

COURSE ROADMAP & EVALUATION:

SOC 476 CONTEMPORARY APPLICATIONS OF
SOCIAL DEMOGRAPHY

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Today's Class

- Roadmap for what we will cover in the course
- Assignments, grading and expectations
- Relevant website links where you will get demographic data

Roadmap for the course

- Refer to the handout
- Course Objective: Gain insights causes & consequences of population change, & social implications of these issues both globally & locally
- Learn about concepts, theories, demographic data, and social applications of demography

References

- Useful Text:
- John R. Weeks. Population: An Introduction to Concepts and Issues. 12th Edition. (Chapters 1,4,5,6,7,8, and 10)
- Anthony Giddens, Mitchell Duneier, Richard P. Appelbaum, and Deborah Carr. Introduction to Sociology. Seagull 12th Edition.(Chapter 14 Work and Economic Life; Chapter 19: Basic concepts part on Demography)
- Articles that may be covered as application papers/referred to in class are mentioned in the first course handout
- Links to Additional Videos/ Application Papers will be shared 1 week in advance

Roadmap for the course

- Week 1: Roadmap for the course+ Introduction to Demography
- Week 2: Demographic Data & Introduction to Basic Concepts: Fertility and Mortality
- Week 3: Basic Concepts: Fertility and Mortality
- Week 4: Demographic Perspectives
- Week 5: Fertility Transition + Unintended Fertility
- Week 6: Unintended Fertility Continued
- Week 7: Introduction to Migration
- Week 8: September 17 – 22, 2024, Mid-Semester Exams
- Week 9: Migration Theories, Measurement Types+ Migration Application Paper 1

Roadmap for the course

- Week 10: Migration Application Papers: Paper Outlines and Discussion
October 4th, 2024, 2 page paper outlines due.
- Week 11: No Classes: Mid-semester Recess Oct 5th – 13th 2024
- Week 12: Migration Application + Demographic Trends and Urbanization
- Week 13: + Demographic Trends and Urbanization + Contemporary Global Challenges: Ageing in Cities
- **PAPER DUE OCTOBER 15th, 2024, 5pm (Delays would cause deduction of marks)**
- Week 14: Contemporary Global Challenges: Ageing in Cities +Work and Economy
- Week 15 & 16: Presentations

Course Evaluation

- Grading (Relative)
- a) Attendance: 5%
- b) Class Participation (Individual component) (Answering discussion questions in class/ in-class engagement/sharing relevant articles)): 10 %
- c) Mid Term: MCQs and Short/Medium Answer Questions 30%
- d) End Term: MCQs and Short/Medium Answer Questions 30%
- e) Group Project (Final Paper) + Viva+ Presentation 25 %
(Details will be given in class)

DUE DATE FOR PROJECTS!

- Form Groups and Update Google Sheet by: **August 7th** .
- Project Outline plus Discussion: **DUE ON October 4th** .
- Group Project, Final Paper: **DUE ON October 15th** .
- Marks will be deducted for delay in submission!

Attendance (5% of your grade)

- Attend 80-100% of the lectures: full marks (5 out of 5)
- Attend 60-79 % of the lectures: receive (4 out of 5)
- Attend 40-59% of the lectures: receive (3 out of 5)
- Attend 25-39% of the lectures: receive (2 out of 5)
- Attend 10-24% of the lectures: receive (1 out of 5)
- Attend less than 10% of the lectures: receive (0 out of 5)

Class Participation (10% of your grades): 9 discussions around contemporary applications

- Contribute to (engage actively and answer questions)

8-9 discussion classes will receive full marks (10 out of 10)

- 7 discussion classes will receive (9 out of 10)
- 6 discussion classes will receive (8 out of 10)
- 5 discussion classes will receive (7 out of 10)
- 4 discussion classes will receive (6 out of 10)
- 3 discussion classes will receive (4 out of 10)
- 2 discussion classes will receive (3 out of 10)
- 1 discussion classes will receive (2 out of 10)
- 0 discussion classes will receive (0 out of 10)

