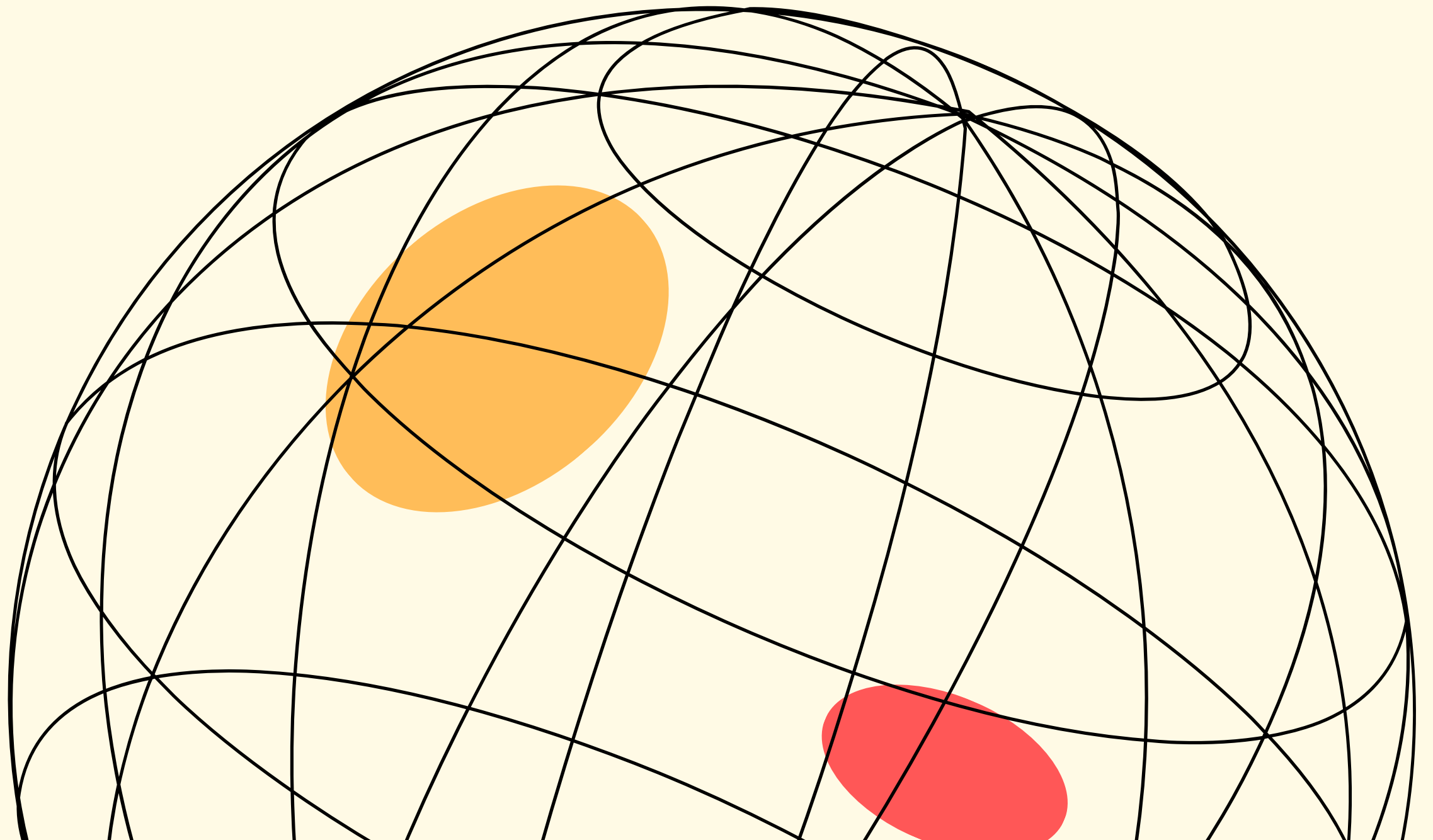


# How Climate Change Feels Around the Globe

Spiced Academy

14 August 2023

Radek Kříček



# Motivation

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Does this number change over time?

How much is it related to the global temperature anomaly?

Is there a clear link between wealth and heat exposure of populations?

# Datasets



872,695 data points  
(Extreme temperature)

Based on Maes, M., et al. (2022), "Monitoring exposure to climate-related hazards: Indicator methodology and key results", OECD Environment Working Papers, No. 201, OECD Publishing, Paris.

374,792 data points  
(Historical population)

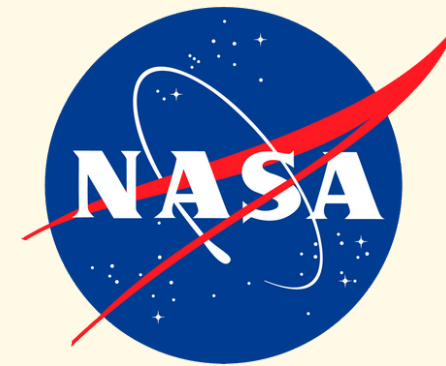
There are three sources for the data: national statistics offices, Eurostat and the United Nations.

# Datasets



872,695 data points  
(Extreme temperature)

374,792 data points  
(Historical population)



Monthly data 1880 - 2023  
(Temperature anomaly)

Tables of Global and Hemispheric  
Monthly Means and Zonal Annual  
Means,  
Combined Land-Surface Air and Sea-  
Surface Water Temperature Anomalies  
(Land-Ocean Temperature Index, L-OTI).



