EPI) at Helmholtz Zentrum München, the Medical Faculty of the Ludwig-Maximilians Universität München (LMU Munich), the Charité – Universitätsmedizin Berlin and the Potsdam Institute for Climate Impact Research (PIK).

This policy brief was written by Dr Franziska Matthies-Wiesler (Helmholtz Zentrum München), Dr Martin Herrmann (KLUG), Dr Peter von Philipsborn (LMU Munich), Katharina Wabnitz MD (LMU Munich and University of Cambridge), Karin Geffert MD (LMU Munich), Dr Alexandra Schneider (Helmholtz Zentrum München) and Dr Susanne Breitner (LMU Munich) with the support of Dr Petra Thorbrietz (Science Writer, Munich). Overall guidance was provided by Prof Annette Peters (Helmholtz Zentrum München), Prof Sabine Gabrysch (PIK and Charité, Berlin), Prof Eva Rehfuess (LMU Munich) and the Lancet Countdown, in particular Dr Nicholas Watts and Jessica Beagley, London.

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 38 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 2020 assessment, visit www.lancetcountdown.org/2020-report.

THE GERMAN MEDICAL ASSOCIATION (BUNDESÄRZTEKAMMER)

The German Medical Association (Bundesärztekammer) is the central organisation in the system of medical self-administration in Germany. As the joint association of the State Chambers of Physicians (Landesärztekammern), it represents the interests of over 500,000 physicians in matters relating to professional policy, and plays an active role in opinion-forming processes with regard to health and social policy and in legislative procedures.

THE HELMHOLTZ ZENTRUM MÜNCHEN - GERMAN RESEARCH CENTER FOR ENVIRONMENTAL HEALTH

Helmholtz Zentrum München is a research center with the mission to discover personalized medical solutions for the prevention and therapy of environmentally-induced diseases and promote a healthier society in a rapidly changing world. It investigates important common diseases which develop from the interaction of lifestyle, environmental factors and personal genetic

background, focusing particularly on diabetes mellitus, allergies and chronic lung diseases. Helmholtz Zentrum München is headquartered in Neuherberg in the north of Munich and has about 2,500 staff members. It is a member of the Helmholtz Association, the largest scientific organization in Germany with more than 40,000 employees at 19 research centers.

MEDICAL FACULTY OF THE LUDWIG-MAXIMILIANS UNIVERSITÄT MÜNCHEN (LMU MUNICH)

The LMU Munich is one Germany's oldest universities. Its Faculty for Medicine combines clinical care with research and teaching on all aspects of human health, including public and planetary health. At the LMU's university hospital, the LMU Klinikum, more than 500,000 patients receive medical treatment annually, making it one of Germany's largest health care organizations.

CHARITÉ – UNIVERSITÄTSMEDIZIN BERLIN

Charité – Universitätsmedizin Berlin is one of the largest university hospitals in Europe, hosting approximately 100 departments and institutes spread across 4 separate campuses. At Charité, the areas of research, teaching and medical care are closely interlinked. Approximately 18,700 members of staff are employed across its group of companies. Charité's Medical Faculty is one of the largest in Germany, educating and training more than 8,000 medical and dentistry students.

THE POTSDAM INSTITUTE FOR CLIMATE IMPACT RESEARCH (PIK)

The Potsdam Institute for Climate Impact Research (PIK) is one of the leading research institutions addressing relevant questions in the fields of global change, climate impacts and sustainable development. Natural and social scientists work closely together to generate interdisciplinary insights that provide a sound basis for decision-making for society, businesses and politics. PIK is a member of the Leibniz Association of 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 2020 assessment, visit www.lancetcountdown.org/2020-report/