

Climate change, Chronic Diseases, and COVID-19: Impact on global health disparities

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Conflicts of interest

Dr. Saria Hassan has no conflicts of interest

Outline: The Global Health Lens

- Climate Change Inequities
- Climate Change and Chronic Diseases
- Climate Change, Chronic Diseases, COVID-19, and Worsening Global Health Disparities
- What's next?

Disclaimer

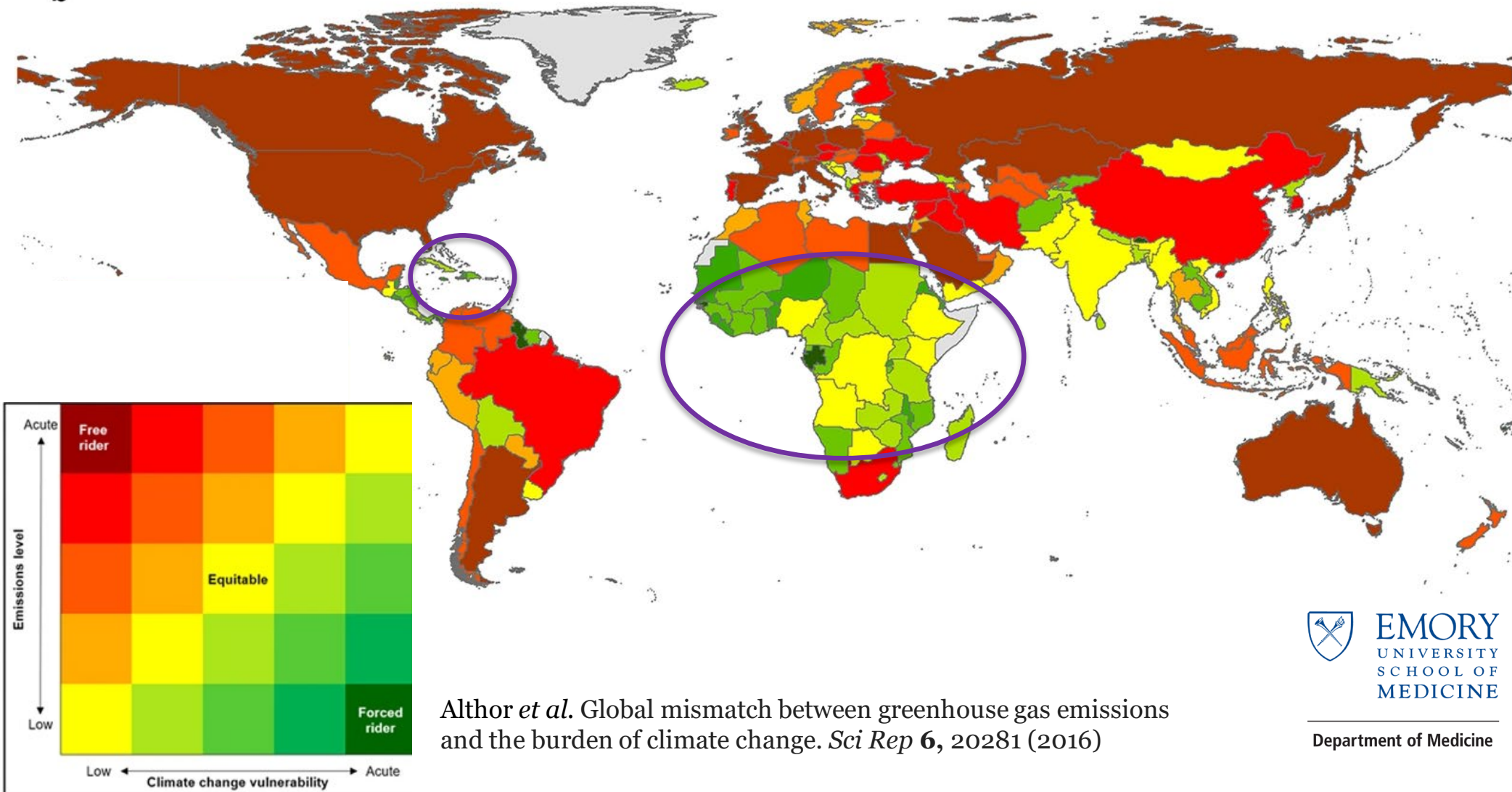
Focus is on the Caribbean and Sub-Saharan Africa

Focus is on natural disasters, but similar principles apply to other effects of climate change

Inequities of Climate Change

Global mismatch between greenhouse gas emissions and the burden of climate change

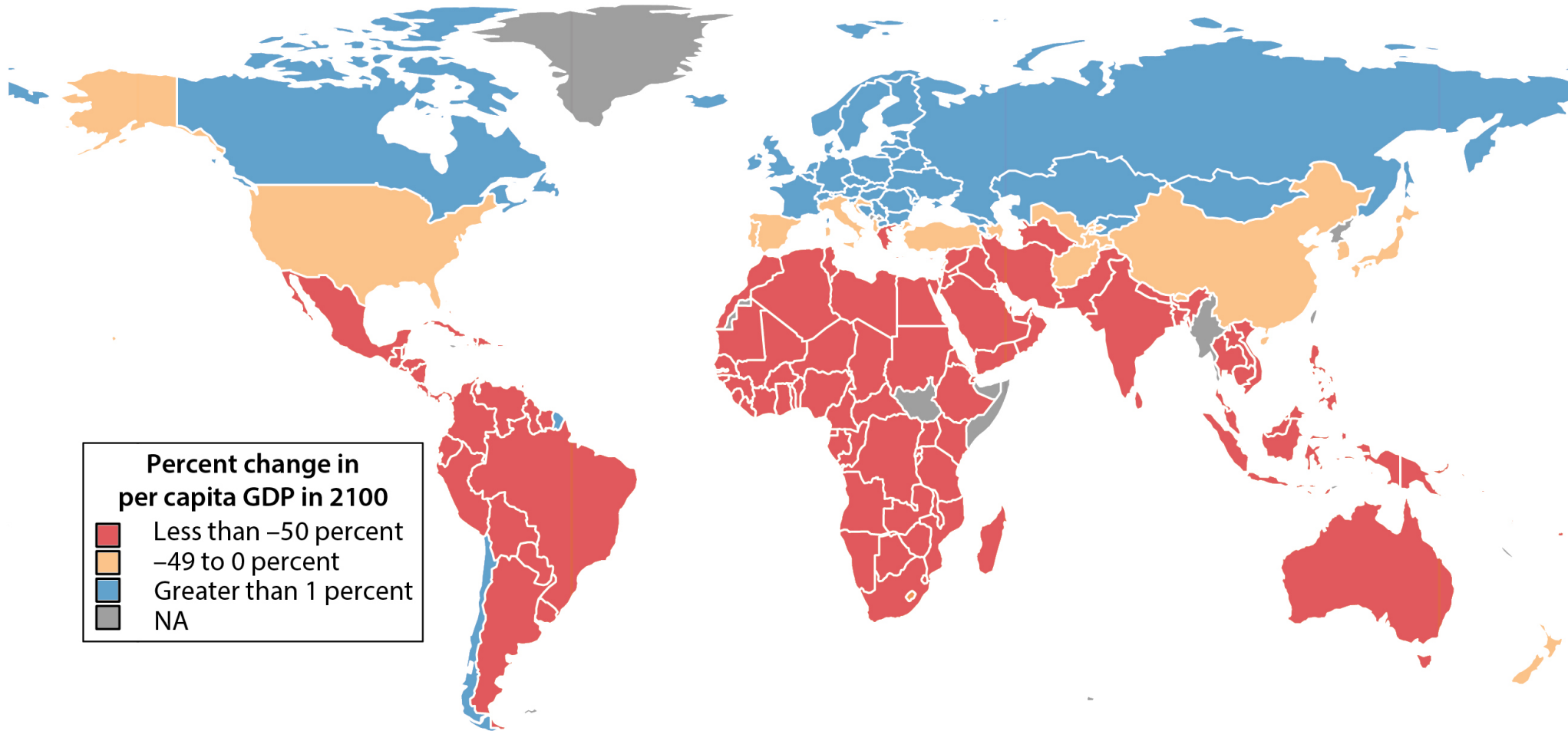
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Inequities of Climate Change

FIGURE 3.