Class Participation

- Before speaking please clearly mention your name so that I can note it down.
- In case you do not get an opportunity to speak in class then email me your responses to the questions by 8 pm that day (within two hours after class ends).
- In case I receive a mail after that it will not be counted as participation, and I won't be able to award any marks for it.
- If there is time remaining for the Friday discussion section to end and no one speaks, but people send emails after class then unfortunately on those days no marks will be given to anyone who emails with responses

Group Project

- **Form groups of 5 by August 7th 2024.**
- On a shared google sheet update the names of the group members
- Start meeting each other and thinking about potential topics for the final project
- Meet me to discuss project ideas/updates atleast once outside class (in –person or over Zoom). All group members have to be present.

Group Project

- Project Outline 2 pages:
- Should Include:
 - A) clear sub-sections and focus areas of the project
 - B) Precise task allocation update within the group
 - B) type of data used/data source
 - C) 5 key academic references that motivate your work
 - D) A key socio-demographic issue (and how it has evolved) that you will focus on in the given country context and why?
- **Due on October 4th where we will discuss your projects !**
- Delays in submitting or discussing project would lead to marks being deducted

Group Project

- Country Demographic Profile
- Groups of 5 people
- Every group has to select an **unique country other than India and China from a list I will give** (update the name of the country & name of the group members on a shared document; country selection will be on a first come first serve basis; if some other group has chosen a country you would like to choose before you and updated it on the sheet, you have to choose a different country that no one else has chosen yet)
- Project cover page should clearly indicate each members contribution (will be asked questions about the same in the Viva too)

Group Project

- Give a general introduction to the non-demographic aspect of the country
- Describe the history of population growth over time, leading to the current demographic situation. For e.g. trend of population growth, leading to the present day demographic situation
- Construct population pyramids for two years; calculate dependency ratio etc.
- What data sources are available for that country. Check if Demographic Health Surveys (DHS data is available) in case of developing countries
- Discuss age/sex-specific mortality rates and life expectancy ; causes of mortality etc.

Group Project

- Find at least two different measures of fertility for at least two different dates
- Which theories of the fertility transition seem to best explain the data that you have acquired for this country
- What are the patterns of internal migration, especially rural-to-urban migration
- Are there any trends in the relationship between population changes and economic changes in the country? What is the government position with respect to economic development & population growth? Can you assess the influence of the current age/sex structure on the future development prospects?

Group Project

- What would be your desired social and economic goals, and what kind of population policy would most likely help to achieve that goal or set of goals? Same or different from policies being followed currently?
- Focus on one particular population related problem in this country, elaborate on how it is related to the economy and society in that country; and how narratives around this population related issue has changed over the years (for e.g. narratives around immigration). You can refer to online articles over the years and analyze this to see whether/ how narratives have shifted.
- Summarize & conclude with predictions about demographic future of the country you have profiled
- Add the list of references
- Approximately 15-20 pages double spaced including graphs & tables

List of Websites

- Useful websites where you would get data:
- **a) World Fact Book World Atlas are two good starting places for background information on your selected country**
- <https://www.cia.gov/library/publications/resources/the-world-factbook/index.html>
- <https://www.census.gov/popclock/world>
- **b) For Population growth rate, crude birth rate, crude death rate, migration etc.**
- i) International Data Base from U.S. Census Bureau:
 - <https://www.census.gov/programs-surveys/international-programs/about/idb.html>
 - ii) United Nations Demographic Yearbook
 - iii) Demographic Yearbook, or Population Reference Bureau website:
 - <http://www.prb.org/DataFinder/Geography.aspx>
- iv) The World Bank database
 - <http://data.worldbank.org>

