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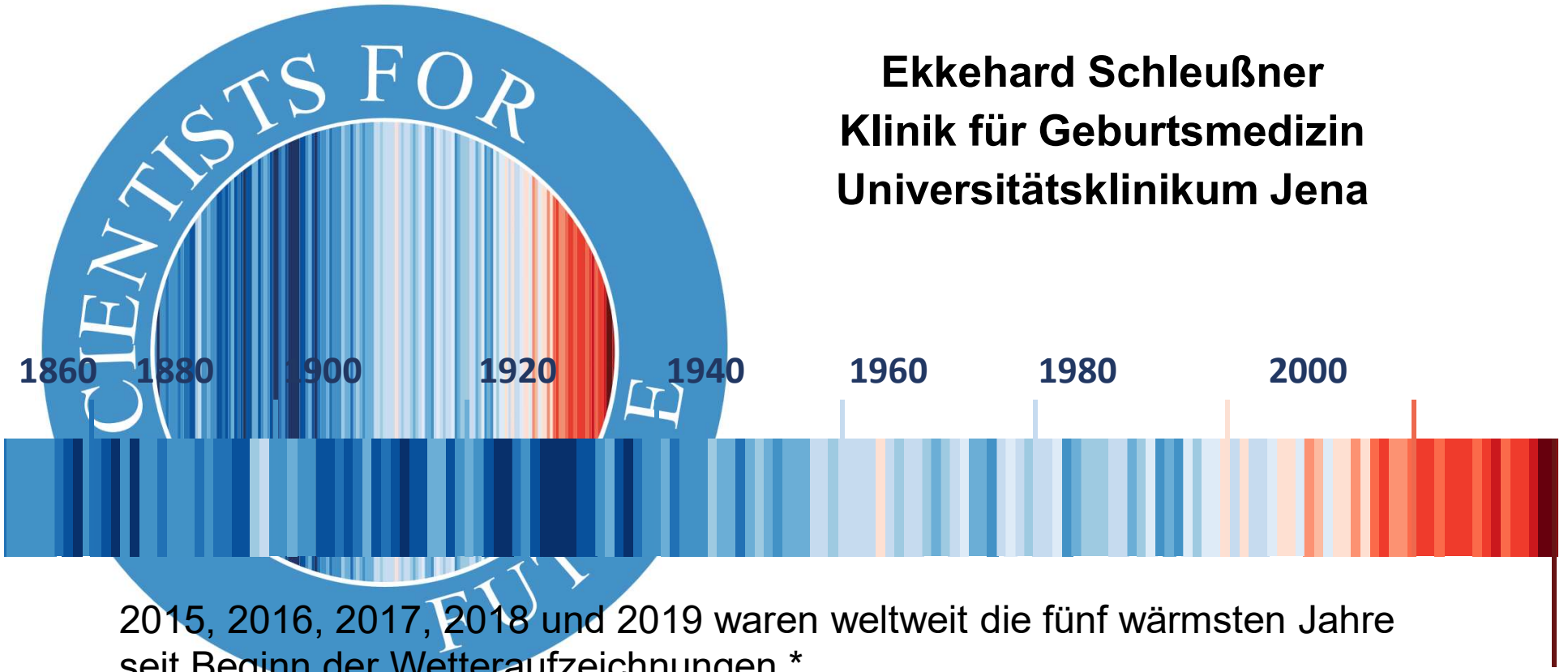
Schwangerschaftsrisiken in der globalen Erwärmung

Ekkehard Schleußner
Klinik für Geburtsmedizin
Universitätsklinikum Jena



2015, 2016, 2017, 2018 und 2019 waren weltweit die fünf wärmsten Jahre seit Beginn der Wetteraufzeichnungen.*


INTERGOVERNMENTAL PANEL ON climate change
ipcc
Climate Change 2021
The Physical Science Basis
Summary for Policymakers
WGI
Working Group I contribution to the
Sixth Assessment Report of the
Intergovernmental Panel on Climate Change
WMO
UNEP

COMMENT | VOLUME 398, ISSUE 10304, P939-941, SEPTEMBER 11, 2021

PDF

Call for emergency action to limit global temperature increases, restore biodiversity, and protect health

Lukoye Atwoli • Abdullah H Baqui • Thomas Benfield • Raffaella Bosurgi • Fiona Godlee • Stephen Hancocks • et al.

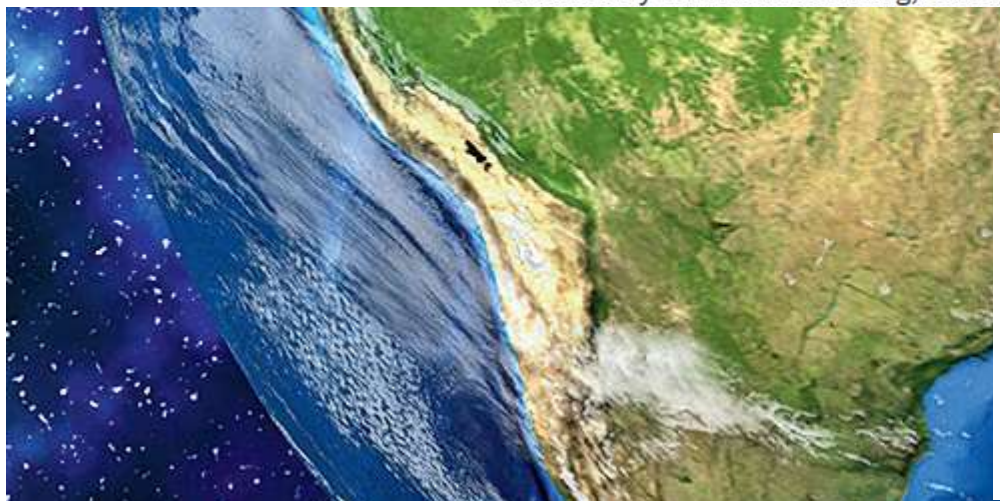
Show all authors

Published: September 04, 2021 • DOI: https://doi.org/10.1016/S0140-6736(21)01915-2 •

Supplementary Material

References

The UN General Assembly in September, 2021, will bring countries together at a critical time for marshalling collective action to tackle the global environmental crisis. They will meet again at the biodiversity summit in Kunming, China, and the UN Climate Change



Die Chefredakteurinnen und -redakteure von 19 medizinischen Fachzeitschriften aus aller Welt haben die Vereinten Nationen dazu aufgerufen, den Ausstoß von Treibhausgasen stärker zu reduzieren um so die Gesundheit der Menschen zu

THE LANCET

Indeed, no temperature rise is “safe”.
In the past 20 years, heat-related mortality among people older than 65 years has increased by more than 50%.
Higher temperatures have brought increased dehydration and renal function loss, dermatological malignancies, tropical infections, adverse mental health outcomes, pregnancy complications, allergies, and cardiovascular and pulmonary morbidity and mortality.

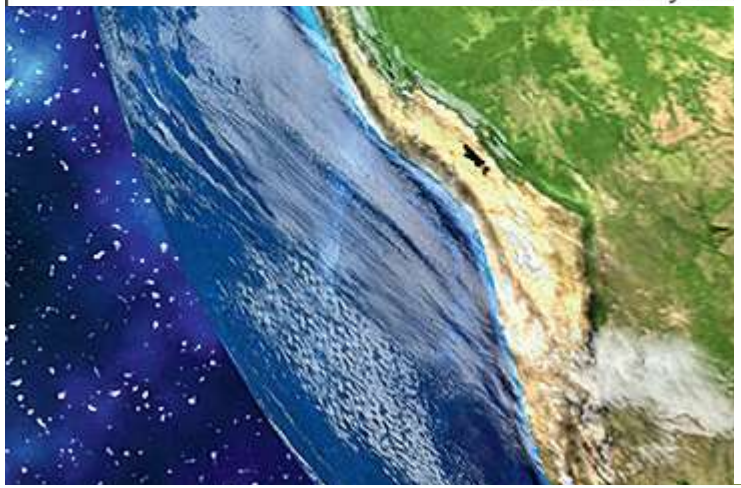
Lukoye Atwoli • Abdullah H Baqui • Thomas Benfield • Raffaella Bosurgi • Fiona Godlee • Stephen Hancocks • et al.
Show all authors

Published: September 04, 2021 • DOI: https://doi.org/10.1016/S0140-6736(21)01915-2 • Check for updates

Supplementary Material

References

The UN General
together at a cri
the global envir
biodiversity sun



Als Mitglieder von Gesundheitsberufen müssen wir alles in unserer Macht Stehende tun, um den Übergang in eine nachhaltige, fairere, resiliente und gesündere Welt zu unterstützen…
Die größte Bedrohung der globalen Gesundheit ist das fortgesetzte Scheitern der politischen Führer der Welt, den globale Temperaturanstieg auf unter 1,5 °C zu begrenzen. Wir rufen die Regierungen dazu auf, jetzt zu handeln und 2021 zu dem Jahr zu machen, in dem die Welt den Kurs gewechselt hat.

