

An aerial photograph of a vast, arid landscape. The terrain is a mix of brown and tan, with a winding river or irrigation canal cutting through it. In the distance, there are several mountain ranges under a clear sky. The foreground shows some sparse vegetation and a few small structures.

AAEC 4730:  
THE WORLD FOOD  
ECONOMY

*Food Security*

Ellen McCullough  
emccullough@UGA.edu

# Today

- 1. What is Food Insecurity?**
2. How do we measure food insecurity?
3. What are food security's other dimensions?

# How do we define food insecurity?

## **FOOD SHORTAGE (Availability)**

- Occurs when total food supplies within a designated area - globally, regionally, or within countries - are insufficient to meet the needs of the population living in that area.
- (physical concept)

## **FOOD POVERTY (Affordability)**

- Occurs when households or individuals do not have the income or resources to obtain the food they need.
- (economic concept)

## **FOOD DEPRIVATION (Utilization)**

- Occurs when individuals have inadequate consumption of food or, especially, of specific nutrients.
- (nutritional concept)

## **INSTABILITY**

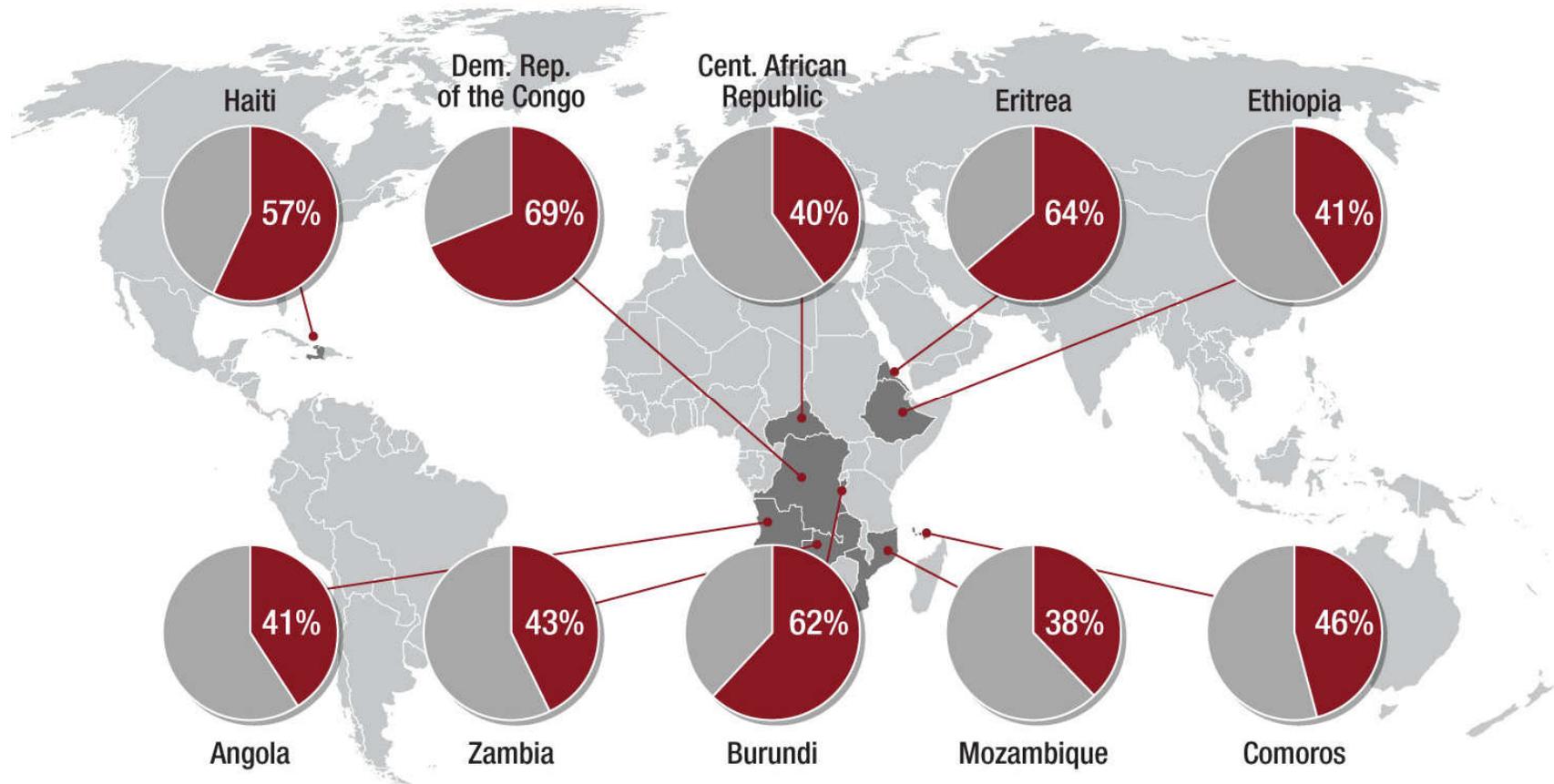
# Food insecurity

How many people suffer?

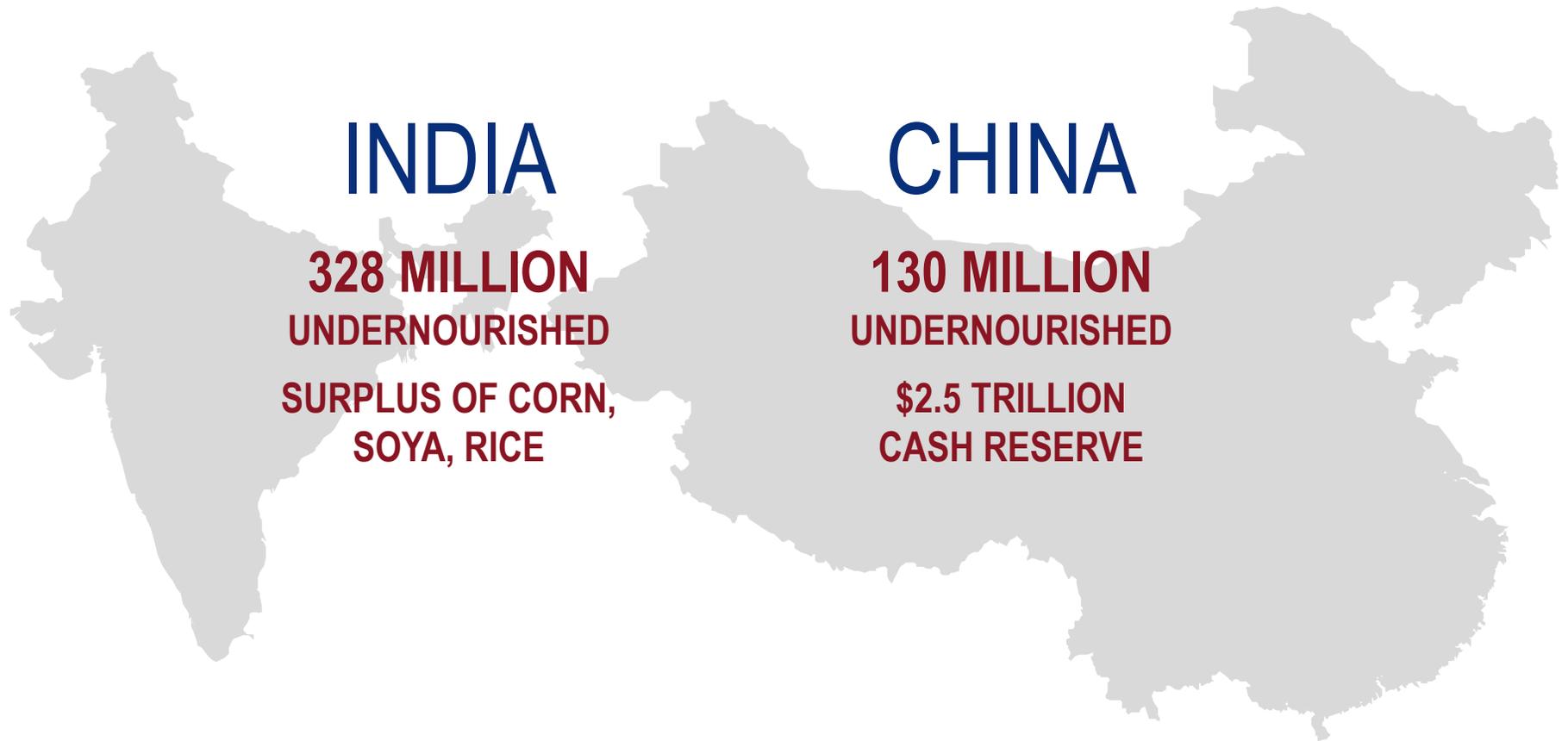


# Where are the world's hungry?

Percent of population undernourished

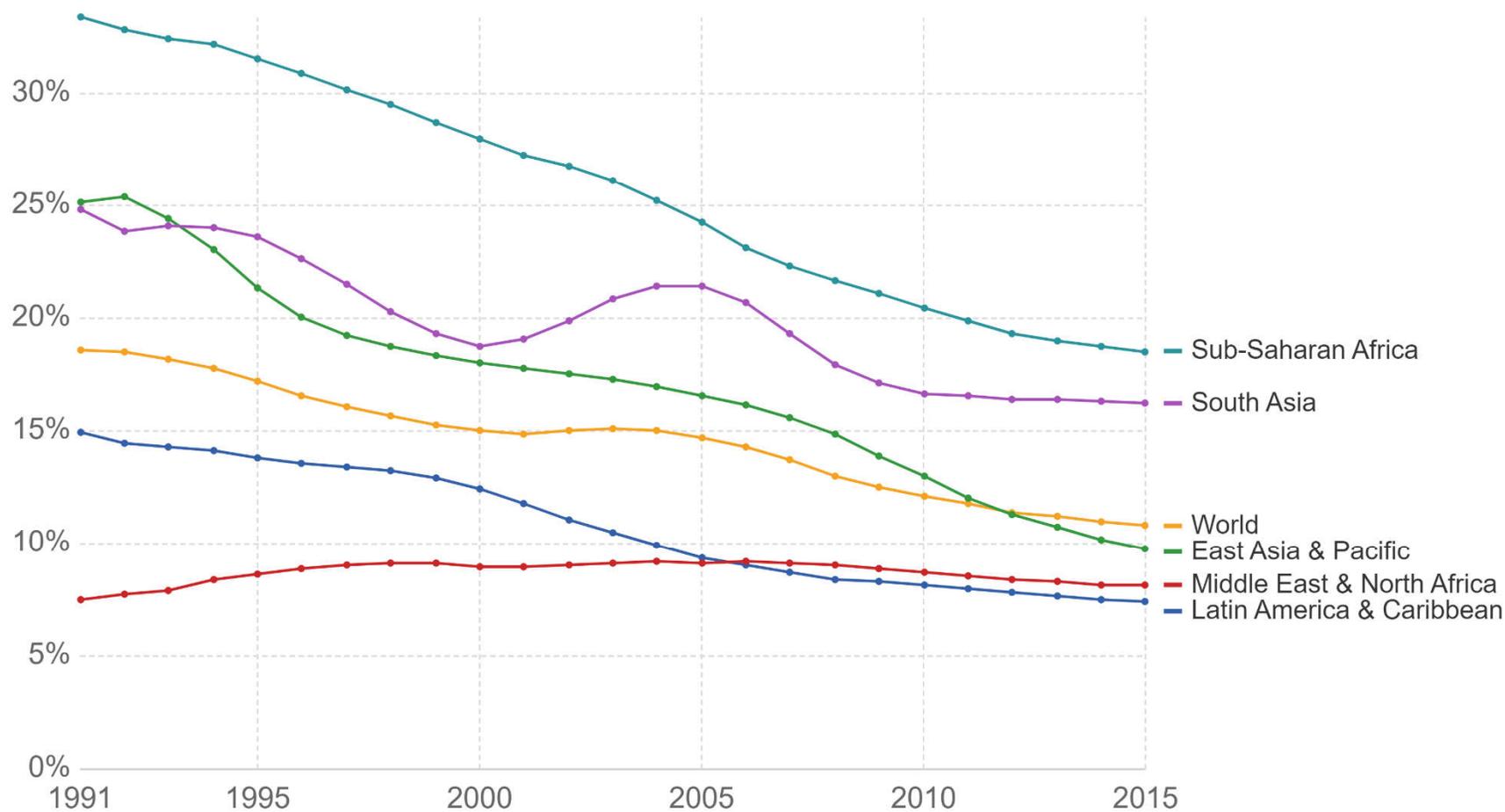


# Where are the world's hungry?



# Share of the population that is undernourished

This is the main FAO hunger indicator. It measures the share of the population that has a caloric intake which is insufficient to meet the minimum energy requirements necessary for a given individual. Data showing as 5 may signify a prevalence of undernourishment below 5%.