List of Websites

- c) **For developing countries check if any data are available from the Demographic Health Surveys:**
 - <https://dhsprogram.com>
- d) **Measures of Mortality:** i) US Census Bureau websites listed above, ii) Population Reference Bureau website above and/or iii) WHO website at
 - <http://www.who.ch/whosis>
- e) **Fertility** :i) U.S. Bureau of the Census's International Database :
 - <https://www.census.gov/data-tools/demo/idb/informationGateway.php>
- ii) Tables in the World Bank's annual World Development Report—
 - <http://www.worldbank.org/>
- f) **Migration:** Migration News, online at:
 - <http://migration.ucdavis.edu>
- g) **Other useful websites:**
 - World Health Organization (www.who.org), the National Center for Health Statistics (www.cdc.gov/nchs), the United Nations Population Division (www.un.org/esa/population), and the United Nations Population Fund (www.unfpa.org).

Plagiarism Policy

- In case your project is plagiarized then you will be asked to resubmit the project and there will also be a grade drop. Please read more on what we mean by plagiarism and what are the different forms of plagiarism below:
- [https://www.ox.ac.uk/students/academic/guidance/skills/plagiarism#:~:text=The%20University%20defines%20plagiarism%20as,your%20work%20without%20full%20acknowledgement.](https://www.ox.ac.uk/students/academic/guidance/skills/plagiarism#:~:text=The%20University%20defines%20plagiarism%20as,your%20work%20without%20full%20acknowledgement)

INTRODUCTION TO DEMOGRAPHY

Opening Question

- What do you think is the most widely accepted official prediction for the global population in 2050?
 - A. 9–10 billion
 - B. 14–15 billion
 - C. 19–20 billion
 - D. 24–25 billion
 - E. 29–30 billion

Today's Class

- a) What is Demography?
- b) Population & Economy:
 - i) How could population processes affect the economy?
 - ii) How could changes in the economy affect population process?
- c) Population & Society:
 - i) How could population processes affect the society?
 - ii) How could changes in the society affect population process?
- d) Interdisciplinary nature of Demography-E.g. of applications in different disciplines

What is Demography?

- **Demography** is the scientific study of human populations
- Coined by Achille Guillard in 1855 in his book '*Éléments de Statistique Humaine ou Démographie Comparée*'
- *demos* → people
- *graphein* → write about a particular subject (population)
- “*The mathematical knowledge of populations, their general movements, and their physical, civil, intellectual and moral state*” (Guillard 1855:xxvi)

What is Demography?

- Two Types of Demography (Hauser and Duncan, 1959; Xie, 2000):
 - a) Formal Demography: Origins traced to John Graunt in 1662, focuses on fertility, mortality, age structure, & spatial distribution of human population
 - b) Population Studies: Origins traced to Thomas Malthus in 1798, focuses on population compositions and changes from perspectives rooted in other disciplines (sociological, economic, biological, or anthropological)
- Formal demography & population studies distinct w.r.t. subject matter & methods used, however, boundary between the two is neither fixed nor impermeable

What does modern day demography deal with?

- Study of determinants & consequences of population change & concerns everything that impacts or can be impacted by:
- a) Population Size
- b) Population Growth or Decline
- c) Population Processes
- d) Population Spatial Distribution
- e) Population Structure
- f) Population Characteristics

Population Processes

- **Population Processes:** Levels & Trends in:

a) Mortality (associated with death)

b) Fertility (associated with birth)

c) Migration (associated with movement)