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Klimakrise und Gesundheit

REVIEW | VOLUME 398, ISSUE 10311, P1619-1662, OCTOBER 30, 2021

Subscribe

The 2021 report of the *Lancet* Countdown on health and climate change: code red for a healthy future

Marina Romanello, PhD • Alice McGushin, MSc • Claudia Di Napoli, PhD • Paul Drummond, MSc • Nick Hughes, PhD
Louis Jamart, MSc • et al. Show all authors

Published: October 20, 2021 • DOI: https://doi.org/10.1016/S0140-6736(21)01787-6 • Check for updates

Lancet 2021; 398: 1619–62

Published Online
October 20, 2021
https://doi.org/10.1016/
S0140-6736(21)01787-6

For the German translation of the Executive Summary see Online for appendix 3

Climate change impacts, exposures, and vulnerability

- 1.1: health and heat
  - 1.1.1: vulnerability to extremes of heat
  - 1.1.2: health and exposure to warming
  - 1.1.3: exposure of vulnerable populations to heatwaves
  - 1.1.4: change in labour capacity
- 1.2: health and extreme weather events
  - 1.2.1: wildfires
  - 1.2.2: flood and drought
  - 1.2.3: lethality of weather-related disasters
- 1.3: global health trends in climate-sensitive diseases
- 1.4: climate-sensitive infectious diseases
  - 1.4.1: climate suitability for infectious disease transmissic
  - 1.4.2: vulnerability to mosquito-borne diseases
- 1.5: food security and undernutrition
  - 1.5.1: terrestrial food security and undernutrition
  - 1.5.2: marine food security and undernutrition

Adaptation, planning, and resilience for health

- 2.1: adaptation planning and assessment
  - 2.1.1: national adaptation plans for health
  - 2.1.2: national assessments of climate change impacts, vulnerability, and adaptation for health
  - 2.1.3: city-level climate change risk assessments
- 2.2: climate information services for health
- 2.3: adaptation delivery and implementation
  - 2.3.1: detection, preparedness, and response to health emergencies
  - 2.3.2: air conditioning—benefits and harms
- 2.4: spending on adaptation for health and health-related activities
- 3.3: air pollution, energy, and transport
  - 3.3.1: exposure to air pollution in cities
  - 3.3.2: premature mortality from ambient air pollution by sector

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Hitzeexposition vulnerabler Gruppen

REVIEW | VOLUME 398, ISSUE 10311, P1619-1662, OCTOBER 30, 2021

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The 2021 report of the *Lancet* Countdown on health and cli… code red for a healthy future

Marina Romanello, PhD • Alice McGushin, MSc • Claudia Di Napoli, PhD • Paul Drummond, MSc
Louis Jamart,

Published: Oc…

Indicator 1.1.2: exposure of vulnerable populations to heatwaves—headline finding: children younger than 1 year were affected by 626 million more person-days of heatwave exposure and adults older than 65 years were affected by 3·1 billion more person-days of heatwave exposure in 2020 than in the 1986–2005 average

+ 4,6 d

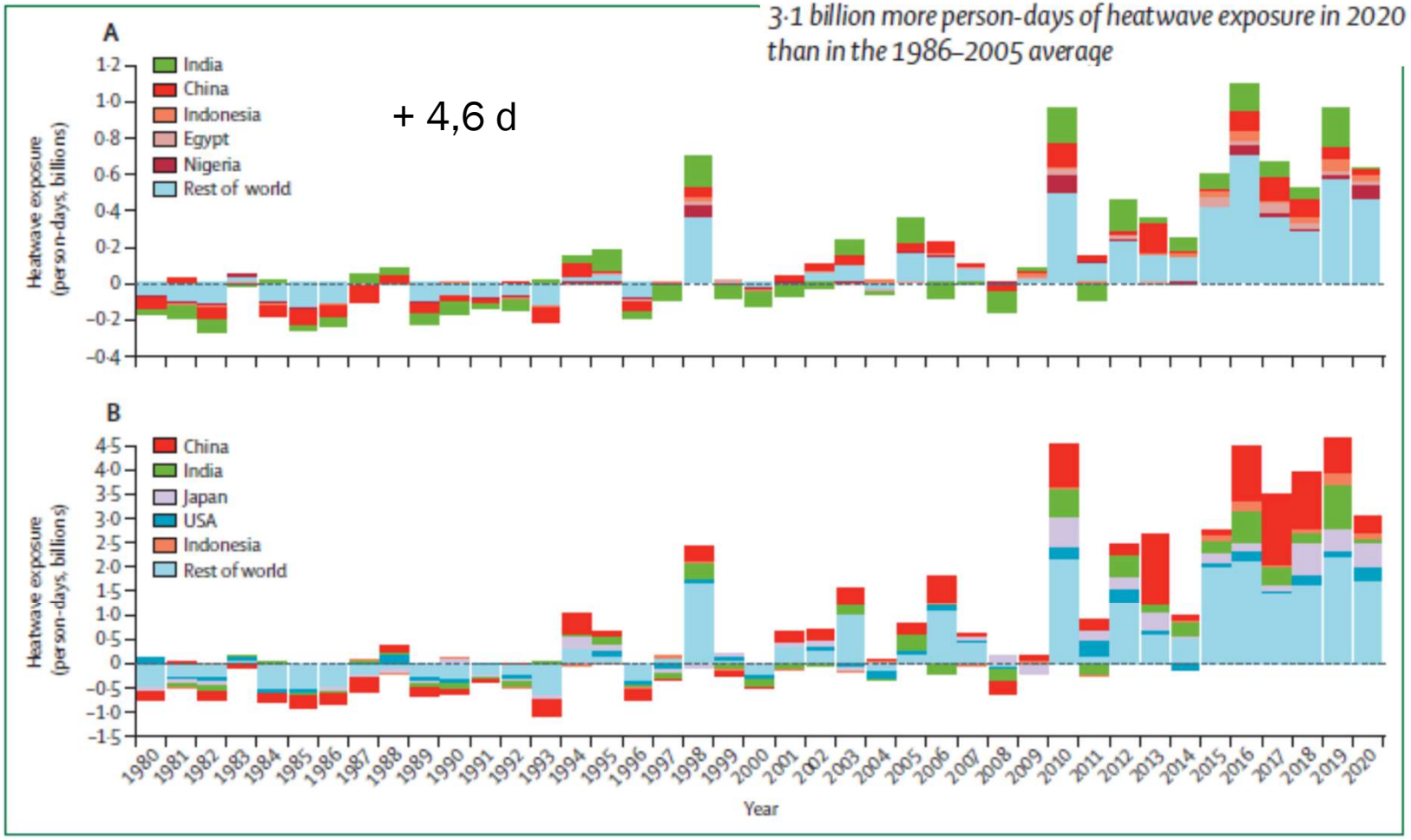

Figure 1: **Change in person-days of heatwave exposure relative to the 1986–2005 baseline**
(A) People younger than 1 year. (B) People older than 65 years. The dotted line at 0 represents the baseline.

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Wetterextreme

REVIEW | VOLUME 398, ISSUE 10311, P1619-1662, OCTOBER 30, 2021

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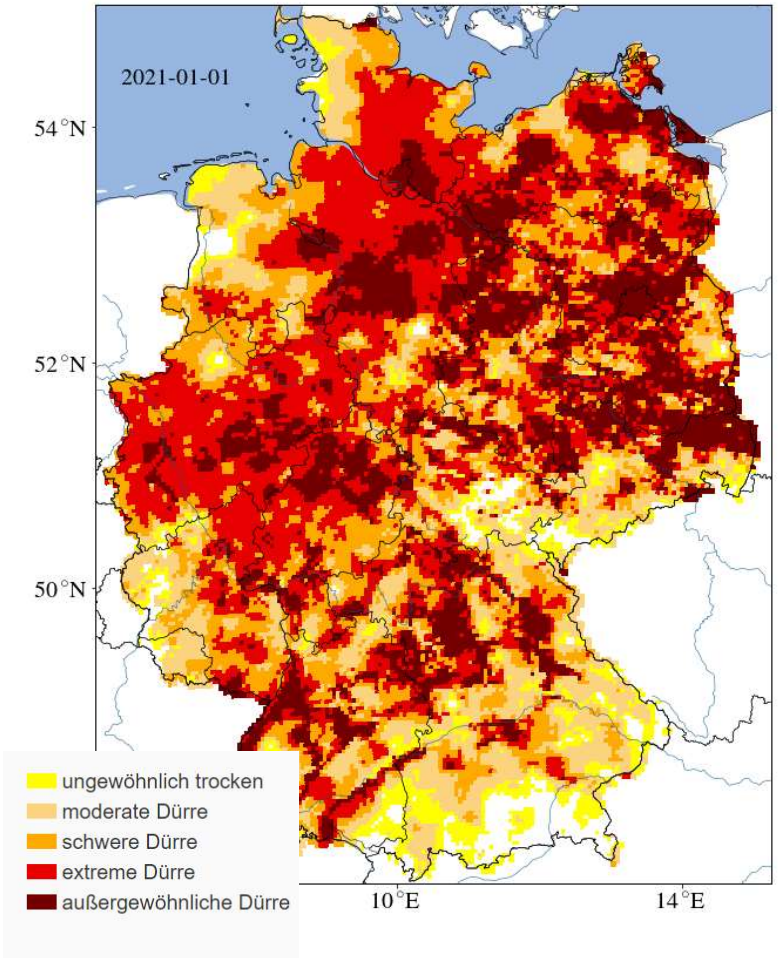
The 2021 report of the *Lancet* Countdown on health and climate change: code red for a healthy future

Marina Romanello, PhD • Alice McGushin, MSc • Claudia Di Napoli, PhD • Paul Drummond, MSc • Nick Hughes, PhD
Louis Jamart, MSc • et al. Show all authors

Published: October 30, 2021 • DOI: https://doi.org/10.1016/S0140-6736(21)01787-6 •

Indicator 1.2.3: lethality of extreme weather events—headline finding: the past 30 years have seen statistically significant increases in the number of extreme weather



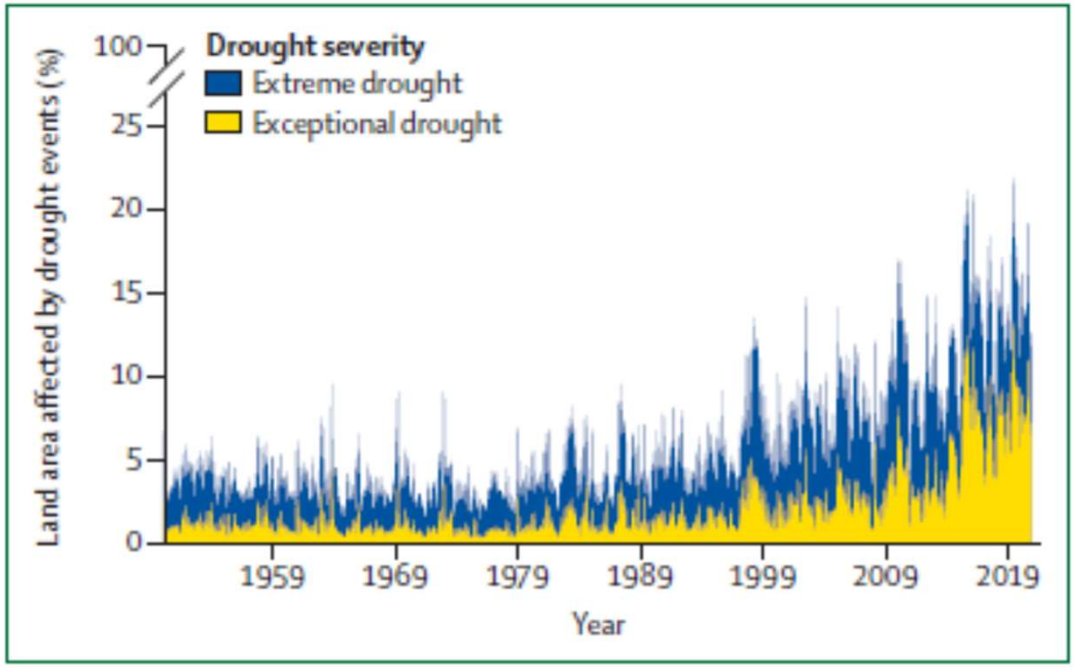


Figure 7: **Global land area affected by drought events per month**
Extreme drought is defined by a SPEI of ≤1·6 and exceptional drought is defined by a SPEI of ≤2. SPEI=standardised precipitation-evapotranspiration index.