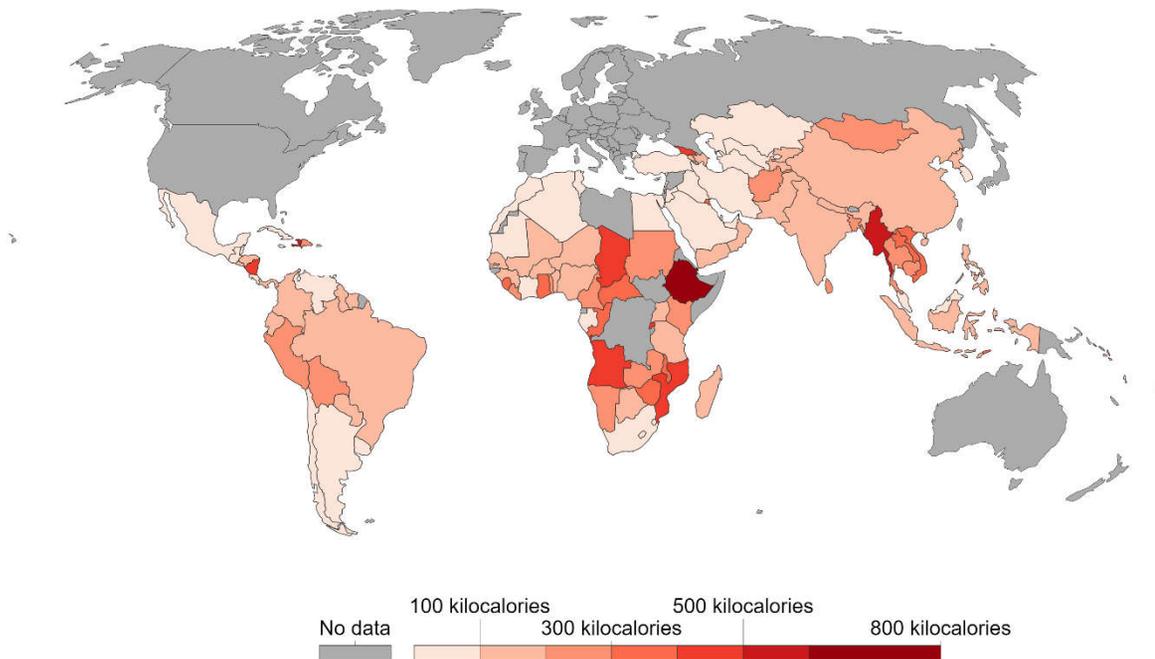
Source: UN Food and Agriculture Organization (FAO)

OurWorldInData.org/hunger-and-undernourishment/ • CC BY-SA

Note: Developed countries are not included in the regional estimates since the prevalence is below 5%.

## Depth of the food deficit (kilocalories per person per day), 1992

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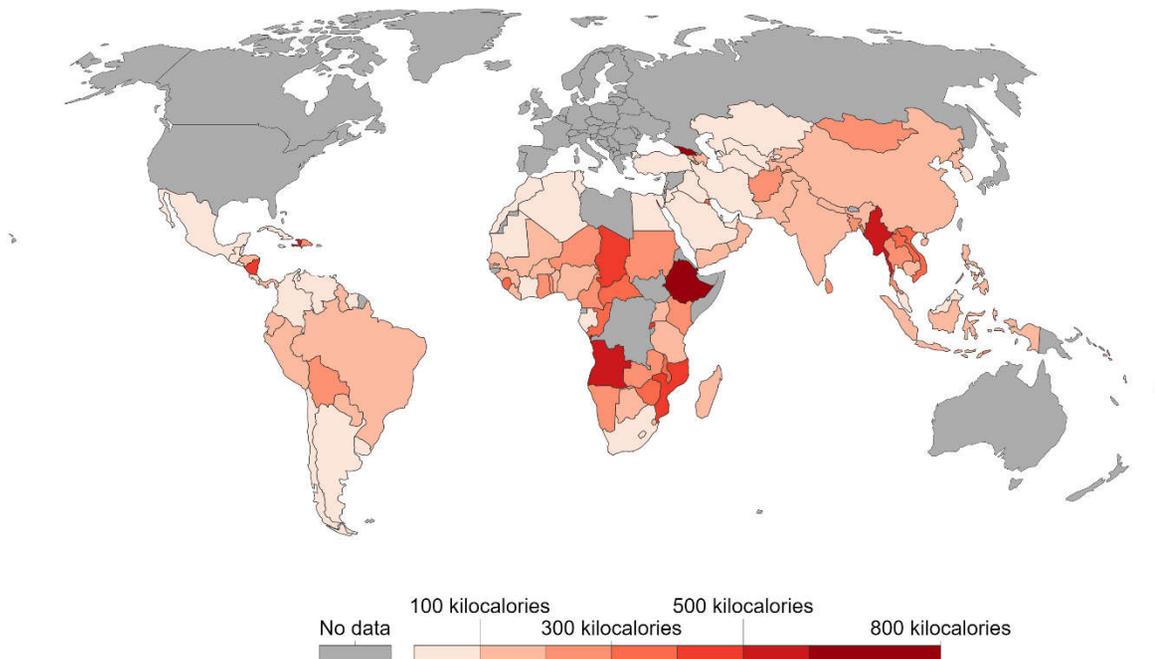


Source: World Bank – WDI

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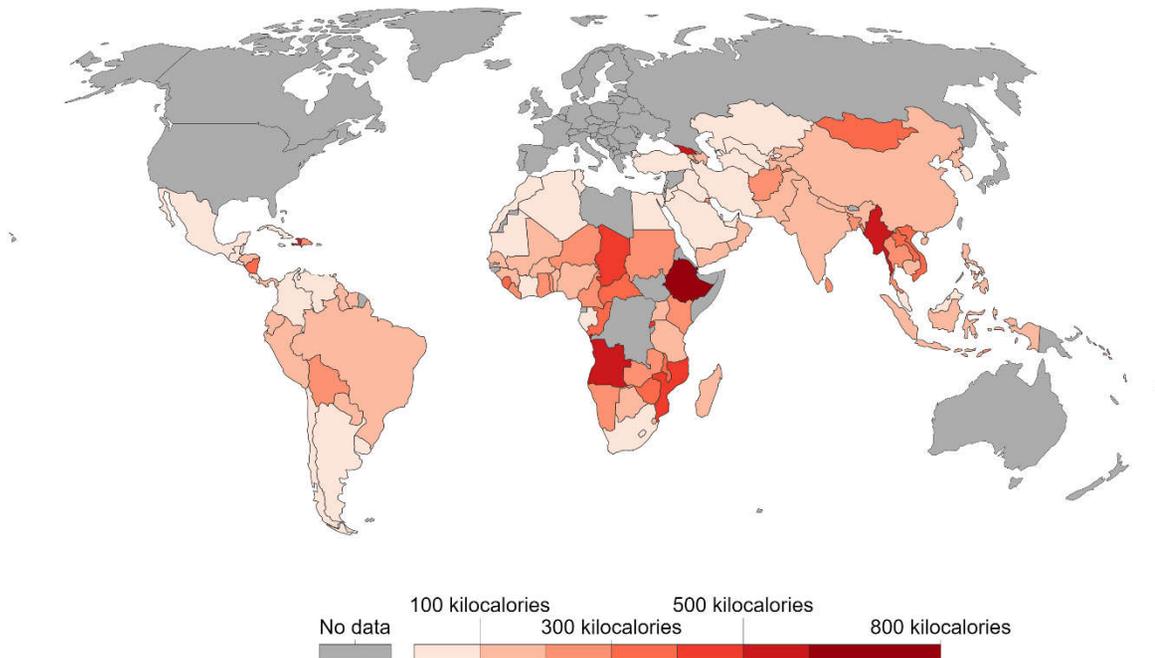


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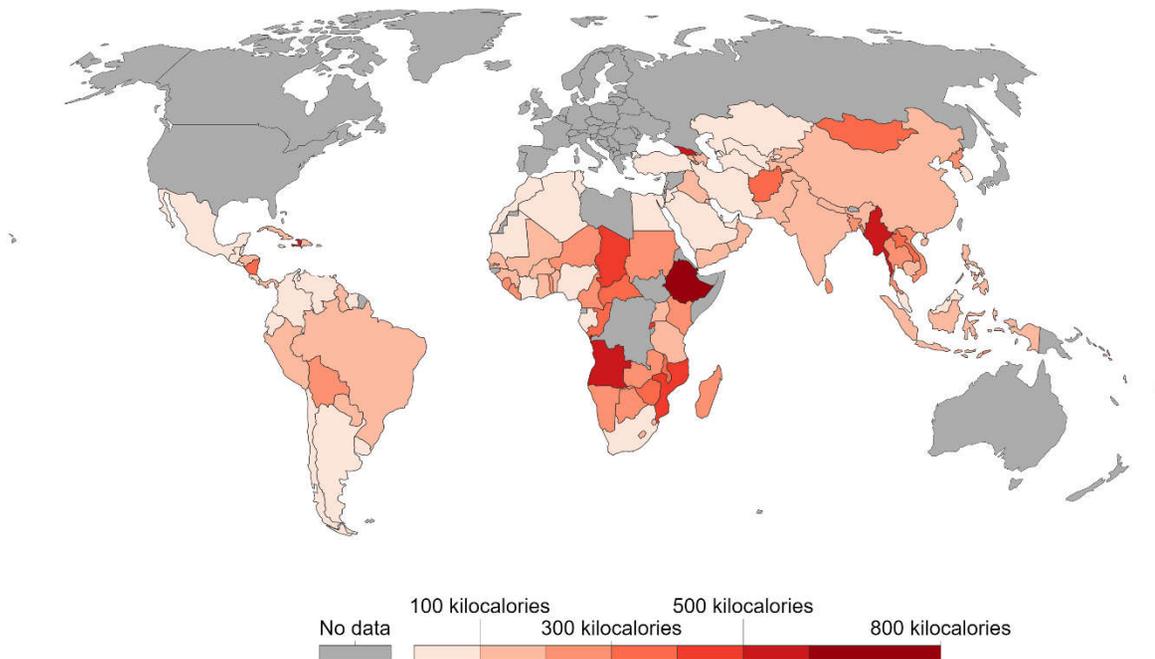


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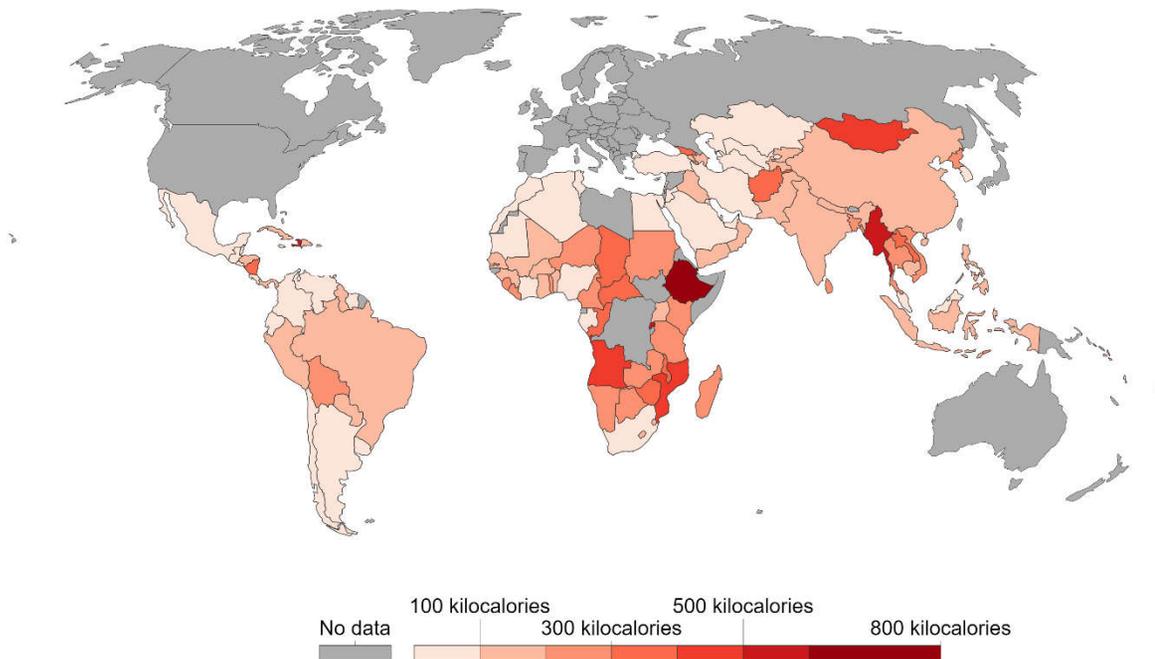


Source: World Bank – WDI

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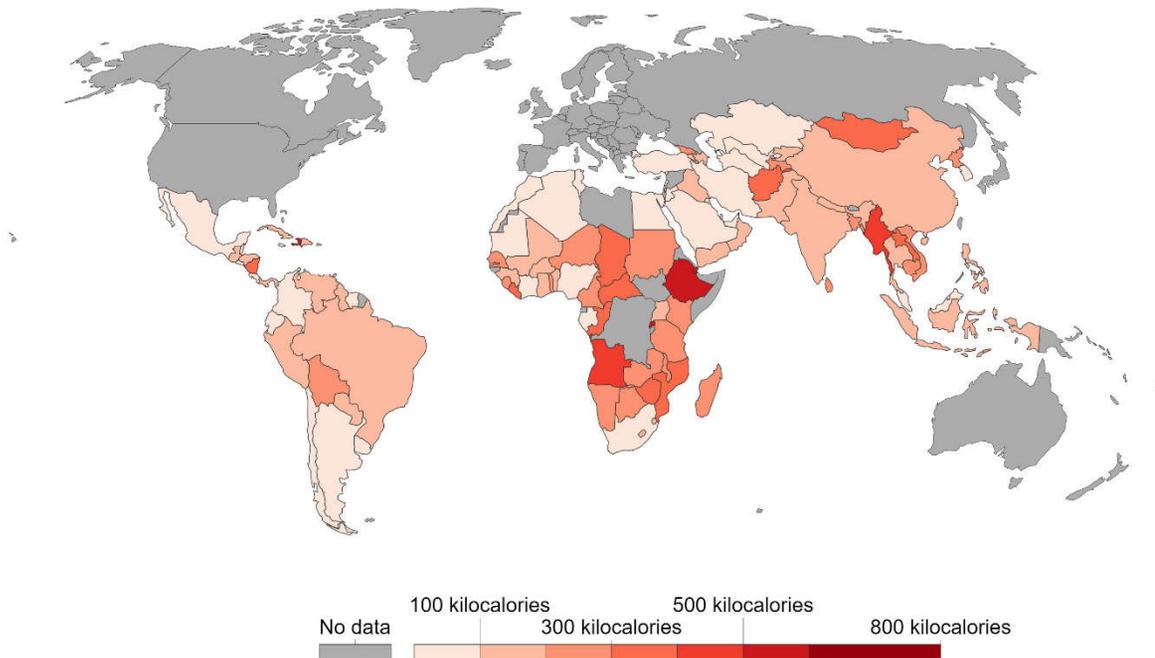


