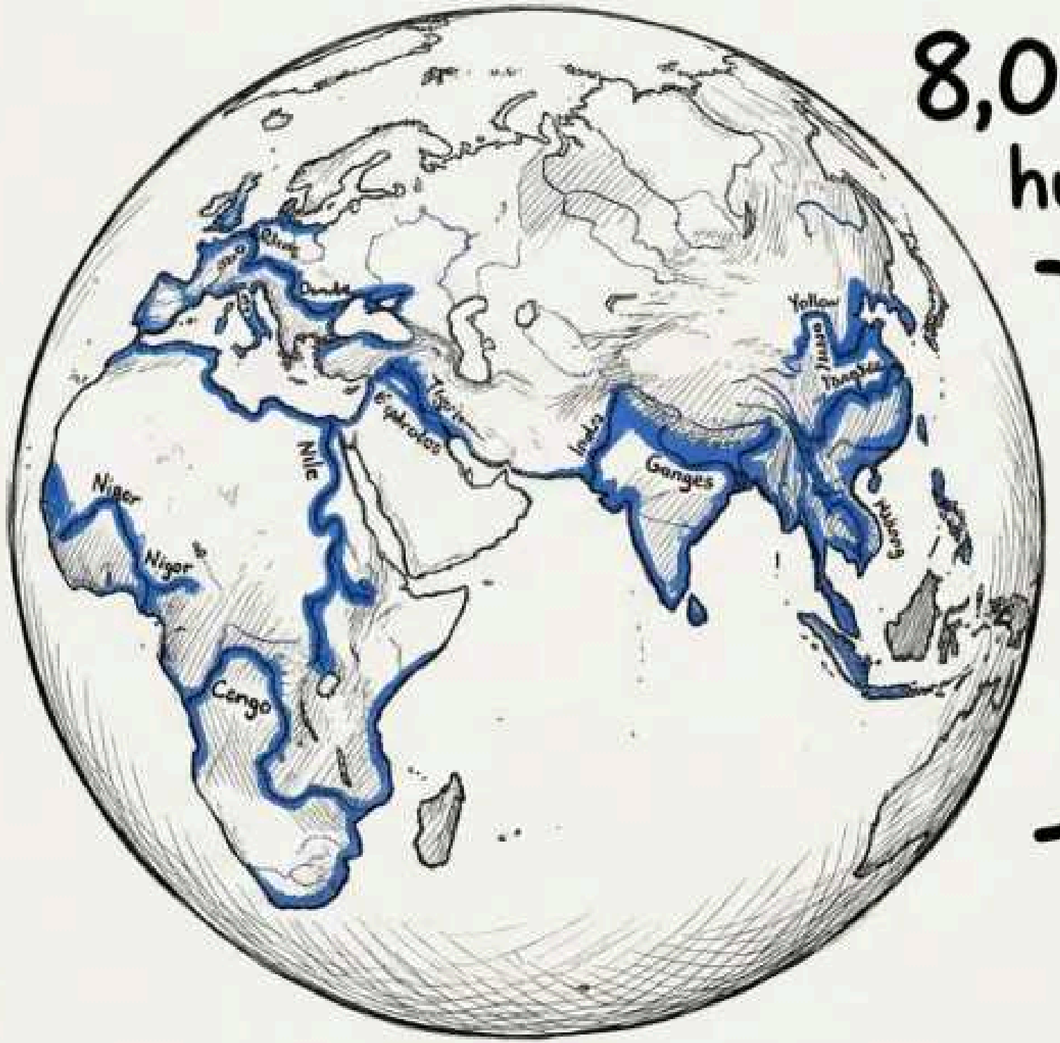
GEOG 101 B - Lecture 2: Population

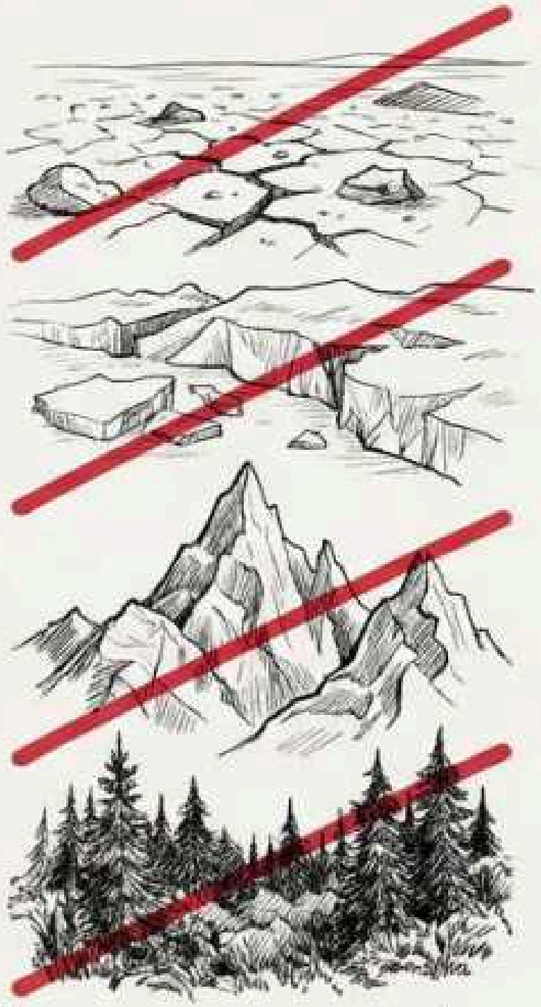
The Uneven Foundation of Human Geography

¶ 2.1



8,000,000,000+
humans on Earth.

Roughly 2/3 live in Asian, African, and European lowlands & river valleys.



Vast areas remain almost entirely unpopulated.

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The Four Great Humanity Clusters

¶ 2.2

China: ~1.5B

India: ~1.5B

> ⅓ of all humanity combined



Historically grounded on fertile plains near coasts and rivers to support early farming.

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Measuring Crowding: Two Types of Density