FIGO
International Federation of Gynecology and Obstetrics

HEAL
HEALTH AND ENVIRONMENT ALLIANCE

UCSF
Program on Reproductive Health and the Environment

How Does Climate Change and Air Pollution Affect Pregnancy and Human Development?

Climate change puts pregnant women and children at risk

The impacts of climate change are already taking place: more frequent natural disasters, extreme weather and temperatures, rising sea levels, and displacement. Mainly because of combustion of fossil fuels, CO_2 is causing warming, and these changes affect food and housing security, vector-borne illness, and access to clean air and water, all of which influence human health, especially that of pregnant women and children. Research shows evidence linking climate change with poor pregnancy outcomes that can have lasting effects on children and the health of subsequent generations [1].

https://www.env-health.org/wp-content/uploads/2020/04/FINAL-Climate-Change-and-Pregnancy-Fact-Sheet.pdf

JAMA Network Open

JAMA Network Open. 2020;3(6):e208243. doi:10.1001/jamanetworkopen.2020.8243

Original Investigation | Environmental Health

Association of Air Pollution and Heat Exposure With Preterm Birth, Low Birth Weight, and Stillbirth in the US

A Systematic Review

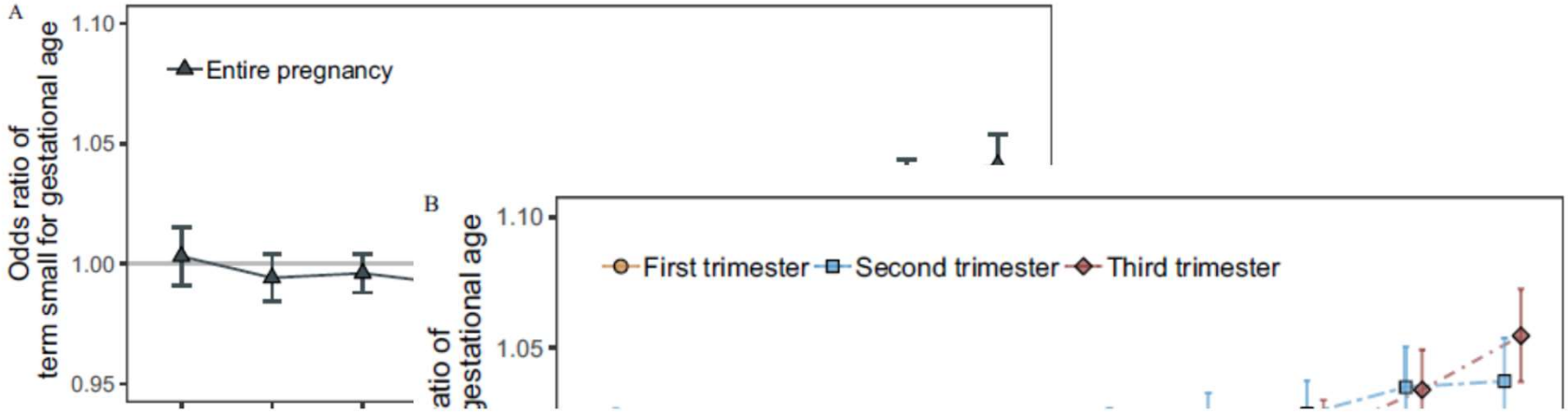
Bruce Bekkar, MD; Susan Pacheco, MD; Rupa Basu, PhD; Nathaniel DeNicola, MD, MSHP

Exposure and outcome	Studies finding an association, No./total No.	Births/study, mean (SD)	Total births in millions	Increased risk, median (range), %[a]	Studies finding racial disparity, No./total No.	Notable findings[b]
Air pollution						
Preterm birth	19/24	318 960 (393 272)	7.3	11.5 (2.0-19.0)[c]	10/19	Preterm birth risk increased 52% for asthmatic mothers
Low birth weight	25/29	661 205 (878 074)	18.5	10.8 (2.0-36.0)[c]	13/25	Low birth weight risk increased 3% for each 5-km proximity to a solid waste plant
Stillbirth	4/5	1 020 975 (1 176 174)	5.1	14.5 (6.0-23.0)[c]	1/4	Stillbirth risk increased 42% with high third-trimester exposure
Heat						
Preterm birth	4/5	192 625 (207 995)	0.8	15.8 (9.0-22.0)[d]	2/4	Preterm birth risk increased 11.6% per 5.6 °C increase
Low birth weight	3/3	902 277 (985 803)	2.7	31.0 (13.0-49.0)[d]	1/3	Term birth weight decreased 16 g per IQR temperature increase
Stillbirth	2/2	115 943 (115 933)	0.2	NA[e]	2/2	Stillbirth risk increased 6% per 1 °C increase the week before delivery during the warm season

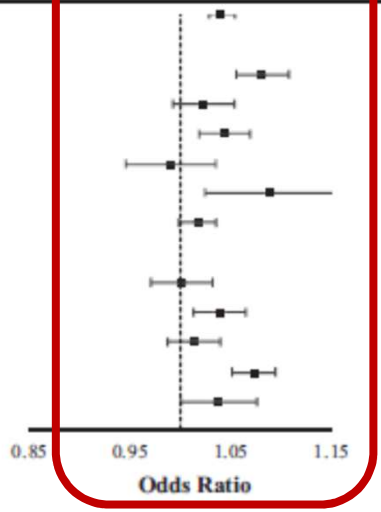
Ambient Temperature and Markers of Fetal Growth: A Retrospective Observational Study of 29 Million U.S. Singleton Births

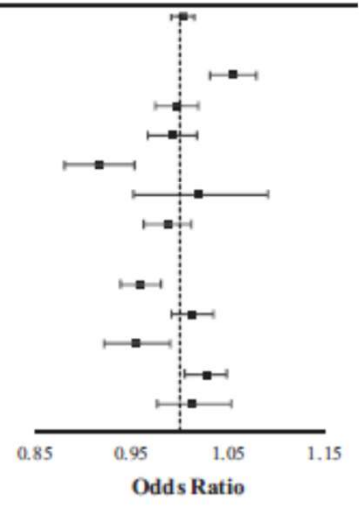
Shengzhi Sun,[1] Keith R. Spangler,[1,2] Kate R. Weinberger,[1] Jeff D. Yanosky,[3] Joseph M. Braun,[1] and Gregory A. Wellenius[1]

Environmental Health Perspectives 127(6) June 2019



Subgroup	No. of Counties	Odds Ratio (95% CI)	*P* Value for Heterogeneity	Odds Ratio (95% CI)	*P* Value for Heterogeneity
Overall	403	1.041 (1.029, 1.054)		1.003 (0.991, 1.015)	
Geographic Region			<0.001		<0.001
Northeast	110	1.081 (1.056, 1.108)		1.055 (1.031, 1.079)	
Southeast	94	1.023 (0.993, 1.054)		0.997 (0.975, 1.019)	
Midwest	99	1.044 (1.019, 1.069)		0.992 (0.967, 1.018)	
Great Plains	35	0.989 (0.946, 1.035)		0.916 (0.881, 0.953)	
Northwest	17	1.088 (1.024, 1.155)		1.019 (0.952, 1.091)	
Southwest	48	1.017 (0.999, 1.036)		0.987 (0.963, 1.012)	
Climate Zone			<0.001		<0.001
Hot-Humid	58	1.001 (0.971, 1.032)		0.959 (0.939, 0.981)	
Mixed-Humid	113	1.039 (1.013, 1.065)		1.013 (0.991, 1.035)	
Hot-Dry/Mixed-Dry	26	1.013 (0.987, 1.040)		0.955 (0.922, 0.990)	
Cold/Very Cold	181	1.073 (1.051, 1.094)		1.027 (1.005, 1.049)	
Marine	25	1.037 (1.000, 1.076)		1.014 (0.977, 1.053)	

