Pädiatrie im Kontext von Planetary Health – was erwartet uns?

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Klimakatastrophen in Deutschland

Bundesministerium
für Umwelt, Naturschutz
und nukleare Sicherheit

Ministerium Themen Service Presse BMU durchsuchen

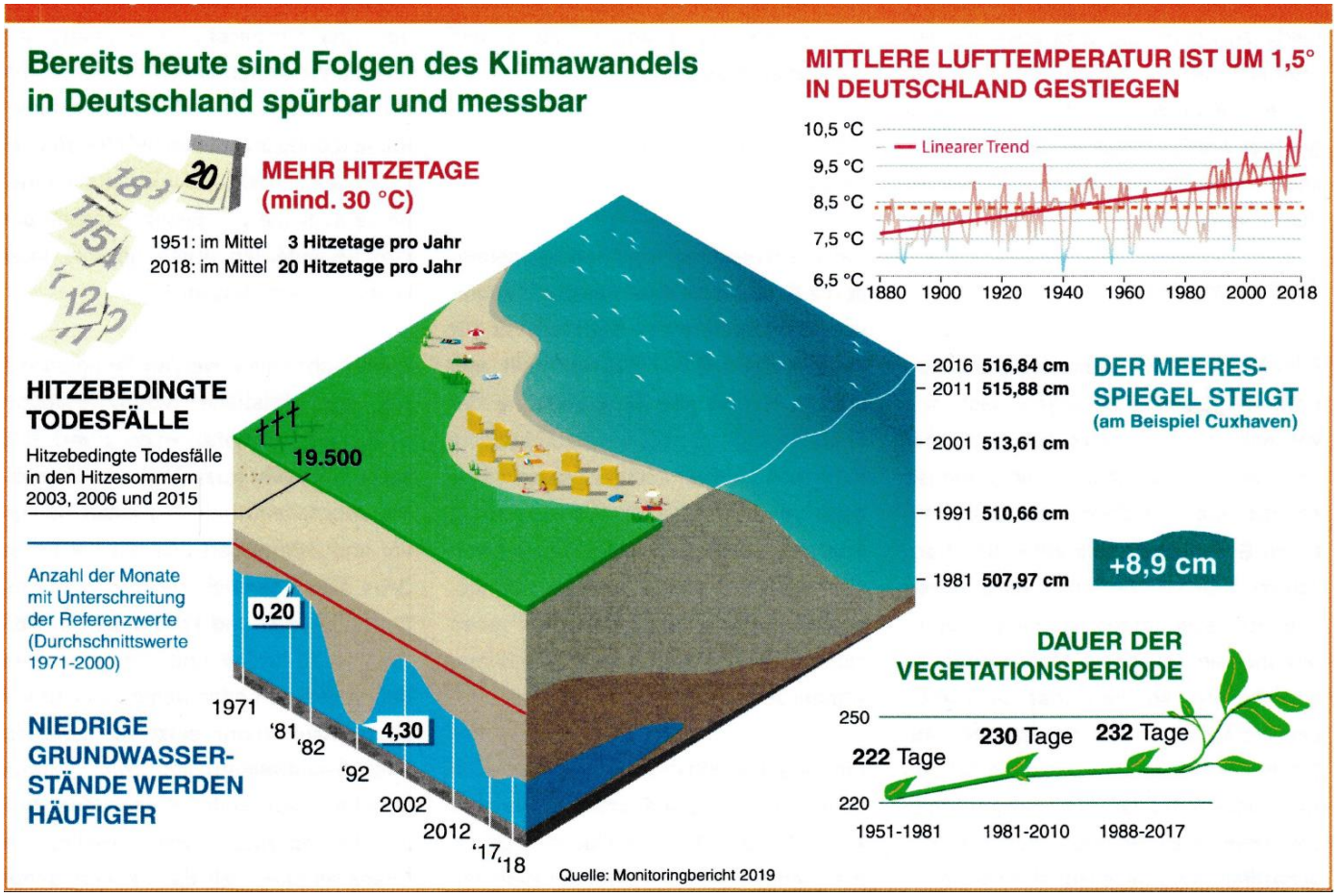
Themen › Gesundheit · Chemikalien › Gesundheit und Umwelt › Klimawandel und Gesundheit › Extremwetterereignisse

Extremwetterereignisse

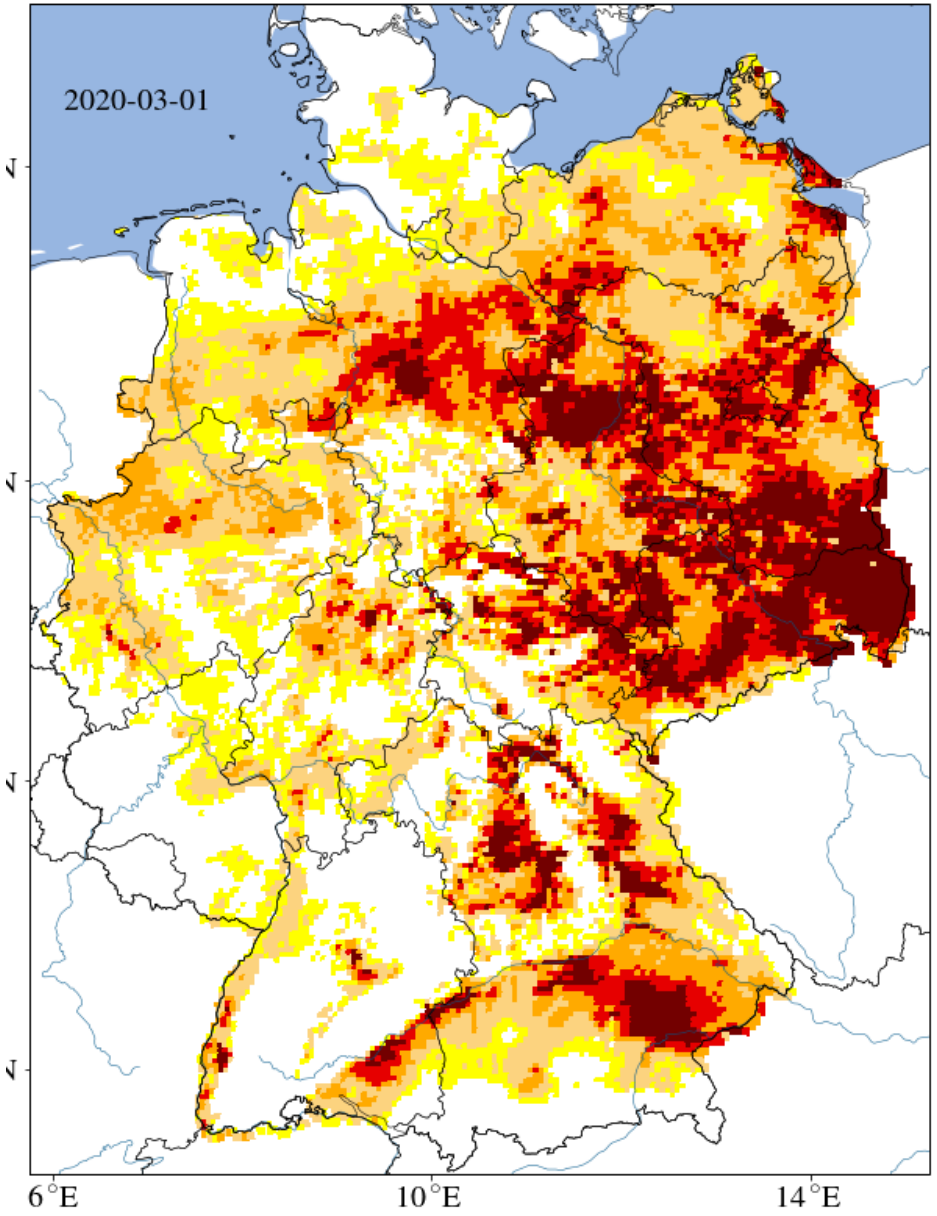
Was ist das Problem?