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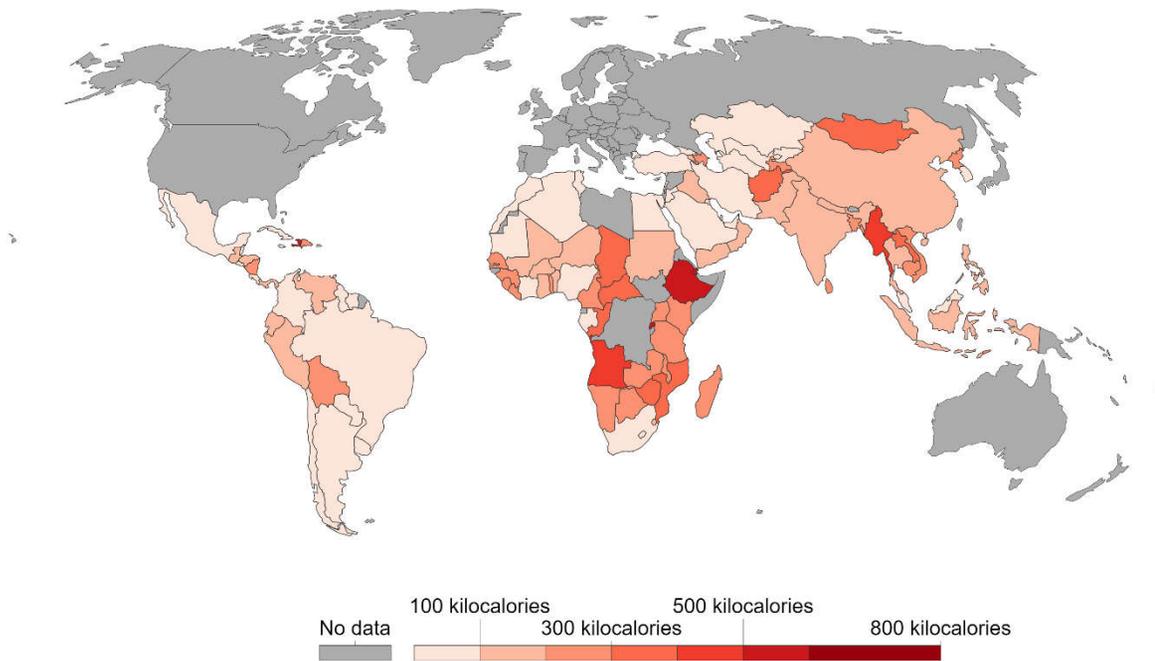


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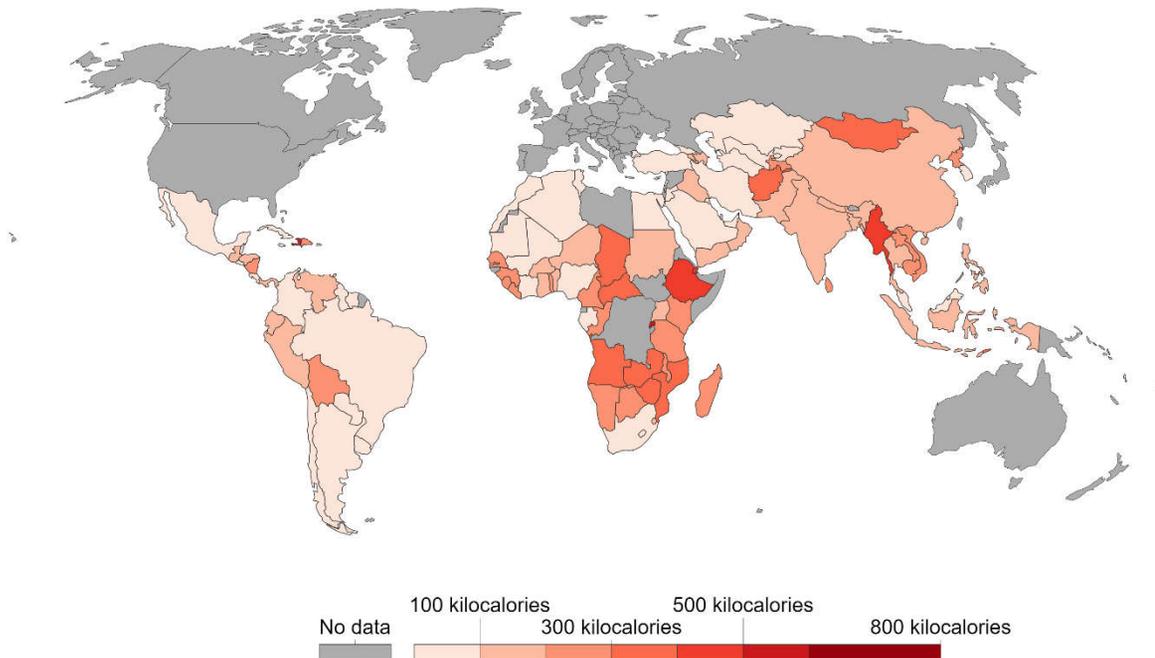


Source: World Bank – WDI

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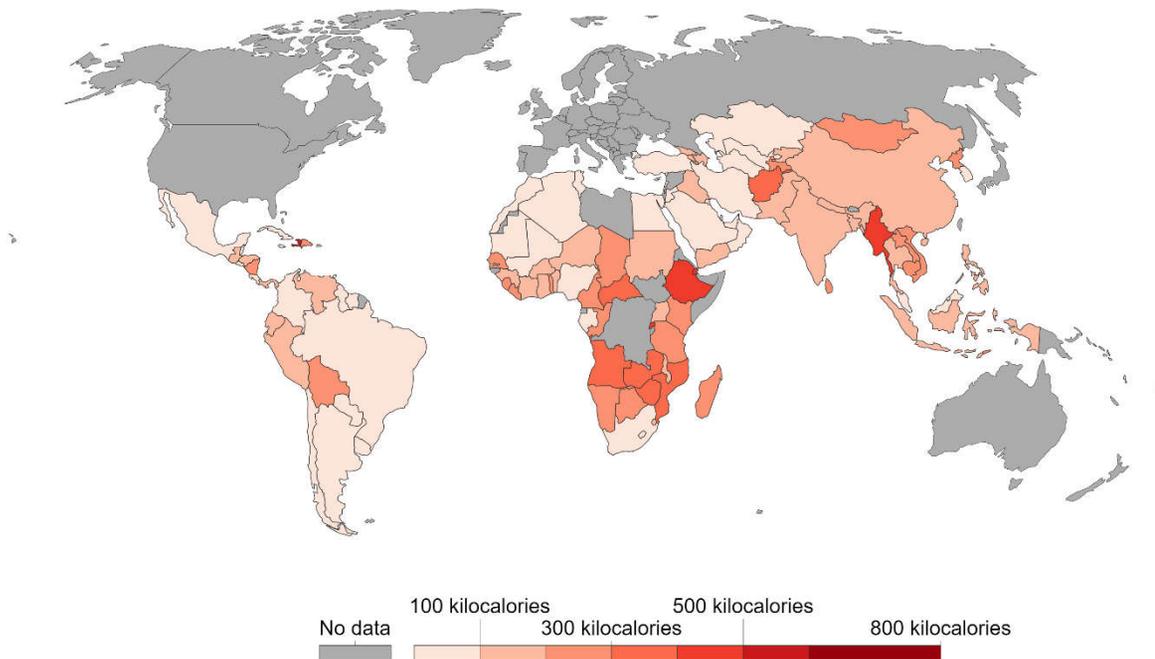


Source: World Bank – WDI

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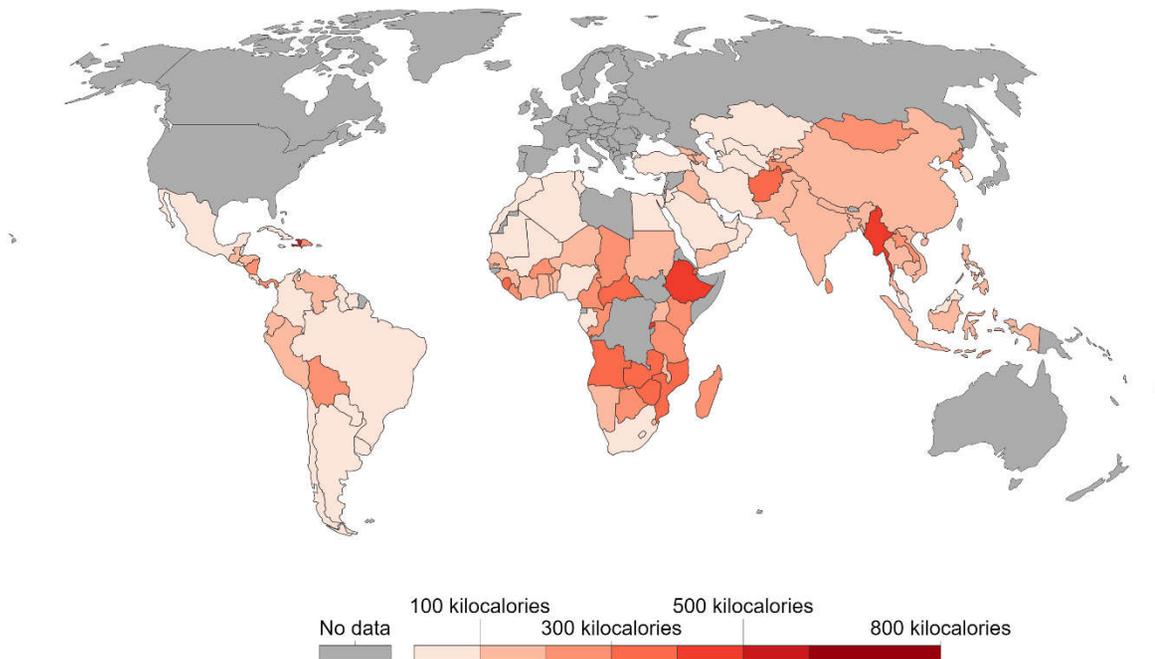


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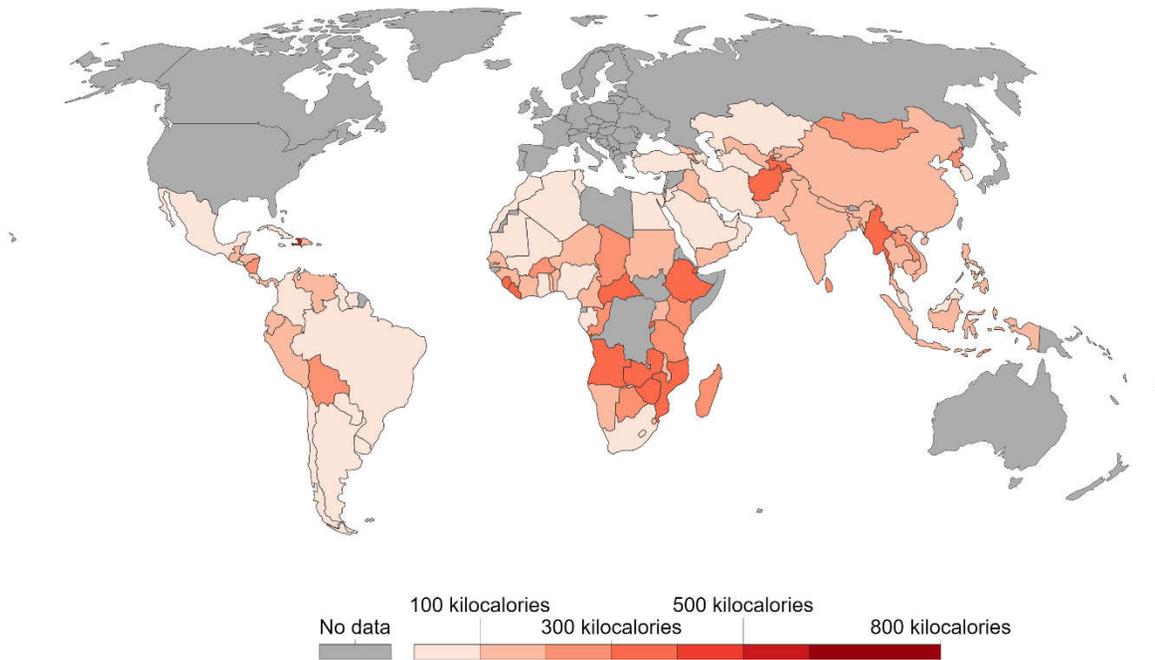


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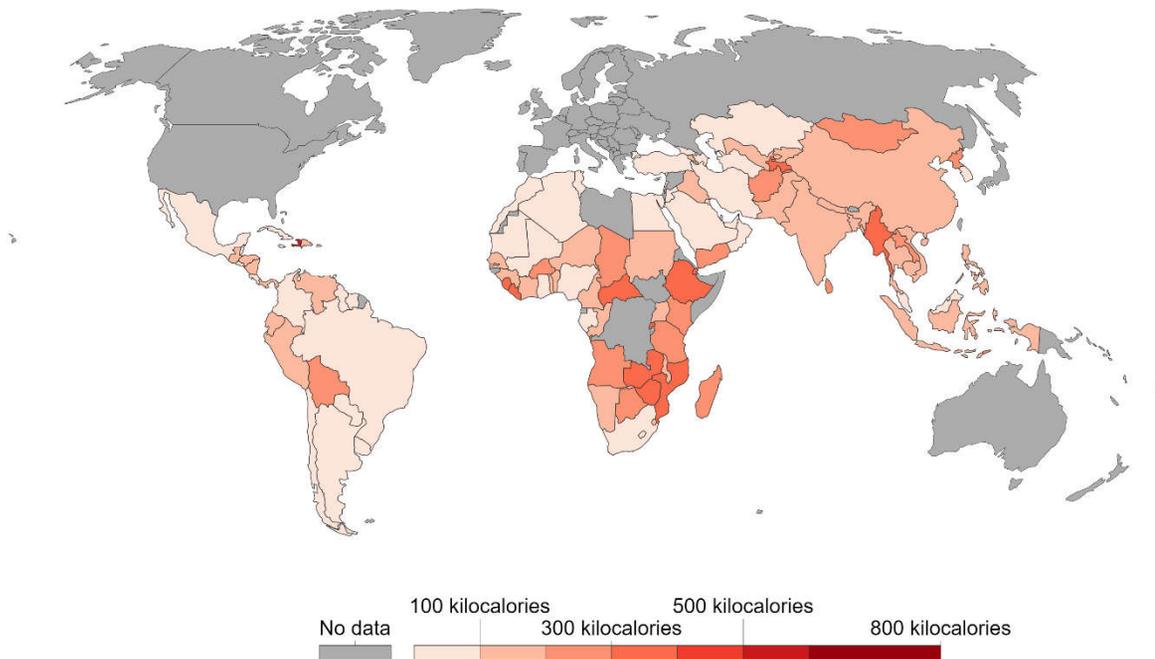