1060 data points  
(GDP per capita)

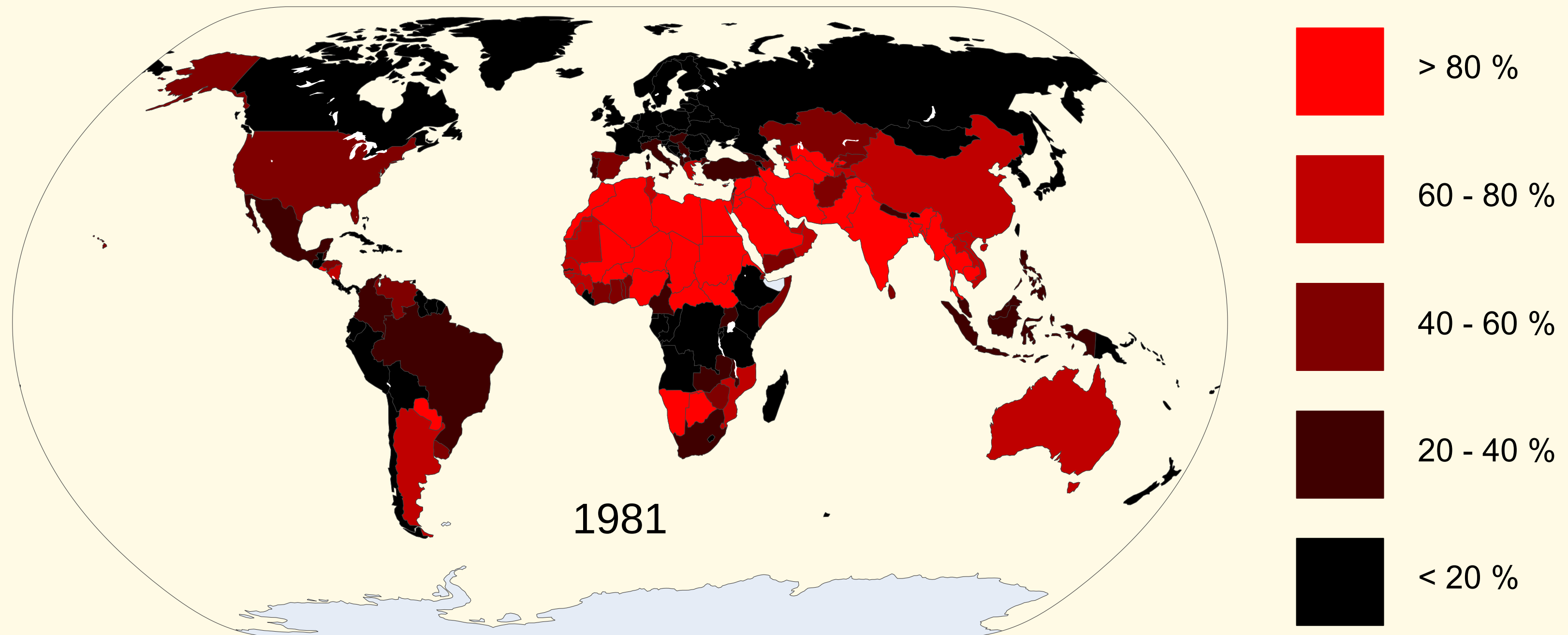
The National Accounts Section of the  
United Nations Statistics Division.



# Exposure of populations to heat

Daily maximum temperature  $> 35^{\circ}\text{C}$  & minimum temperature  $> 20^{\circ}\text{C}$ , in %

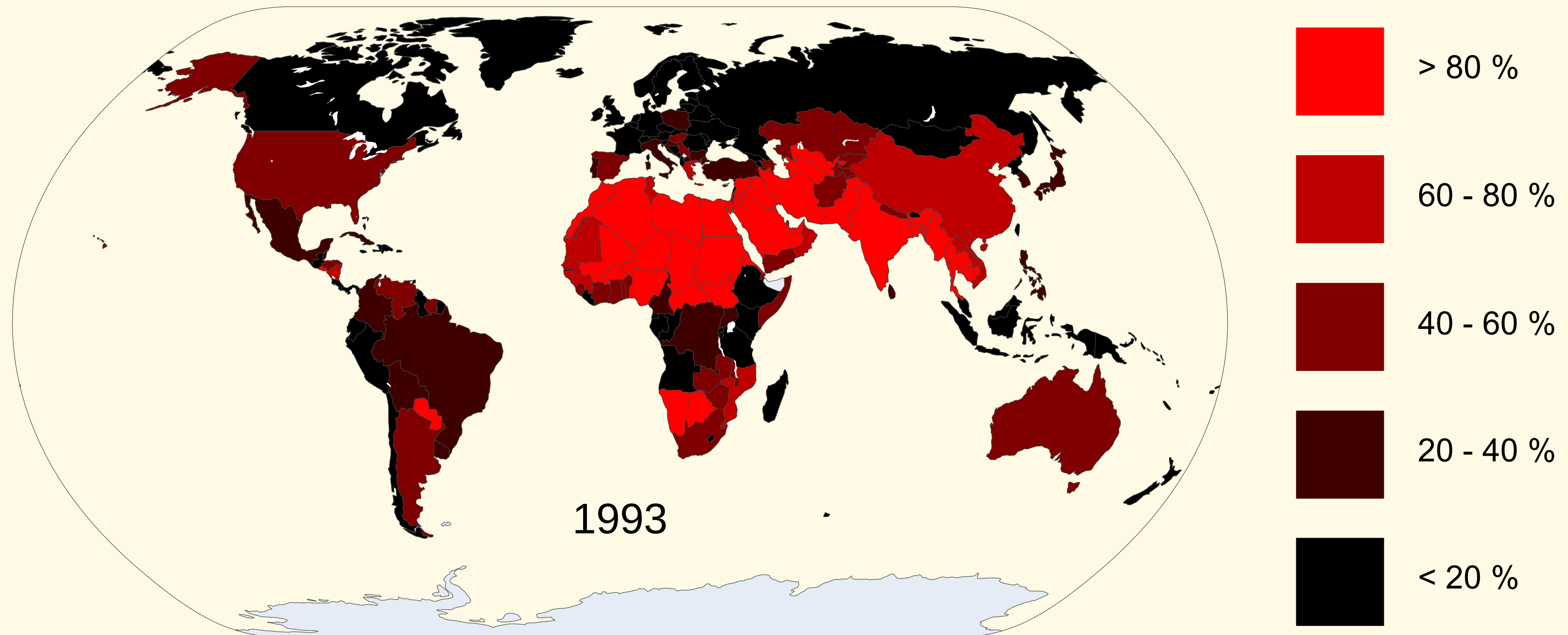
Rolling average over 5 years



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Daily maximum temperature  $> 35^{\circ}\text{C}$  & minimum temperature  $> 20^{\circ}\text{C}$ , in %