These cornerstones of demography would determine population size & change

Population Characteristics

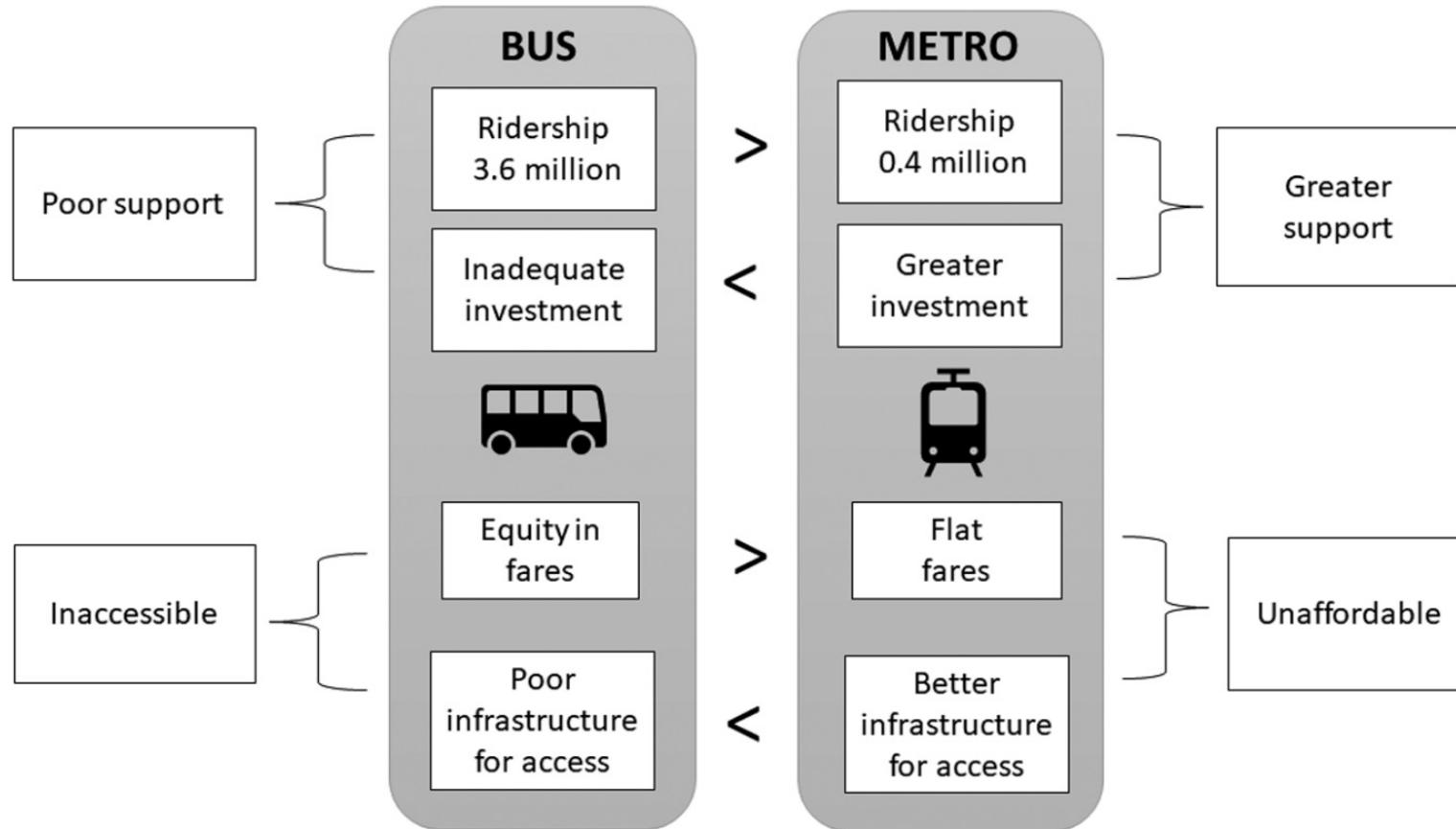
- **Population characteristics:** How people in a given place are, in terms of factors such as:
 - Education
 - Income
 - Occupation
 - Household relationships

..that sum up to what we are as individuals or groups

Transport policies and their everyday impact on mobilities of older adults in Bengaluru (Nagesh et al. 2024)

- Policymakers envision & look to provide age-friendly transport environments
- Later age mobilities face challenges in the Indian context due to traffic congestion and inequities
- Earlier policy & transport research treated congestion, equity & age-friendly mobilities as unrelated issues
- This study looks at: how policies to mitigate congestion can impact the provisioning of age-friendly infrastructure.
- They review Bengaluru's transport policies and peer-reviewed articles concerning these policies to understand the positioning of age-friendly transport within this context

Figure 4: Graphical representation of equity in Bengaluru's public transport



Source: Authors' representation using data from [BMTC \(2019\)](#) and [BMRCL \(2019\)](#).