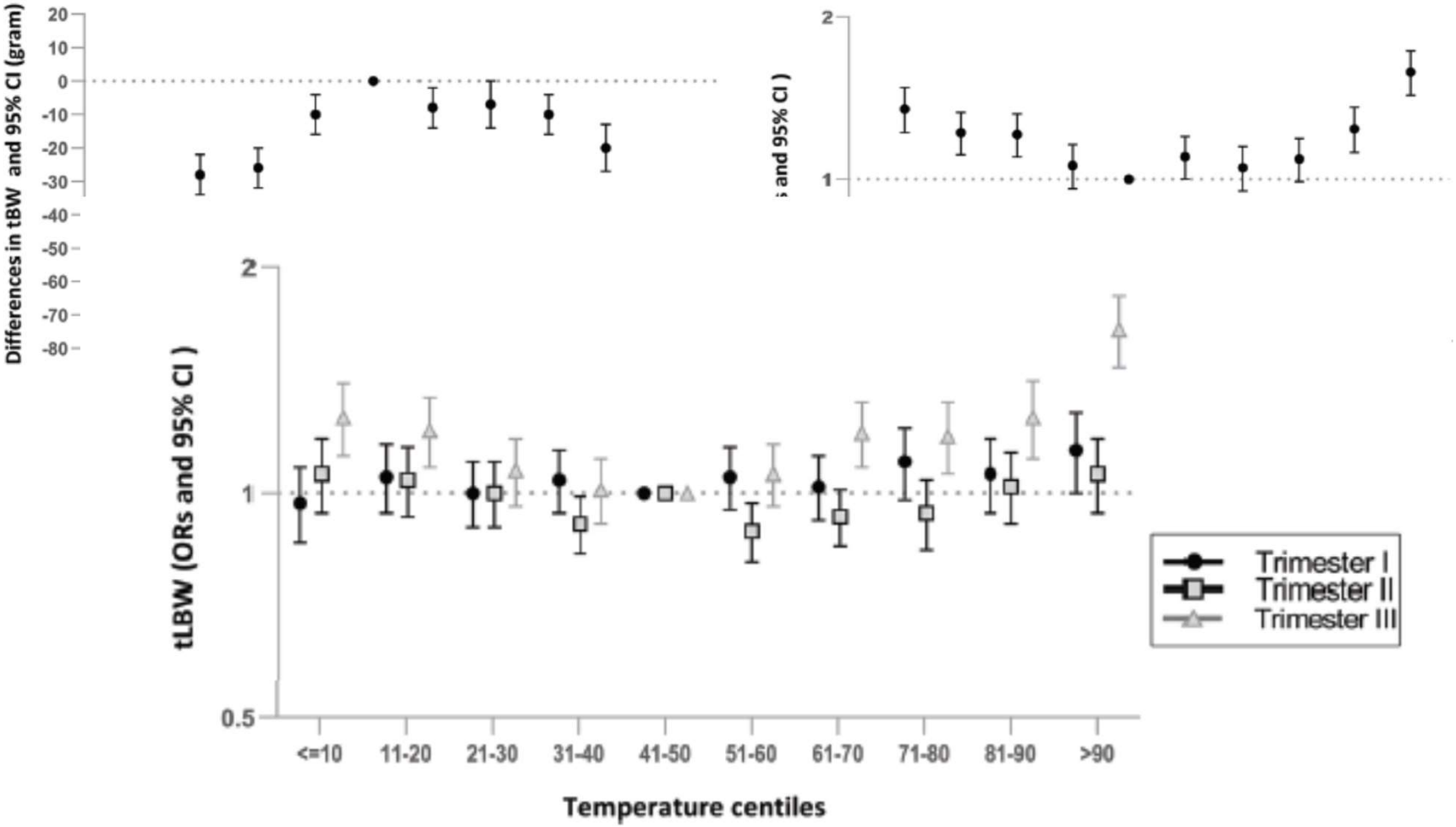




Low and High Ambient Temperatures during Pregnancy and Birth Weight among 624,940 Singleton Term Births in Israel (2010–2014): An Investigation of Potential Windows of Susceptibility

Xavier Basagaña,[1,2,3] Yaron Michael,[4] Itamar M. Lensky,[4] Lisa Rubin,[5] Itamar Grotto,[6] Elyakom Vadislavsky,[7] Yoav Levi,[7] Eyal Amitai,[7] and Keren Agay-Shay[8]

Environmental Health Perspectives 129(10) October 2021



nature climate change

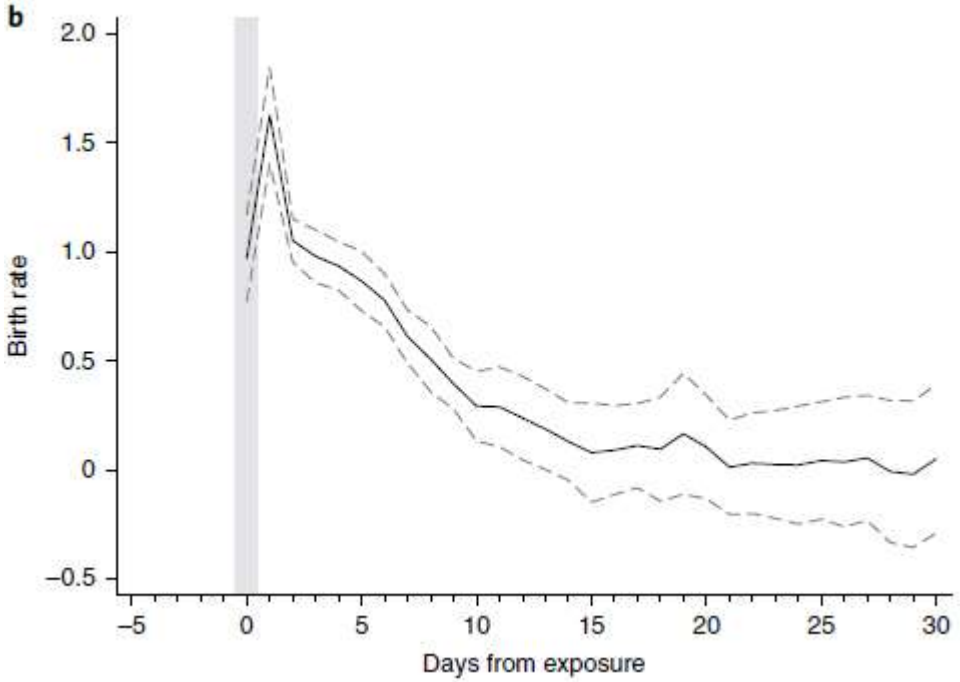
ARTICLES

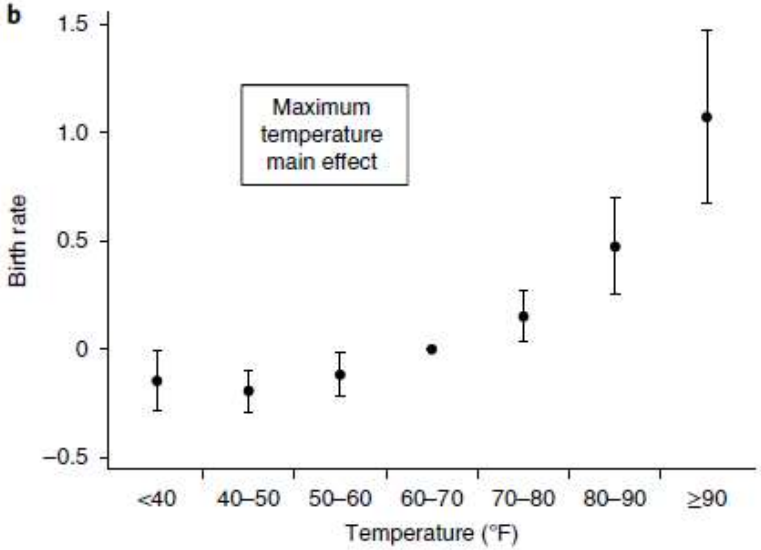
https://doi.org/10.1038/s41558-019-0632-4

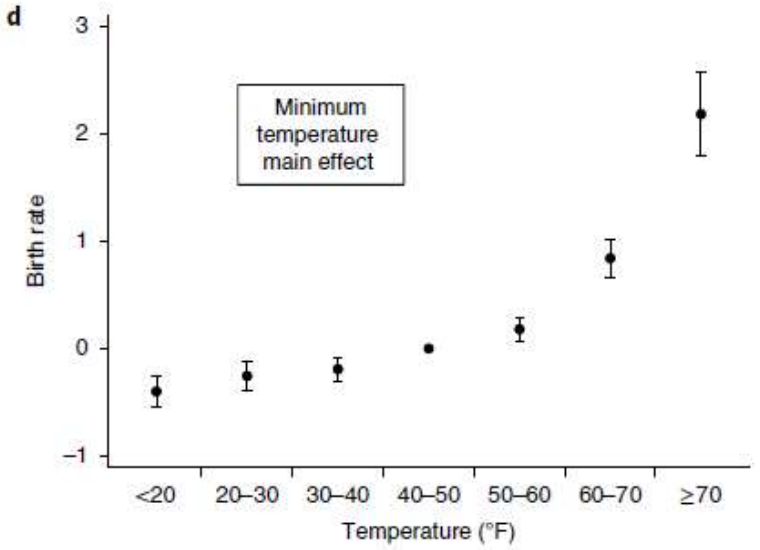
USA 1969-1988
56 Mill Geburten

The impact of high ambient temperatures delivery timing and gestational lengths

Alan Barreca[1,2,3*] and Jessamyn Schaller[3,4]



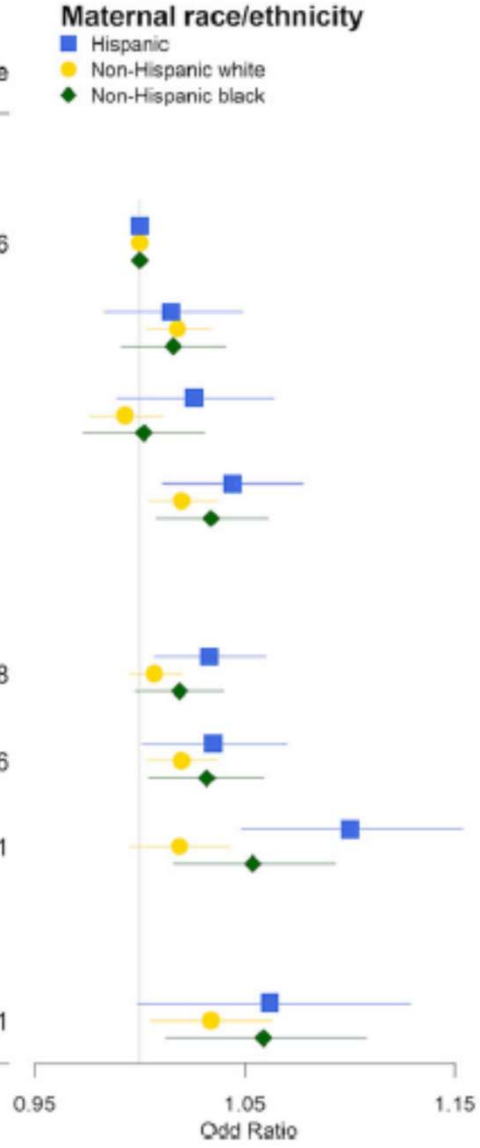


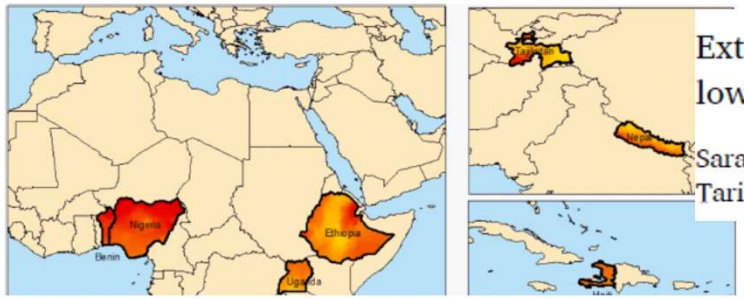


weeks. We estimate that an average of 25,000 infants per year were born earlier as a result of heat exposure, with a total loss of more than 150,000 gestational days annually. Absent adaptation, climate projections suggest additional losses of 250,000 days of gestation per year by the end of the century.