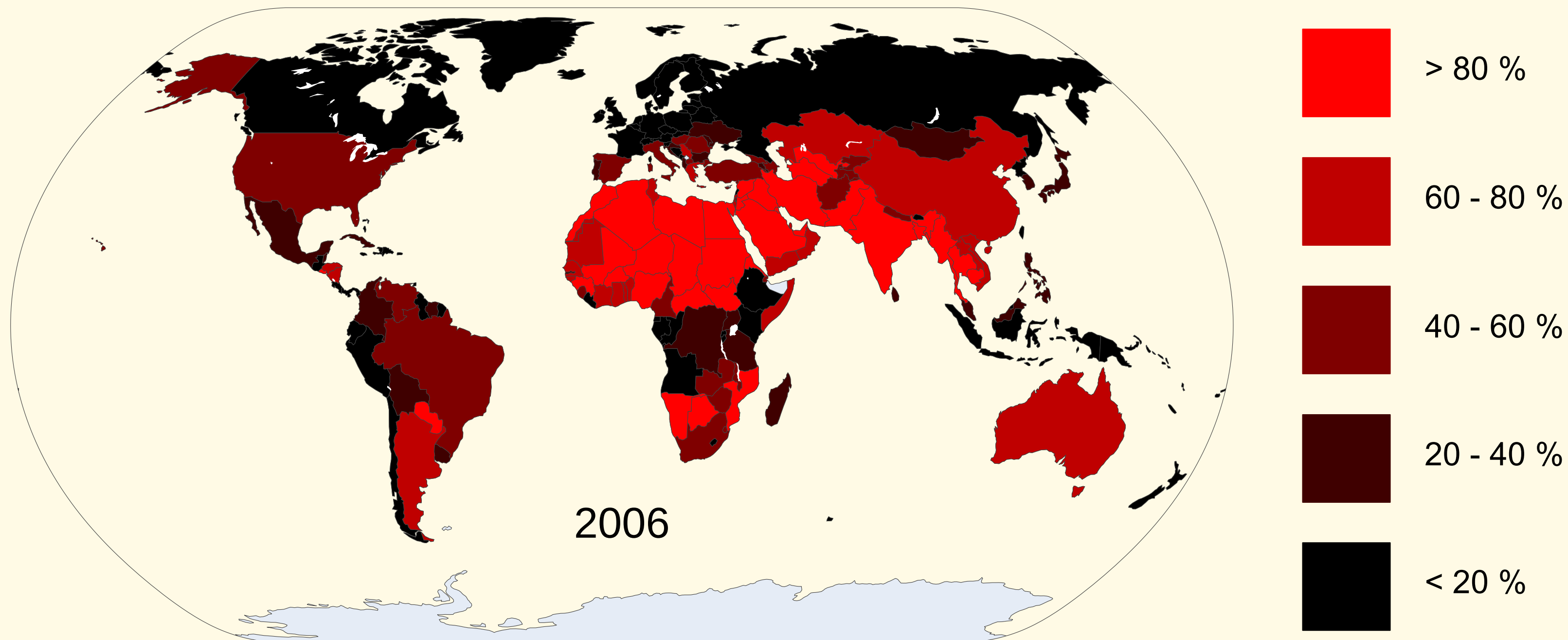
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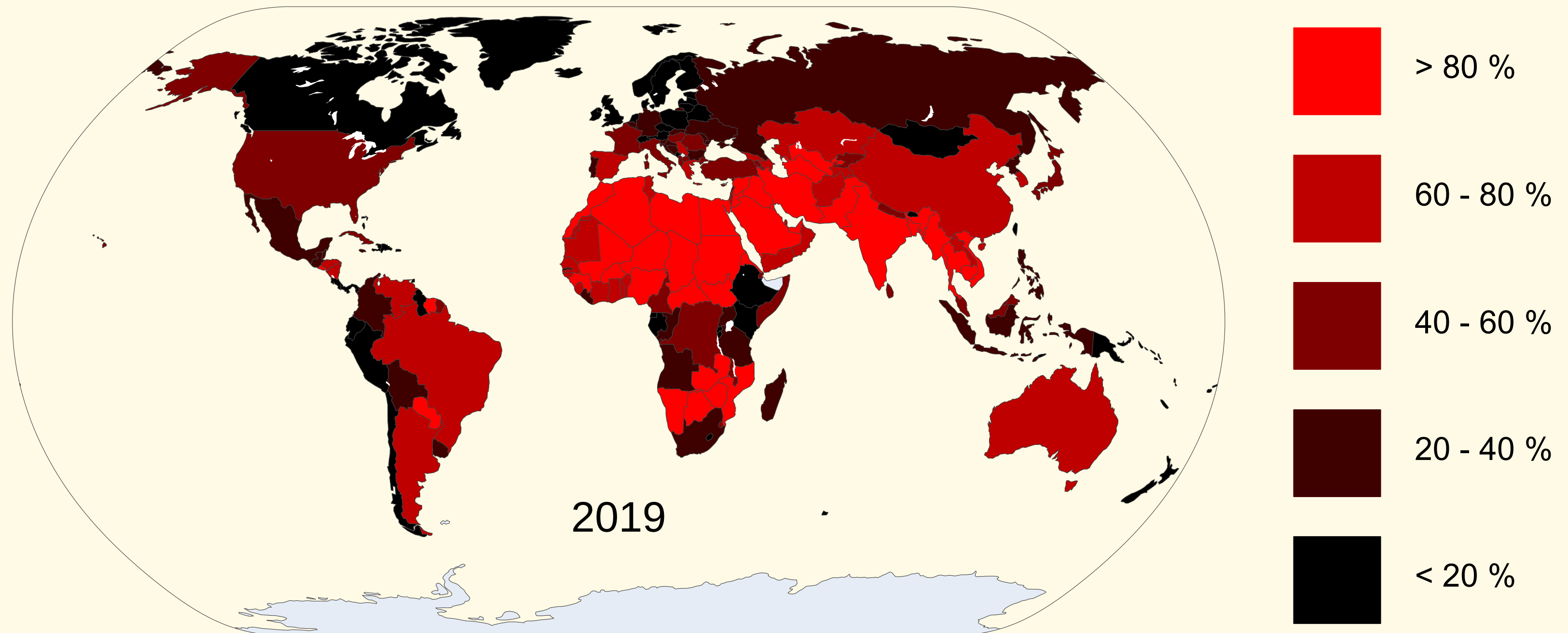
Rolling average over 5 years



