Why are so many people, especially children, chronically hungry?

Joel E. Cohen
Rockefeller University & Columbia University
cohen@rockefeller.edu
Harvard-Radcliffe Class of 1965, 2022-05-14
1 person in 10 is chronically hungry & 1 child in 5 is stunted because:

1. They are too poor to buy food (NOT because the world produces too little food);

AND

Price of MY food takes no account of YOUR hunger.

A market works only for people with enough money to pay for what the market offers. One must pay to play in grain markets.
Governance of markets reflects values. Slavery was acceptable. Hunger still is.
Food is superabundant.

Current cereal grain production could provide all the calories needed by 11-14 billion people.

Earth has 8 billion people.
Grains piled on runways, parking lots, fields amid global glut

A mountain of grain sits in a storage pile, as midwestern grain farmers and merchants struggle to find storage space after three years of record harvests, near Minburn, Iowa, U.S., March 11, 2017. REUTERS/Scott Morgan
Global cereal production & use were 2.8 billion tonnes in 2021-22.
1 tonne (1000 kg) of carbohydrate supplies enough energy for 4-5 people for 1 year.

<table>
<thead>
<tr>
<th>200 kg of this grain provides</th>
<th>kilocalories per day for a year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>2,000</td>
</tr>
<tr>
<td>Wheat pasta</td>
<td>2,032</td>
</tr>
<tr>
<td>Corn (maize)</td>
<td>1,984</td>
</tr>
<tr>
<td>Oatmeal</td>
<td>2,028</td>
</tr>
</tbody>
</table>

2.8 bln tonnes of cereal have calories for 11-14 billion people.
The gentrification of food: 43% of cereal grains feed people.

<table>
<thead>
<tr>
<th>Use</th>
<th>Million metric tons</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food 2017-18</td>
<td>1,118</td>
<td>43</td>
</tr>
<tr>
<td>Feed</td>
<td>932</td>
<td>36</td>
</tr>
<tr>
<td>Other</td>
<td>565</td>
<td>22</td>
</tr>
<tr>
<td>Total use</td>
<td>2,615</td>
<td>100</td>
</tr>
</tbody>
</table>

FAO GIEWS Food Outlook July 2018
Hunger is economically invisible.

Chronically undernourished people exercise less demand (supported by customers' orders and capacity to pay) in world food markets than people who demand meat, biofuels, and other non-food uses of grain.
Chronic hunger versus famine

Chronic hunger affects many more people (750-800 million, ~1 in 10) than famine (40-50 million, ~1 in 200).
Global number of chronically undernourished rose since 2014.

2020: 768 million

2020: 9.9% ~ 1 in 10

FAO, IFAD, UNICEF, WFP, WHO State of Food Security and Nutrition in the World 2021
Chronic hunger stunts children.

Child suffers stunting if child's height falls 2 or more standard deviations below median height of child of that age by World Health Organization Child Growth Standards.

WHO Nutrition Landscape Information System

Stunting comes from chronic undernutrition and/or chronic infection.
Stunting affected 22% (>1 in 5) of children under 5 y in 2020.
FAO, IFAD, UNICEF, WFP, WHO
State of Food Security & Nutrition in the World 2021
Guatemala: 42.8% of children under 5 y were stunted, 2020.

FAO, IFAD, UNICEF, WFP, WHO
State of Food Security & Nutrition in the World 2021

Mayan descent, Guatemala

Mayan descent, USA

Children 9 years old
Undernourishment alters brain.

M. de Onis & F. Branca 2016 from Cordero et al. 1993

Well-nourished infant

Undernourished infant

Typical brain cells
Extensive branching

Impaired brain cells
Limited branching
Abnormal, shorter branches
Stunting is commoner in poorer countries.
Within countries, wealth quintile (lowest=red, highest=blue) influences child stunting more than sex or urban-rural residence influence stunting.

Black et al. *Lancet* 2013
Governance of markets reflects values. Slavery was acceptable. Hunger still is. Hope, Hope, fallacious Hope! Where is thy market now?

J.M.W. Turner 1840
Following slides are supplemental.
Summary

The world produces enough food to feed everyone well. People who are too poor to buy enough food suffer chronic hunger. Chronic hunger stunts children. The price of food does not reflect poor people's chronic hunger.
>1/2 hungry people were in Asia, >1/3 were in Africa in 2020.

% of USA households with food insecurity, 2001-2020

In USA in 2020, 38.3 million people

Hispanic

All

White non-Hispanic

Black non-Hispanic

USDA Economic Research Service, 2021
What to do?

2. Education: Girls & boys, especially the poor. Include empathy & human biology.
Nutrition programs cost now, pay back later.

Galasso & Wagstaff 2019
Hunger bonds

Governments or development banks should sell bonds to patient investors to reap returns in the adult labor force of reduced stunting in childhood.

Auditing is required to assure proper use of money.

Political stability is required.
Population, economics, environment & culture interact.
Stunting threatens human development.

“The severe irreversible physical and neurocognitive damage that accompanies stunted growth poses a major threat to human development.”

Mercedes de Onis, Francesco Branca
Maternal & Child Nutrition 2016
Undernourishment or chronic hunger is defined as "an individual’s habitual food consumption is insufficient to provide the amount of dietary energy required to maintain a normal, active, healthy life."

Prevalence of undernourishment is based on each country's average dietary energy consumption, inequality in access to dietary energy, & minimum dietary energy requirement. 

FAO, IFAD, UNICEF, WFP, WHO

State of Food Security & Nutrition in the World 2021
Example: stunting in India

Stunted children have $z<-2$.

Healthy children height-for-age WHO standards

HAZ = height-for-age z-score

M. de Onis & F. Branca
Maternal & Child Nutrition (2016)
Stunting is not obvious to eye.

2 girls in Maldives

2 y 2 m old

4 y 4 m old