Example: Introducing Project Sidewalk

- [https://www.youtube.com/watch?v= GBLqZDXB_0](https://www.youtube.com/watch?v=GBLqZDXB_0)

Examples from other areas where Demography plays a part (Rufat et al. 2015)

- Other areas: Environmental Science, Geology etc.
- Which population sub-groups are most vulnerable to natural disasters?
- Key demographic variables : age (elderly & young), gender, race, recent migrants & single parent families (review by Rufat et al. 2015)
- Jonkman et al. 2005 examined fatalities caused by hurricane Katrina in Louisiana, USA
- Most of the victims were elderly who were unable/unwilling to evacuate &/or be most impacted by delays in rescue, bad public health facilities etc.

Examples from other areas where Demography plays a part: Climate Induced Migration

- <https://www.youtube.com/watch?v=pO18pM9ZLj4>

Questions for discussion

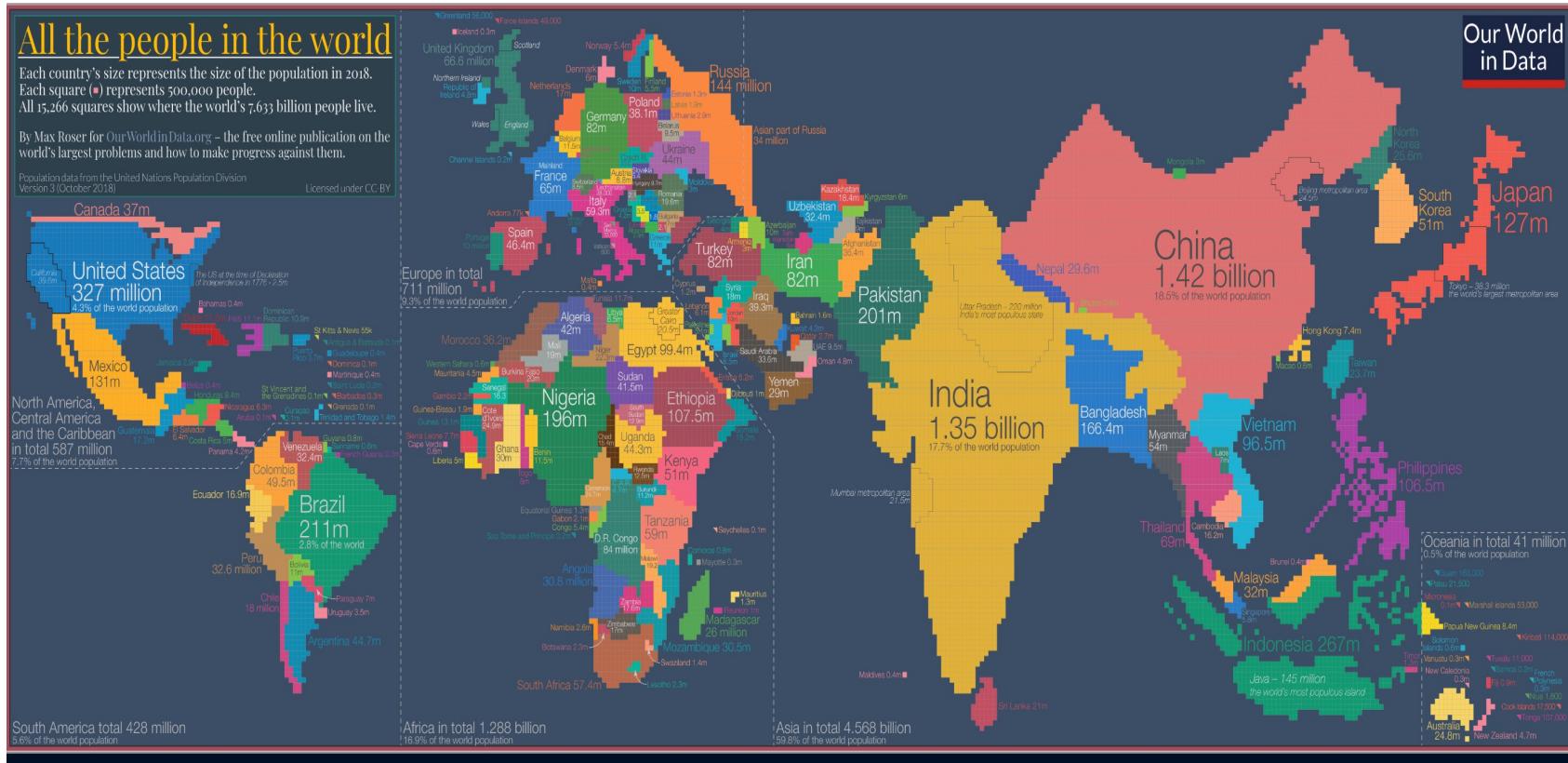
- a) Think of a couple of current issues globally & try to think how population, economy & society are linked to the scenario
- b) Think of a couple of examples of what are other sub-fields where demographic variables could play an important part
- C) Think of a concrete example in your field (related field) where demographic variables could play an important part
- D) Think of a transportation-related policy in a city that you have spent time in, does it adequately cater to all demographics? What kinds of amendments might be useful?