# Exposure of populations to heat

Daily maximum temperature > 35 °C & minimum temperature > 20 °C, in %

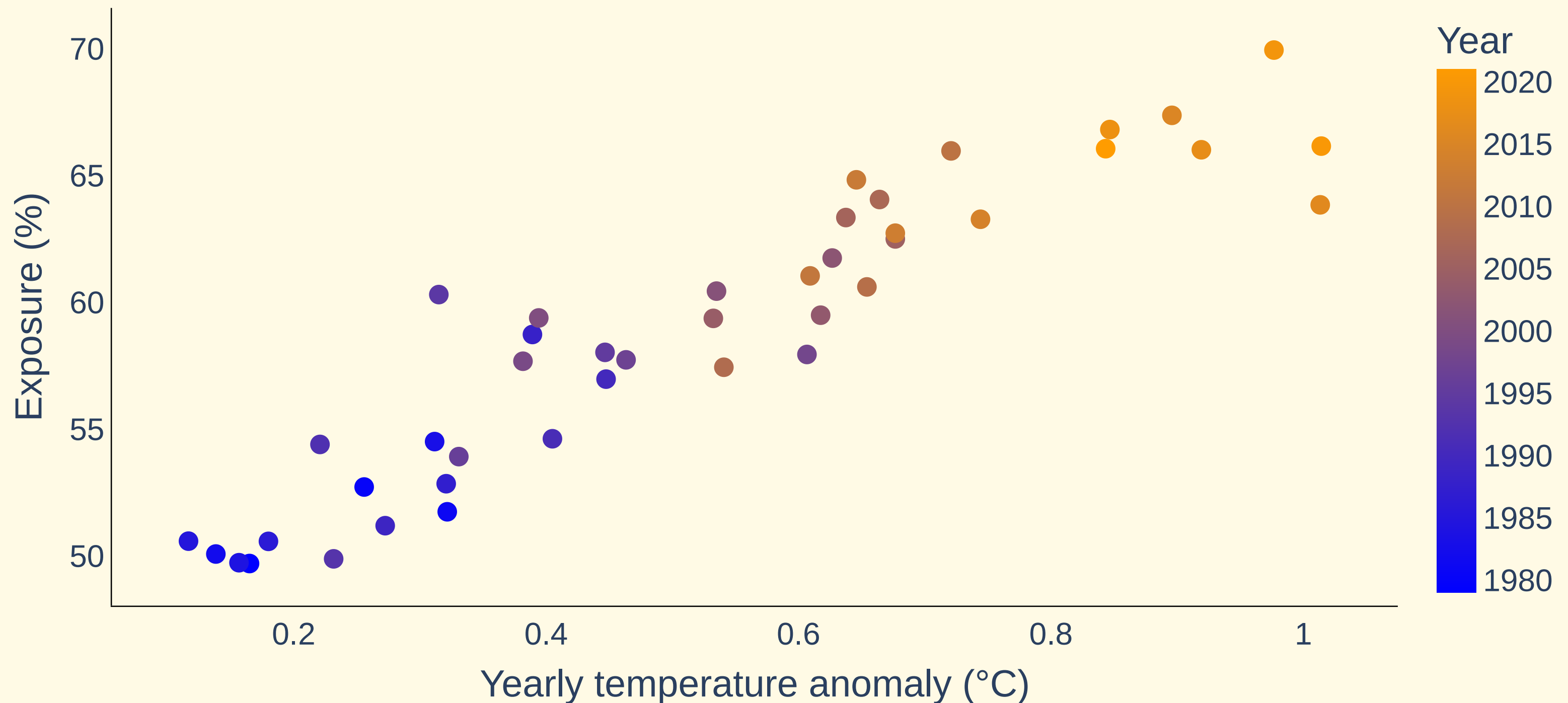
Rolling average over 5 years



# Exposure vs temperature anomaly

Daily maximum temperature > 35 °C & minimum temperature > 20 °C

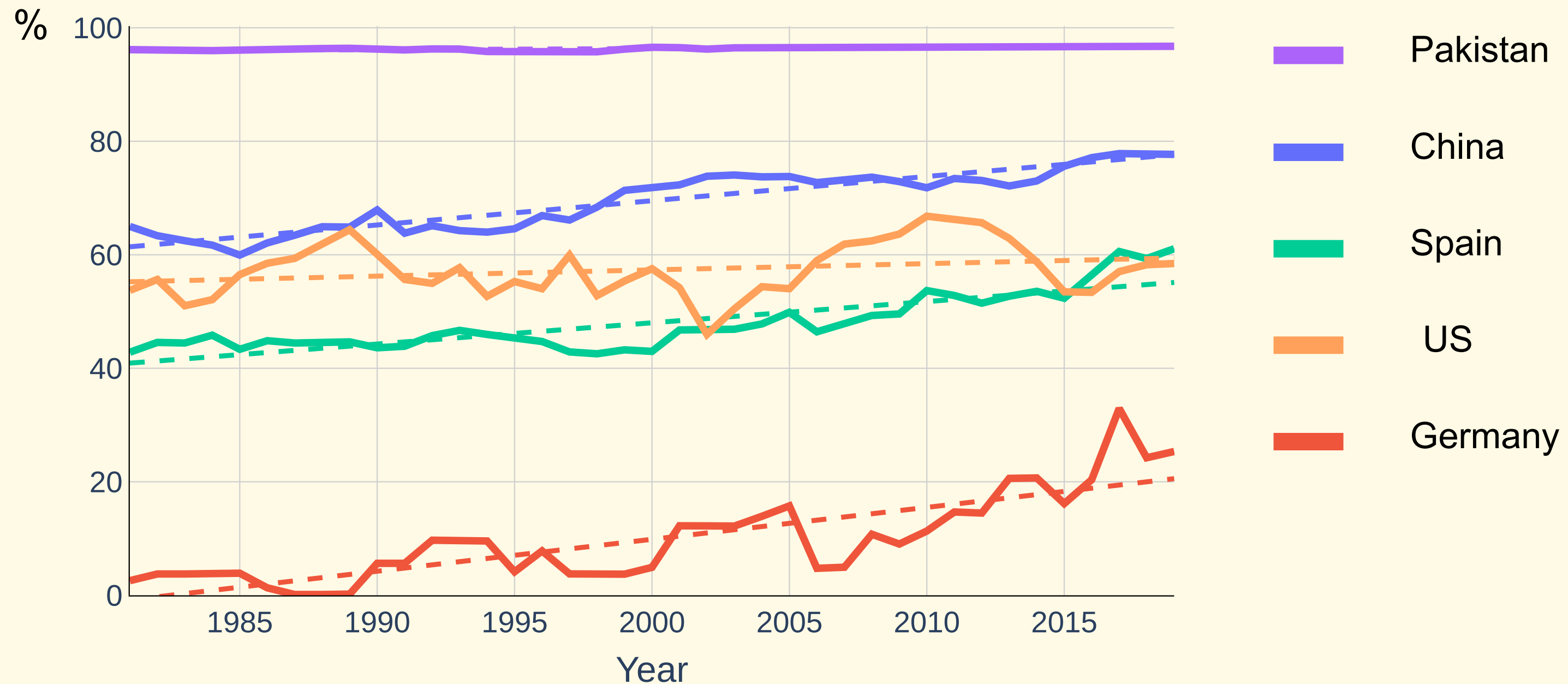