Schon die bisher beobachteten Klimaveränderungen in Deutschland führen zu einer Zunahme extremer Wetterereignisse, die Teile unserer Gesellschaft vor große Herausforderungen stellen. Viele Menschen werden in ihrer Gesundheit erheblich belastet, in dessen Folge es zu einem Anstieg der Mortalität (Sterblichkeit) kommt.

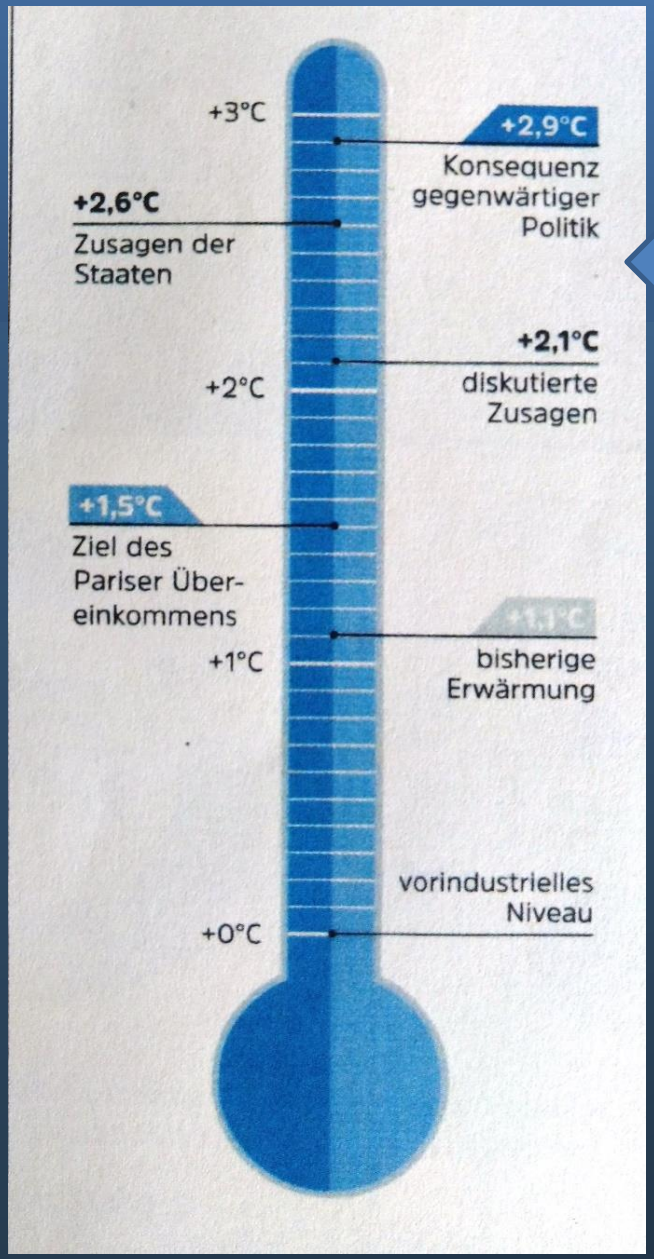
Helmholtz-Zentrum München: Mehr Todesfälle bei Hitze und Kälte


Bereits heute sind Folgen des Klimawandels in Deutschland spürbar und messbar
MEHR HITZETAGE (mind. 30 °C)
1951: im Mittel 3 Hitzetage pro Jahr
2018: im Mittel 20 Hitzetage pro Jahr
MITTLERE LUFTTEMPERATUR IST UM 1,5° IN DEUTSCHLAND GESTIEGEN
10,5 °C
9,5 °C
8,5 °C
7,5 °C
6,5 °C
Linearer Trend
1880 1900 1920 1940 1960 1980 2000 2018
HITZEBEDINGTE TODESFÄLLE
Hitzebedingte Todesfälle in den Hitzesommern 2003, 2006 und 2015
19.500
DER MEERES-SPIEGEL STEIGT
(am Beispiel Cuxhaven)
2016 516,84 cm
2011 515,88 cm
2001 513,61 cm
1991 510,66 cm
1981 507,97 cm
+8,9 cm
Anzahl der Monate mit Unterschreitung der Referenzwerte (Durchschnittswerte 1971-2000)
0,20
4,30
1971
'81
'82
'92
2002
2012
'17
'18
NIEDRIGE GRUNDWASSER-STÄNDE WERDEN HÄUFIGER
DAUER DER VEGETATIONSPERIODE
250
220
222 Tage
230 Tage
232 Tage
1951-1981
1981-2010
1988-2017
Quelle: Monitoringbericht 2019

Dürre-Atlas Deutschland (Helmholtz Institut)



Planetare Grenzen

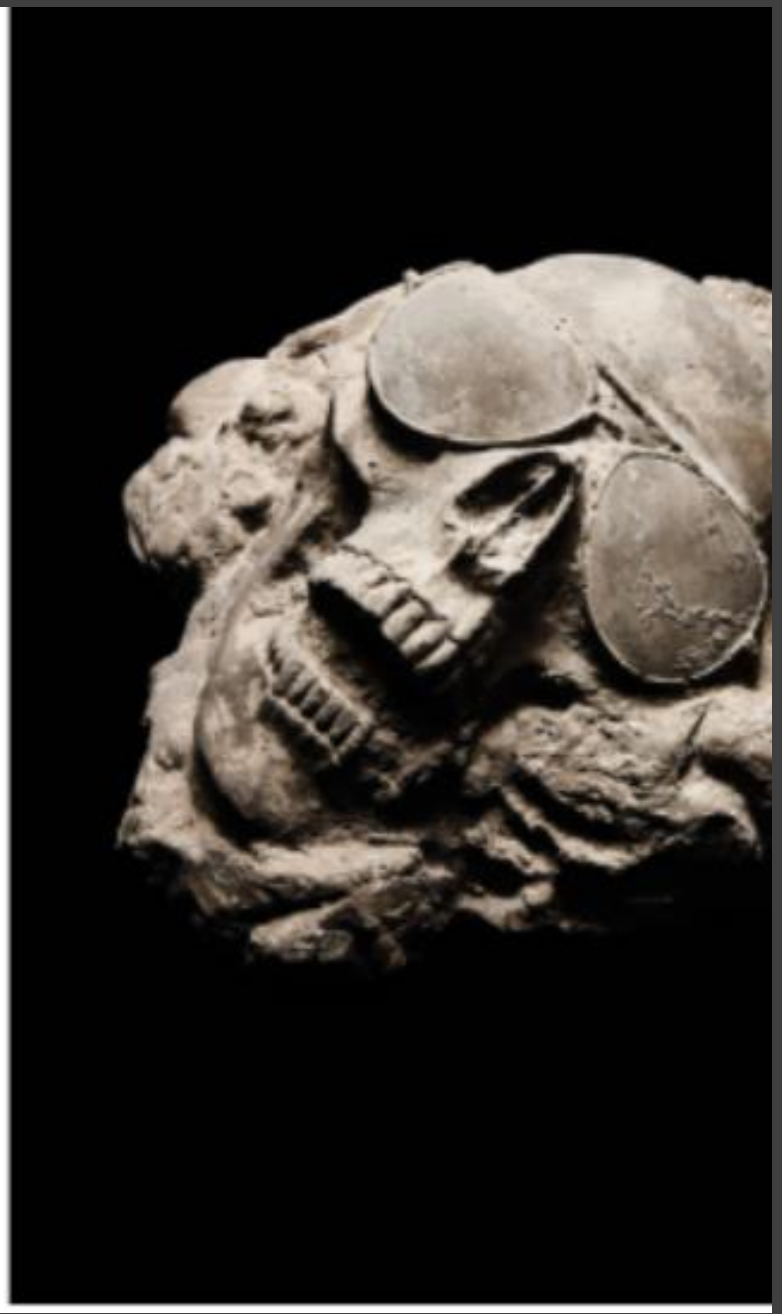


Glasgow Agreement

The Uninhabitable Earth

Famine, economic collapse, a sun that cooks us: What climate change could wreak — sooner than you think.