Huang *et al. Environmental Health* (2021) 20:47
https://doi.org/10.1186/s12940-021-00733-y

	Hispanic	Non-Hispanic white	Non-Hispanic black	
	OR[95%CI]	OR[95%CI]	OR[95%CI]	P-value
HW1(# of extreme heat days)				
0	ref	ref	ref	0.506
1	1.015 [0.983, 1.049]	1.018 [1.003, 1.034]	1.016 [0.991, 1.041]	
2	1.026 [0.989, 1.064]	0.993 [0.976, 1.011]	1.002 [0.973, 1.031]	
3 or more	1.044 [1.011, 1.078]	1.020 [1.004, 1.037]	1.034 [1.008, 1.061]	
HW2(consecutive days of heat)				
≥2 consec. days	1.033 [1.007, 1.060]	1.007 [0.995, 1.020]	1.019 [0.998, 1.040]	0.128
≥3 consec. days	1.035 [1.001, 1.070]	1.020 [1.003, 1.037]	1.032 [1.004, 1.059]	0.556
≥4 consec. days	1.100 [1.048, 1.154]	1.019 [0.995, 1.043]	1.054 [1.016, 1.093]	0.011
HW3(AUC)				
per 1 °C	1.062 [0.999, 1.129]	1.034 [1.005, 1.063]	1.059 [1.012, 1.108]	0.521



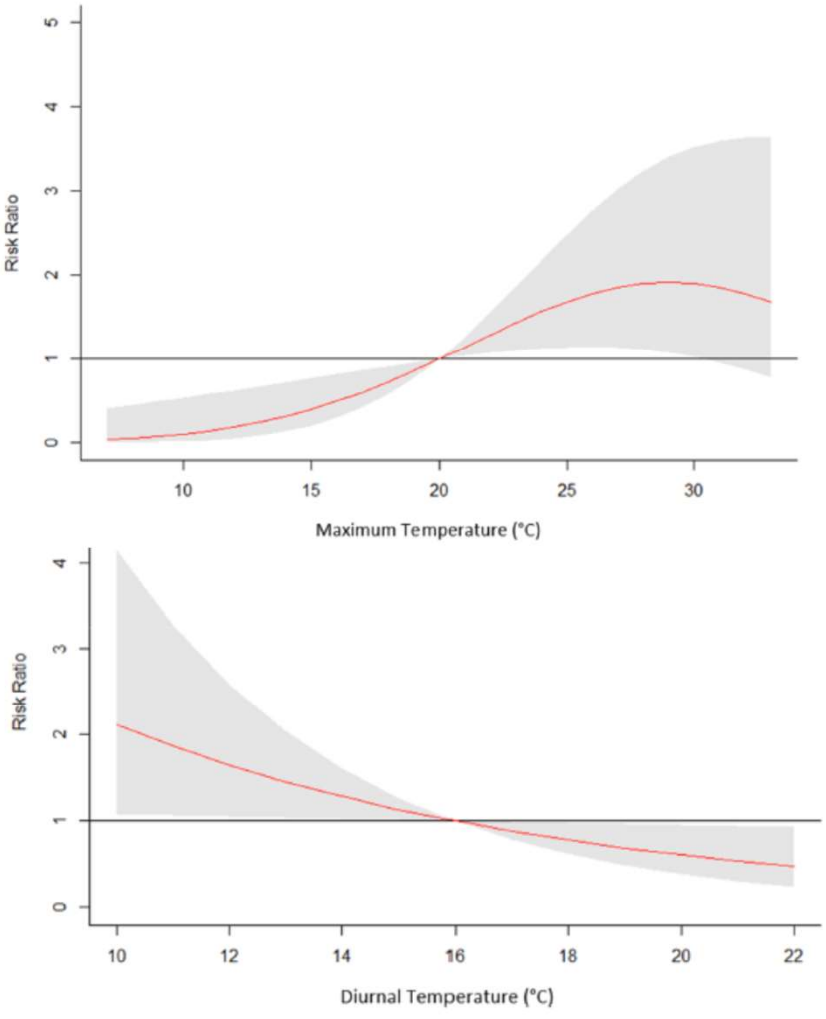


Extreme heat, preterm birth, and stillbirth: A global analysis across 14 lower-middle income countries

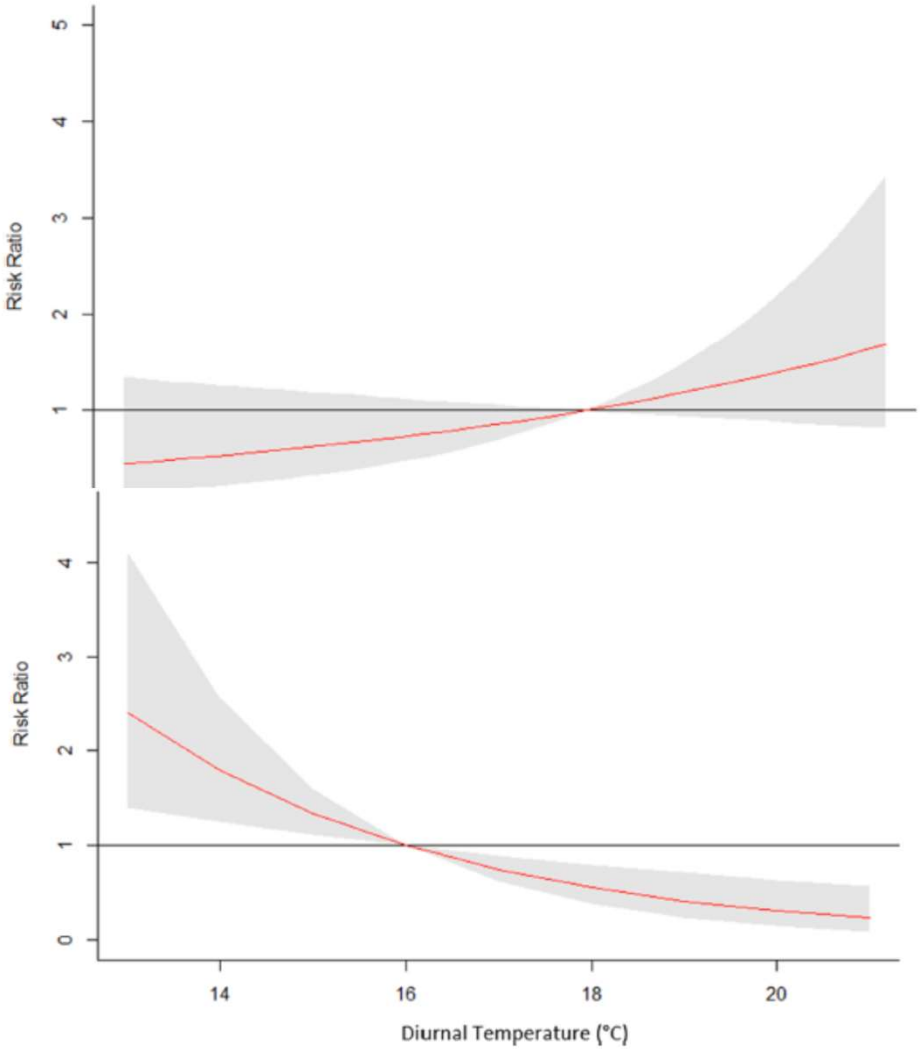
Sara McElroy [a,b,c,*], Sindana Ilango [a,b,c,d], Anna Dimitrova [a,b,c], Alexander Gershunov [a,b,c], Tarik Benmarhnia [a,b,c]

Environment International 158 (2022) 106902

Overall Effect of Extreme Heat and Stillbirth



Overall Effect of Extreme Heat and Preterm Birth



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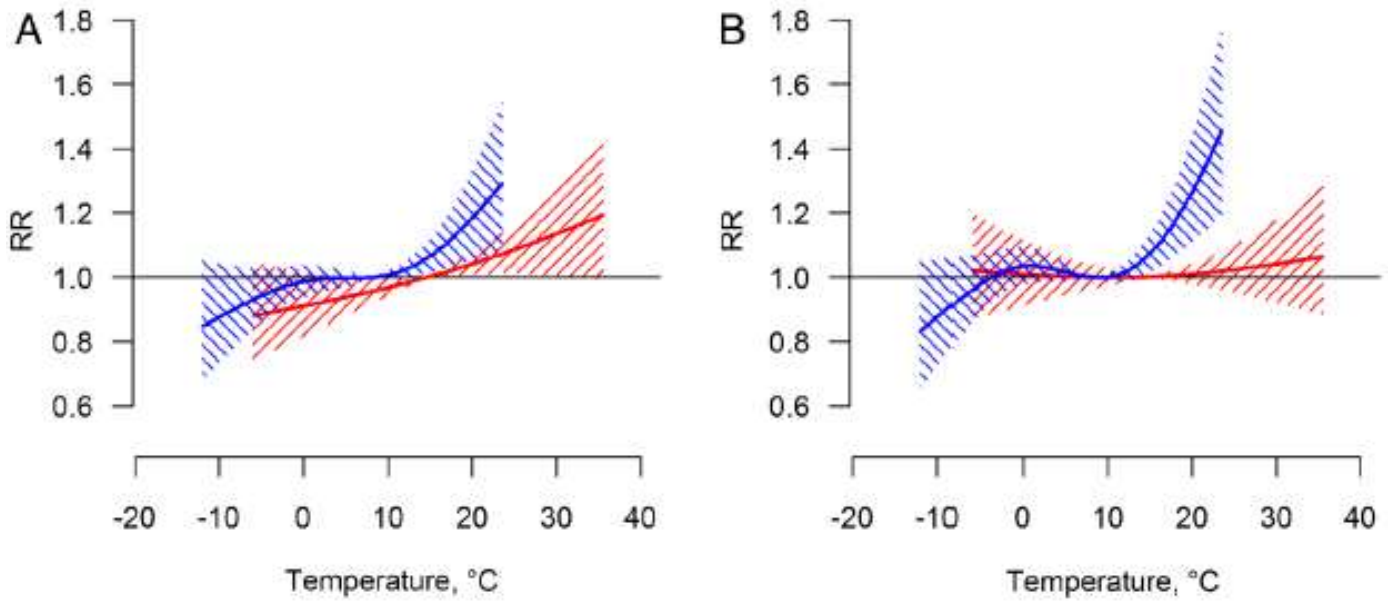
Hitzestress



A) lag 0–1 days; and (B): lag 0–3days

Methods: association between temperature and the risk of preterm birth in Flanders(Belgium) we used data on 807 835 singleton deliveries (January 1998–July 2011).