DEMOGRAPHIC DATA

All the people in the world

Each country's size represents the size of the population in 2018.
Each square (■) represents 500,000 people.
All 15,266 squares show where the world's 7.633 billion people live.

By Max Roser for OurWorld in Data.org – the free online publication on the world's largest problems and how to make progress against them.



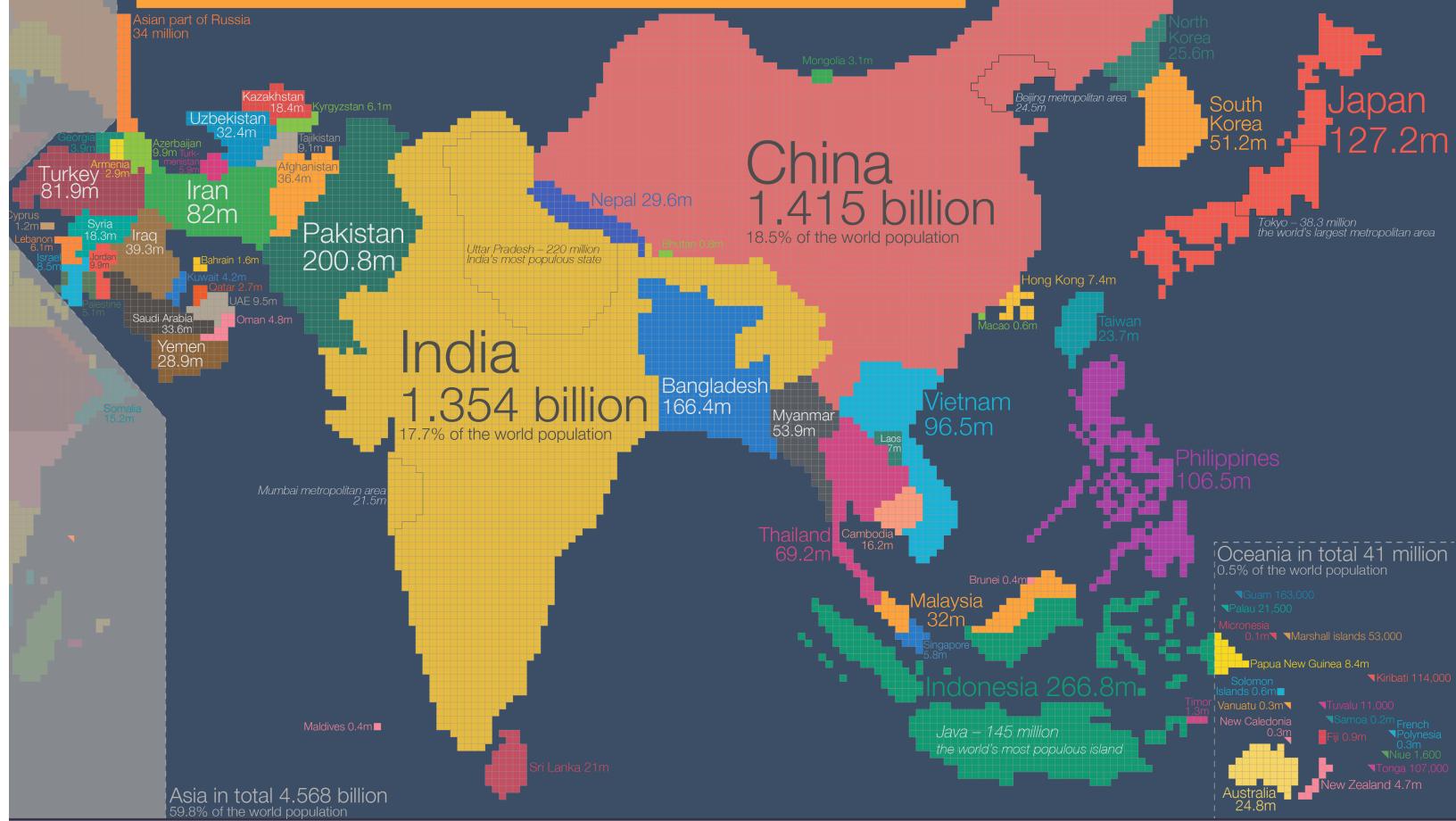
Population of Asia and Oceania in 2018

The country's size in this map represents the size of the population.
Each square [■] represents 500,000 people.

by Max Roser for OurWorldInData.org – the free online publication that presents the data and research on how the world is changing.