Climate Change Effect on per Capita GDP in 2100 by Country



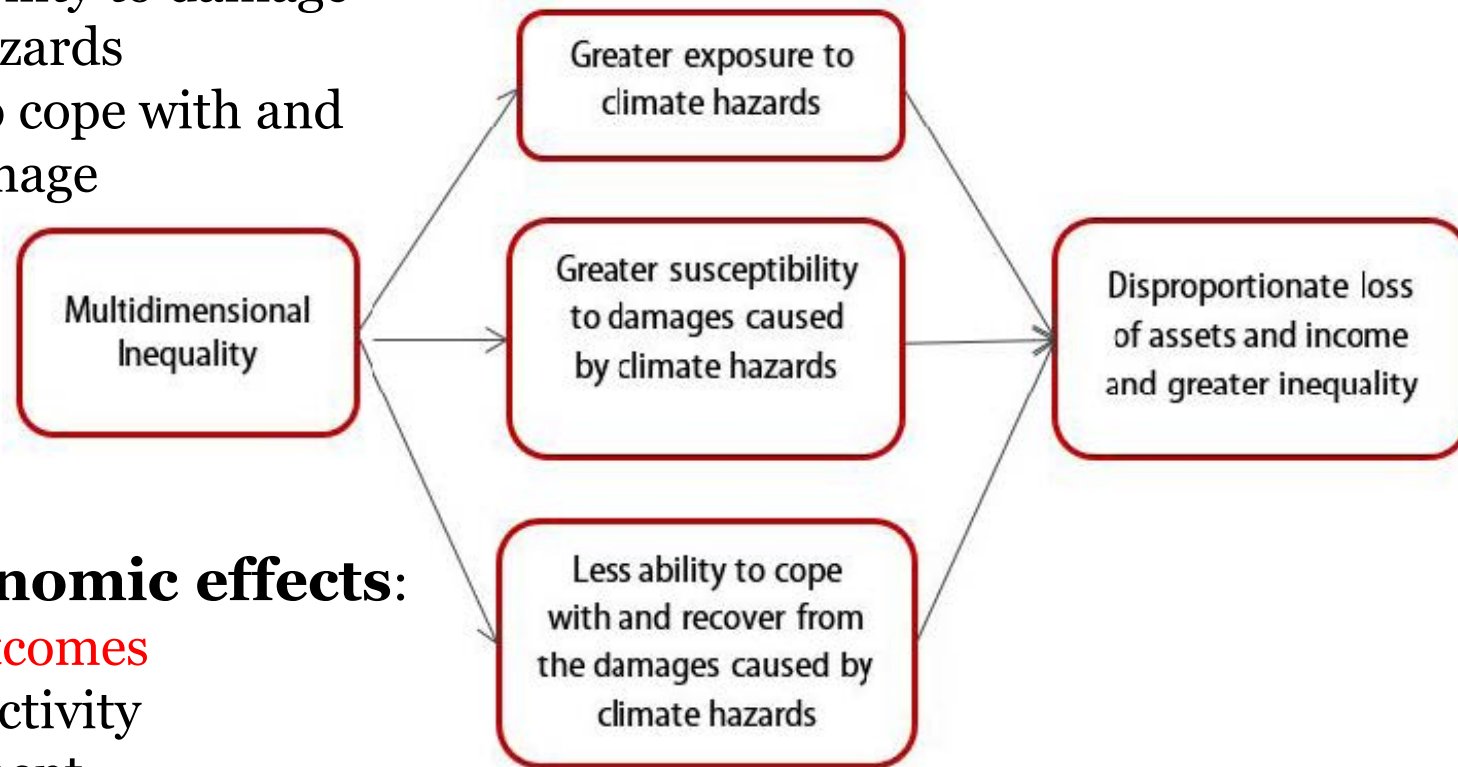
Source: Burke, Hsiang, and Miguel (2015); authors' calculations.

Note: Country-level estimates for GDP per capita in 2100. Figure assumes RCP 8.5, which corresponds to roughly 3.2°C to 5.4°C of warming. GDP loss is associated with the warming from a baseline of 1980–2010 average temperatures. As explained in Burke, Hsiang, and Miguel (2015), estimates include growth-rate effects over the period through 2100.

Explaining the Inequities of Climate Change

Channels of influence of inequality:

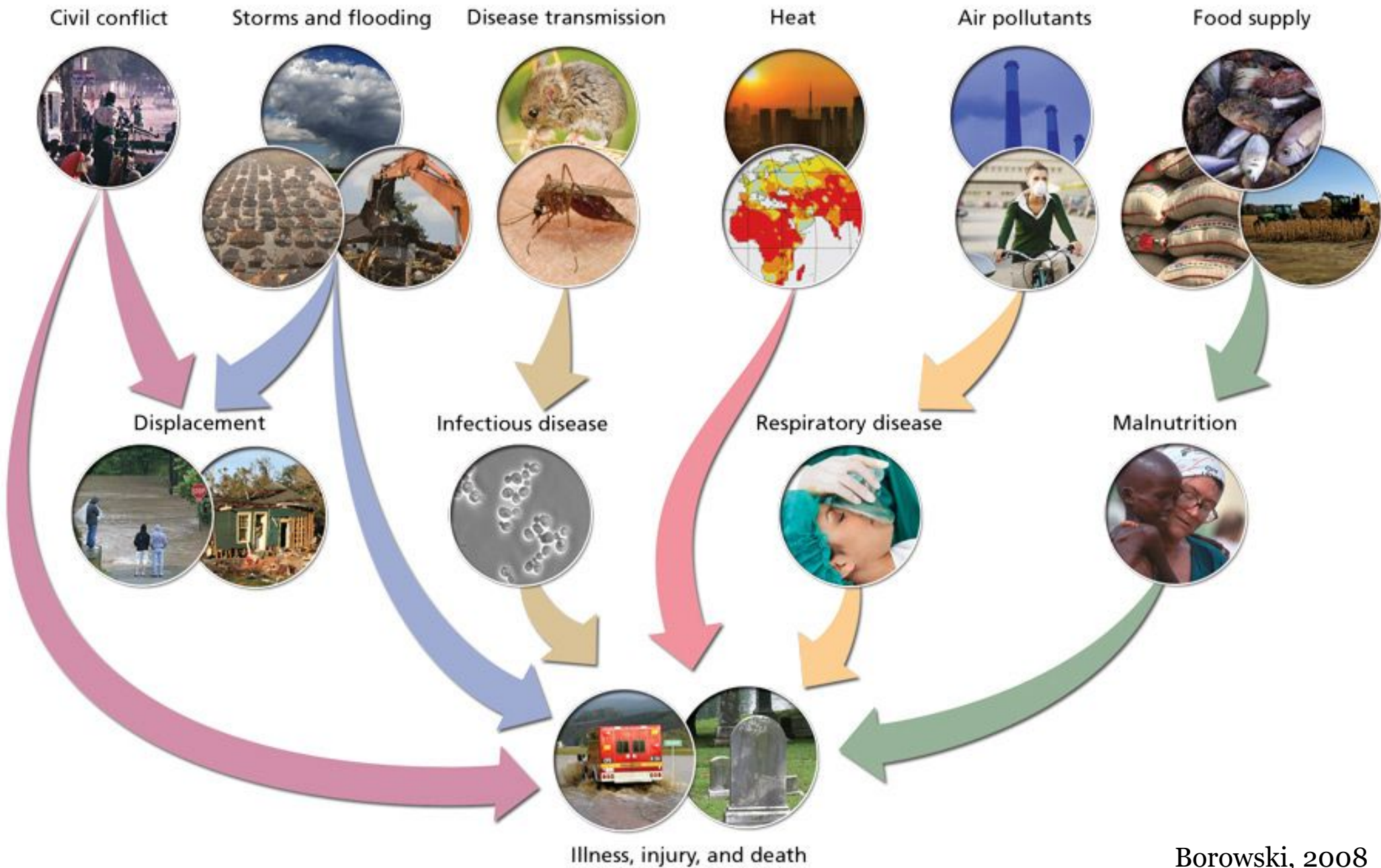
1. Increase in exposure to climate hazards
2. Increase in susceptibility to damage caused by climate hazards
3. Decrease in ability to cope with and recover from the damage