By **David Wallace-Wells**



Klimakonferenz Vereinte Nationen

IPPC Report 2021


© Léa Weimann
Gift Wrap
BOLSONARO
TRUMP
STOP Ökozid

The health effects of climate change: Know the risks and become part of the solutions

C Howard[1,2*], P Huston[3]

Abstract

Climate change presents a clear and present danger to human health. Health impacts are already being demonstrated in Canada, which is warming at roughly twice the global rate. A recent United Nations *Environment Emissions Gap Report* noted that if countries maintain current emission efforts, emissions will exceed the targets laid out in the Paris Agreement and global warming will exceed 2°C worldwide. An important consequence of global warming is an increase in health risks. Much can be done to prevent and mitigate the health impacts of climate change, and understanding and communicating these has been shown to be one of the best ways of motivating action. This editorial provides an overview of the some of the global and national initiatives underway to decrease emissions, and address the health risks of climate change in general, and highlights some of the national initiatives underway to mitigate the increased risk of infectious diseases in Canada in particular.

Suggested citation: Howard C, Huston P. The health effects of climate change: Know the risks and become part of the solutions. Can Commun Dis Rep 2019;45(5):114–8. https://doi.org/10.14745/ccdr.v45i05a01

Keywords: climate change, health impact, infectious diseases, resilience, adaptation, prevention, emissions, eco-anxiety, ecological grief, mosquito-borne diseases, surveillance

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Einige Regionen in Kanada zeigten 2019 schon eine Temperaturerhöhung über 3 C

International Journal of
Environmental Research and Public Health

MDPI

Review

Climate Change and Child Health Inequality: A Review of Reviews

Emmanuelle Arpin [1], Karl Gauffin [2,*], Meghan Kerr [3], Anders Hjern [2,4], Angela Mashford-Pringle [5], Aluisio Barros [6], Luis Rajmil [7], Imti Choonara [8] and Nicholas Spencer [9]

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Citation: Arpin, E.; Gauffin, K.; Kerr, M.; Hjern, A.; Mashford-Pringle, A.; Barros, A.; Rajmil, L.; Choonara, I.; Spencer, N. Climate Change and Child Health Inequality: A Review of Reviews. *Int. J. Environ. Res. Public Health* **2021**, *18*, 10896. https://doi.org/10.3390/ijerph182010896

Academic Editors: Jacques Oosthuizen, Neil J. Hime, Peng Bi and Andrew Mathieson

Received: 20 September 2021
Accepted: 14 October 2021
Published: 17 October 2021

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Abstract: There is growing evidence on the observed and expected consequences of climate change on population health worldwide. There is limited understanding of its consequences for child health inequalities, between and within countries. To examine these consequences and categorize the state of knowledge in this area, we conducted a review of reviews indexed in five databases (Medline, Embase, Web of Science, PsycInfo, Sociological Abstracts). Reviews that reported the effect of climate change on child health inequalities between low- and high-income children, within or between countries (high- vs low–middle-income countries; HICs and LMICs), were included. Twenty-three reviews, published between 2007 and January 2021, were included for full-text analyses. Using thematic synthesis, we identified strong descriptive, but limited quantitative, evidence that climate change exacerbates child health inequalities. Explanatory mechanisms relating climate change to child health inequalities were proposed in some reviews; for example, children in LMICs are more susceptible to the consequences of climate change than children in HICs due to limited structural and economic resources. Geographic and intergenerational inequalities emerged as additional themes from the review. Further research with an equity focus should address the effects of climate change on adolescents/youth, mental health and inequalities within countries.

Keywords: climate change; children; health inequality; scoping review; global health

1. Introduction

The uneven distribution of social and environmental factors on birth and early life give rise to avoidable child health inequalities [1]. Differences in child survival, health, development and well-being are stark between low- and middle-income countries (LMICs) and high-income countries (HICs) [2]. Many children in LMICs live in circumstances in which they are deprived of essential determinants of health such as clean air, adequate shelter, nutrition, safe water and sanitation [3], all of which contribute to the higher risk of adverse child health outcomes such as stunting secondary to malnutrition [4], acute

Der Klimawandel erhöht die **Ungleichheit für Kinder** aus sozioökonomisch schlechter gestellten Bereichen und Ländern, u.a. aufgrund fehlender Ressourcen.

Die Autoren fordern wie das IPPC und Editorials von über 200 medizinischen Fachzeitschriften **Notfallaktionen der Regierungen, um den Temperaturanstieg** auf max. 1,5 C zu begrenzen, die Biodiversität wieder herzustellen, um die Gesundheit von Kindern zu schützen.

Bislang gibt es wenig Literatur zum Klimawandel bei älteren Kindern, bei denen aber besonders die **mentale Gesundheit** gefährdet ist .

Medizinische Folgen des Klimawandels

- Temperatur bedingte Erkrankungen und Todesfälle
- Wasserverschmutzung
- Erhöhung von Infektionserkrankungen
- Erkrankungen und Todesfälle durch Luftverschmutzung