Environmental health

Ambient temperature as a trigger of preterm delivery in a temperate climate

Bianca Cox,[1] Ana M Vicedo-Cabrera,[2] Antonio Gasparrini,[3,4] Harry A Roels,[1,5] Evelyne Martens,[6] Jaco Vangronsveld,[1] Bertil Forsberg,[2] Tim S Nawrot[1,7]

J Epidemiol Community Health 2016;70:1191–1199

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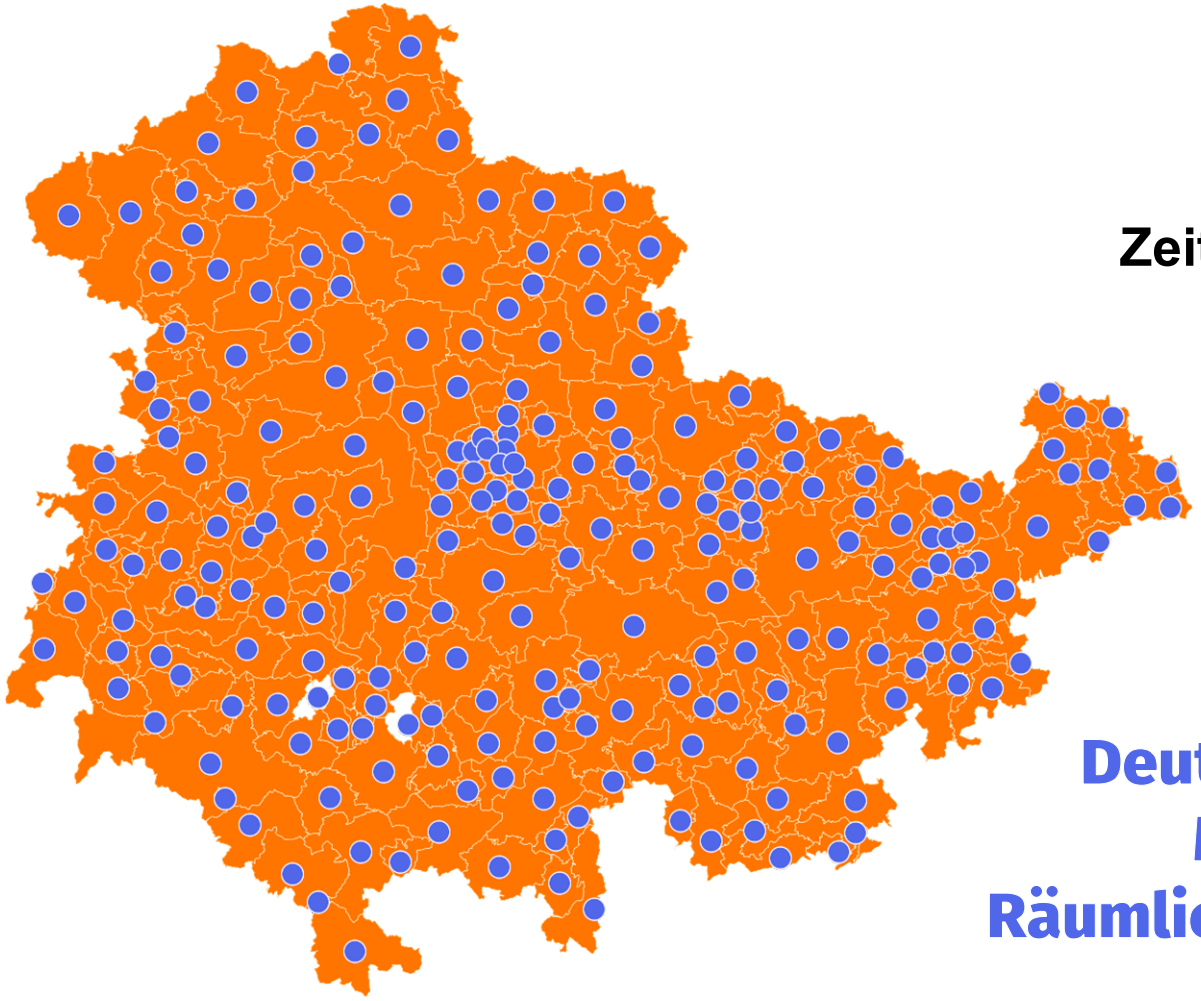
Mid German Climate Preterm Birth study

Perinatalerhebung Thüringen

2014 – 2019 74.893 Geburten

6.663 Frühgeburten



Zeitliche Auflösung pro Tag

~ 40 Mill. Datenpunkte

Deutscher Wetterdienst
Messnetz-Daten
Räumliche Auflösung nach PLZ

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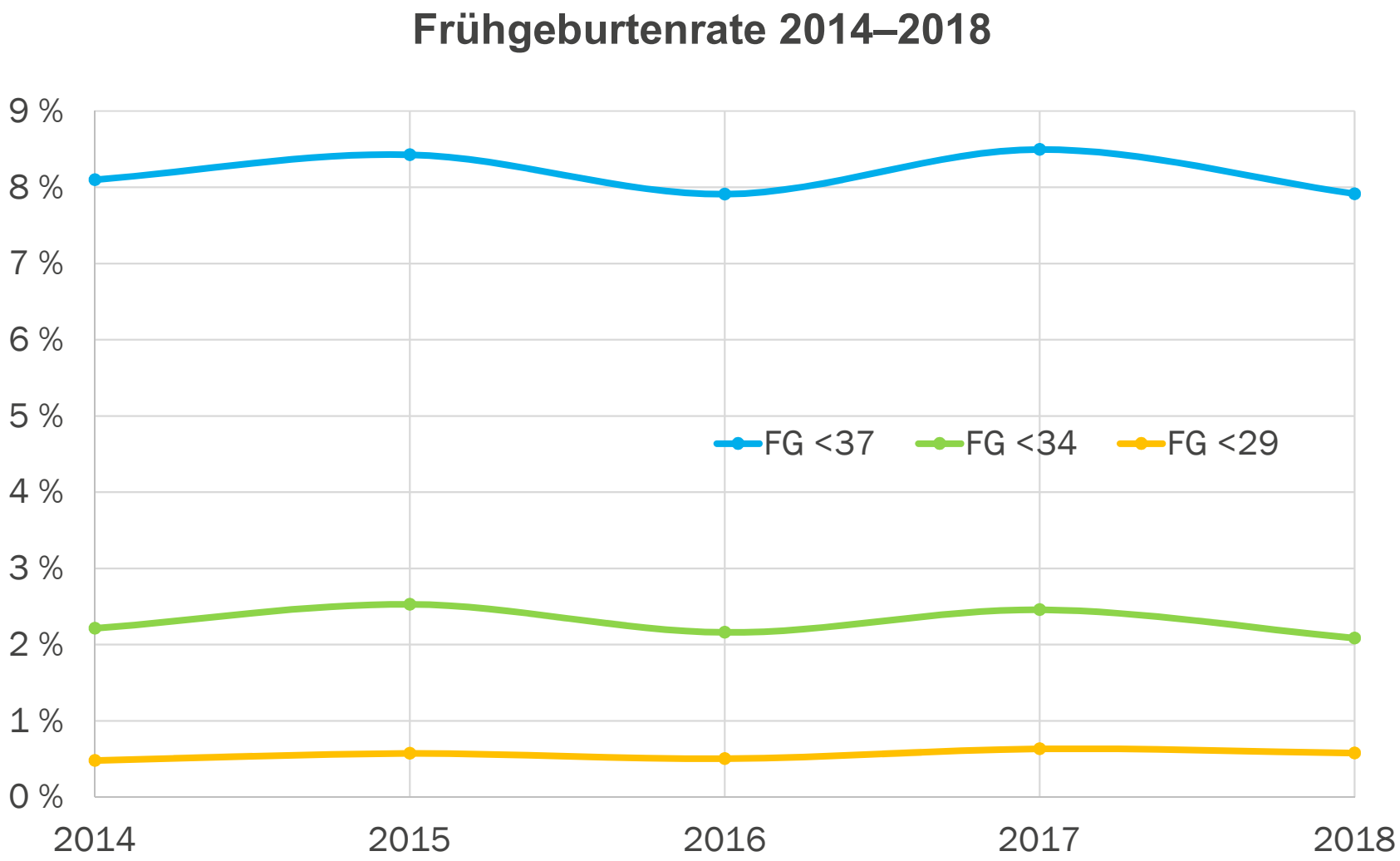
MGCPB study



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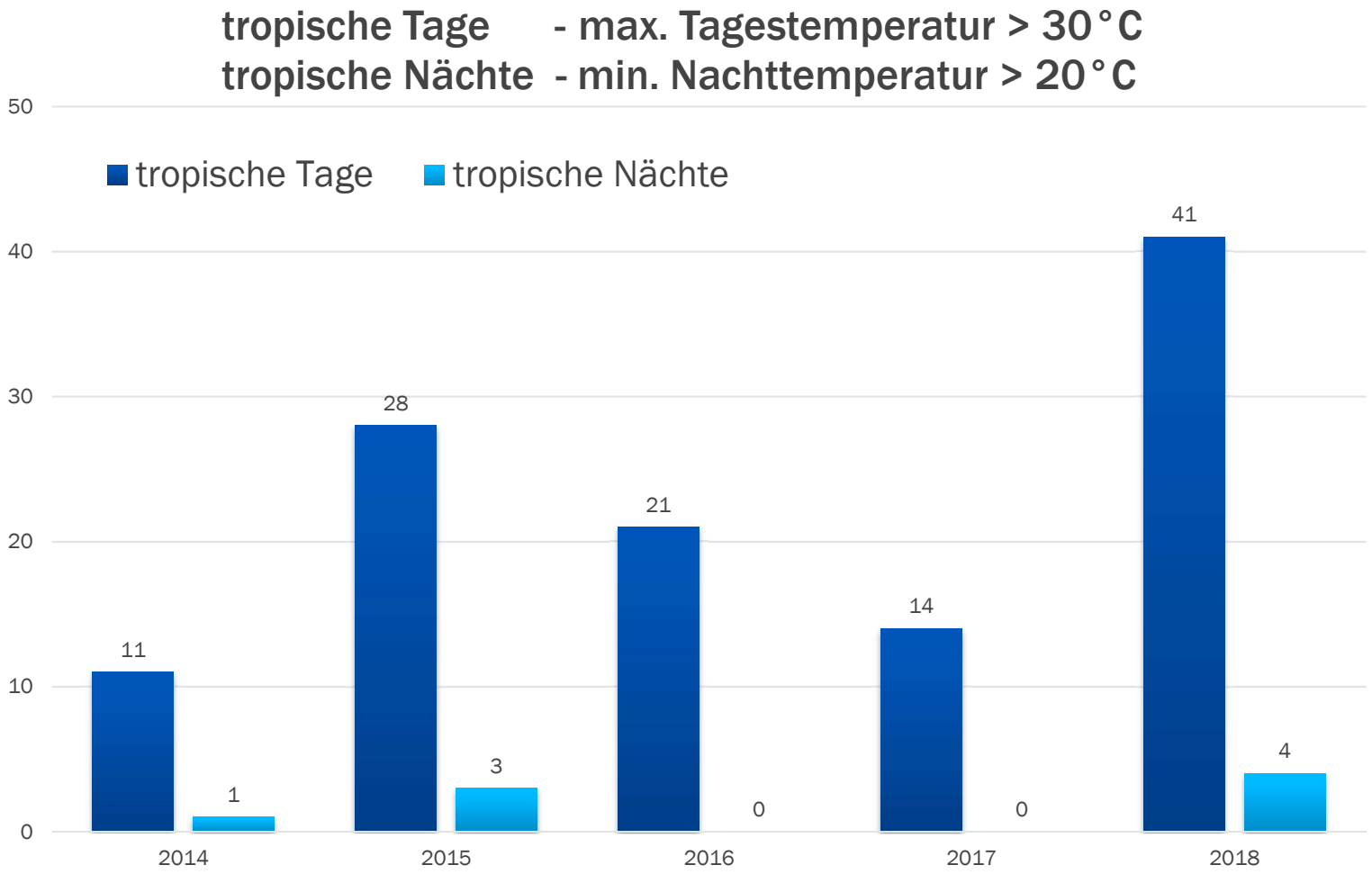
MGCPB study