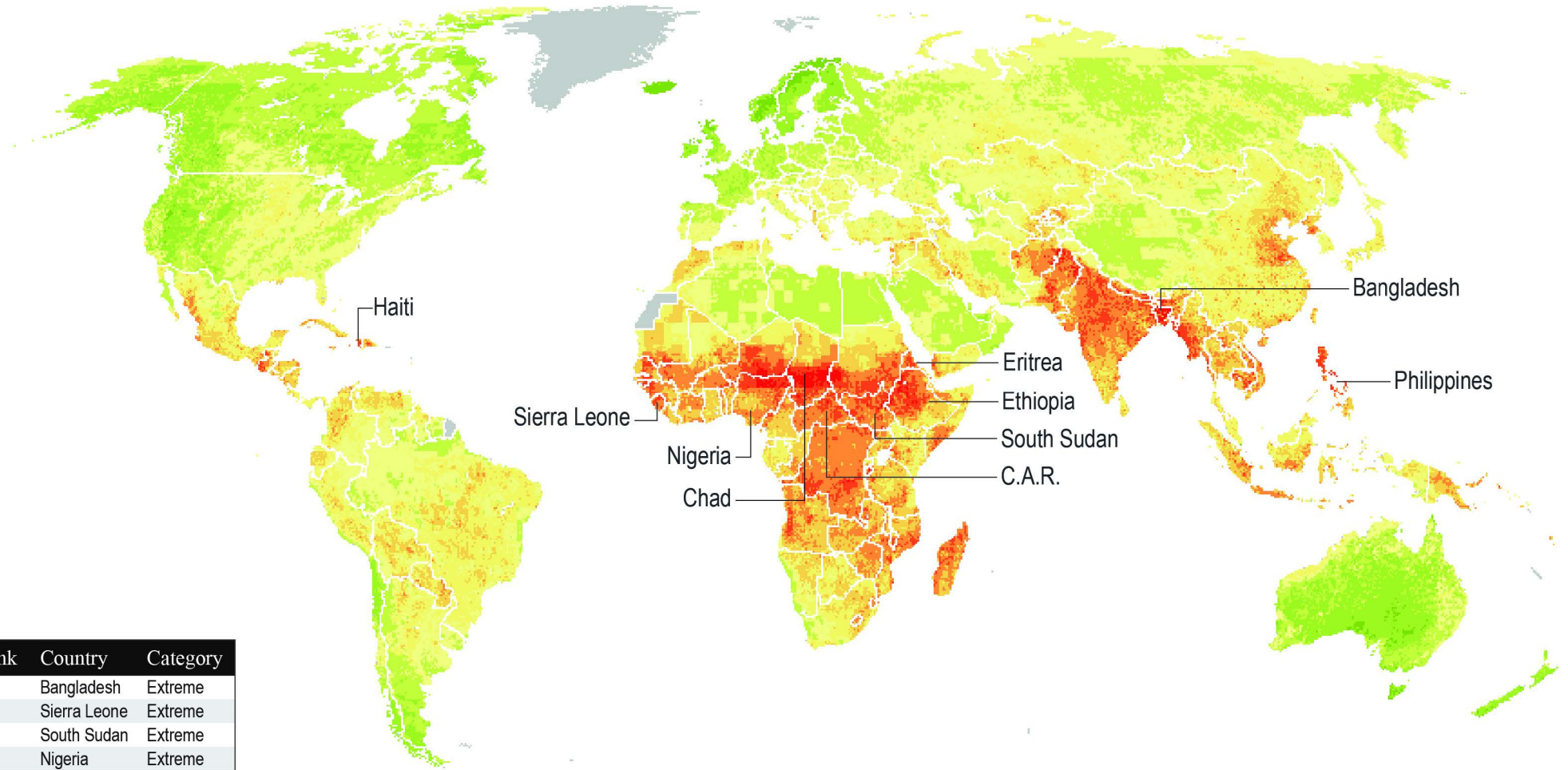


Explaining the economic effects:

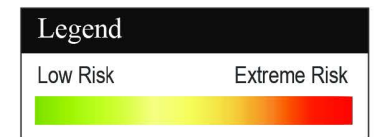
1. **Worsened health outcomes**
2. Decreased job productivity
3. Migration/displacement
4. Decreased tourism
5. Food insecurity

Climate change effects on health

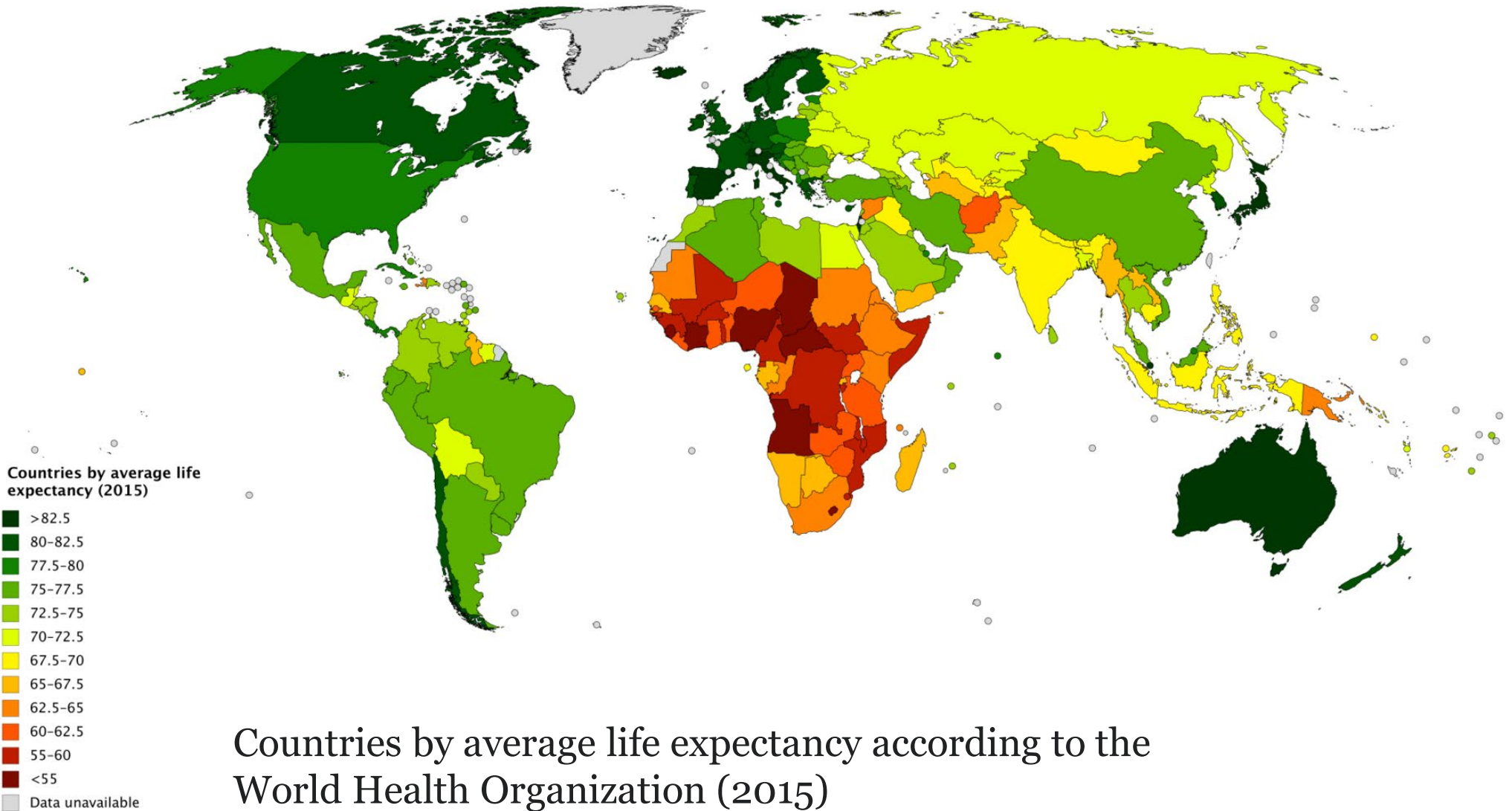




Rank	Country	Category
1	Bangladesh	Extreme
2	Sierra Leone	Extreme
3	South Sudan	Extreme
3	Nigeria	Extreme
5	Chad	Extreme
6	Haiti	Extreme
7	Ethiopia	Extreme
8	Philippines	Extreme
9	C.A.R.	Extreme
9	Eritrea	Extreme



Countries with highest climate change vulnerability have the lowest life expectancy



Climate Change and Health: Compounded by Chronic Disease

What are Chronic Diseases or Non-Communicable Diseases

- Diabetes
- Cardiovascular disease
- Pulmonary disorders
- Cancer
- Mental Health

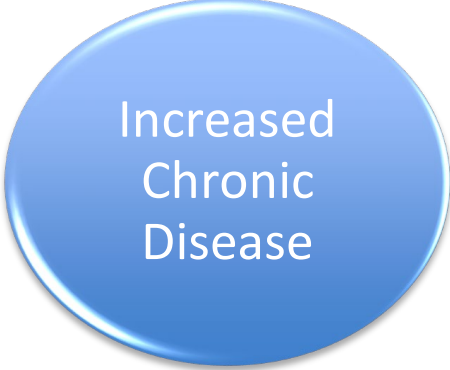
75% of mortality due to chronic disease occurs in LMICs

WHO, 2018

How does Climate Change Effect Non-Communicable Diseases

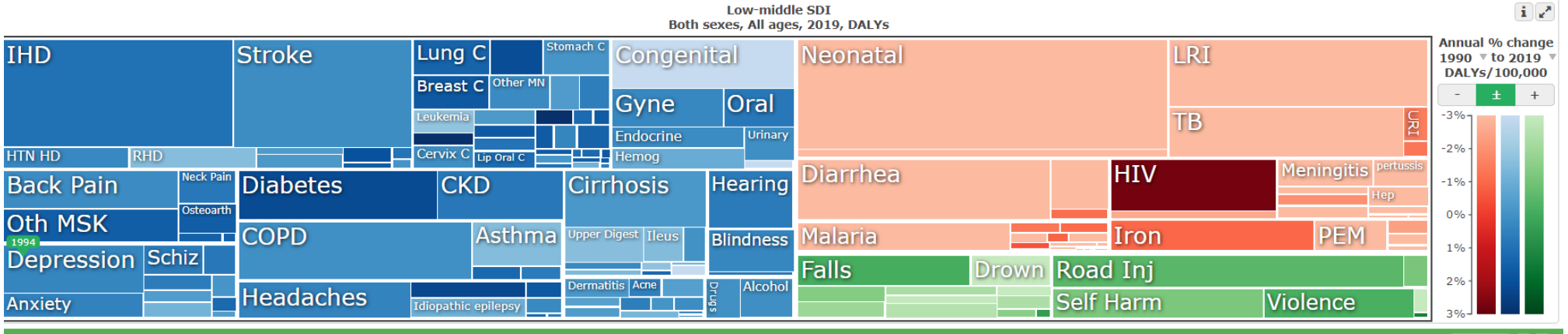
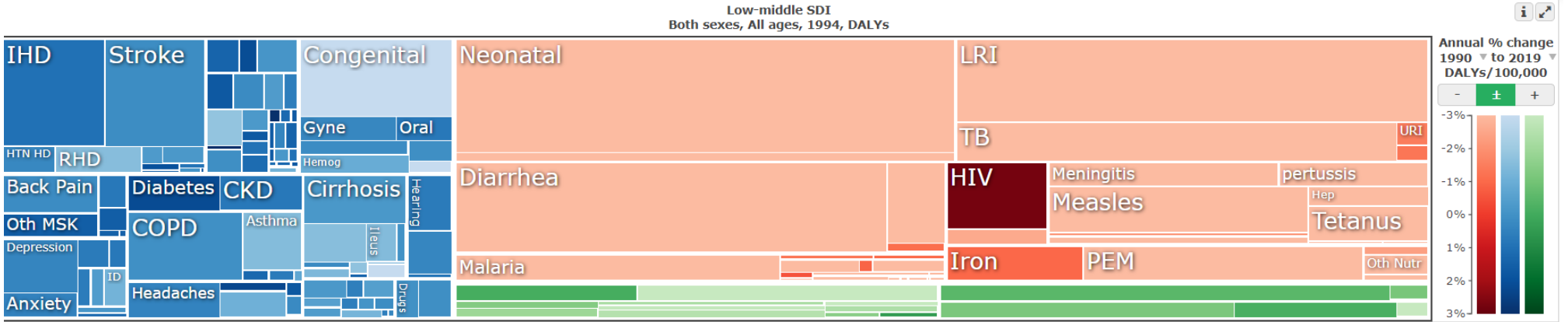
- Air pollution → indoor/outdoor → worsened respiratory disorders
- Food insecurity → unhealthy diet
- Displacement/migration → limited access to healthcare
- Civil conflict → limited access to healthcare
- Civil conflict → mental health disorders
- Natural disasters → limited access to healthcare
- Natural disasters → mental health disorders