Säuglinge und Kinder tragen ein hohes Risiko

19

Neonatologie und Pädiatrie

Thomas Lob-Corzilius und Edda Weimann

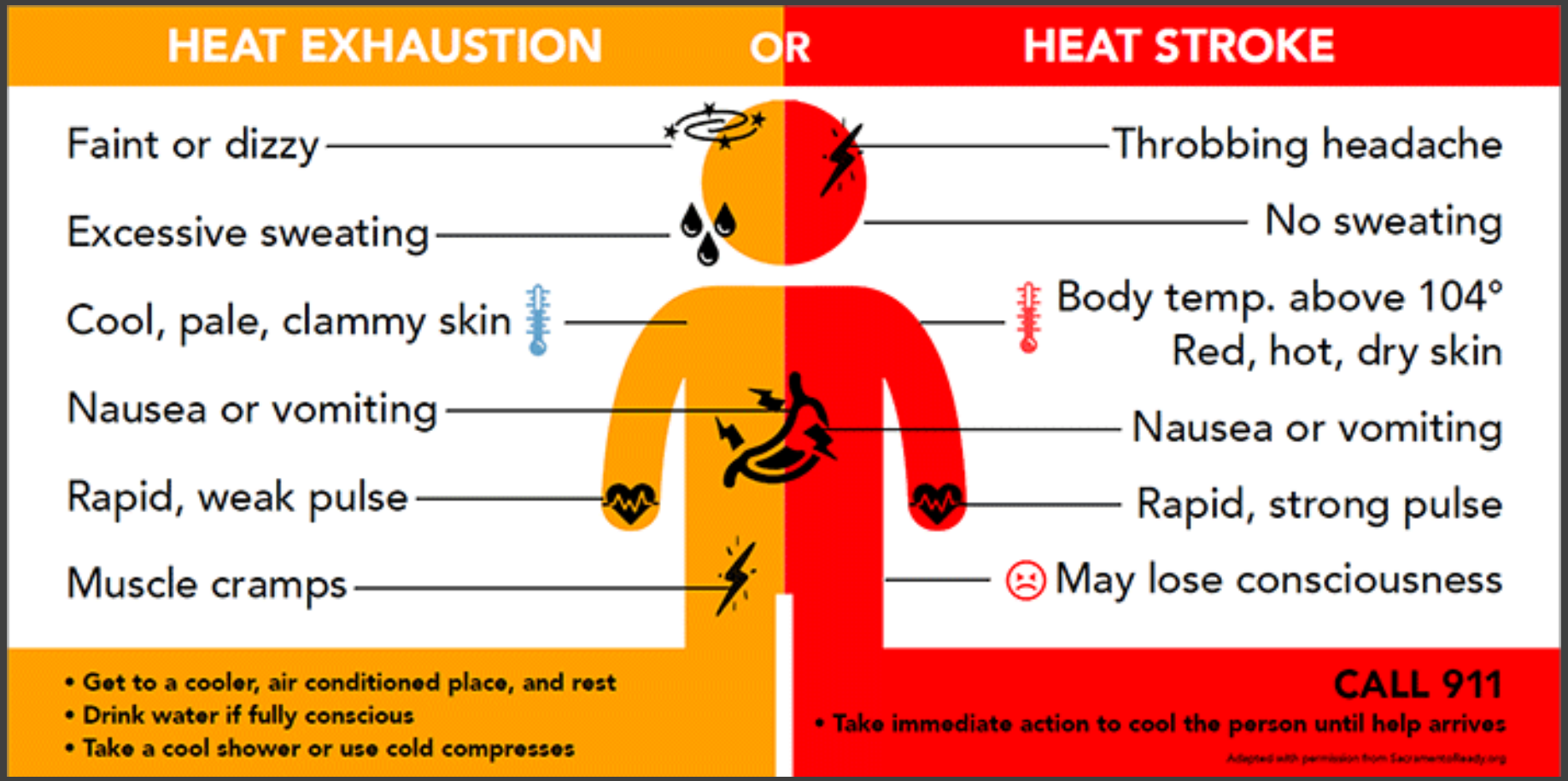
Medizinische Auswirkungen

- Covid-19 und weitere Pandemien
- Hitze
- Luftverschmutzung & Asthma
- Übergewicht
- Diabetes
- Allergien

The heat is on …

Definition Hitzewelle

- Eine Hitzwelle mindestens drei Tagen in Folge heißen Wetters (über 30° C), was mit hoher Luftfeuchtigkeit vergesellschaftet sein kann



Tote in Europa

- 70.000 während Hitzewellen

Hitzewellen

Climate Change and Global Public Health pp 123-161 | Cite as

Heat Waves and Rising Temperatures: Human Health Impacts and the Determinants of Vulnerability

Authors | Authors and affiliations

Helene G. Margolis

Springer Link

ICB 2011 - Students / New Professionals | Published: 23 March 2013

The impact of heat waves on children's health: a systematic review

Zhiwei Xu, Perry E. Sheffield, Hong Su, Xiaoyu Wang, Yan Bi & Shilu Tong

International Journal of Biometeorology 58, 239–247 (2014) | Cite this article

Heatwaves and diabetes in Brisbane, Australia: a population-based retrospective cohort study FREE

Zhiwei Xu ✉, Shilu Tong, Jian Cheng, James Lewis Crooks, Hao Xiang, Xiangyu Li, Cunrui Huang, Wenbiao Hu

International Journal of Epidemiology, Volume 48, Issue 4, August 2019, Pages 1091–1100, https://doi.org/10.1093/ije/dyz048

- Anstieg der hitzebedingten Morbidität und Mortalität (HRMM)
- Medizinische Aktionspläne für extreme Hitzeereignisse notwendig
- Vorbereitet sein auf Hitze
- Chronisch Kranke, Kinder, Säuglinge und Ältere sind besonders gefährdet
- Mehr Hospitalisationen von Diabetikern und mehr vorzeitige Todesfälle
- Patienten mit Nierenerkrankungen, Atemwegserkrankungen, Elektrolyt-Imbalanzen (u.a. NNR Insuffizienz) und Fieber haben ein erhöhtes Risiko

Mentale Gesundheit

Trauma

Table 1. Health impacts resulting from extreme weather events that are likely to increase in certain areas of South Africa under future climatic conditions.

Floods and Storms	Drought	Fire
• Increased or decreased vector (e.g. mosquito) abundance (e.g. if breeding sites are washed away). • Increased risk of respiratory and diarrhoeal diseases. • Drowning. • Injuries. • Health effects associated with population displacement. • Impacts on food supply. • Mental health impacts.	• Changes in abundance of vectors that breed in dried up river beds. • Food shortages. • Illness. • Malnutrition. • Increased risk of infections. • Death (starvation). • Health impacts associated with population displacements.	• Burns and smoke inhalation. • Soil erosion and increased risks of landslides. • Increased mortality and morbidity. • Increased risk of hospital and emergency admissions.

US wildfires and mental illness stress health systems

The record wildfire season on the US west coast, coupled with the raging COVID-19 pandemic, is testing the health system's preparedness. Roxanne Nelson reports from Seattle, WA.

For more on the **mental health effects of disasters** see https://www.annualreviews.org/doi/full/10.1146/annurev-publhealth-032013-182435

On the morning of Sept 9, 2020, Heather Johnson, a writer from Oakland (CA, USA), decided to venture out for a morning run. Wildfires had been burning for the past month or so, periodically filling the skies with smoke, and the air quality had been poor for the past several weeks. A competitive runner, Johnson hit the streets of her urban neighbourhood before sunrise, but then noticed something very odd. About the time the sun would normally come up, the sky remained dark, almost in a pseudo twilight, and then everything was bathed in an overpowering orange light that looked like a sunset on steroids.

"I ran for a little bit but it was so surreal and so frightening, I turned around and raced home", said Johnson. Once back in her apartment, she called her father who lives thousands of miles away, on the opposite coast. "I was so freaked out, and just tried to describe it to him", she said. "I've never seen anything like it."

Johnson is no stranger to fires. In many western areas of the USA and Canada, wildfires are common, particularly between August and November, following long dry spells and the heat of summer. But the ominous orange colour that engulfed the skies in the San Francisco Bay Area was like nothing seen before, and reminiscent of post-apocalyptic movies such as Blade Runner. "The streets were empty and it never really got light out", said Johnson. "It was really eerie."

David Peterson/Reuters

"...fire is a 'very potent trauma'..."

The National Interagency Fire Center reports that as of Oct 19, 46 148 wildfires have burned 8 404 047 acres during 2020—about 2·1 million more acres burned than the 10-year average—smothering the entire west coast in heavy smoke, from the tip of southern California all the way into western Canada. Although the intense heat has lessened and fires have died down in many of the hotspots, it is not yet over: in California, almost 4100 firefighters continue to battle 22 wildfires across the state as of Nov 3.

The fires have added another layer to an already many-layered crisis. The wildfires began in full force in August, while the nation was struggling to deal with a pandemic that had left millions unemployed with an uncertain future, an ever-rising death toll, and constraints on free movement and activity. The intense heat of the summer was also record breaking. The meteorological summer, which lasts from June to the end of August, was the fourth hottest and in the driest third of all summers in the historical record. Six US states—Arizona, California, Colorado, Nevada, New Mexico, and Utah—each reported their warmest August on record.