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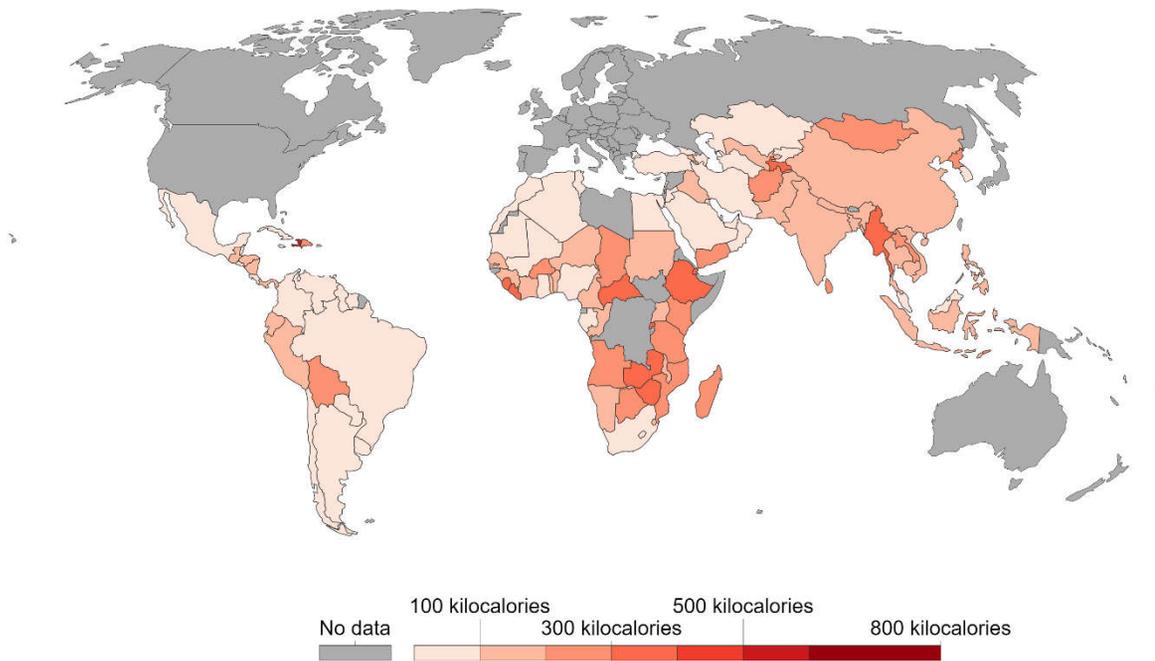


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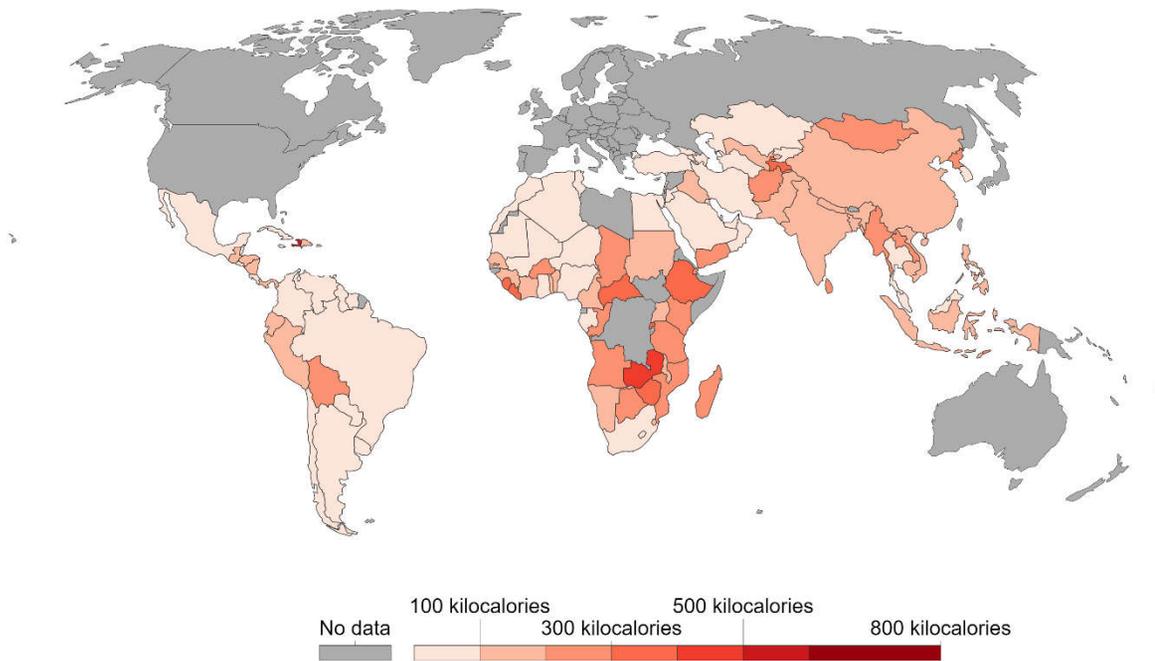


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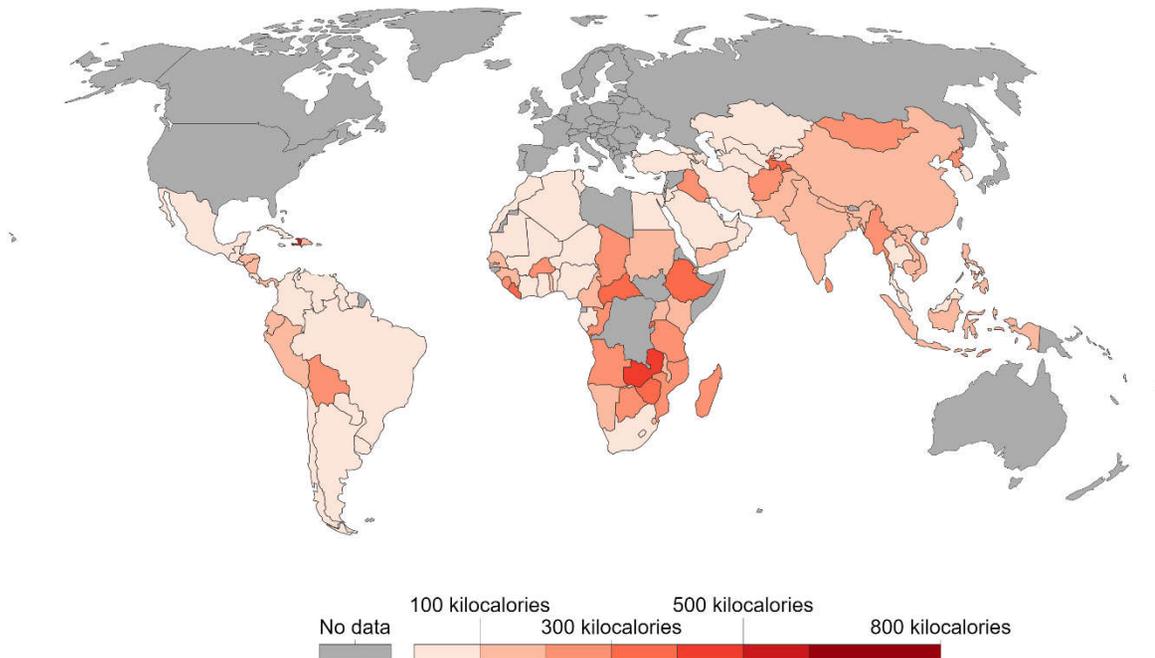


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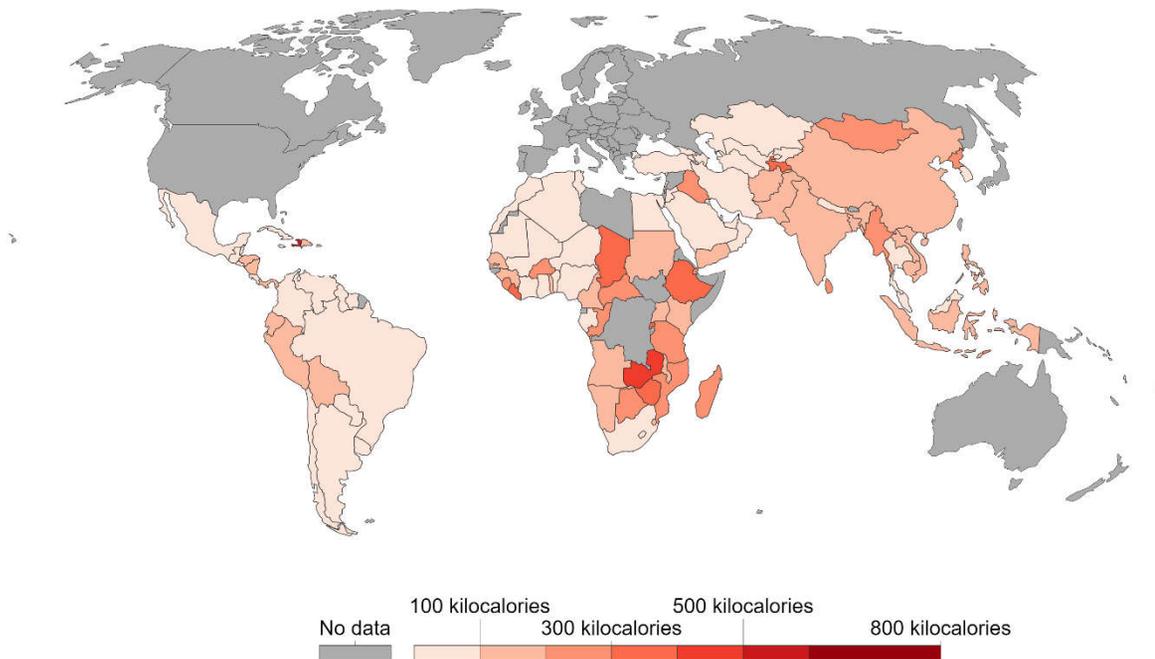


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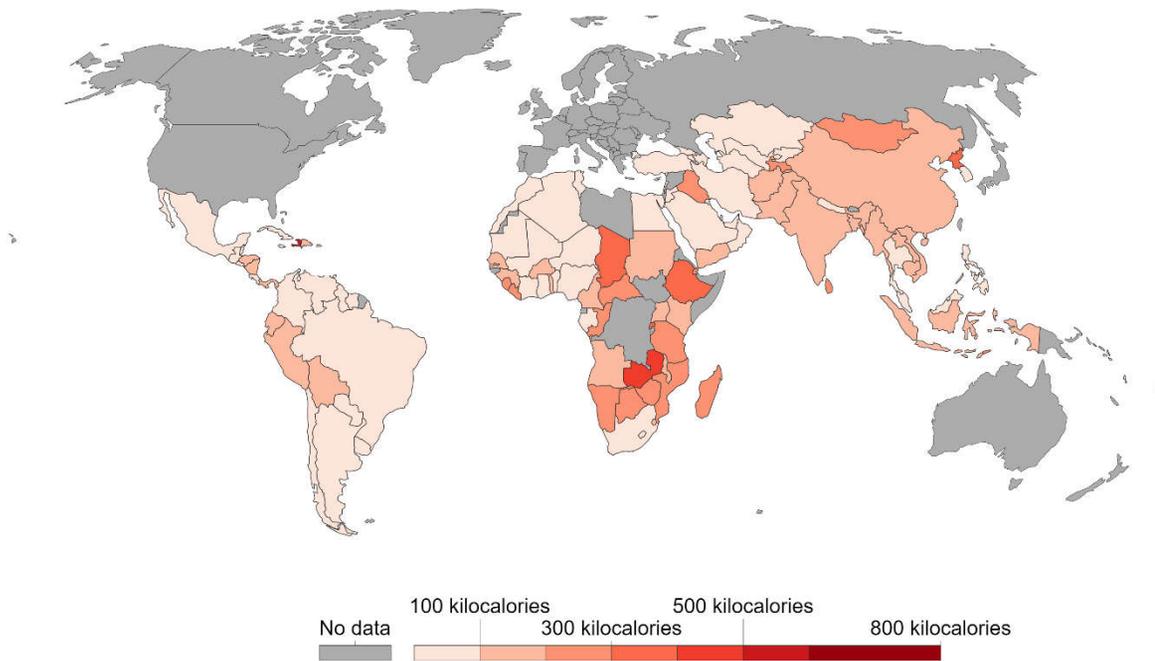