¶ 2.3

$$\text{Arithmetic Density (Da)} = \frac{\text{Total Population}}{\text{Total Land Area}}$$

$$\text{Physiological Density (Dp)} = \frac{\text{Total Population}}{\text{Total Farmable Land}}$$

Physiological density reveals the true pressure on a nation's food production.



Moderate Arithmetic Density

World-High Physiological Density

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The Mechanics of Population Change

¶ 2.4

CBR (Crude Birth Rate): Births per 1,000 people / year.

Migration

Rate of Natural Increase (RNI) = CBR - CDR

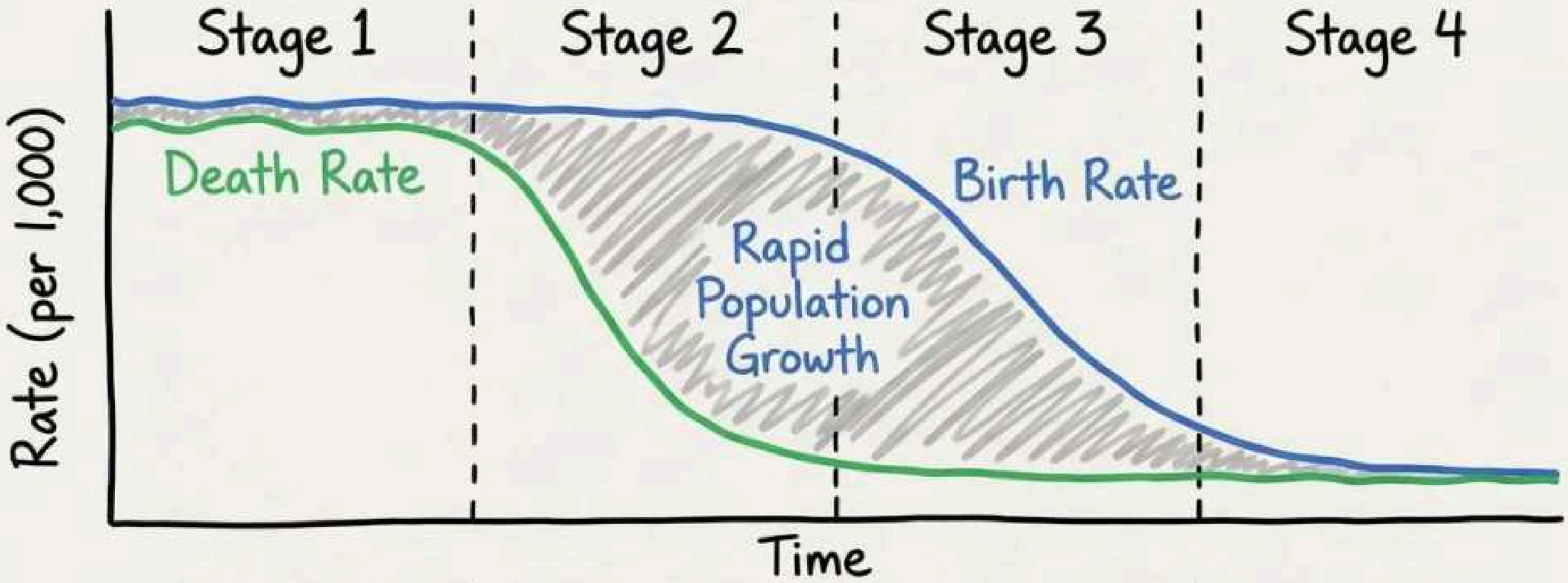
CDR (Crude Death Rate): Deaths per 1,000 people / year.