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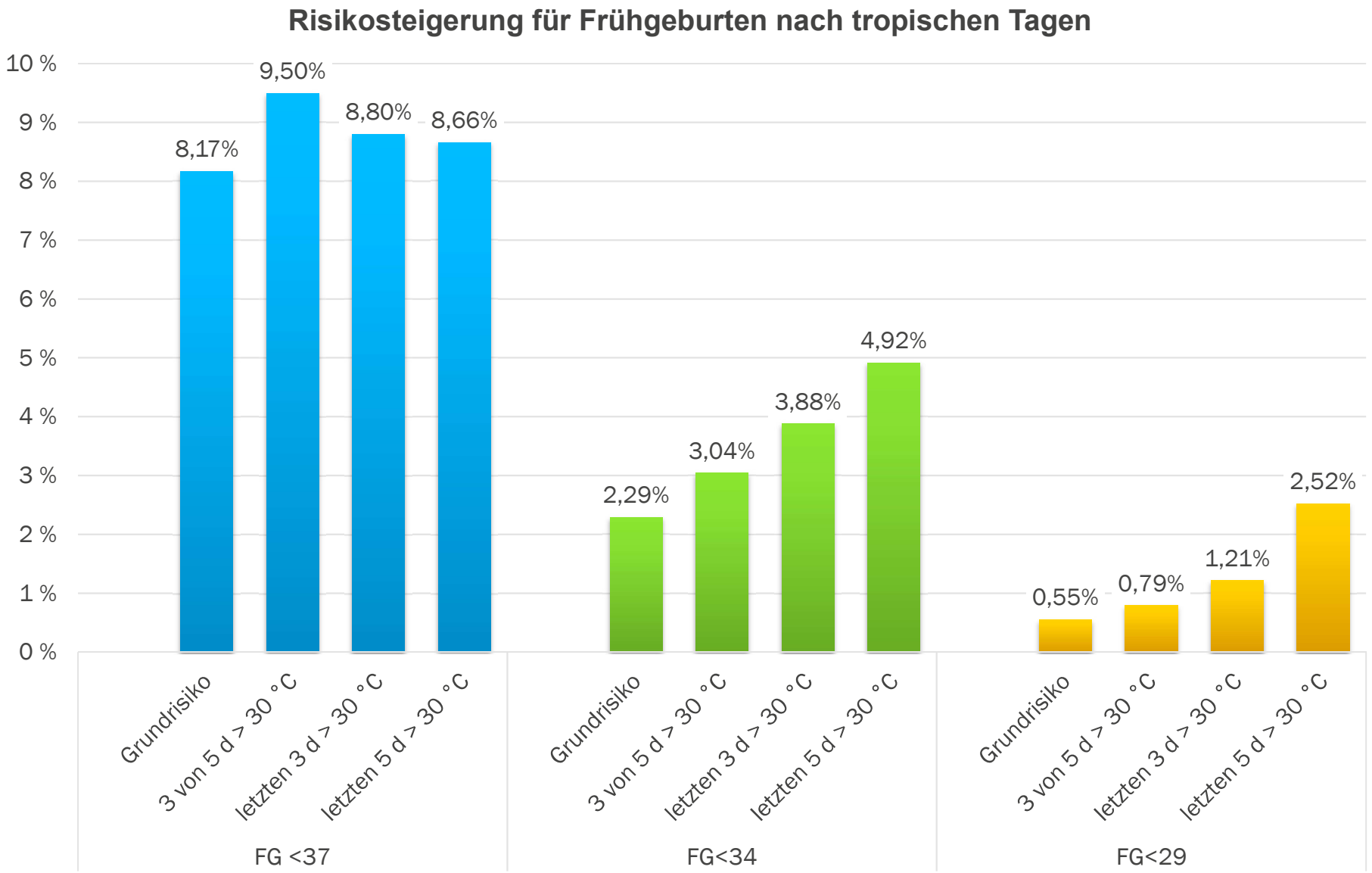
MGCPB
deskriptive Analyse



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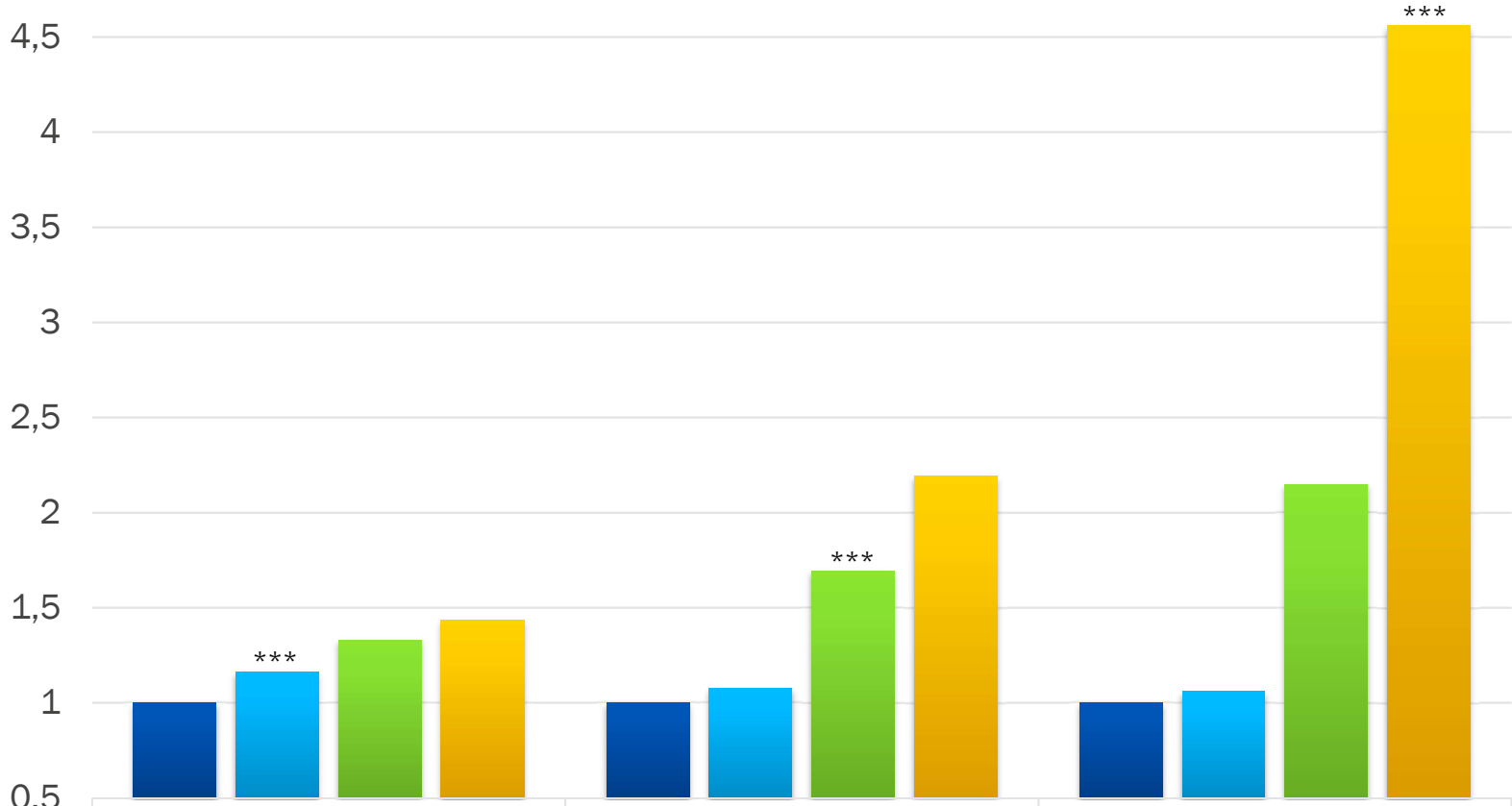
MGCPB
statistische Analyse