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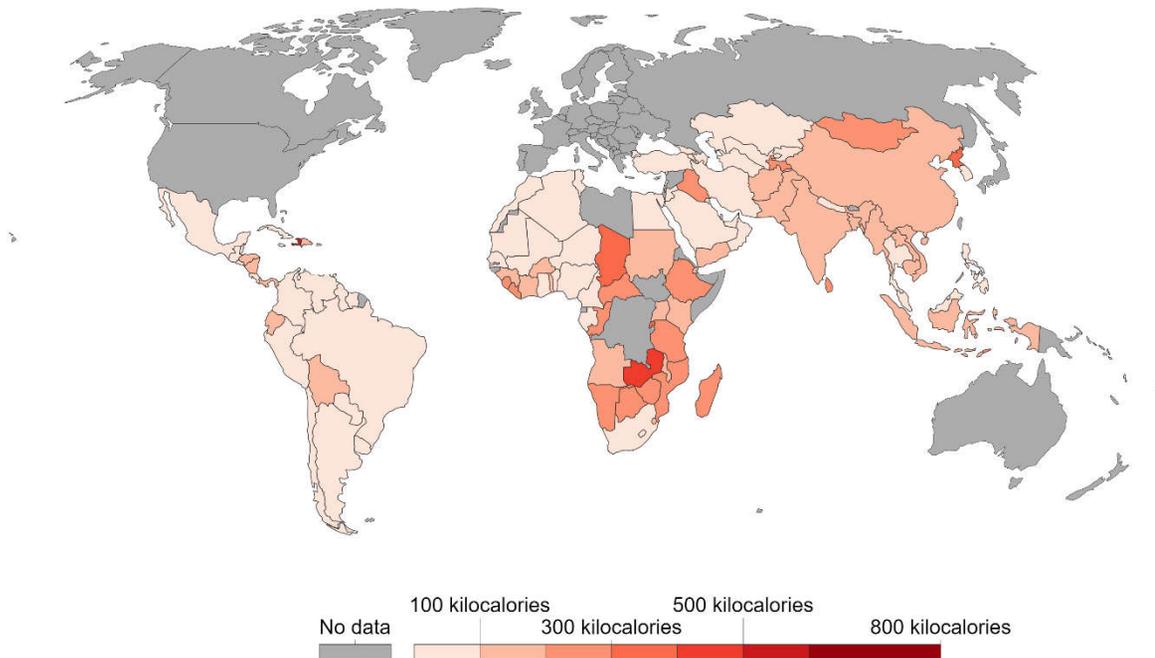


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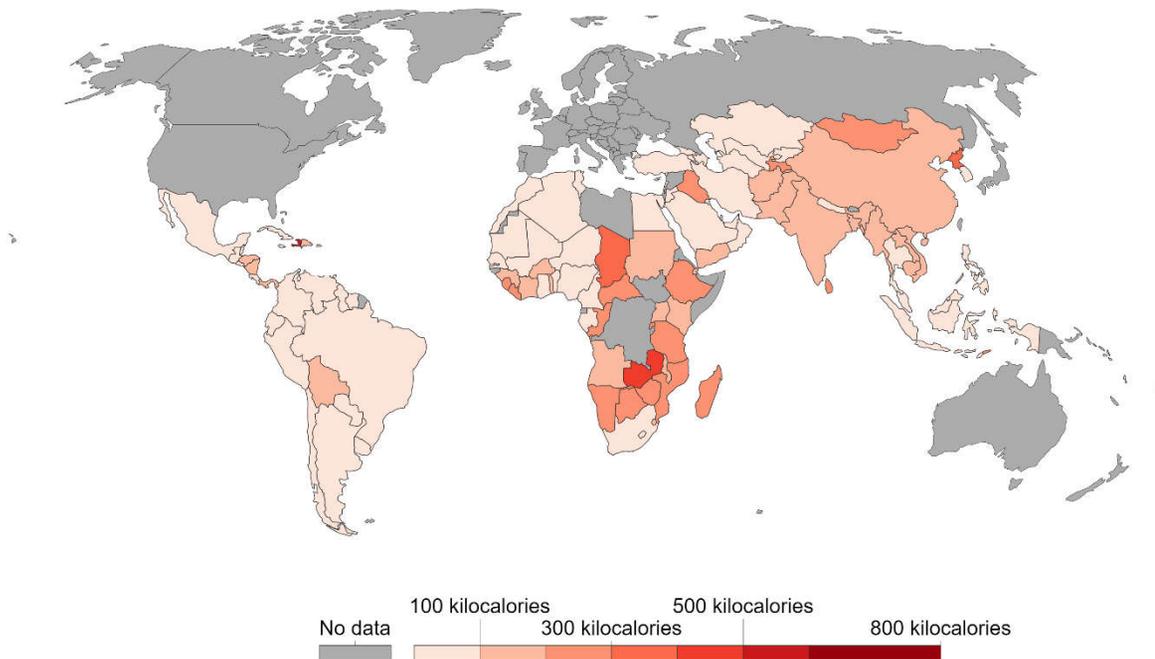


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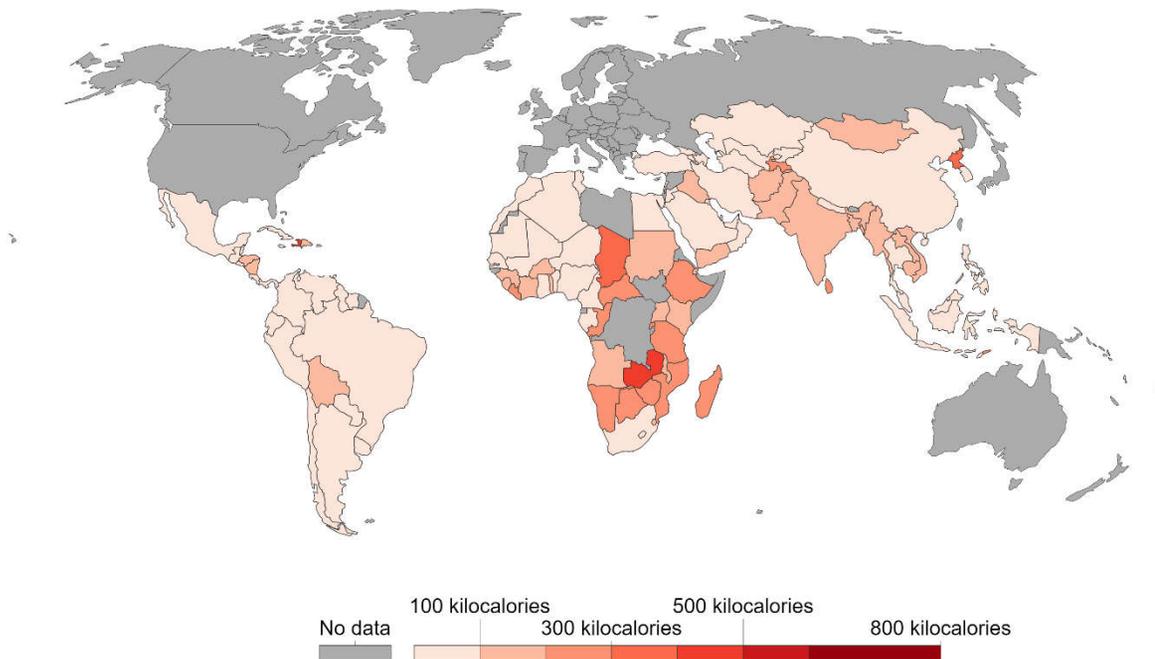


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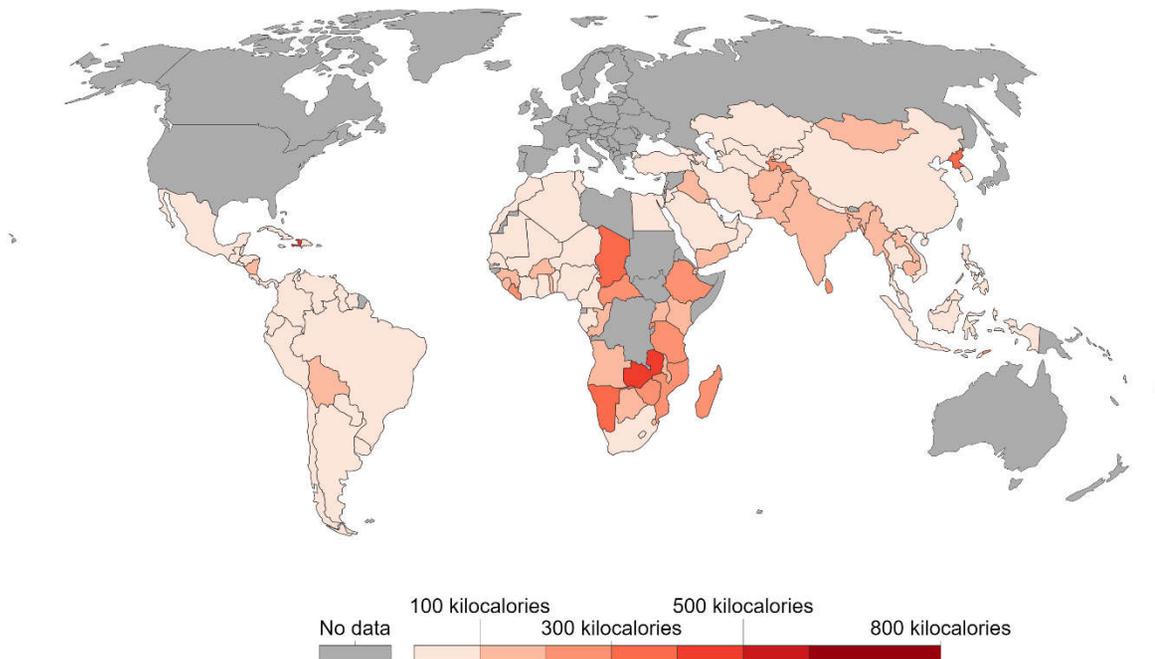


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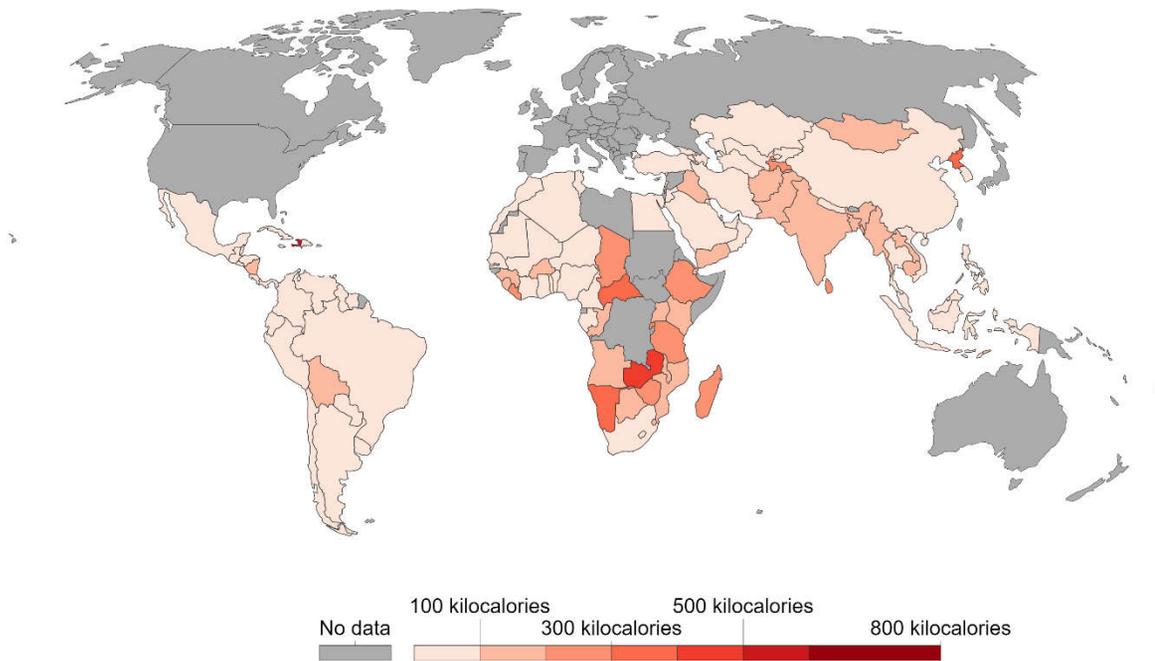


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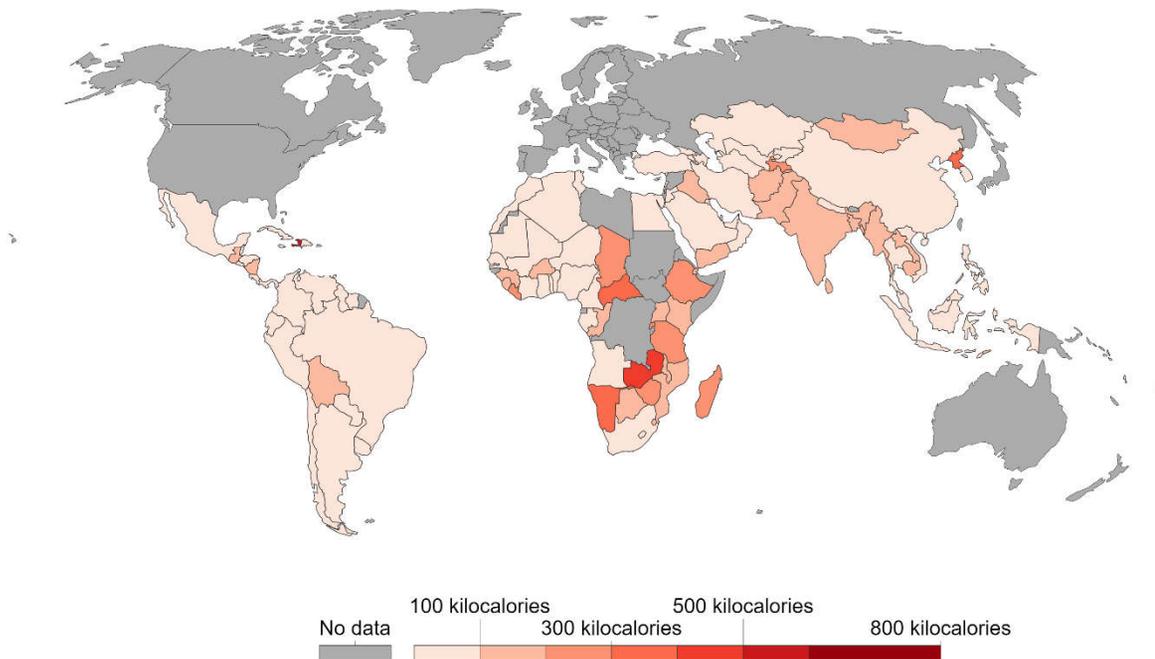