Climate Change and Chronic Disease: bad combination

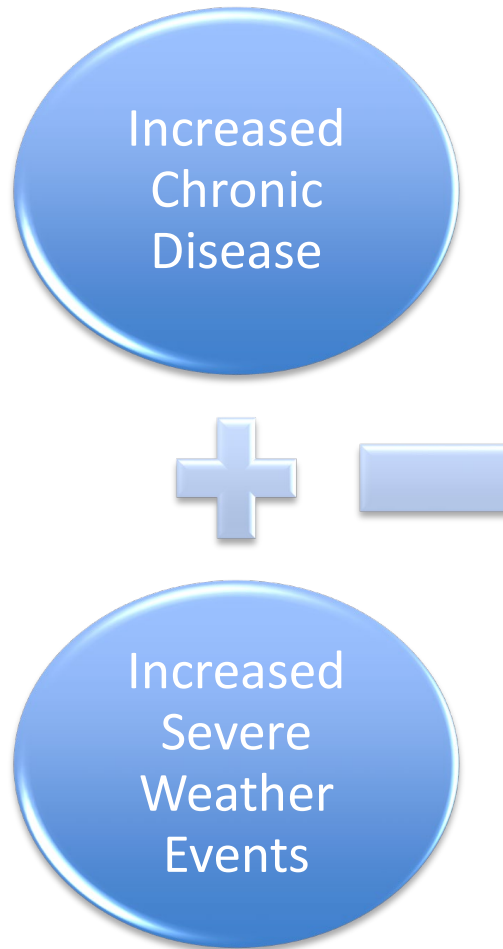


Increased
Chronic
Disease

Climate Change and Chronic Disease: bad combination

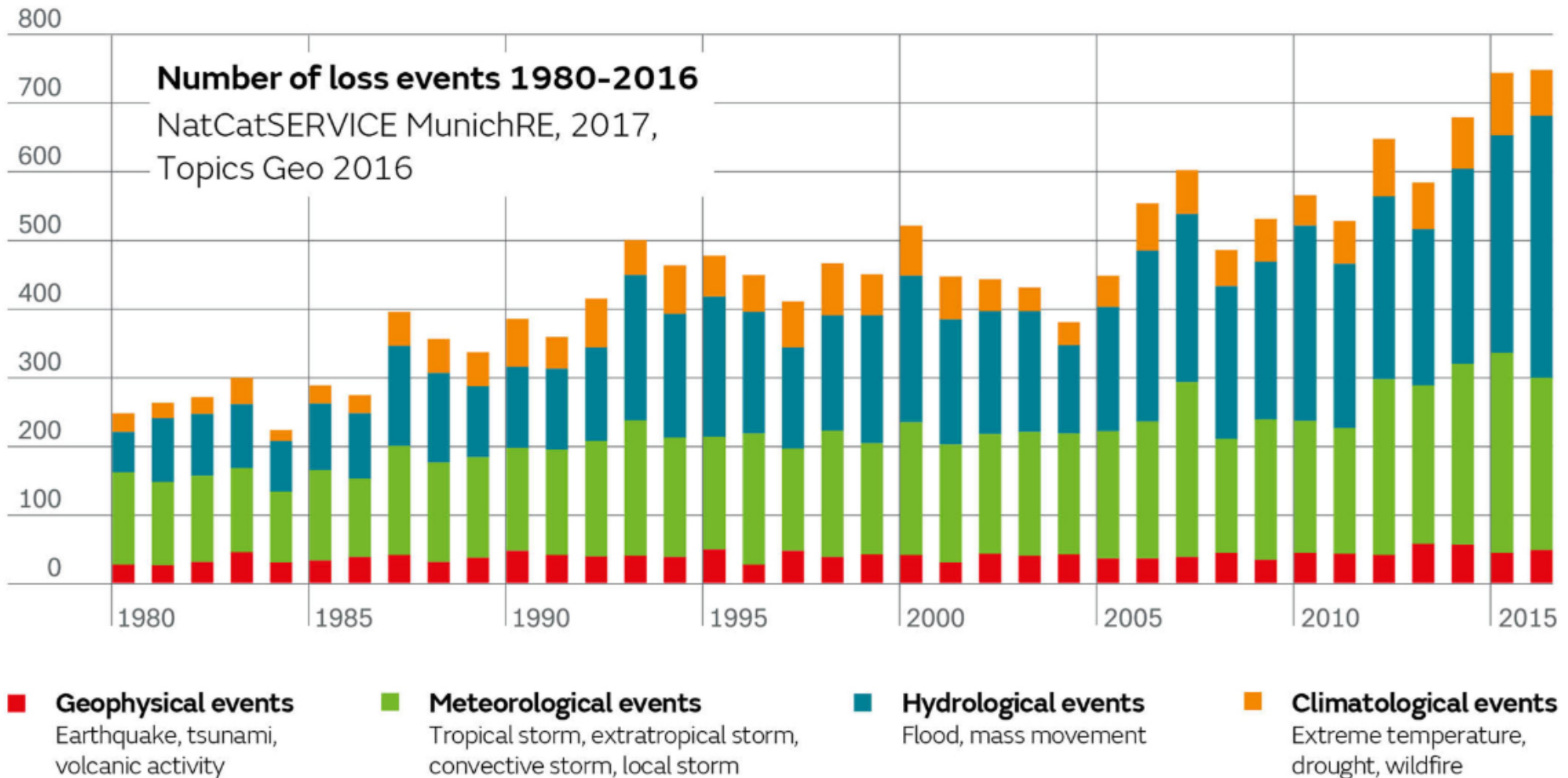


Climate Change and Chronic Disease: bad combination

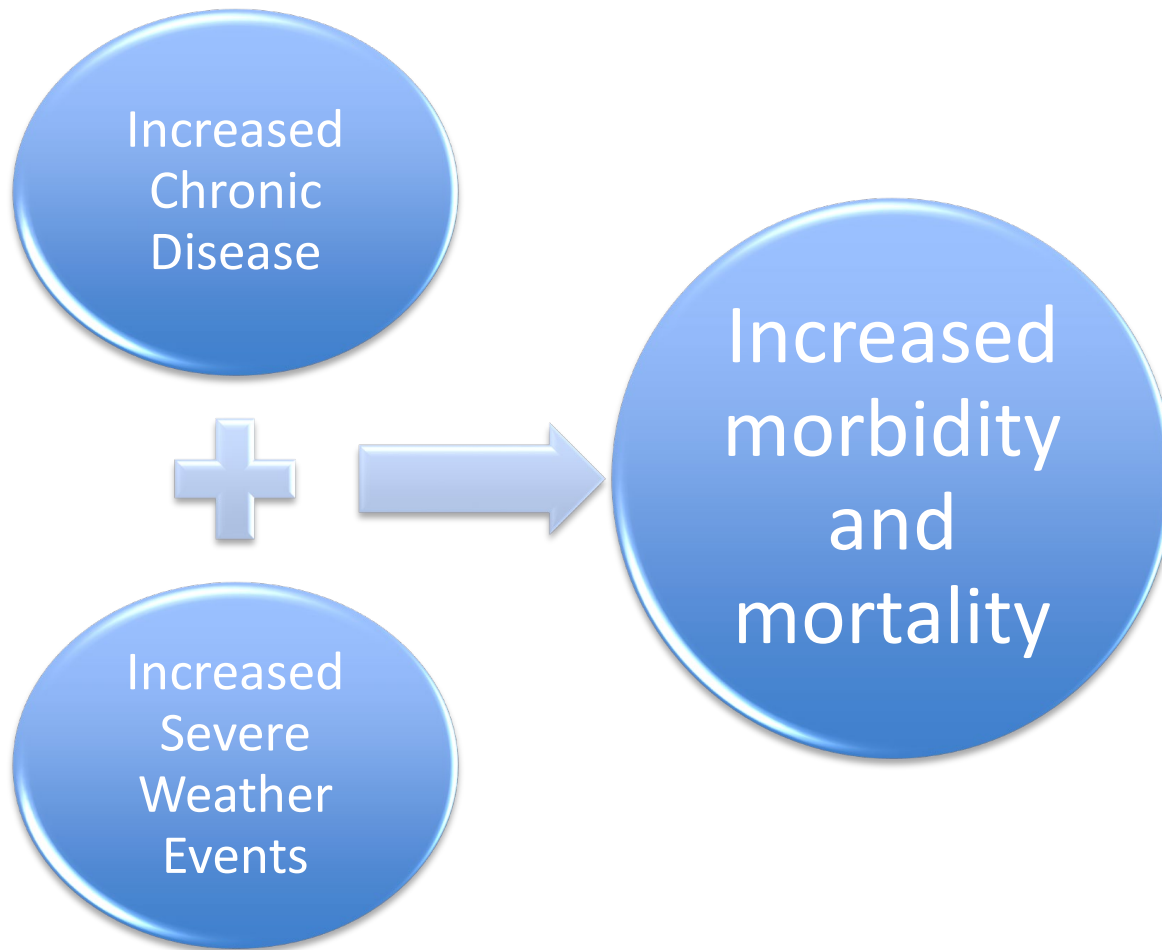


Climate Change and Chronic Disease: bad combination

Are extremes becoming more frequent?



Climate Change and Chronic Disease: bad combination



Now add:

- Weaker health system
 - Greater vulnerability to extreme weather events
 - Decreased mitigation/adaptation
- **Increased Global Health Disparities**

Climate Change and Chronic Disease: bad combination

Now add on COVID-19!

Who is dying of COVID-19?

- *People with obesity:*
3-4-fold increased risk of needing critical care;
7-fold increased chance of needing mechanical ventilation

Tartof *et al*, 2020

Simonnet *et al*, 2020

- *People with diabetes:*
increased risk of hospitalizations, increased risk of dying.
- *People with heart disease:*
~10% with CVD who contract COVID-19 will die,