Although the physical health effects of smoke exposure have been well publicised, less is known about the mental health effects of the fires. Mental health disorders can often develop following a disaster. One review has put the prevalence of post-traumatic stress disorder (PTSD) at 30–40% among direct victims, 10–20% among rescue workers, and 5–10% in the general population. Depression, anxiety, substance misuse, and domestic violence also tend to increase following a natural disaster.

"I think PTSD would be a concern based on what I've read from survivor accounts", said Royce Lee, associate professor of psychiatry and behavioural neuroscience at the University of Chicago (IL, USA). "And then, PTSD in all of the first responders, crisis workers, and disaster response personnel."

Lee noted that fire is a "very potent trauma. It's terrifying and there are high levels of fears." Coping afterwards can be difficult, and that makes recovery harder. "Then there are other things to think about, such as guilt and moral injury", he said. "That's its own form of PTSD, since there can be survivor's guilt." To add to that, Lee explained that there are also reports about air quality being linked to psychopathology via oxidative stress.

However, for most individuals suffering mental health effects, the effects tend not to be long lasting. "Typically there are a lot of symptoms in the first 2 days or so, and then it decreases and quickly dissipates over time", he said. "About 80–90% will go to zero in a few weeks or months, and in a quarter or less, the symptoms remain constant."

Timothy Black, an associate professor of counselling psychology at the University of Victoria (BC, Canada) who specialises in PTSD, notes that exposure to trauma does not necessarily mean a person will be traumatised. "But exposure ticks the box, so to speak, for the first domino to fall if you are

Klima und Öko-Angst: Eco- and climate anxiety

Solastalgie: Verlustgefühl durch Zerstörung des Lebensraums und der Heimat

Open Access Review

The Interplay between Social and Ecological Determinants of Mental Health for Children and Youth in the Climate Crisis

by Maya K. Gislason * , Angel M. Kennedy and Stephanie M. Witham

Faculty of Health Sciences, Simon Fraser University, 8888 University Drive, Burnaby, BC V5A 1S6, Canada

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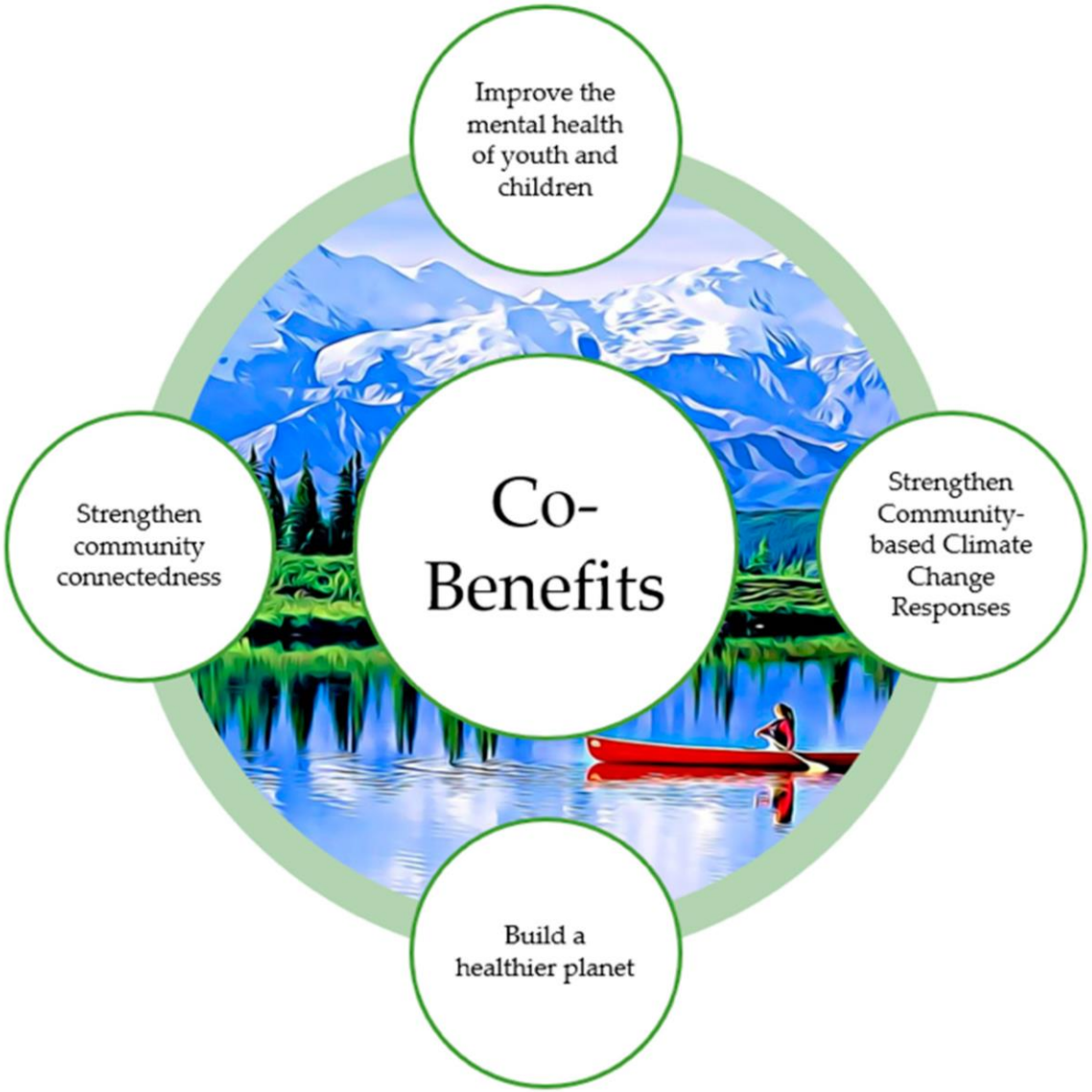
Academic Editors: Maki Umeda and Eizaburo Tanaka

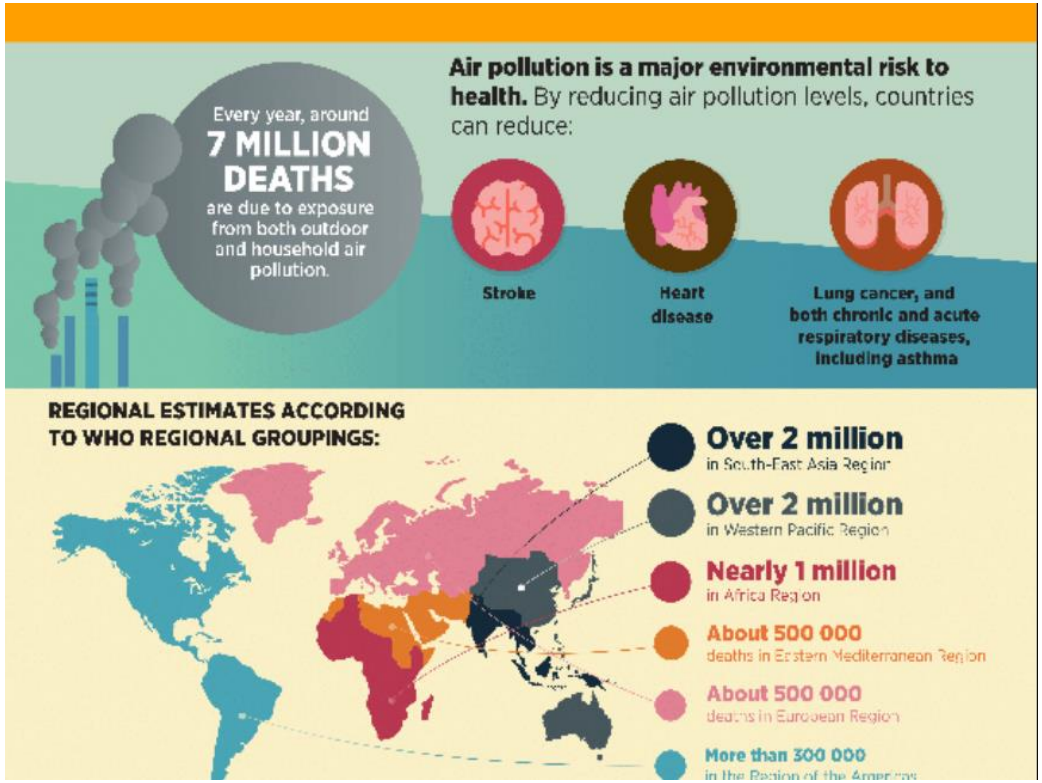
Int. J. Environ. Res. Public Health **2021**, *18*(9), 4573; https://doi.org/10.3390/ijerph18094573