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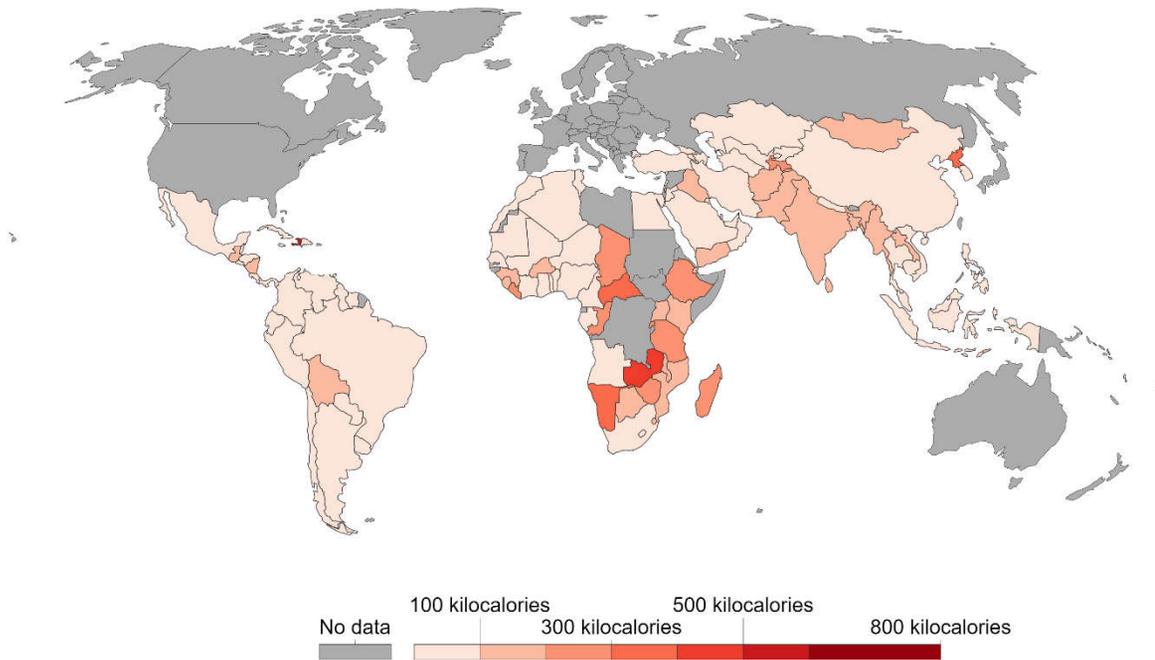


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Source: World Bank – WDI

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$$\sim 1 \text{ billion} \times \sim 400 \text{ kcals} = 60 \text{ Million Tons}$$

Malnourished people      Average daily calorie deficit      Whole grain

1/3 the amount  
of grain we  
convert to fuel

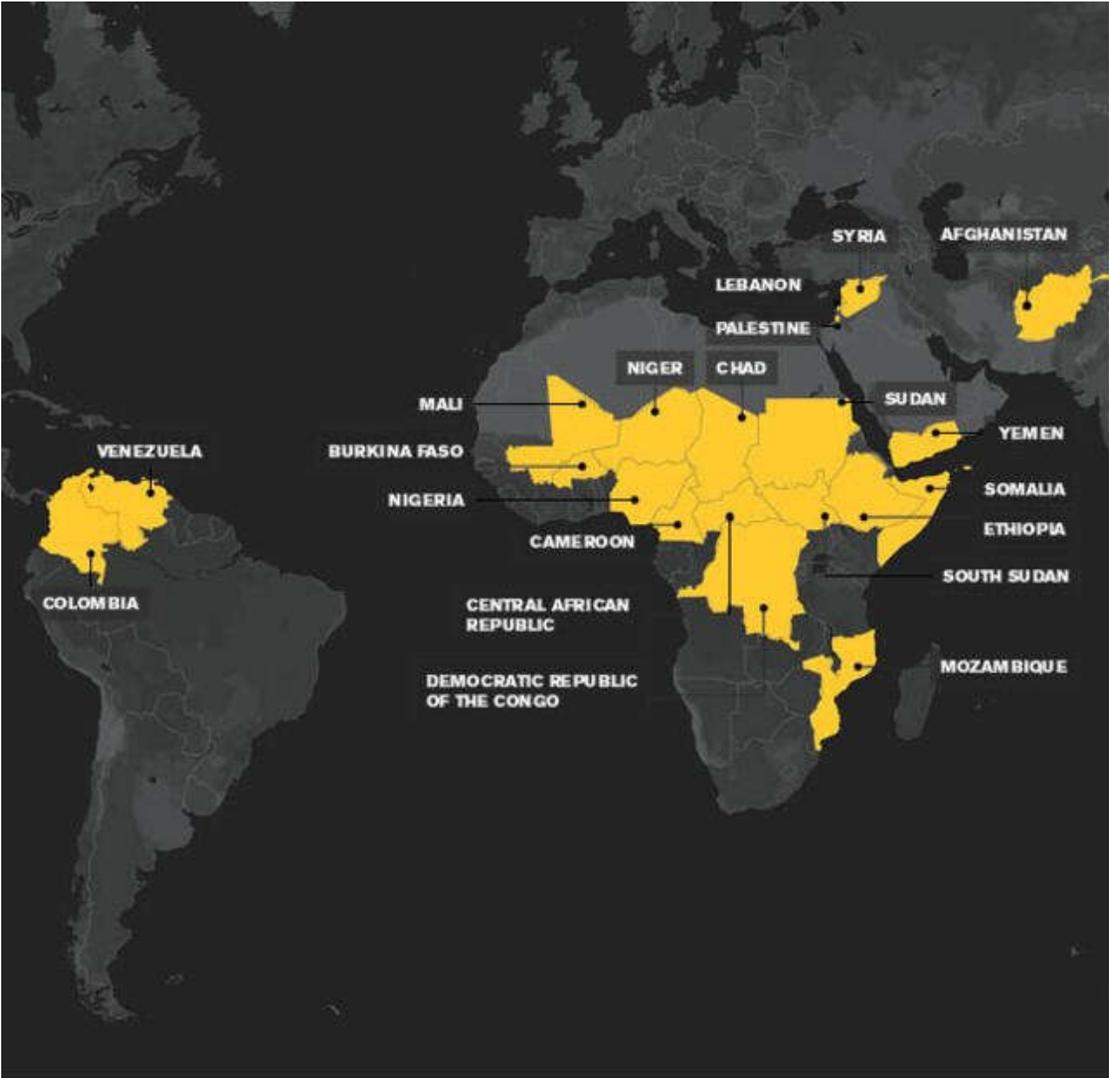
# Famine vs. Chronic Hunger



- Famine: 10-15 million people/year

**Famine**, as defined by the UN: occurs when malnutrition rates exceed 30 percent, more than two people per 10,000 people are dying each day, and there is a severe lack of food access for large population.

- Chronic hunger: 800 million to 1 billion per year



# WATCHLIST 2021

## About the IRC's global crisis response

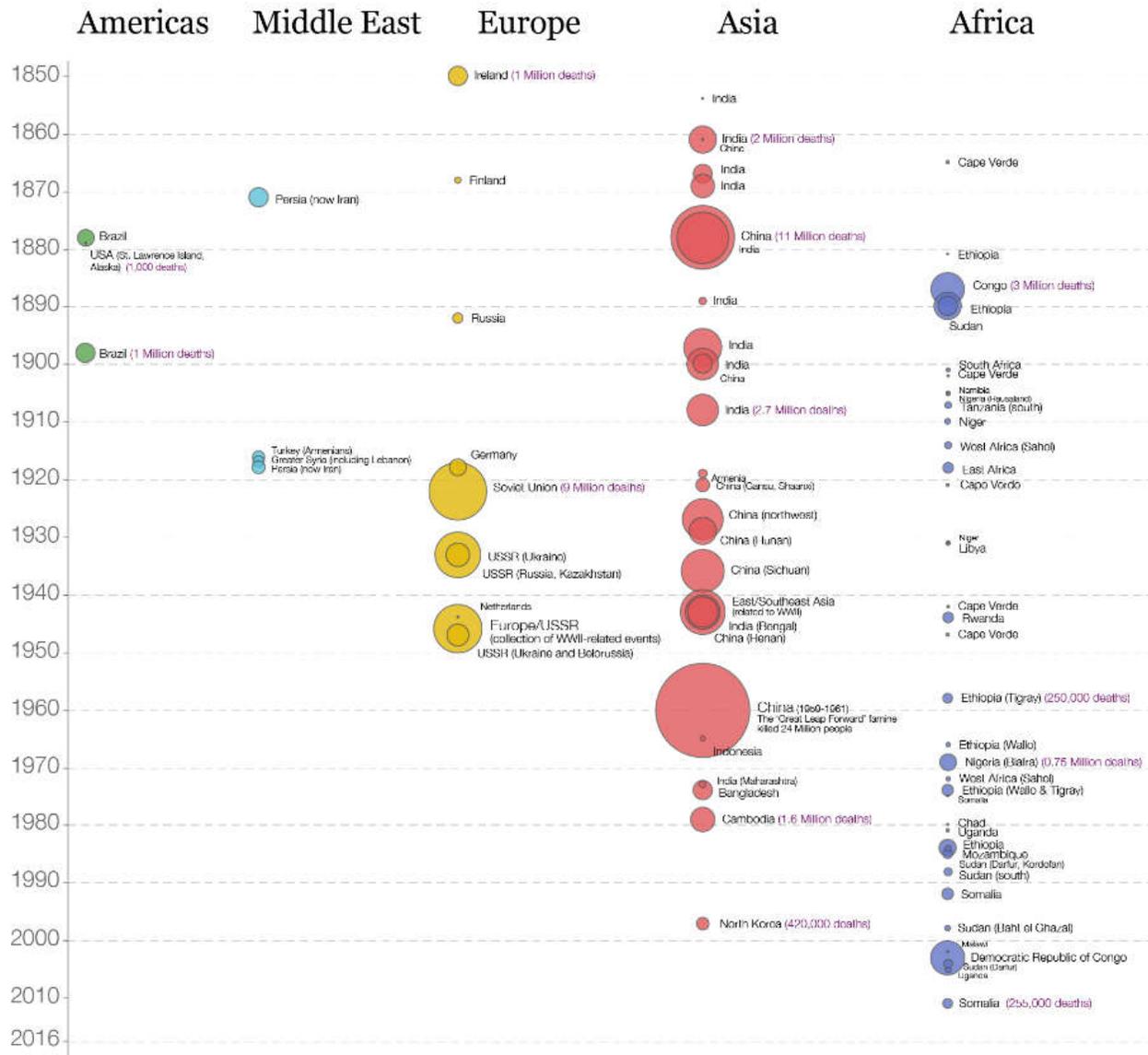
In 2021, the IRC will have been working for an average of around 15 years in the 18 Emergency Watchlist countries where we have a presence.



<https://youtu.be/Kph7G6hNLuU>

# Famines by world region, 1860-2016

The size of the bubble represents the death count of the famine (excess mortality).  
For famines for which different excess mortality estimates are published the midpoint between these estimates was chosen here.  
Detailed information on this dataset is available at [OurWorldInData.org/famines](https://ourworldindata.org/famines).



# Today

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- 2. How do we measure food insecurity?**
3. What are food security's other dimensions?

# Food Security

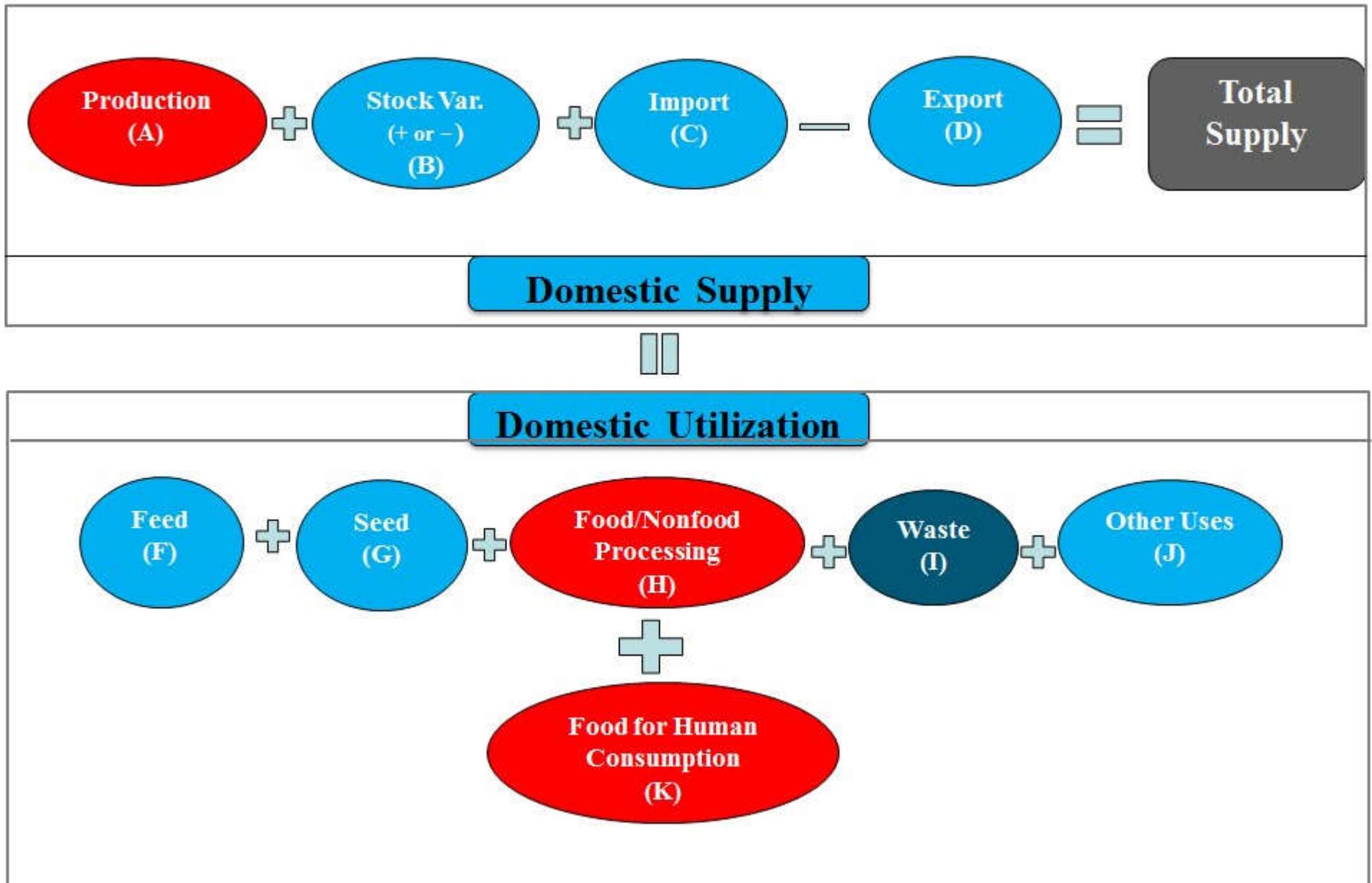
## 1. Availability

How many calories are available per person?