Total Fertility Rate (TFR): Average number of children a woman has in her lifetime.

TFR = 2.1 → Replacement Level

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The Demographic Transition Model



Stage 1	Stage 2	Stage 3	Stage 4
High birth & death. Slow growth.	Death rates fall (food, sanitation, medicine). Fast growth.	Birth rates fall. Growth slows.	Low birth & death. Growth stops.

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¶2.6

Transition Timelines and Stage Five

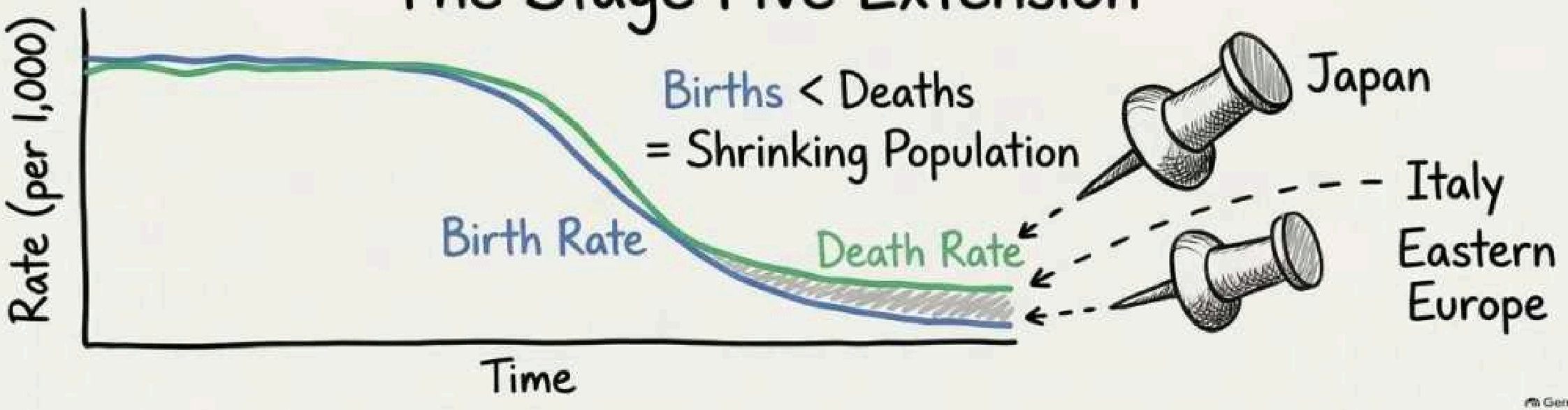
The Pioneers

1750 Britain: 200 years to transition. 1950

The Accelerators

Asia & Latin America: Rapid 20th-century transition. 1950 2000

The Stage Five Extension



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¶2.7

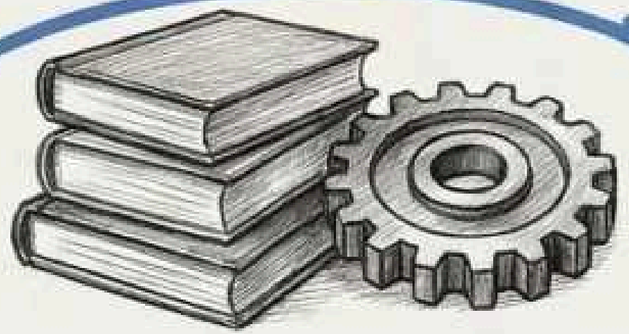
Why Do Birth Rates Fall?