Received: 30 March 2021 / Revised: 22 April 2021 / Accepted: 23 April 2021 / Published: 26 April 2021


Improve the mental health of youth and children
Strengthen community connectedness
Co-Benefits
Strengthen Community-based Climate Change Responses
Build a healthier planet

Luftverschmutzung

In Europa sterben jedes Jahr 450.00 Menschen aufgrund der Luftverschmutzung - vermeidbare Todesfälle



Lufterschmutzung

ELSEVIER

Environmental Pollution

Volume 232, January 2018, Pages 385-391

Effects of air pollution on infant and children respiratory mortality in four large Latin-American cities ☆

Nelson Gouveia [a], Washington Leite Junger [b]

the ESCALA investigators

- Luftverschmutzung hat eine wichtige Auswirkung auf Kinder- und Säuglingsmortalität
- PM_{10} (Feinstaub), O_3 (Ozon), $S0_2$ (Schwefeldioxid) und NO_2 (Stickstoffdioxid) sind assoziiert mit Todesfällen von Säuglingen und Kleinkindern
- Wir brauchen eine bessere Gesetzgebung und Gesetzesausführung, um die negative Auswirkungen auf die Kindergesundheit zu verringern

PLOS ONE

OPEN ACCESS PEER-REVIEWED

RESEARCH ARTICLE

Effect of outdoor air pollution on asthma exacerbations in children and adults: Systematic review and multilevel meta-analysis

Pablo Orellano, Nancy Quaranta, Julieta Reynoso, Brenda Balbi, Julia Vasquez

Published: March 20, 2017 • https://doi.org/10.1371/journal.pone.0174050

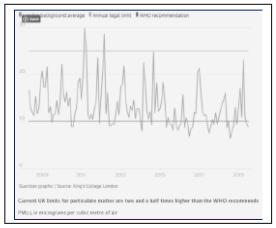
Luftverschmutzung

ISSOP e-Bulletin N° 49
January 2021
4. Current Controversy

4.1 Air Pollution: a case for legal action?

Air pollution verdict shines political light on UK's and world's invisible killer

Air pollution is the invisible killer of 8,8 million people worldwide and is most probably the leading global cause of death. But until now it is not acknowledged on a death certificate. In the UK 40,000 people died prematurely due to air pollution in 2019, in India even 1,7 million people. But a turning point might be reached: On the 16 December 2020 a verdict made history: The coroner's conclusion ruled that ir pollution was the reason for Ella Kissi-Debrah' s death, a nine-year-old who lived close to a high traffic area in the south-east of London, just 25 metres from South Circular Road in Lewisham. Between 2006 and 2010 nitrogen dioxide air pollution and fine particle pollution (PM 2,5) from traffic constantly exceeded the annual legal limit of 40 µg/m³ and 10 µg/m³ (Figure 1). Last year in a similar case a mother successfully sued the French state about living close to traffic polluted ring road Saint Queen in Paris. The family moved to Orleans on their doctor's advice where the heath significantly improved.



Prof Sir Stephen Holgate explained in the court case that unlike most people with asthma, Ella's attacks were not triggered by pollen or respiratory infections. During the winter months when air pollution levels spiked Ella had to be frequently admitted to hospital with coughing fits, which caused secretions in her lungs that in turn resulted in the collapses of her lung. Ella's health deteriorated over the years from being an active sportsperson wearing her gymnastics leotard hung with medals to her death in February 2013 due to acute respiratory failure. As most citizens the family did not know about the detrimental effects of car fumes and the damage the toxic air is causing. Around Ella's death huge spikes in air pollution were recorded.

The legal levels of pollution can now no longer be ignored by politicians despite the noisy interventions of the motoring lobby and car industry. The ruling is supported by the Royal College of Paediatrics and Child Health and other organisations such as Mumsnet. Worldwide air pollution levels frequently exceed set WHO limits. Small particle pollution as well as illegal levels of diesel-driven nitrogen dioxide are common in many cities and residential areas close to highways and traffic polluted streets. It is not only that air pollution damages the air ways but has extensive side effects on every organ in the body ranging from diabetes, heart disease, dementia, reduced mental health and increased risk for depression. Most vulnerable are children and the unborn. Hence there is worldwide a drive for clean air and car free zones in inner city areas to reduce toxic pollution levels and make life for residents and pedestrians healthier. Let this be a hopeful start that deaths like Ella's will be avoided in the future and child health will be more important than the car industry and diesel drivers especially in a time visibly illustrating the devastating impacts of the Climate Emergency. It is an urgent time to act.

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Editorials

Control pollution, protect children, save lives

BMJ 2021 ; 373 doi: https://doi.org/10.1136/bmj.n1110 (Published 30 April 2021)
Cite this as: *BMJ* 2021;373:n1110

The NEW ENGLAND JOURNAL of MEDICINE

Perspective

Environmental Racism and Climate Change — Missed Diagnoses

Renee N. Salas, M.D., M.P.H.

The mother clutches her daughter as the nebulized albuterol permeates the young girl's airways. My eyes dart between the monitor and the child's small, dark-skinned chest as it heaves up and down at an alarming rate. I smile reassuringly, but the mother's eyes begin to well with tears as she recounts her daughter's numerous emergency department (ED) visits and home treatments.

"I have done everything the doctors have asked, and she just keeps getting worse. What am I missing?"

Later, while charting, I review in greater depth the patient's extensive records — far too many for someone so young. Her care teams have all been following the evidence-based guidelines. What are we missing?

In my emergency medicine practice, I often stop at the primary diagnosis, which ignores the critical secondary diagnoses that make it harder to treat a patient's primary condition. Evidence has linked pediatric asthma exacerbations to exposure to traffic-related and particulate-matter (PM) air pollution, ground-level ozone, and pollen.[1-3] Though it is often impossible to determine with certainty that a given exposure caused a disease in an individual patient, many clinicians would not hesitate to link a history of 50 pack-years of tobacco use to a patient's lung cancer. It is reasonable to view certain environmental exposures in the same way.