Deviations from 1951-1980 mean temperature



# Exposure of populations to heat

Daily maximum temperature > 35 °C & minimum temperature > 20 °C

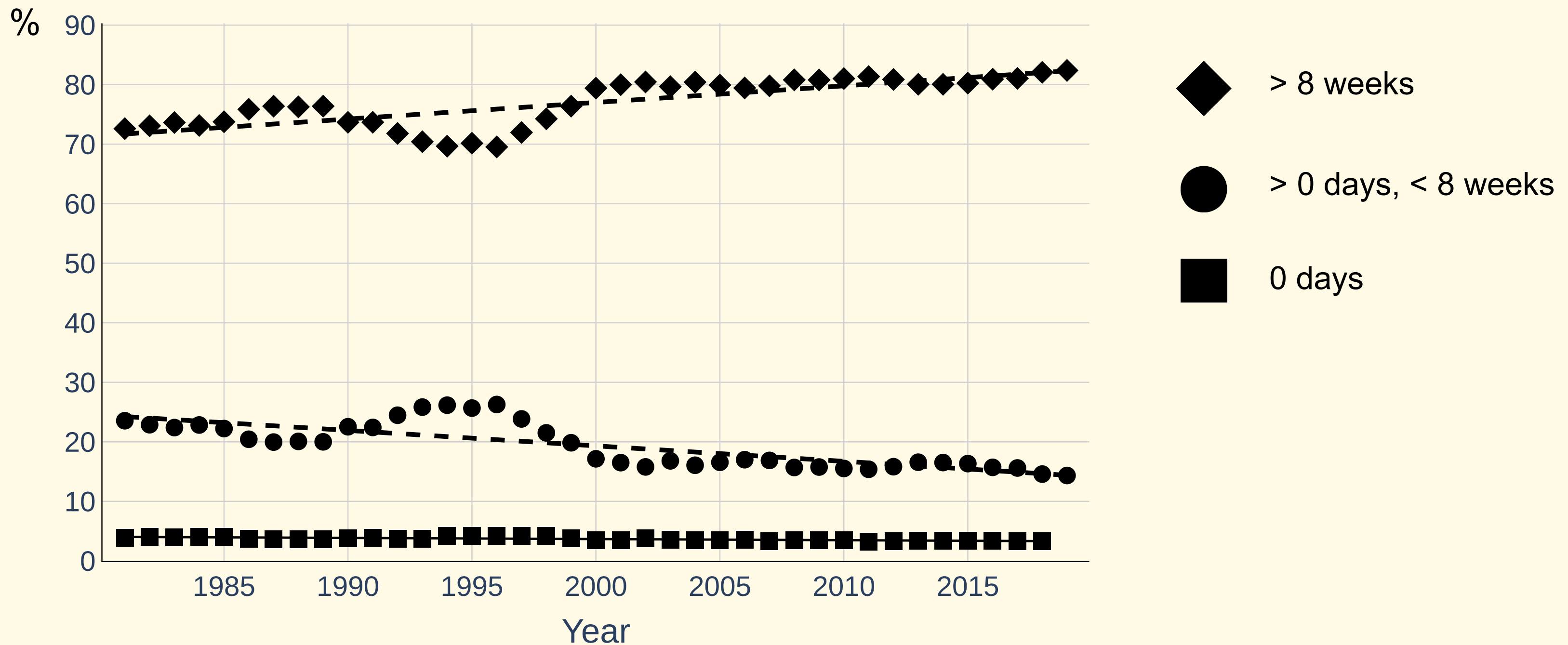
Rolling average over 5 years



# Pakistan: different durations

Daily maximum temperature  $> 35^{\circ}\text{C}$  & minimum temperature  $> 20^{\circ}\text{C}$