- National / local production
- National stocks
- Import capabilities
- Food aid

Measure with food balance sheets

# FAO Food Balance Sheet



# Food Security

## 2. Access

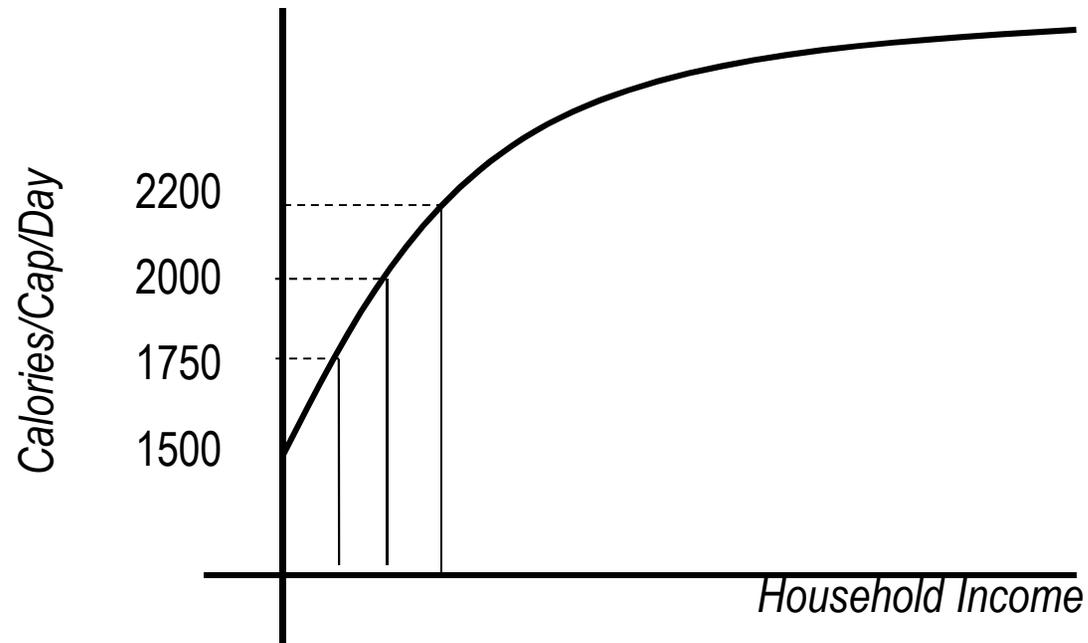
How many can access enough food to live a healthy and productive life?

- Purchasing power
- Prices
- Infrastructure
- Political stability

# Measuring food insecurity

- How many people have access to sufficient calories?
  - Direct household diet surveys
    - Time, accuracy, recall
  - Indirect measures: Income needed to purchase minimum amount of calories → This is a poverty measure combined with prices!
    - US Thrifty Food Budget
    - Household income and expenditure surveys

# How many are hungry?



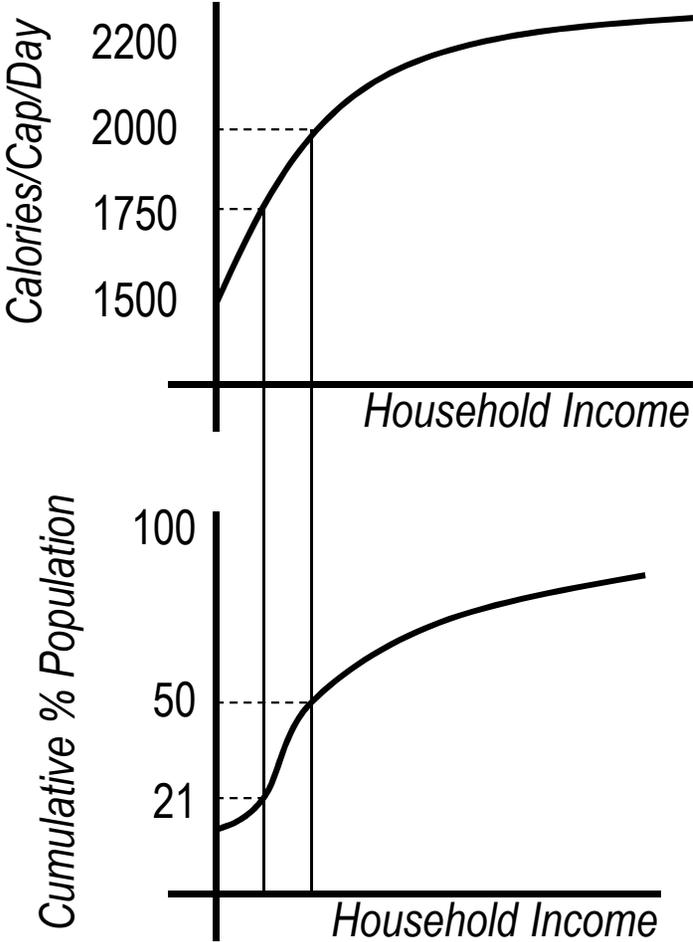
FAO/WHO Calorie  
Requirements: 2200

90% = ~2000

80% = ~1750

Assumes certain share of  
income spent on food

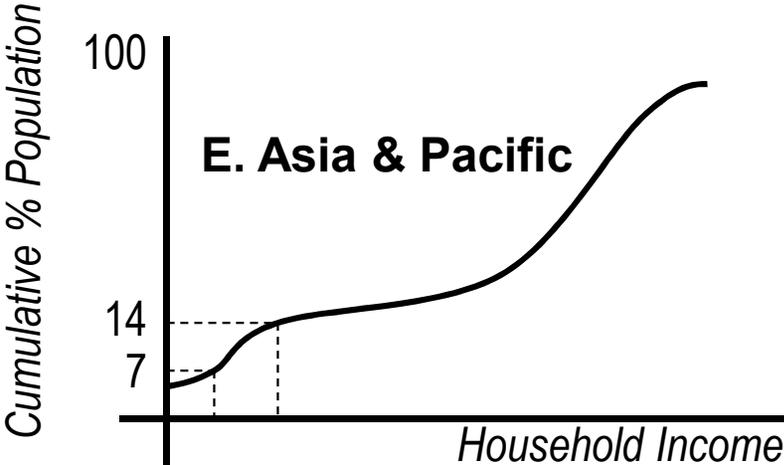
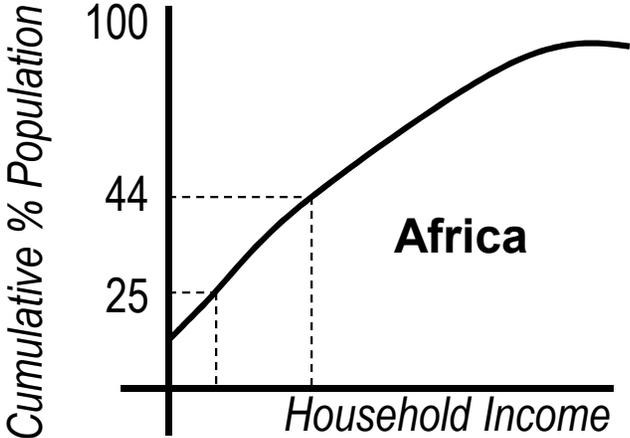
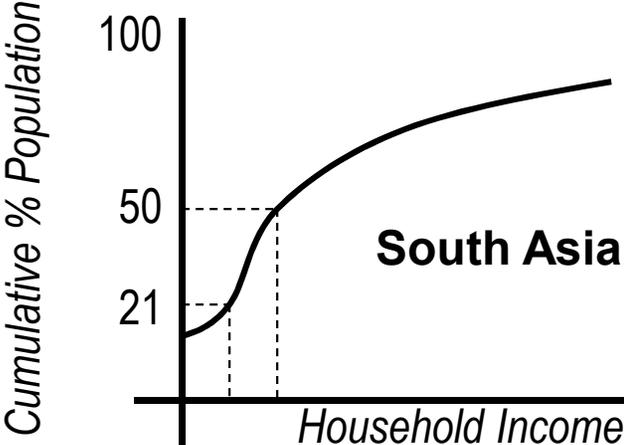
# How many are hungry?



Also depends on income distribution

(and the assumption about income share spent on food)

# How many are hungry?



# Food Security Measurement

FAO Food Insecurity Experience Scale

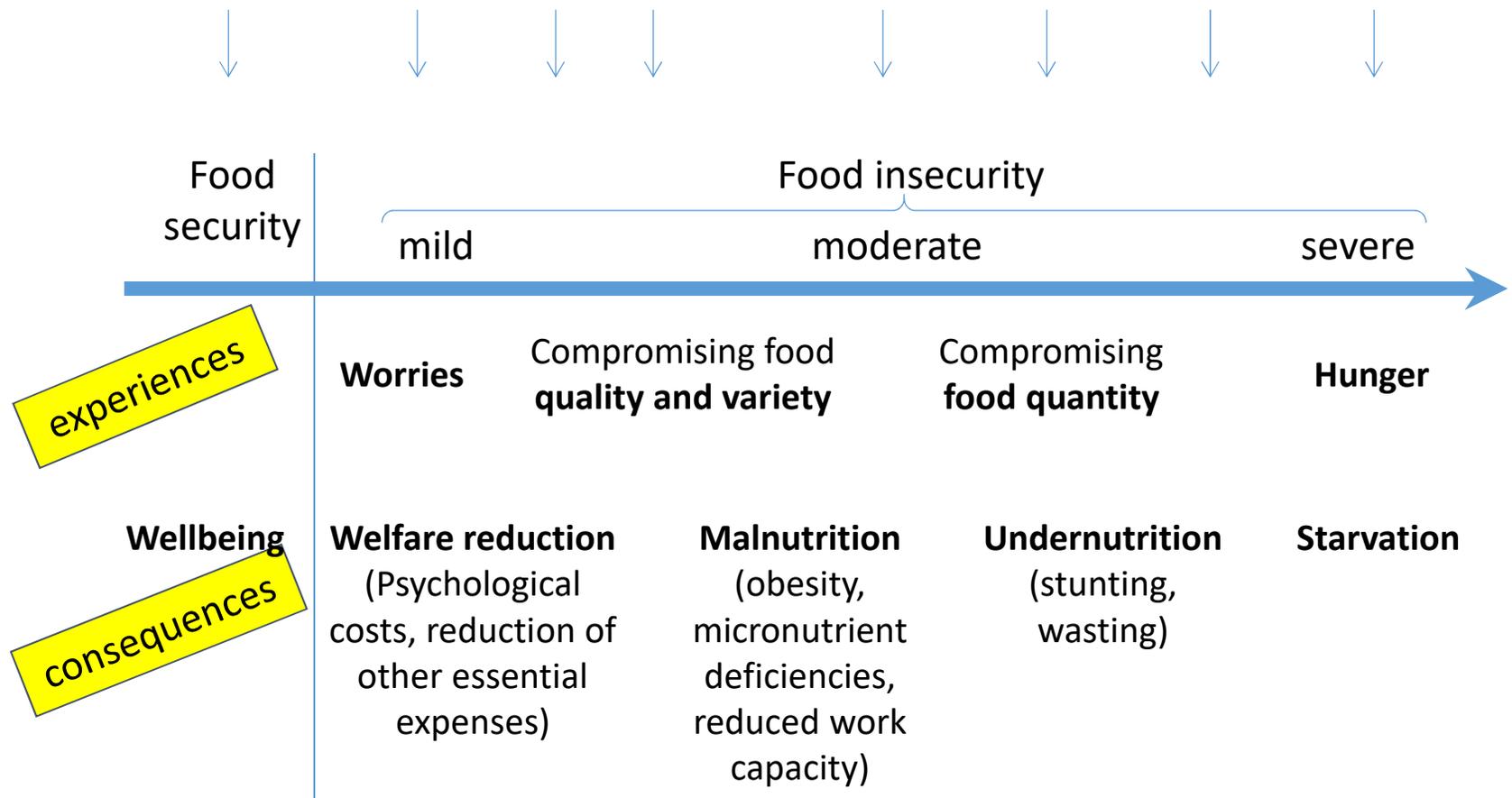
- Voices of the Hungry project



**During the last 12 months, was there a time when, because of lack of money or other resources:**

1. You were worried you would not have enough food to eat?
2. You were unable to eat healthy and nutritious food?
3. You ate only a few kinds of foods?
4. You had to skip a meal?
5. You ate less than you thought you should?
6. Your household ran out of food?
7. You were hungry but did not eat?
8. You went without eating for a whole day?