Lower Child Mortality: Fewer births needed to ensure family survival.



Urbanization: Cities make children expensive and reduce their utility as farm labor.



Women's Empowerment: Education and paid work are strongly linked to smaller families.



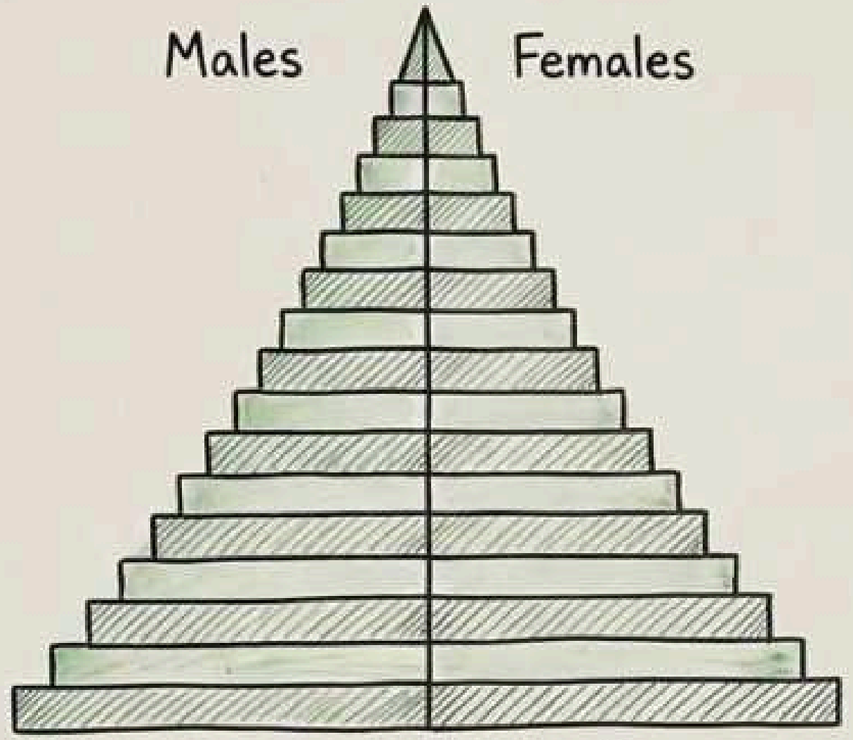
Contraception Access: Allows people to control and achieve their desired family size.