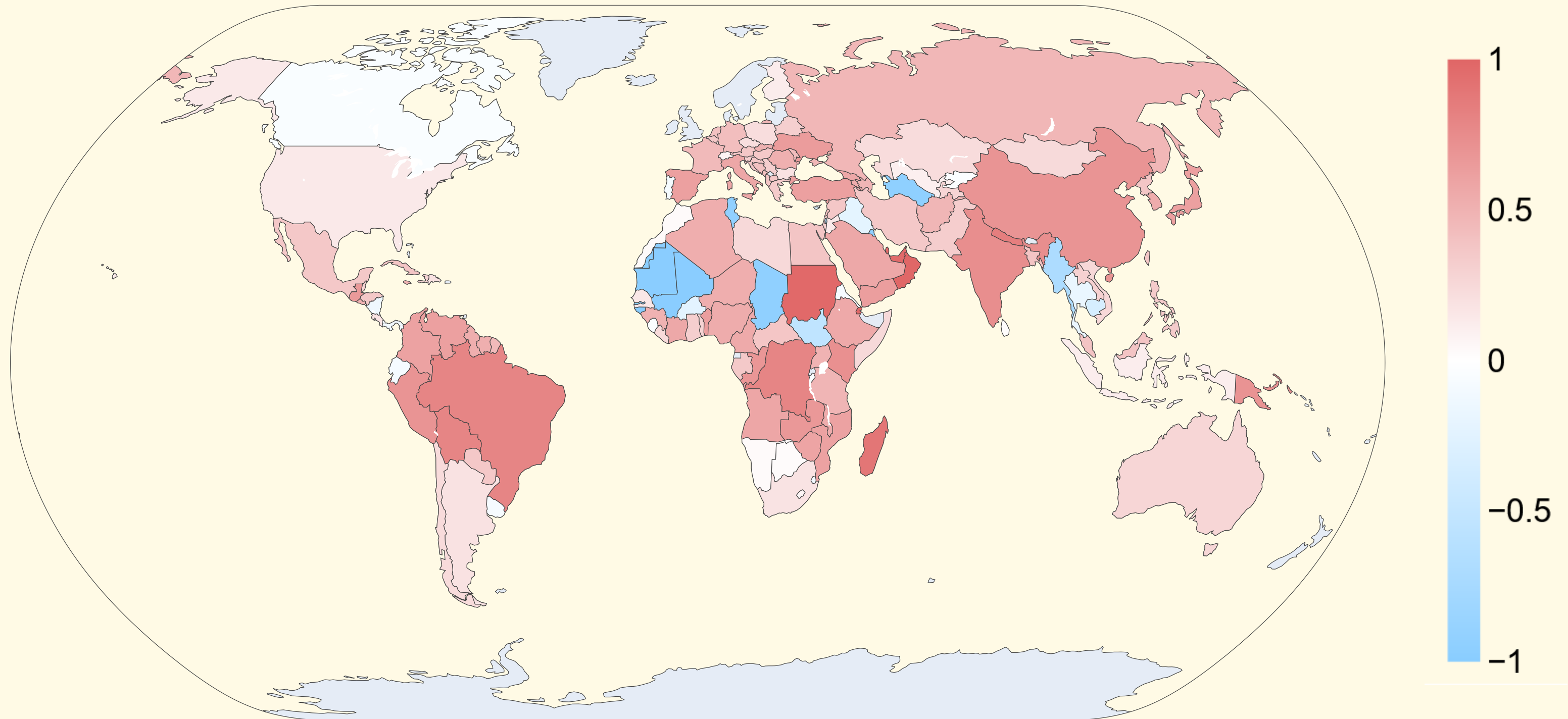
Rolling average over 5 years





# Correlation exposure vs time

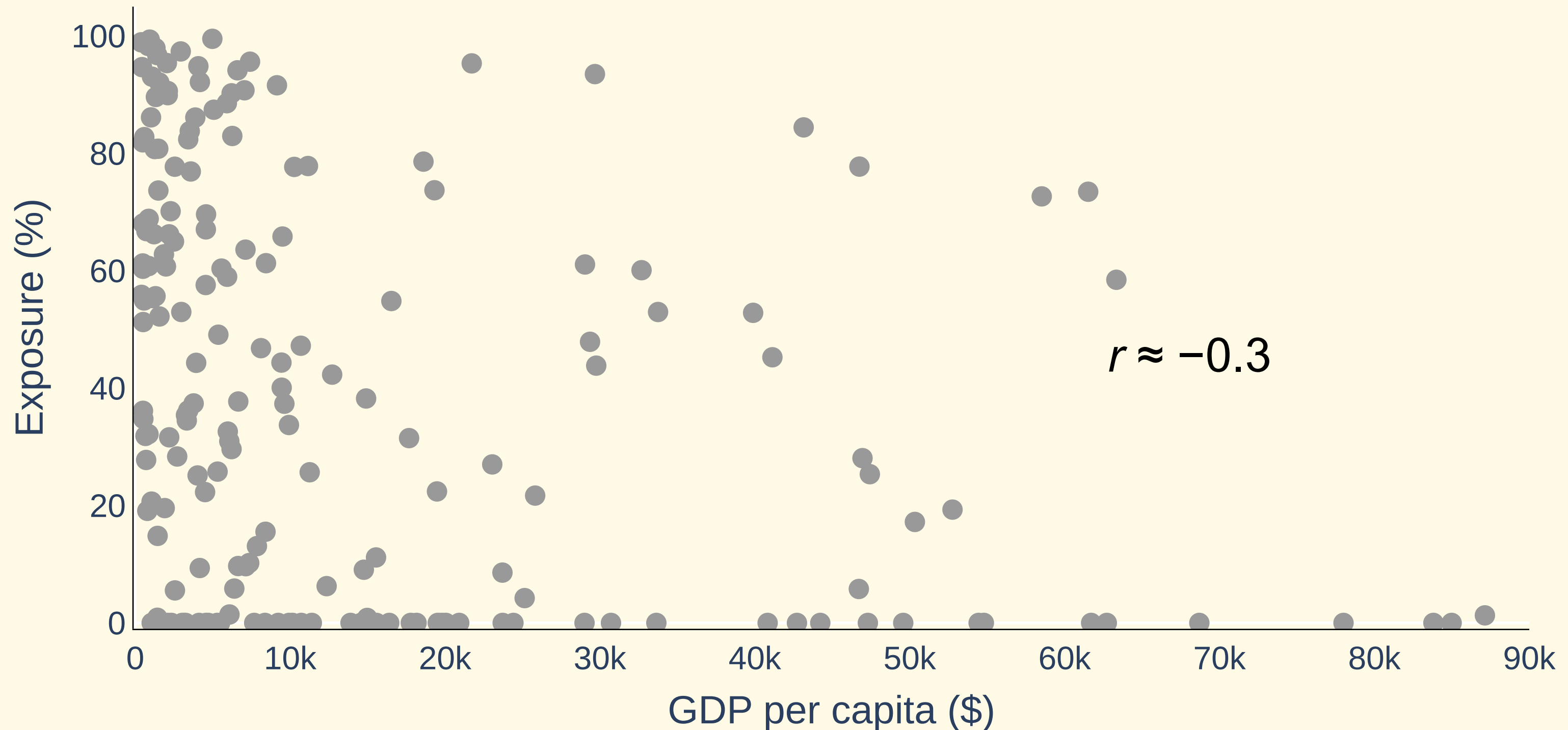
Daily maximum temperature  $> 35^{\circ}\text{C}$  & minimum temperature  $> 20^{\circ}\text{C}$