vs 1% if otherwise healthy.

Zhou *et al*, 2020

Remuzzi *et al*, 2020

Chronic disease and climate change: bad combination

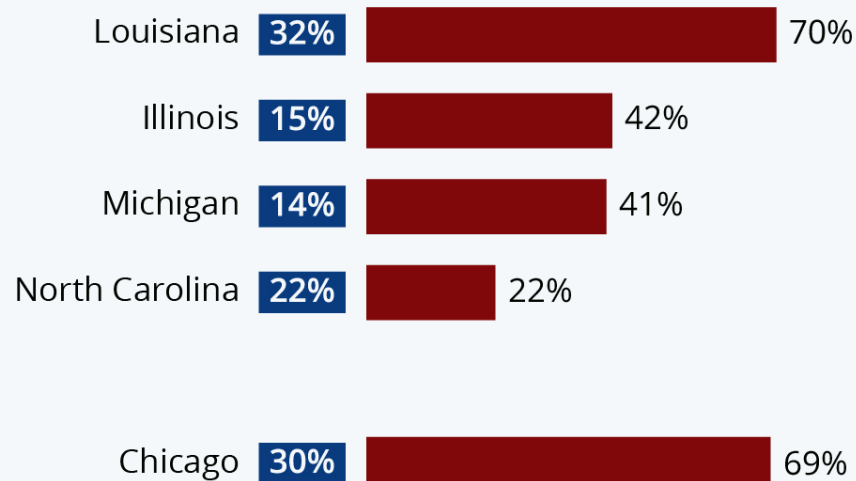
Now add on COVID-19!

Can this partly explain US COVID-19 Disparities?

COVID-19's Devastating Impact On African Americans

African American share of state/city populations and COVID-19 deaths (as of Apr 06, 2020)

■ Share of state/city's population ■ Share of COVID-19 deaths



Sources: 2010 Census, respective state/city health departments



statista

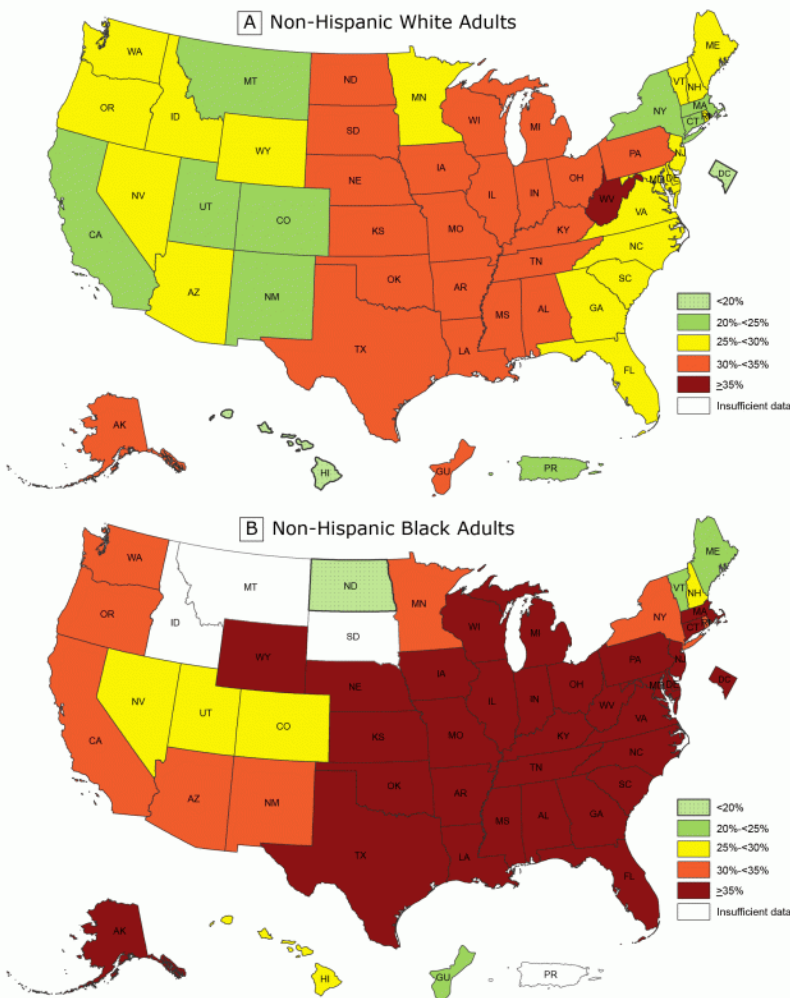
- Hospitalization rates for Native Americans and Black Americans are approx. 5 and 4.5 x that of white Americans.
- Latinx American hospitalization rates 4x that of white Americans
- Chicago + Michigan: proportion of COVID19 mortality among blacks is 2x proportion of black residents in the area

Chronic disease and climate change: bad combination

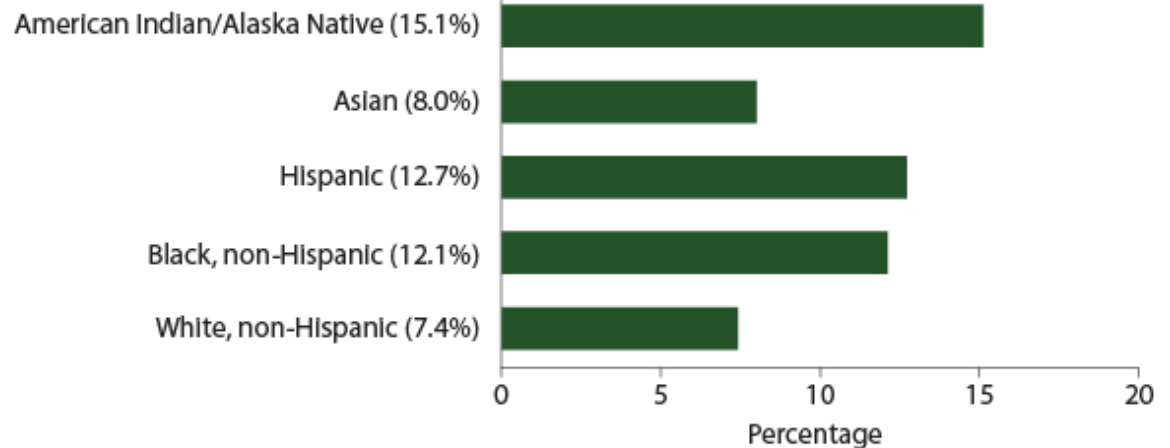
Now add on COVID-19!

Can this partly explain US COVID-19 Disparities?