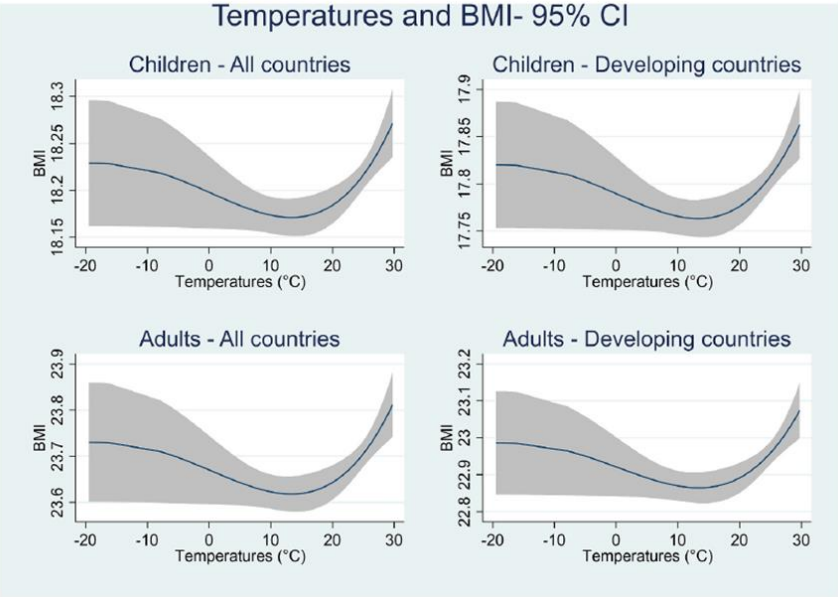
More than a decade ago, the American Heart Association concluded that there is a causal relationship between exposure to air pollution by fine PM with an aerodynamic diameter of 2.5 μm or less ($PM_{2.5}$) and cardiovascular illness and death. Last year, the American Thoracic Society documented that long-term air-pollution exposure causes childhood asthma,[3] and a United Kingdom coroner listed exposure to air pollution as a cause of death in a 9-year-old girl with asthma. As accumulating evidence increasingly links environmental exposures to disease — including the emerging application to health research of detection and attribution methods from climate science — our understanding of contributing diagnoses needs to evolve. There is already a code for air-pollution exposure (Z77.110) in the *International Classification of Diseases*.

Recognizing that exposures to air pollution, ground-level ozone, and pollen are key secondary diagnoses that may be pertinent to my patient, I look up her home address. Suddenly, I am ashamed of missing an additional diagnosis a layer below these exposures: environmental racism. A subtype of structural racism, environmental racism includes the use of racist practices in determining which communities receive health-protective infrastructure, such as

Übergewicht

Übergewicht

- Übergewicht als Wohlstandserkrankung steigt mit Zunahme des Klimawandels an
- Vermehrt träger Lebensstil mit höheren Temperaturen



Trentinaglia et al 2021. Climate Change and Obesity, Global Food Security 29: 1-14

THE LANCET

THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

WORLD OBESITY

Milken Institute School of Public Health
THE GEORGE WASHINGTON UNIVERSITY

The Global Syndemic of Obesity, Undernutrition, and Climate Change: *The Lancet* Commission report

Boyd A Swinburn, Vivica I Kraak, Steven Allender, Vincent J Atkins, Phillip I Baker, Jessica R Bogard, Hannah Brinsden, Alejandro Calvillo, Olivier De Schutter, Raji Devarajan, Majid Ezzati, Sharon Friel, Shifalika Goenka, Ross A Hammond, Gerard Hastings, Corinna Hawkes, Mario Herrero, Peter S Hovmand, Mark Howden, Lindsay M Jaacks, Ariadne B Kapetanaki, Matt Kasman, Harriet V Kuhnlein, Shiriki K Kumanyika, Bagher Larijani, Tim Lobstein, Michael W Long, Victor K R Matsudo, Susanna D H Mills, Gareth Morgan, Alexandra Morshed, Patricia M Nece, An Pan, David W Patterson, Gary Sacks, Meera Shekar, Geoff L Simmons, Warren Smit, Ali Tootee, Stefanie Vandevijvere, Wilma E Waterlander, Luke Wolfenden, William H Dietz

Diabetes

Diabetes

- Temperaturansteig um 5 °C steigert Krankenhauseinweisungen um 6%
- Luftverschmutzung führt zu einer erhöhten Diabetesprävalenz
- Hitzewellen reduzieren die körperliche Aktivität von Kindern und vermindern die Blutzuckerspiegel
- Hitze beeinflusst die Insulinmedikation

ELSEVIER

Available online at
ScienceDirect
www.sciencedirect.com

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www.em-consulte.com

Review

Diabetes mellitus in the era of climate change

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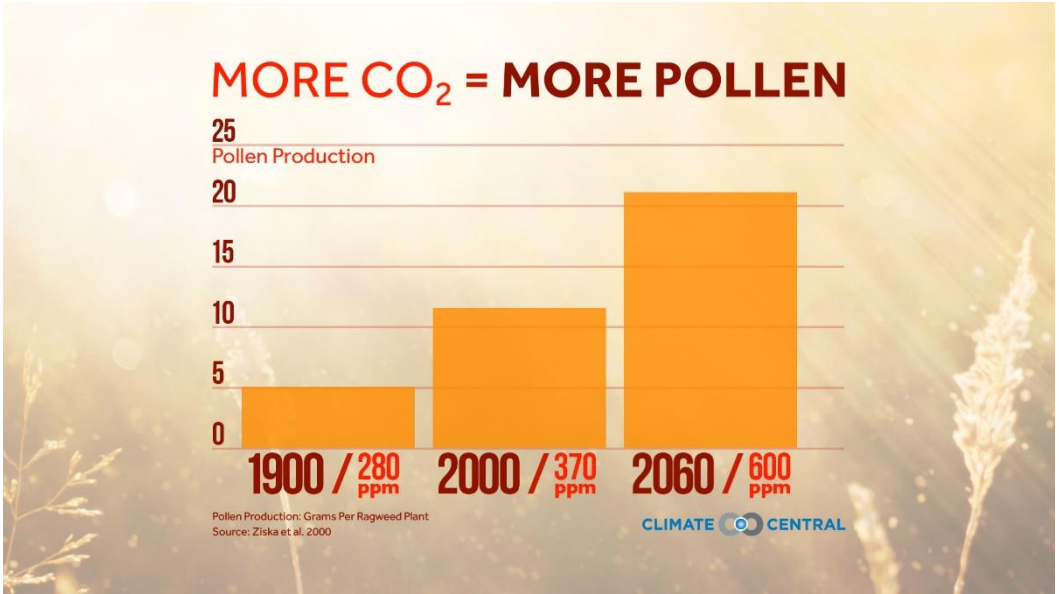
Allergien

Allergien

- Klimawandelbedingte Verlängerung der Pollensaison
- Besonders: Birke, Ambrosia (Beifuss), Eichenprozessionsspinner



Globaler Süden

- **Assoziation zwischen Wetter, Luftverschmutzung und Krankenhauseinweisungen für Klima-sensitive Erkrankungen**
- **Erhöhte Prävalenz von Pneumonien nach Änderungen der Luftqualität innerhalb von 10 bis 15 Tagen**
- **Schaffung von Frühwarnsystemen und Klimawandel Adaptationsplänen, um die Gesundheit der Bevölkerung zu schützen**

Science of The Total Environment
Volume 791, 15 October 2021, 148307

Exploring rural hospital admissions for diarrhoeal disease, malaria, pneumonia, and asthma in relation to temperature, rainfall and air pollution using wavelet transform analysis