Relatives Risiko FG nach tropischen Tagen

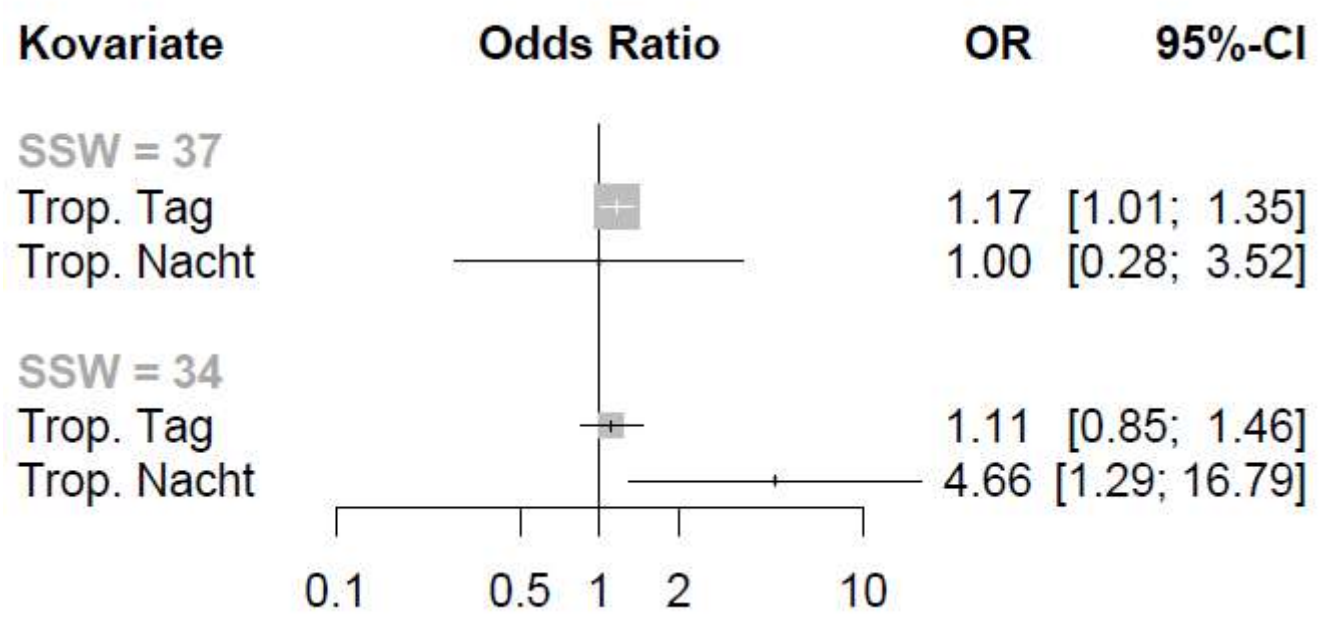


	3of5_td	last3_td	last5_td
TG	1	1	1
FG <37	1,16	1,08	1,06
FG <34	1,33	1,69	2,15
FG <29	1,43	2,19	4,56

Case-crossover Analyse

Proposed by Maclure (1991) to study transient effects on the risk of acute health events (Am J Epidemiol. 1991;133(2):144-153)

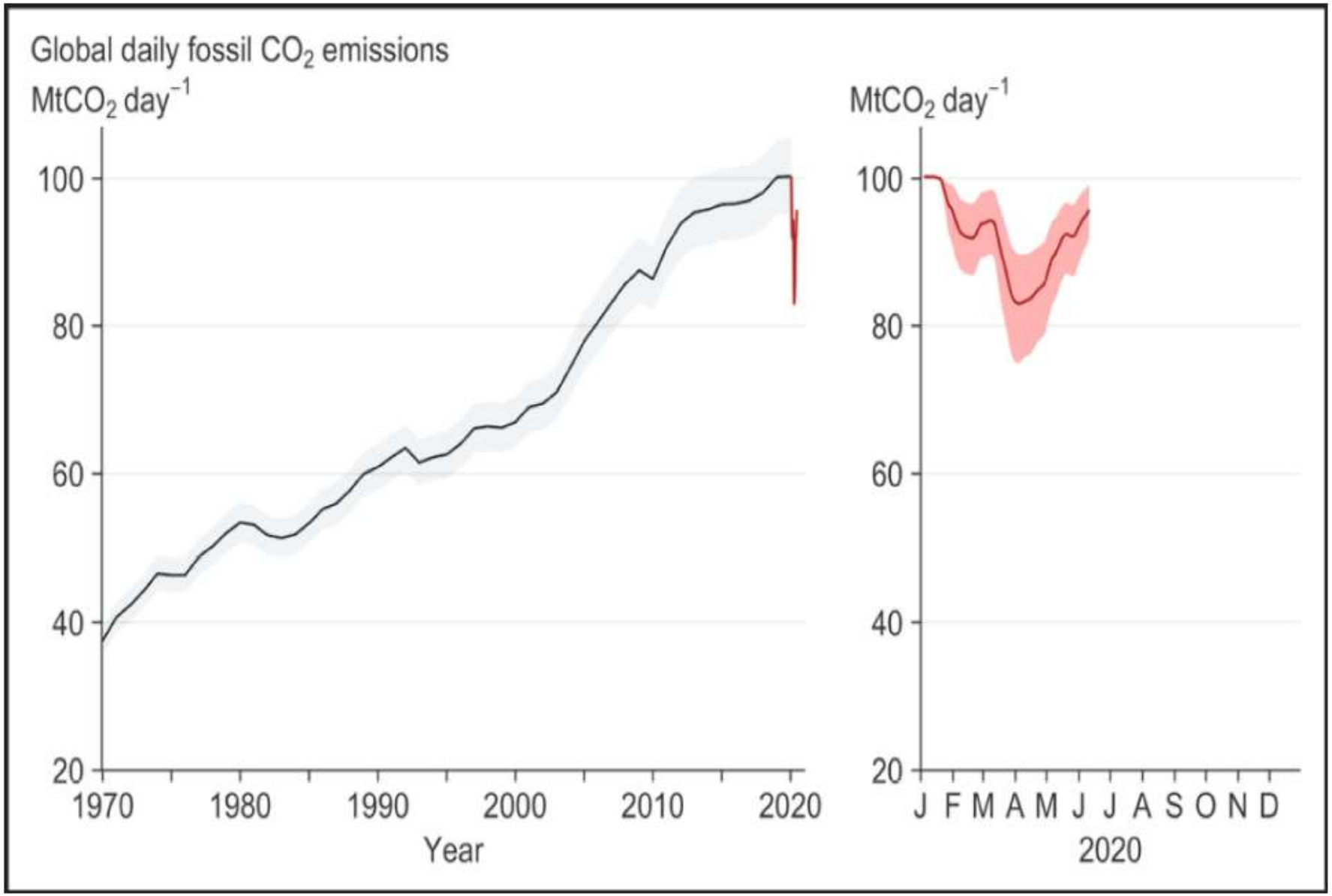
Generalised linear mixed models (logistic regression with random effects)



Vorläufige Ergebnisse

- Auf Basis einer zeitlich und räumlich hoch aufgelösten Hitzeexpositionsanalyse läßt sich auch in Deutschland eine Erhöhung des Frügeburtsrisikos nachweisen
- Hitzestress ist stärker mit früher und extremer Frühgeburtlichkeit assoziiert
- Limitation ist die zu geringe Datenbasis

  → eine Analyse auf Basis der deutlandweiten Perinatalerhebung ist in Vorbereitung



Le Quéré et al., Nature Climate Change (2020):

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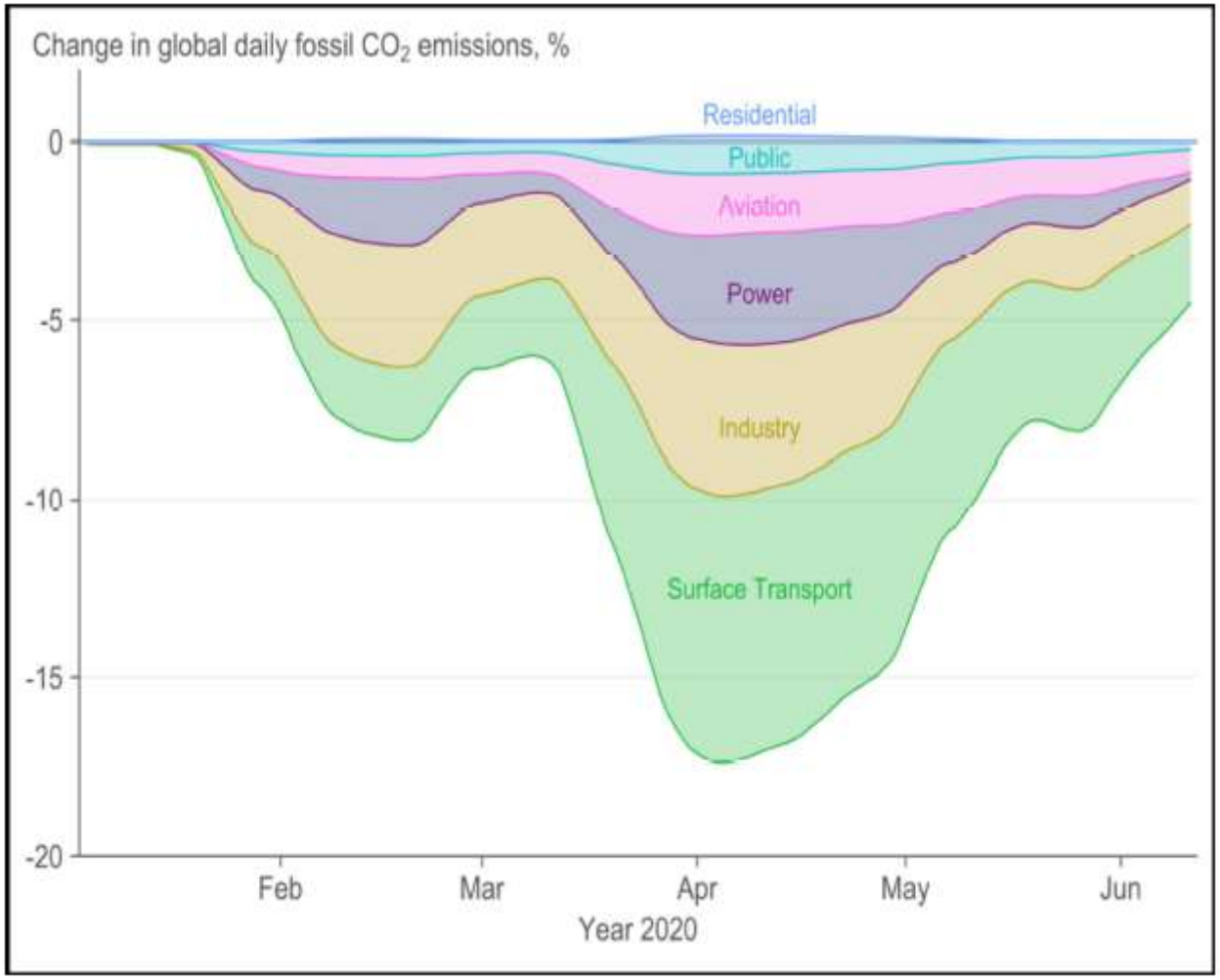
Das kann jeder von uns tun



Le Quéré et al., Nature Climate Change (2020):

Danke für Ihre Aufmerksamkeit

Die größte Bedrohung der globalen Gesundheit ist das fortgesetzte Scheitern der politischen Führer der Welt, den globale Temperaturanstieg auf unter 1,5 °C zu begrenzen……