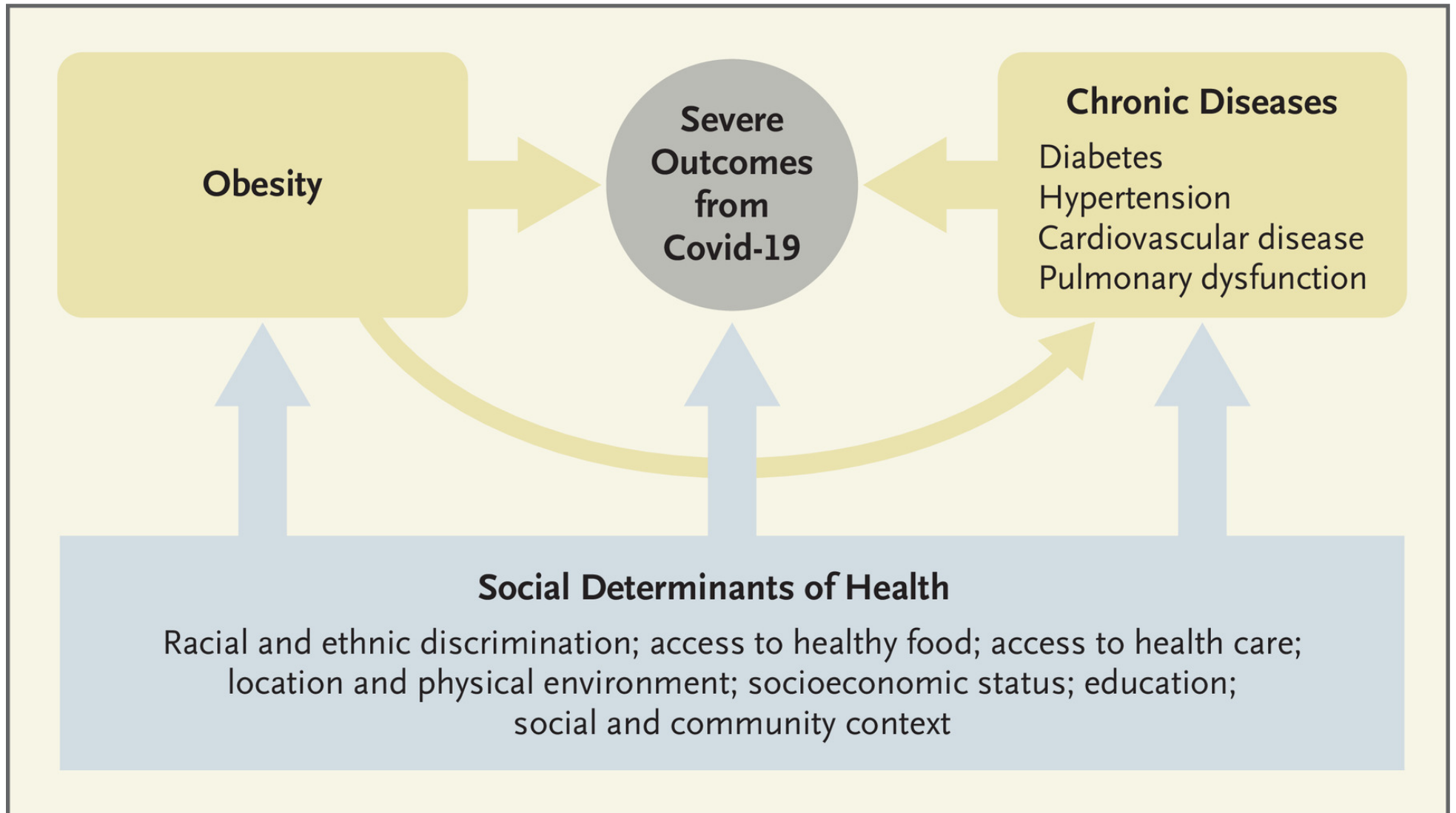
Obesity Disparities in the US



Percentage of US Adults Aged 18 or Older with Diagnosed Diabetes, by Racial and Ethnic Group, 2013-2015
2017 Diabetes Report Card



Chronic disease and COVID-19: US Health Disparities



Belanger, M. J., et al. (2020). "Covid-19 and Disparities in Nutrition and Obesity." *New England Journal of Medicine* **383**(11): e69.

Climate change, chronic disease, and COVID-19: Global health disparities



COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins

Global Cases

43,895,968

Cases by
Country/Region/Sovereignty

8,774,093 US

7,946,429 India

5,439,641 Brazil

1,537,142 Russia

1,244,242 France

1,116,738 Spain

1,116,609 Argentina

1,033,218 Colombia

920,664 United Kingdom

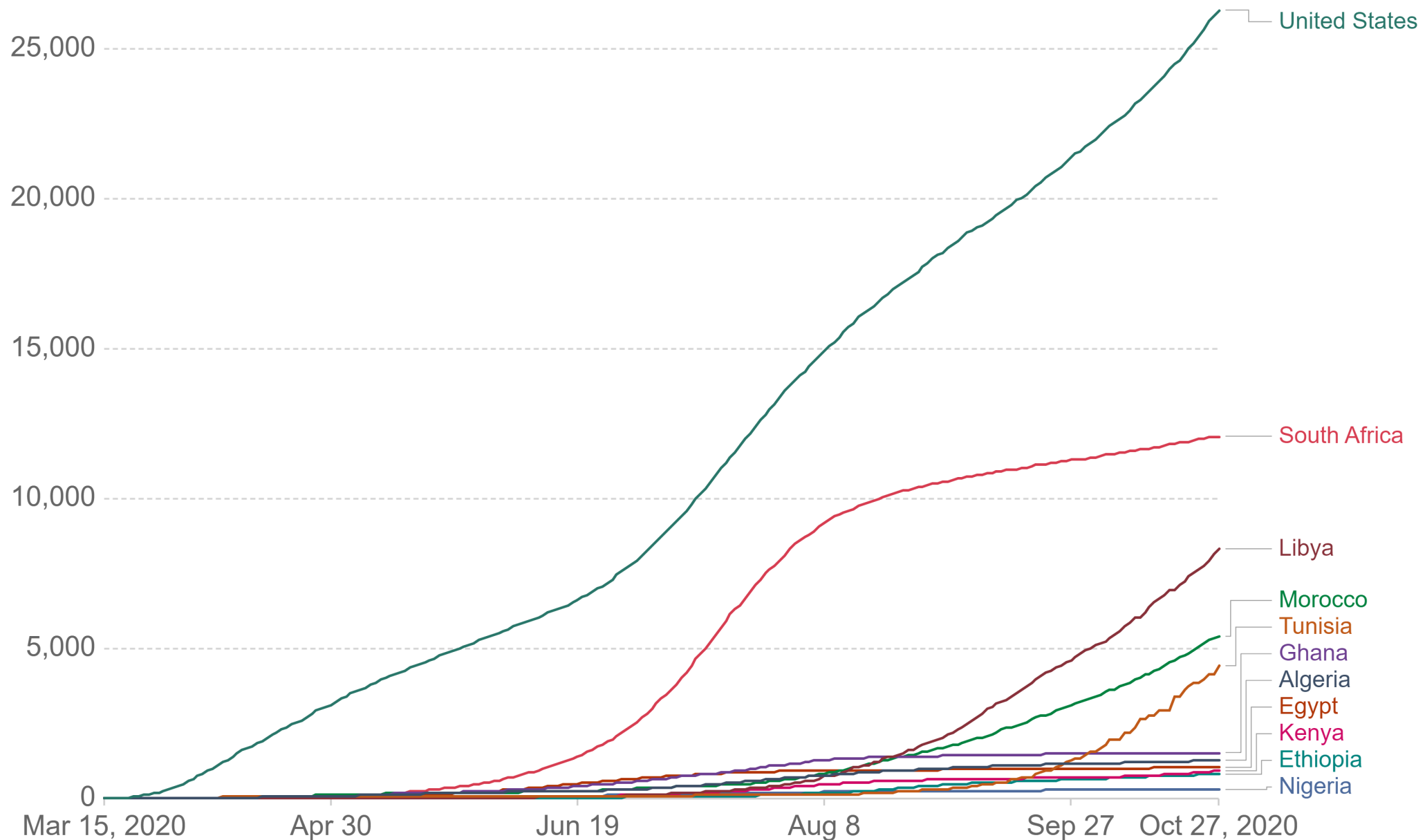


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Cumulative confirmed COVID-19 cases per million people