# What countries have in common

Exposure to heat + GDP per capita, average values from 2017 to 2021



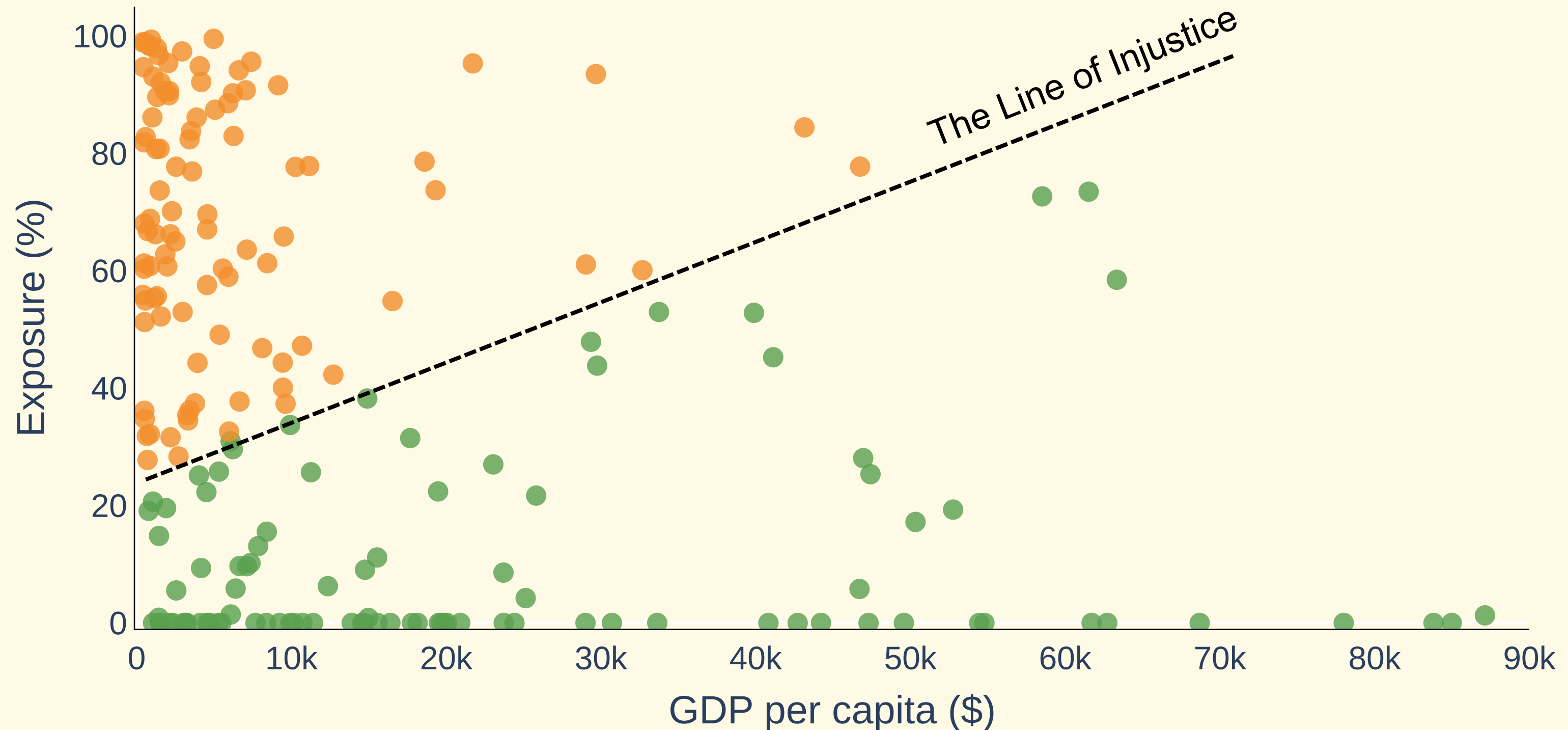
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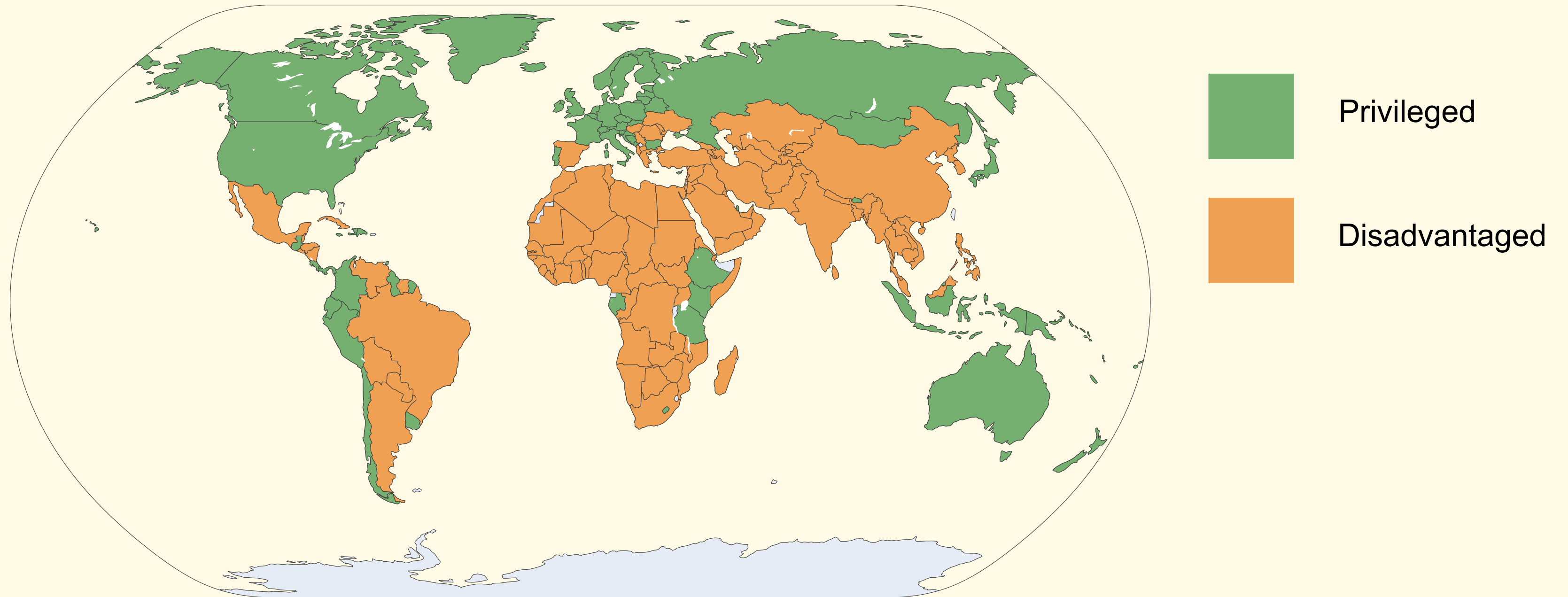