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¶ 2.8

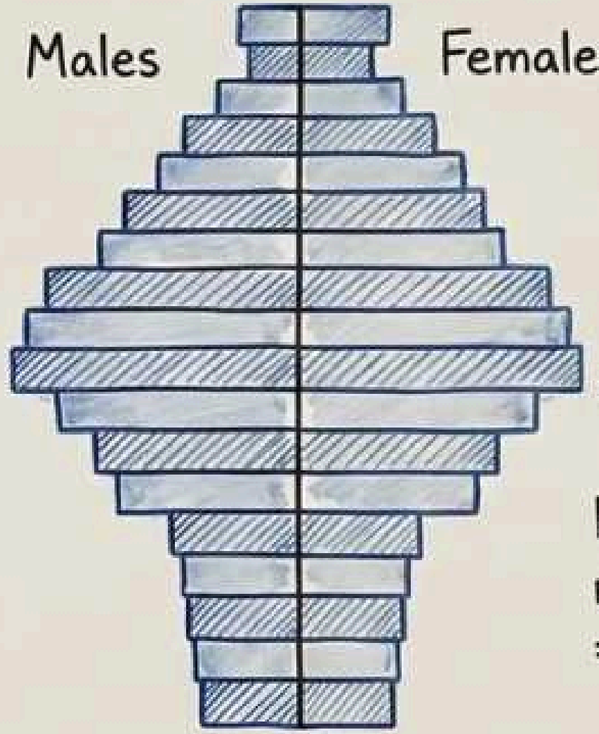
Reading Population Pyramids

Niger / Uganda



Wide base of children
= rapid future growth

Japan / Germany



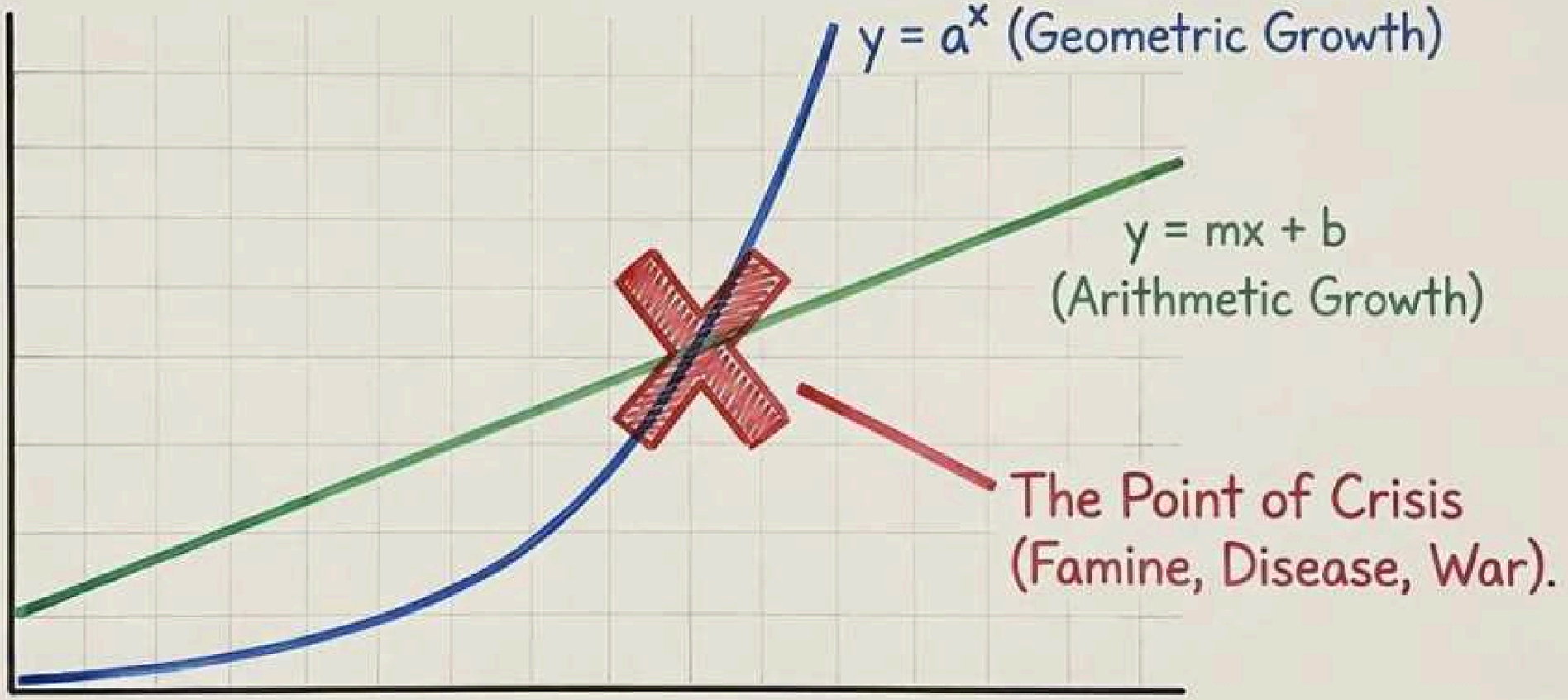
Bulge in
middle/old age
= aging society

Y-Axis: Age Groups.
X-Axis: Population Size.

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¶2.9

The Malthusian Warning (1798)



For 200 years, the prediction failed. Farming productivity surged and birth rates fell. But the underlying question of 'limits' remains.

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¶2.10

The Debate Over Limits: Malthus vs. His Critics



The Thinker	Core Argument	Historical Reality
Thomas Malthus	Population outpaces food	Disproved by 20th-century tech & falling fertility.
Ester Boserup (1965)	Pressure drives innovation ("Necessity is the mother of invention")	Vindicated by the Green Revolution (new crops, fertilizer, irrigation).
Neo-Malthusians	Total ecological limits exist	Current reality: Soil, water, and climate set hard boundaries.