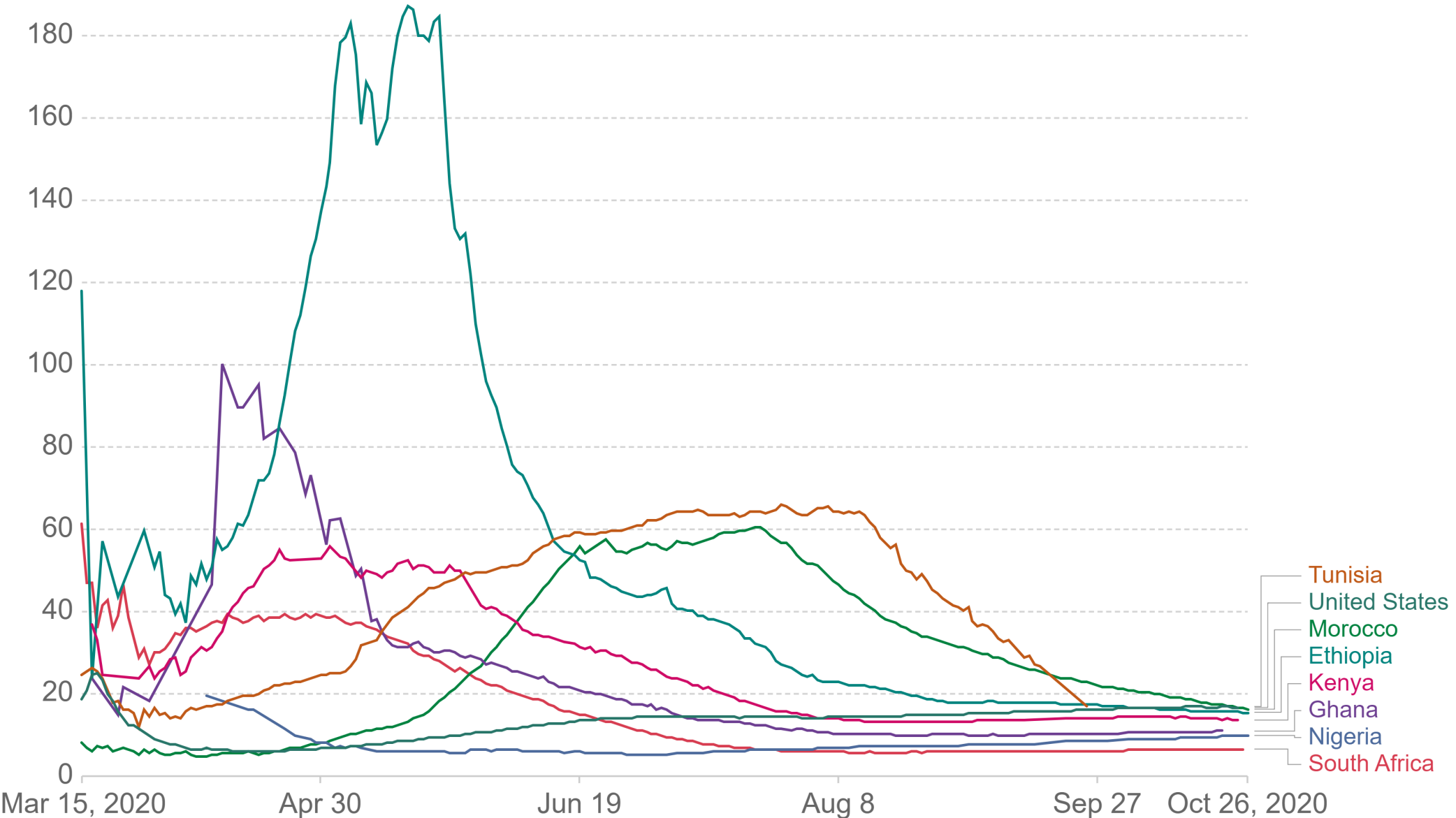
The number of confirmed cases is lower than the number of actual cases; the main reason for that is limited testing.



Source: European CDC – Situation Update Worldwide – Last updated 27 October, 10:05 (London time)

Cumulative tests conducted per confirmed case of COVID-19

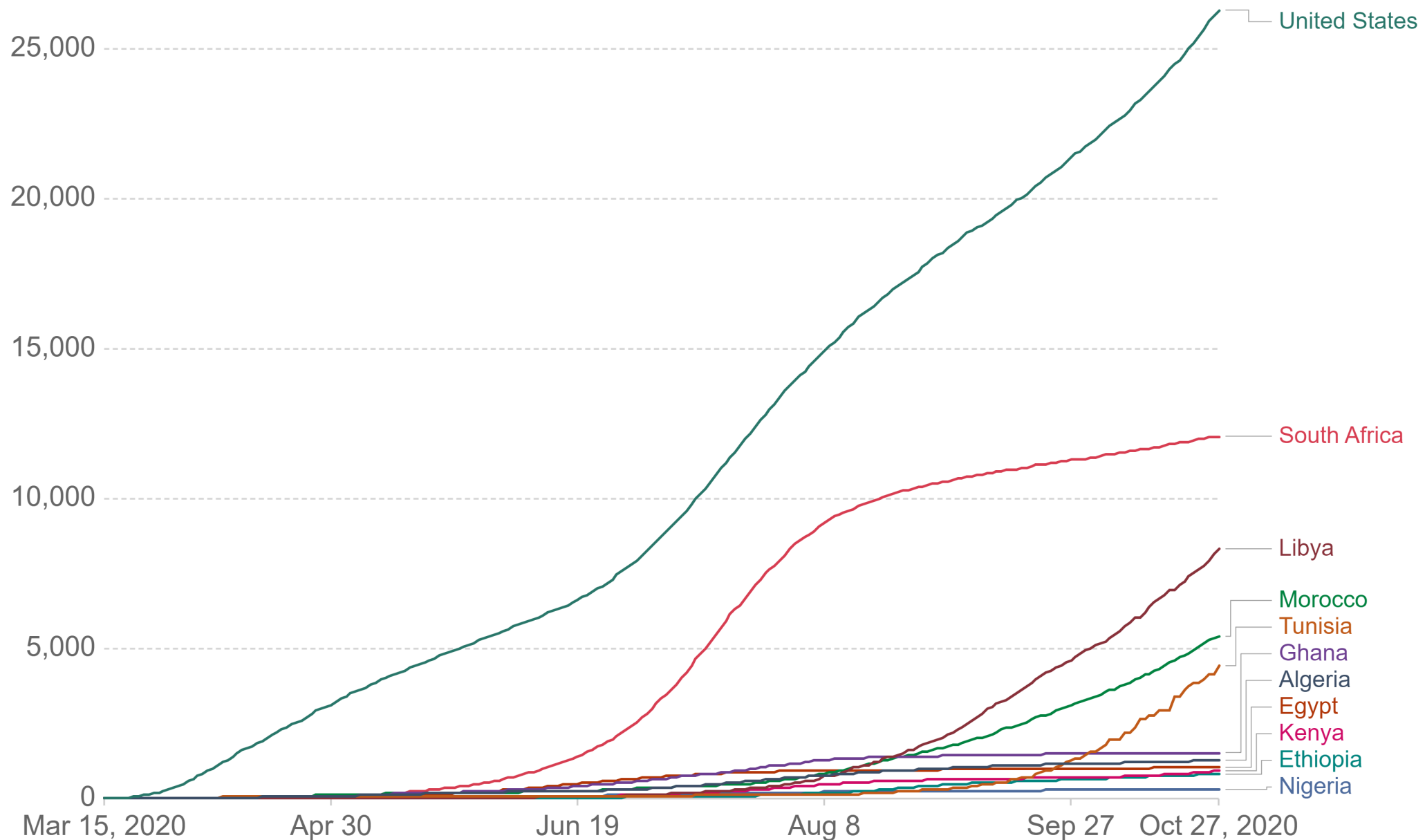
The number of tests divided by the number of confirmed cases. Not all countries report testing data on a daily basis.



Source: Official data collated by Our World in Data

Cumulative confirmed COVID-19 cases per million people

The number of confirmed cases is lower than the number of actual cases; the main reason for that is limited testing.



Source: European CDC – Situation Update Worldwide – Last updated 27 October, 10:05 (London time)

What about chronic disease and COVID-19: Who is dying of COVID-19 in Africa?

South Africa (nearly half of all cases and deaths on the continent):