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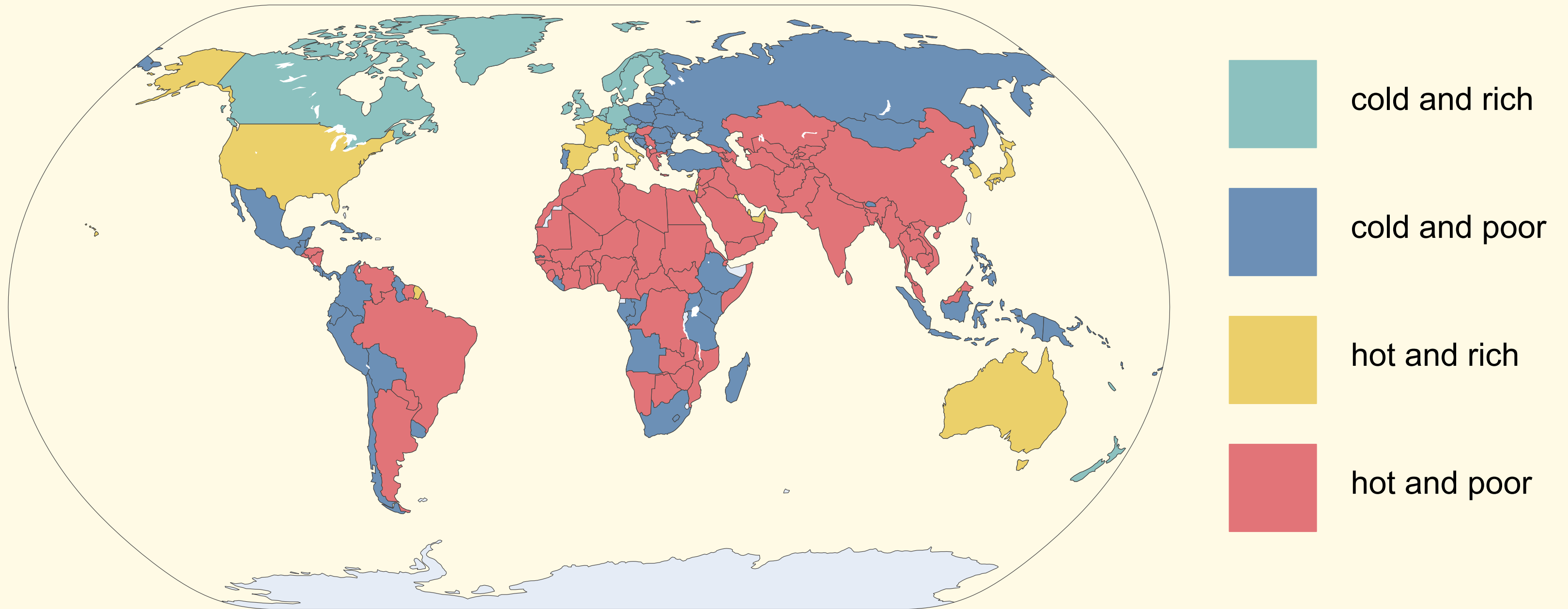


# What countries have in common



# 4 clusters

Exposure to heat + GDP per capita



# Summary

Exposure to extreme heat increases worldwide and within countries.

Warming of  $\sim 1^{\circ}\text{C}$  increased the exposure from 50 to 65 % worldwide.

There is large amount of countries with both high exposure and low income.