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¶2.11

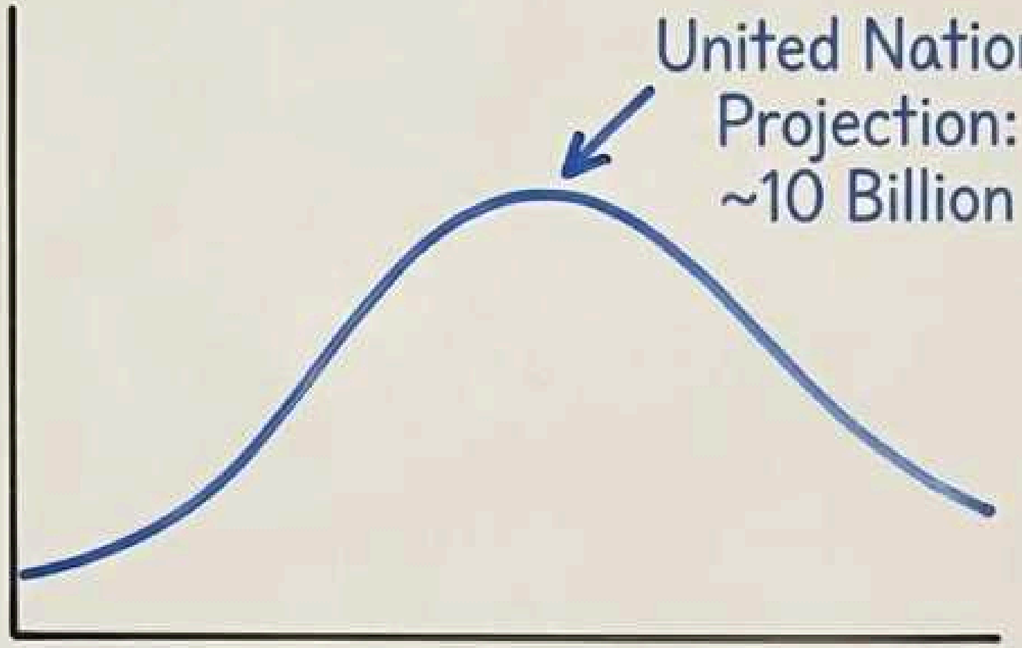
The Population Bomb vs. The Global Peak

(The 1968 Fear)



Paul Ehrlich predicted mass 1970s famines. They did not happen on his scale.

(The Modern Consensus)



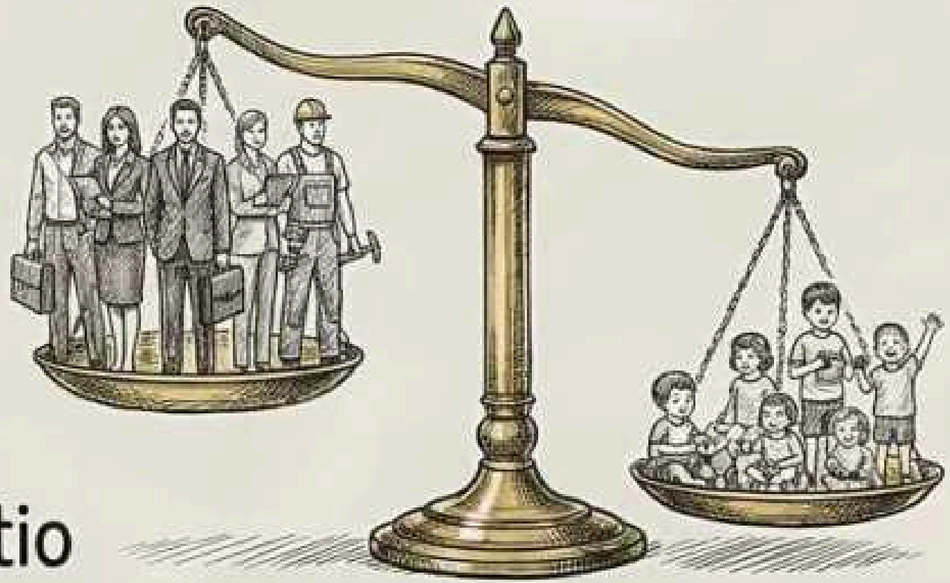
Later this century.

The great demographic question is shifting: from "How do we feed too many people?" to "How do societies cope with ageing?"