→ 61% of the COVID-19 patients in hospitals had hypertension and

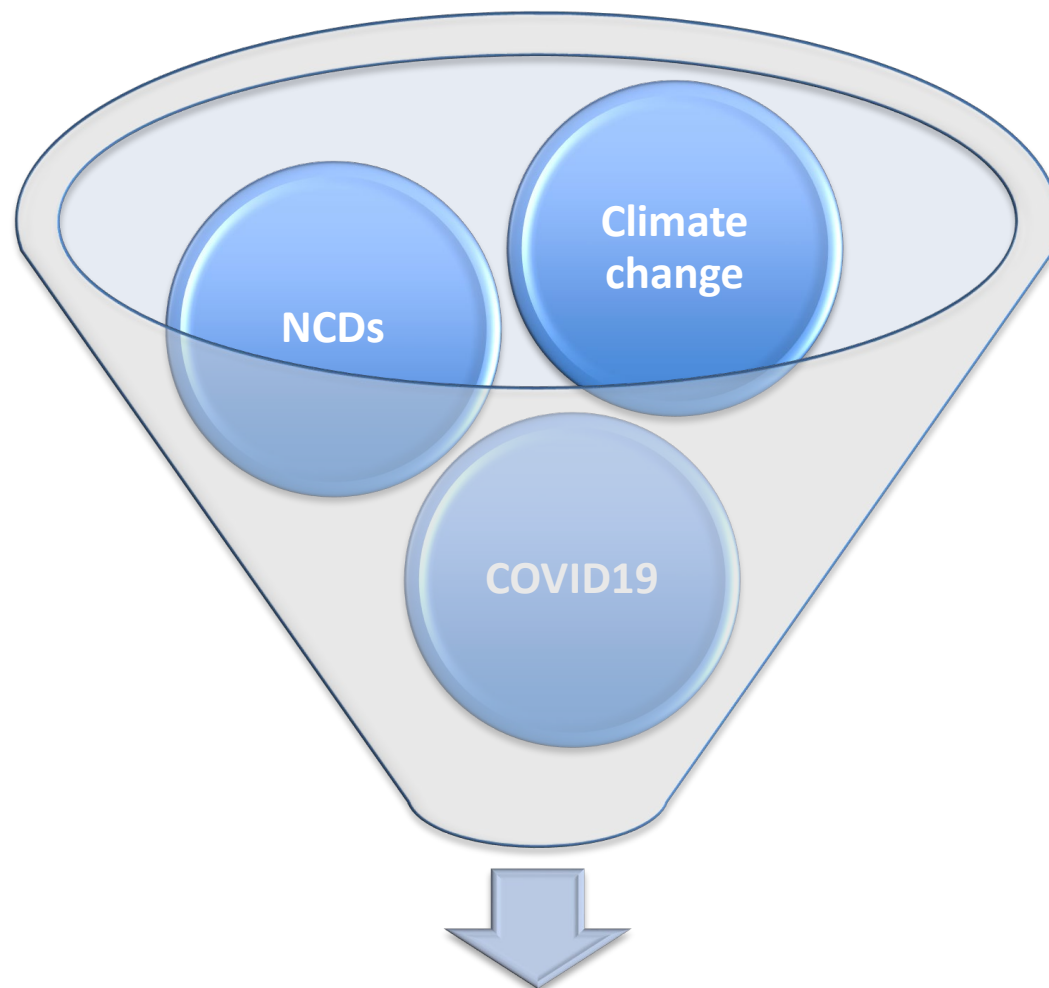
→ 52% had diabetes

→ 45% of people aged 60–69 who died from COVID-19 also had hypertension.

Kenya, around half of COVID-19 deaths occurred in people with NCDs

Democratic Republic of the Congo, 85% of COVID-19 deaths in people with NCDs

Climate change, NCDs, COVID-19: worsening global health disparities



NCDs=Non-Communicable
Diseases (or chronic diseases)

**Worsening global
health disparities**

Climate change, COVID-19, and global health: Floods in Sudan



Residents of
Wad Ramli
returned by
boat to try
to salvage
their
possessions

2019 floods affected 360,000 people in Sudan alone

www.developmentaid.org



Climate change, COVID-19, and global health: Hurricanes



Accuweather.com

Hurricane Laura devastates the Caribbean and US



Volunteers from Dominican Republic Red Cross carry out evacuations after floods from Tropical Storm Laura, August 2020. Photo: Dominican Republic Red Cross



Members of the civil defence rescue a resident amid floods caused by tropical storm Laura in Azua, Dominican Republic, on Aug. 23, 2020. (Ricardo Rojas/Reuters)



Buildings and homes are flooded in the aftermath of Hurricane Laura Thursday, Aug. 27, 2020, near Lake Charles, La. (AP Photo/David J. Phillip) (David J. Phillip/AP)



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Climate change, COVID-19, and global health: I could go on...



Wildfires wreaked havoc in states including California, Noah Berger/Associated Press



National Disaster Response Force conducting evacuations in Bihar, India. (Source: NDRF Director Satya Pradhan/@satyaprad1)



Typhoon Vongfong, Eastern Phillipines [Alren Beronio/AFP]

At least 90 dead, 32 missing and 5 million affected as more floods and landslides hit central Vietnam

Posted by Julie Celestial on October 19, 2020 at 10:48 UTC (8 days ago)

Categories: Editors' picks, Featured articles, Floods, Landslide, Severe weather



Africa

Southern Africa's Hunger Upsurge Blamed on Climate, COVID-19

By Associated Press
September 07, 2020 04:46 PM



1619-2019



US Marks 400th Anniversary of Arrival of First Africans

CHILD MARRIAGE



The Worth of a Girl

SOUTH SUDAN



South Sudan in Focus

MUSIC TIME IN AFRICA ARCHIVE

Climate change, chronic disease, COVID-19, and global health: Where do we go from here?

“Climate change is the single greatest threat to sustainable development. Yet, too often, one important fact gets lost amid the fear: addressing climate change is one of our greatest opportunities.”

-2013 Ban Ki-moon

“Given the potential of climate change to reverse the health gains from economic development, and the health co-benefits that accrue from actions for a sustainable economy, tackling climate change could be the greatest global health opportunity of this century... A public health perspective has the potential to unite all actors behind a common cause - the health and wellbeing of our families, communities, and countries.”

-2015 Lancet Commission on Health and Climate Change



Climate change, chronic disease, COVID-19, and global health: Where do we go from here?

Key Recommendations from the NCD Alliance:

1. Co-benefit solutions
2. Public health considerations should be explicitly built into climate mitigation plans and vice versa
3. Development aid and technical assistance to LMICs for climate mitigation/adaptation and NCD prevention and control
4. Implementation and cost-effectiveness research



CLIMATE CHANGE AND HEALTH IN SMALL ISLAND DEVELOPING STATES

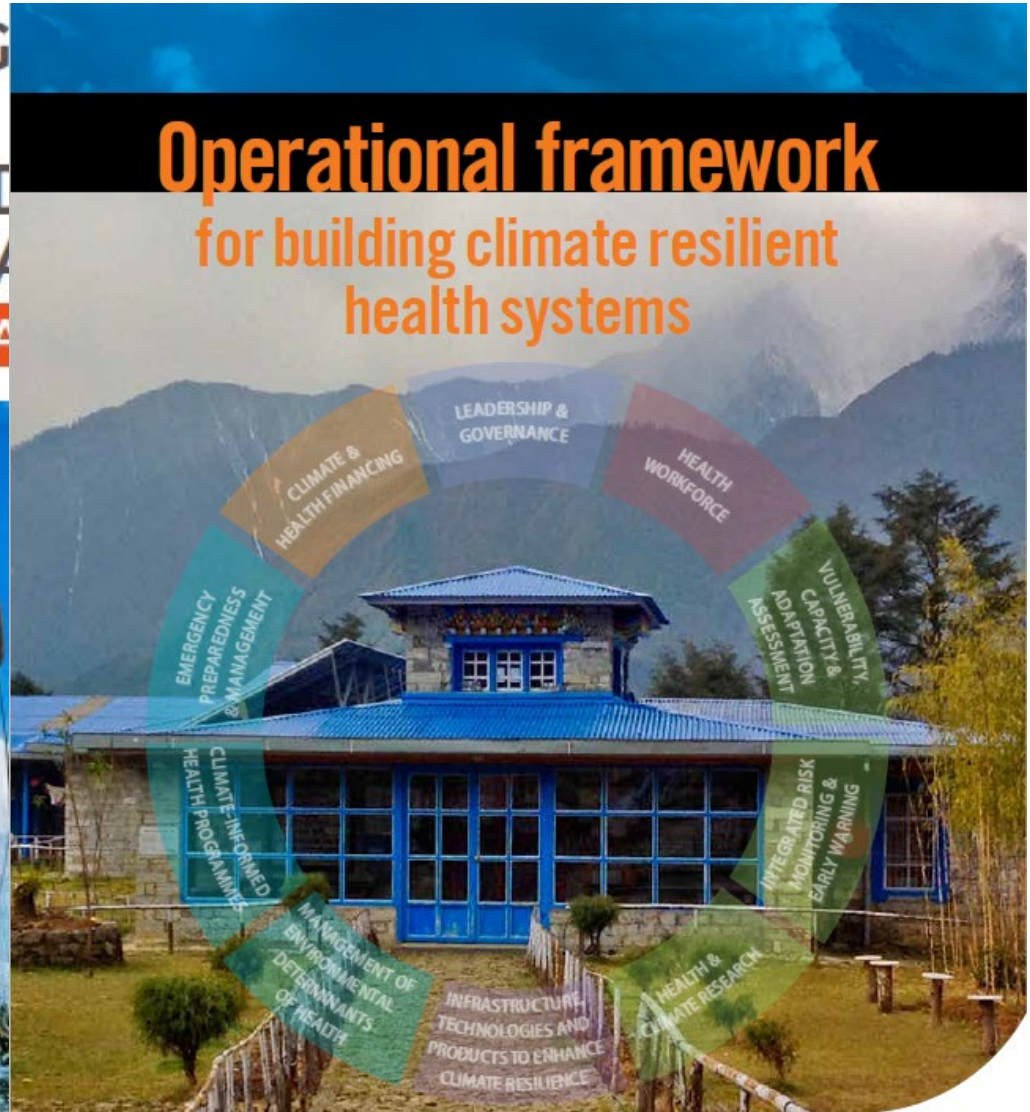
A WHO SPECIAL INITIATIVE

SAM

SM



Operational framework for building climate resilient health systems



Climate change, chronic disease, COVID-19, and global health:
Where do we go from here?

NIH/NHLBI Grant:

Reducing Morbidity and Mortality from NCDs after Natural Disasters
FQHCs in USVI and Puerto Rico

Yale Institute for Global Health Grant:

*Regional approach to addressing chronic disease
during disasters in the Caribbean*

PAHO

Healthy Caribbean Coalition

Yale Center for Climate Change and Health

Eastern Caribbean Health Outcomes Research Network

Summary

- Climate change inequities reflect the fact that the largest emitters are least affected
- Climate change inequities result in global economic, social, and health inequities
- Chronic diseases exacerbates global health inequities that result from climate change
- COVID-19 further exacerbates global health inequities
- Opportunity to “build back better”: resilient health systems, public health considerations in all climate change mitigation efforts

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