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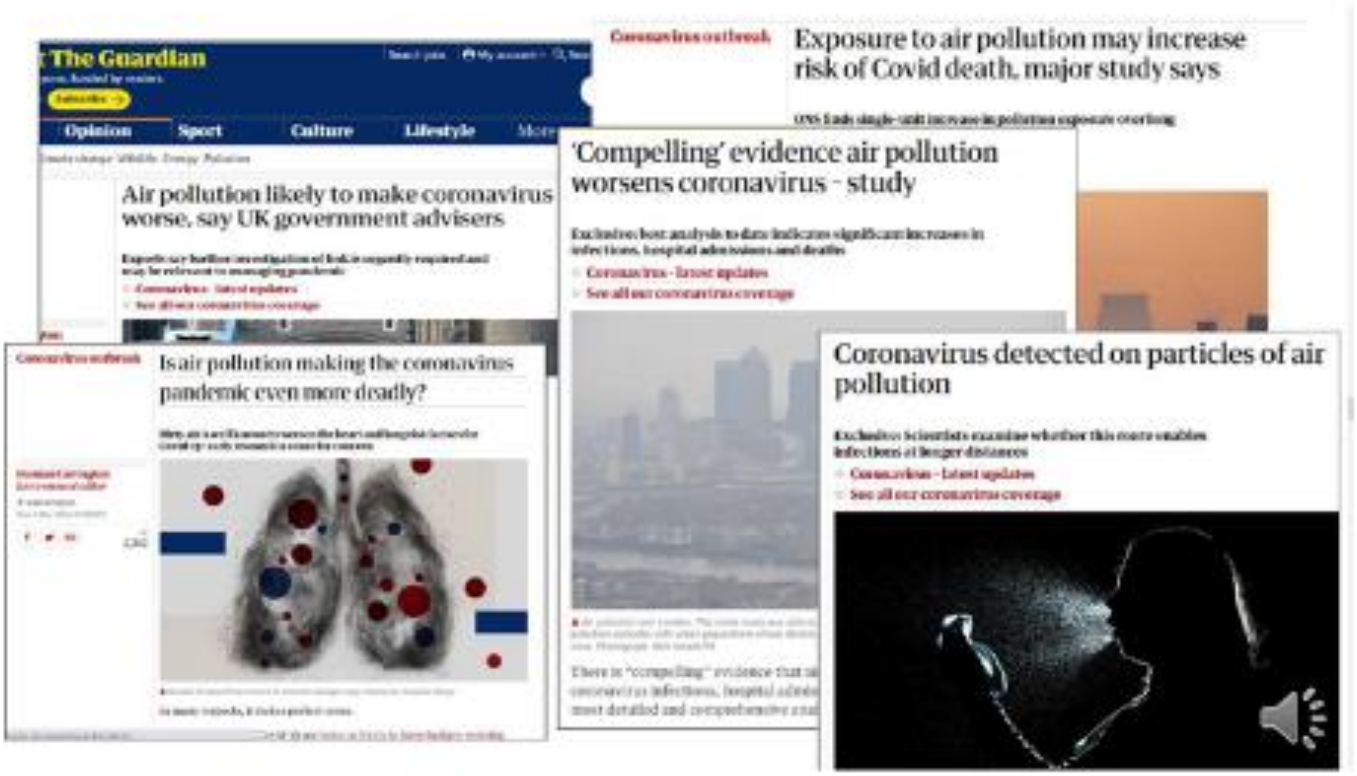
Welche Beziehung gibt es zwischen den Coronaviren und der Klimakrise?

- Covid-19 und SARS haben den Ursprung auf illegalen Wildtiermärkten (Missachtung des Artenschutzes) in China
- Die Globalisierung und der weltweite Flugverkehr trägt zur schnellen Verbreitung bei
- Zoonosen treten häufiger auf

Luftverschmutzung & Corona



A Section 508–conformant HTML version of this article is available at https://doi.org/10.1289/EHP9726.

Ambient Air Pollution in Relation to SARS-CoV-2 Infection, Antibody Response, and COVID-19 Disease: A Cohort Study in Catalonia, Spain (COVICAT Study)

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Background: Emerging evidence links ambient air pollution with coronavirus 2019 (COVID-19) disease, an association that is methodologically challenging to investigate.

Objectives: We examined the association between long-term exposure to air pollution with SARS-CoV-2 infection measured through antibody response, level of antibody response among those infected, and COVID-19 disease.

Methods: We contacted 9,605 adult participants from a population-based cohort study in Catalonia between June and November 2020; most participants were between 40 and 65 years of age. We drew blood samples from 4,103 participants and measured immunoglobulin M (IgM), IgA, and IgG antibodies against five viral target antigens to establish infection to the virus and levels of antibody response among those infected. We defined COVID-19 disease using self-reported hospital admission, prior positive diagnostic test, or more than three self-reported COVID-19 symptoms after contact with a COVID-19 case. We estimated prepandemic (2018–2019) exposure to fine particulate matter [PM with an aerodynamic diameter of $\leq$2.5 μm ($PM_{2.5}$)], nitrogen dioxide (NO_2), black carbon (BC), and ozone (O_3) at the residential address using hybrid land-use regression models. We calculated log-binomial risk ratios (RRs), adjusting for individual- and area-level covariates.

Results: Among those tested for SARS-CoV-2 antibodies, 743 (18.1%) were seropositive. Air pollution levels were not statistically significantly associated with SARS-CoV-2 infection: Adjusted RRs per interquartile range were 1.07 (95% CI: 0.97, 1.18) for NO_2, 1.04 (95% CI: 0.94, 1.14) for $PM_{2.5}$, 1.00 (95% CI: 0.92, 1.09) for BC, and 0.97 (95% CI: 0.89, 1.06) for O_3. Among infected participants, exposure to NO_2 and $PM_{2.5}$ were positively associated with IgG levels for all viral target antigens. Among all participants, 481 (5.0%) had COVID-19 disease. Air pollution levels were associated with COVID-19 disease: adjusted RRs = 1.14 (95% CI: 1.00, 1.29) for NO_2 and 1.17 (95% CI: 1.03, 1.32) for $PM_{2.5}$. Exposure to O_3 was associated with a slightly decreased risk (RR = 0.92; 95% CI: 0.83, 1.03). Associations of air pollution with COVID-19 disease were more pronounced for severe COVID-19, with RRs = 1.26 (95% CI: 0.89, 1.79) for NO_2 and 1.51 (95% CI: 1.06, 2.16) for $PM_{2.5}$.

Discussion: Exposure to air pollution was associated with a higher risk of COVID-19 disease and level of antibody response among infected but not with SARS-CoV-2 infection. https://doi.org/10.1289/EHP9726

Article | Open Access | Published: 07 May 2019

The impact of human health co-benefits on evaluations of global climate policy

Noah Scovronick ✉, Mark Budolfson, Francis Dennig, Frank Errickson, Marc Fleurbaey, Wei Peng, Robert H. Socolow, Dean Spears & Fabian Wagner

Nature Communications **10**, Article number: 2095 (2019) | Cite this article

Notwendige Aktionen

Reduktion der lokalen und globalen Luftverschmutzung

Schaffung von Grünflächen und Respektieren von Natur

Ermöglichen regelmäßiger Aktivitäten draußen

Umsetzung des Pariser Klimaschutzabkommens

Zusammenfassung

Der Klimawandel hat große Auswirkungen auf die Kindergesundheit

Die Auswirkungen des Klimawandels auf die Kindergesundheit ist nicht im öffentlichen Blickpunkt

Anstieg von Asthma, Übergewicht, Diabetes und Allergien

Jede Anstrengung muß unternommen, um das Voranschreiten des Klimawandels und eine Klimakatastrophe zu verhindern

Vielen Dank!

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