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¶ 2.12

The Challenges of Ageing Societies





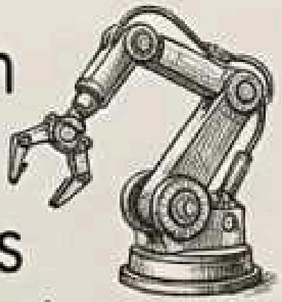
The Dependency Ratio

$$DR = \frac{\text{Children + Retirees}}{\text{Working Age Adults}}$$

The Impact (Japan, S. Korea, Italy, China): Shrinking workforces, soaring pension/ health costs, empty rural villages.

Policy Responses:

- ✓ - Increased Immigration
- ✓ - Automation & Robots
- ✓ - Later Retirement Ages
- ✓ - State Support for Families



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State Population Policies: Three Approaches

Coercion (China 1980-2015)

Policy: "The One-Child Policy."

Mechanism: Strict limits, state enforcement.

Result: Sharply cut births, but caused rapid aging and a severe sex imbalance (preference for sons).



Incentivization (Europe today)

Policy: "Pro-Natalist Benefits."

Mechanism: Paying generous family stipends to raise fertility.

Result: Only modest results; economic incentives struggle to reverse cultural shifts.

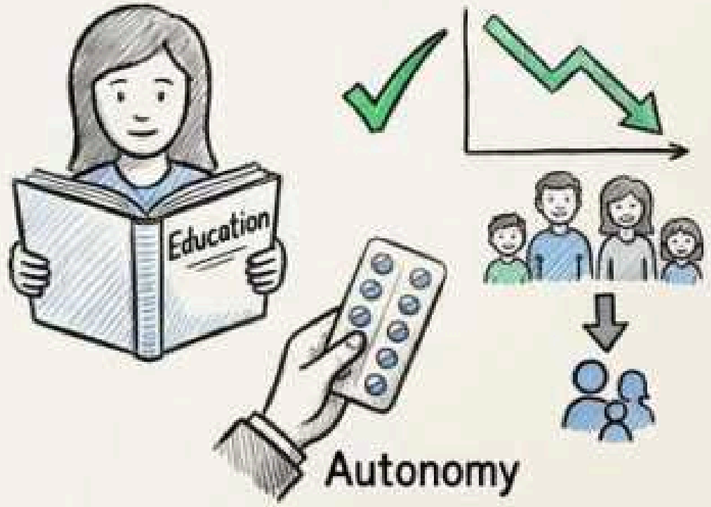


Education & Autonomy (Iran & Thailand)

Policy: "Voluntary Family Planning."

Mechanism: Widespread education and access to contraception.

Result: Highly successful lowering of fertility without coercion.



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Africa and the Demographic Dividend

Rapid Population Growth
(Nigeria projected world's 3rd largest by mid-century)

↓

Falling Birth Rates

↓

The "Youth Bulge"
(Large generation of young adults entering working age).

↓

Conditional Gateway



Requires Jobs, Schooling, and Good Governance.

↓

The Demographic Dividend
(Massive economic growth, mirroring late-20th century East Asia).

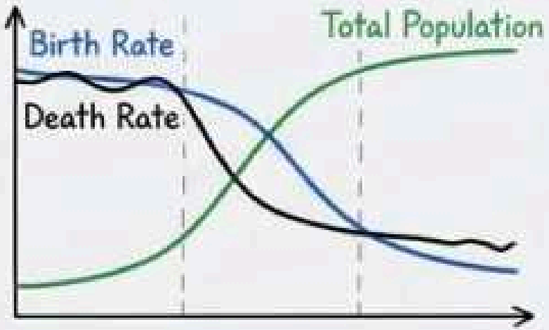
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Summary: The Geometry of Population

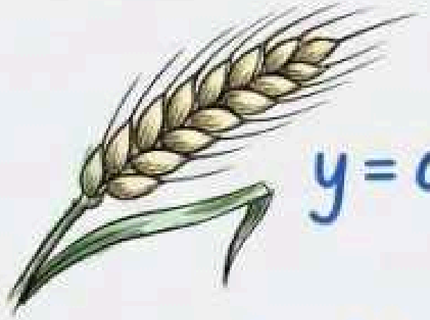
¶ 2.15



Humanity is clustered on fertile plains and coasts.



Populations shift through the Demographic Transition (births, deaths, migration).



$y = a^x$

Malthus warned of hard limits; critics proved the power of innovation.



The modern divide: some regions grow rapidly, while others face the strain of ageing.

Next Lecture: Following People as They Move (Migration).

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