# What is FIES?



# Today

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3. **What are food security's other dimensions?**

# Food Security

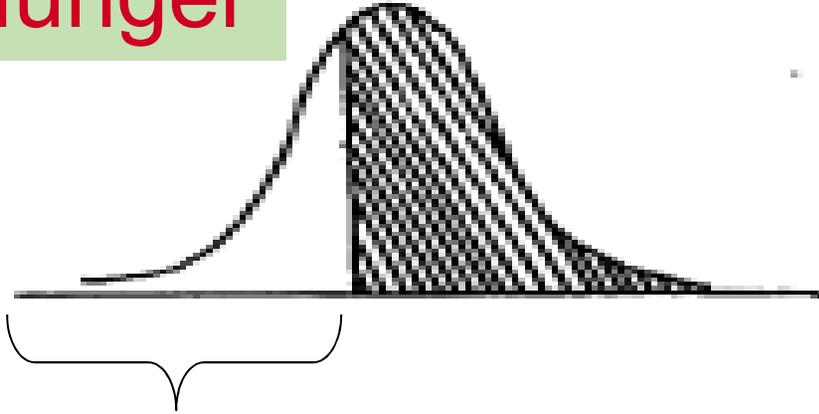
## 3. Utilization

Health dimension of food security

- Hygienic and sanitary qualities
- Food safety
- Nutritional balance

# The Middle Income Trap: Development, Inequality, and the Near-Poor

## Hidden Hunger



China: 150 million people < \$2 / day  
300 million people < \$3 / day  
*[although most billionaires in the world!]*

Implications of high inequality:

Although average per capita income rising & absolute grinding poverty is disappearing, there are still many “near-poor” people

Low macro-nutrient deficiency;

High micro-nutrient deficiency



Source: Scott Rozelle

# Hunger reduction in China



- Extreme poverty and hunger fell from >70% to 15%
- National and global hunger rates decreased as a result

Now faced by a second food security challenge



Source: Scott Rozelle

# Anemia can have severe effects on infant and child populations



## Anemia affects...

- Birth weights
- Infant mortality
- Infant morbidity
- IQ
- Health



## Anemia affects...

- School performance
- Attendance
- IQ
- Health
- Behavior

## Anemia: Risk of poor educational and cognitive performance

- These are often PERMANENT / lifelong effects
- Experienced throughout the world

# Middle income countries, aspiring to become rich

Almost all have high levels of inequality (gini ratios)

- Argentina (46)
- Brazil (54)
- Chile (52)
- Costa Rica (50)
- Malaysia (46)
- Mexico (52)
- Russia (42)
- Thailand (42)
- Tunisia (41)
- Turkey (43)
- Uruguay (42)
- Venezuela (44)

***China: 50***

# Malnutrition - Deficiencies

1. Anthropometric development
  1. Weight for age – weight loss in first 1000 days after conception is most critical
  2. Height for age
2. Hunger and mental development
3. Hunger and disease

“Hunger and disease then feed off each other, leaving the invisible poor to die in invisible numbers.”

# Food Security

## 4. Stability

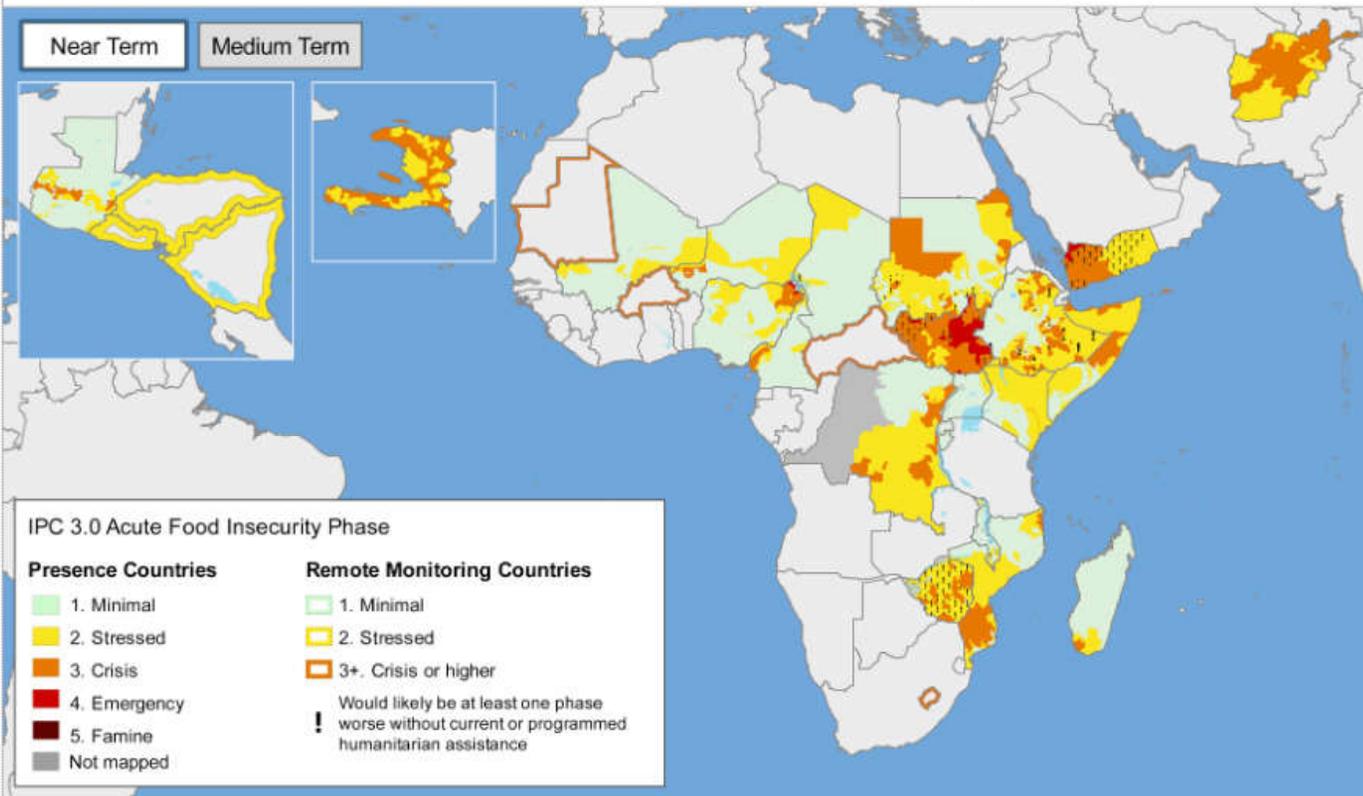
Permanent and durable access to sufficient food to live a healthy and productive life

- What is the risk of going below the poverty line with a price or income shock?
- How much would prices move if there was a demand or supply shock?

# UPDATE

FEWS NET IS MONITORING THE MULTIPLE IMPACTS OF THE COVID-19 PANDEMIC ON ACUTE FOOD INSECURITY IN THE COUNTRIES WHERE WE OPERATE, AND WILL INCORPORATE THIS ANALYSIS INTO OUR ONGOING REPORTING.

## Acute Food Insecurity: Near Term (February - May 2020)



### Areas of Highest Concern

Country or Region

Reason for Concern

Observations

**SOUTH SUDAN**

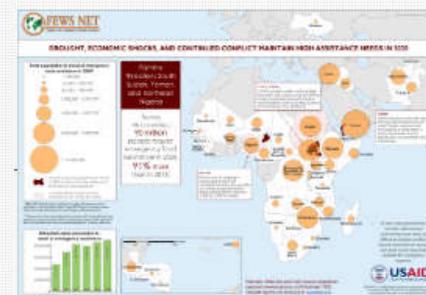
Conflict events have declined, but periodically affect trade, humanitarian access, and livelihoods. The loss of livelihood assets during the conflict has reduced household food and income sources and eroded coping

Thousands of people are fleeing inter-communal conflict in Jonglei State and the newly created Greater Pibor Administrative Area.

### Latest News

Southern Africa  
Apr 02, 2020

High food assistance needs persist due to consecutive droughts and erratic 2019/20 rainfall



### Quick Links

- [Food Assistance Needs](#)
- [Food Prices](#)
- [Weather Hazards](#)
- [Story Map Gallery](#)
- [Guidance Documents](#)

# You try!

- Answer the following questions on Acadly

# Famines – a Political Economy Perspective

- Amartya Sen & Entitlement Theory
- Concerned with “Malthusian optimism” – can have starvation even when the “Malthusian” conditions are good.
- Famine is an acquirement problem -- access

# Famines – a Political Economy Perspective

- Each consumer has an entitlement set:
  - What the consumer is endowed with (e.g. land, labor)
  - What the consumer is able to access by exchanging endowments for market goods
- Entitlement set must be large enough to allow consumer to access enough food
- Can fail because initial endowments are too low or because terms of exchange are unfavorable (wage rates too low, commodity prices too high, e.g.)



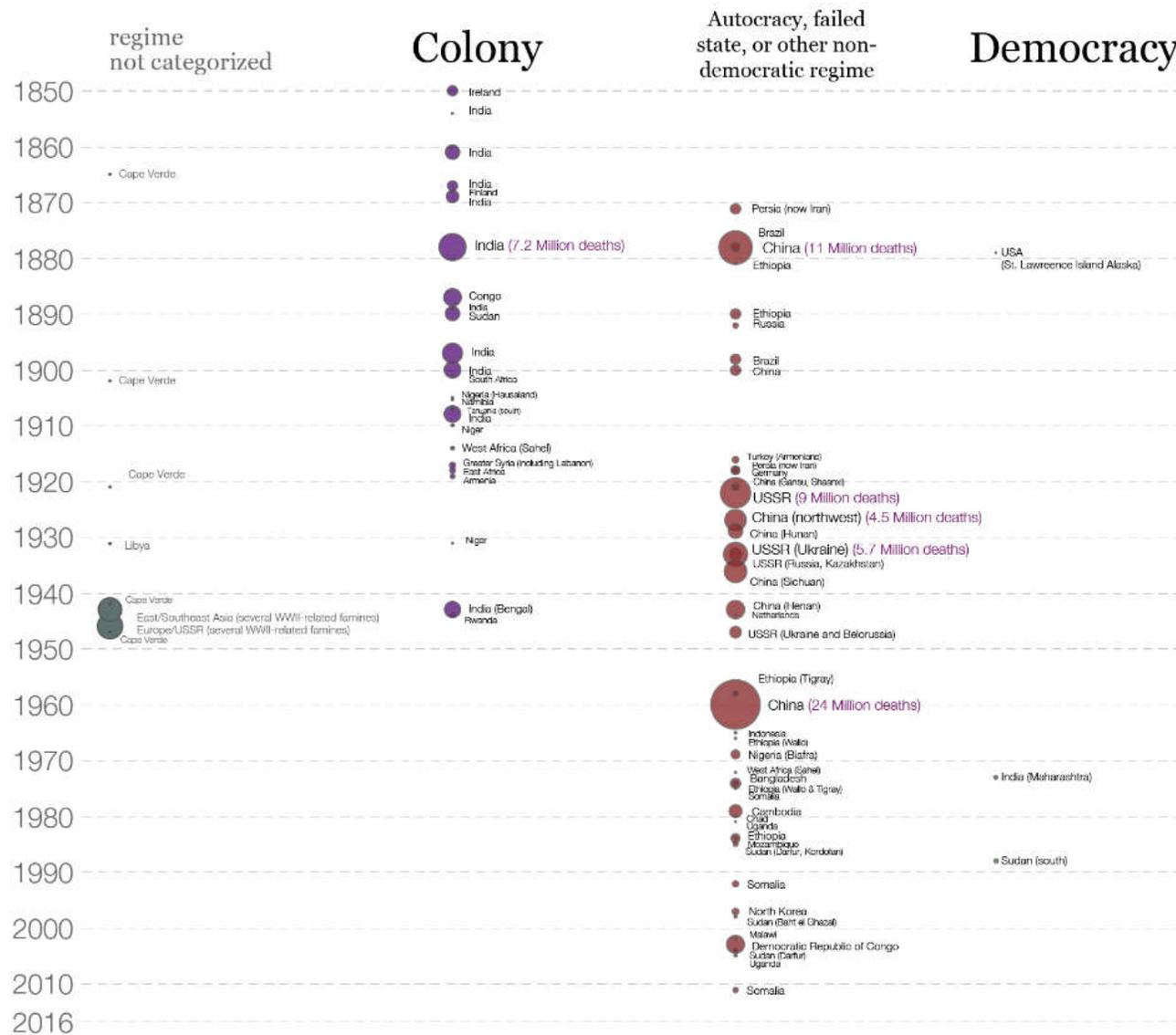
Governance:

Cannot get entitlements without good governance

Cannot exchange entitlements without good governance

# Famines by political regime, 1860-2016

The size of the bubble represents the death count of the famine (excess mortality).  
Detailed information on this dataset is available at [OurWorldInData.org/famines](https://OurWorldInData.org/famines).



Data sources: The dataset on famine deaths can be found on [OurWorldInData.org/famines](https://OurWorldInData.org/famines).  
The political regime is defined according to the Polity IV dataset. Where a famine continued over several years, the political regime at the start of the period is listed. Where a famine is attributed to a country not listed in the Political Regime data or to an area that spans multiple countries that have different classifications, the regime is recorded as 'not categorized'. On the other hand, where a famine affected clusters of countries of the same classification this is recorded as such. Note that, for two famines – Somalia in 2011; Cambodia in 1979 – listed as having an 'interruption' in their regime status in the affected years we have listed the country as their prior regime type. Where upper and lower estimates for famine victims are recorded, the average is used here. Famines for which no estimate for the number of victims has been found, or those below 1000 deaths are excluded.

This visualization is available at [OurWorldInData.org](https://OurWorldInData.org). There you find the full dataset and more research and visualizations on famines and global development. Licensed under CC-BY-SA by the author Max Roser.

# Conclusion

- Converging messages from different dimensions of food security
- Chronic malnutrition is a crisis and should be faced with urgency, not insurmountable

The New York Times

## *85,000 Children in Yemen May Have Died of Starvation*

The aid organization Save the Children said the number was a conservative estimate of those under age 5 who may have died.



Source: NY Times,  
November 18, 2018