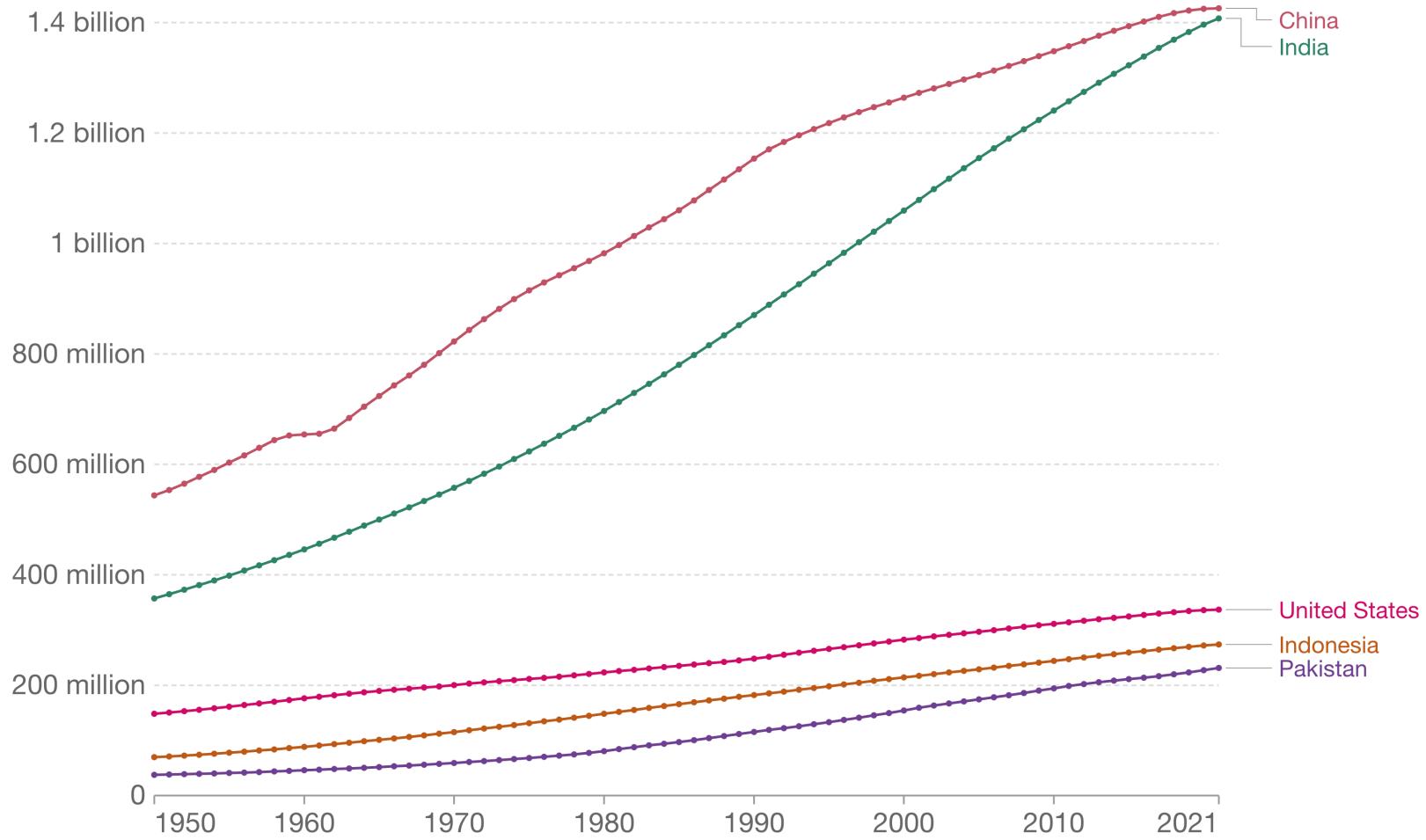
Population data from the UN Population Division. Version 1 (September 2018).

Licensed under CC-BY-SA.



Population, 1950 to 2021

Our World
in Data



Source: United Nations, World Population Prospects (2022)

CC BY

Today's Class

- What are the sources of demographic data?
- Introduction to Census:
 - i) What is the importance of census data?
 - ii) How should census data be collected?
 - iii) History of Census in India
- Vital Statistics Data
- Administrative data
- Sample Surveys
- Spatial Data
- Other Methods of collecting data
- Discussion Questions

What are the sources of demographic data?

For the whole population

- Census (e.g. Census of India, IPUMS-Warehouse of global census data)
- Vital statistics records (e.g. birth certificate, death certificate)
- Administrative data

For a sample of the population

- Surveys

What are the sources of demographic data: Census

- Censuses have a long history, but have been systematically collected only since the late 18th century.
- They have a tendency to be contentious when different groups use their numbers for political purposes.
- But, they are also the richest available source of demographic information.

What is a census?

The total process of collecting, compiling, evaluating, analyzing and publishing or otherwise disseminating demographic, economic and social data pertaining, at a specified time, to all persons in a country or in a well delimited part of a country

(United Nations Statistics Division, 2008)

UN Recommendations for Censuses

1. Sponsorship by national government
2. Defined territory
3. Universality – include everyone on either *de jure*¹ or *de facto*² basis
4. Simultaneity – a fixed day, hour, and moment becomes the chronological dividing line for inclusion or exclusion.
5. Individual units (persons) are counted, not groups
6. Defined periodicity - conduct the census at fixed time intervals (typically every 10 years in India)
7. Compilation and publication of the data must occur regularly

¹De Jure – the enumeration classifies each person according to his or her legal place of residence.

²De Facto – the enumeration classifies each person according to his or her geographical location on the day of the census undertaking.

Who Is Included in a Census?

- **de facto population** - people who are in a given territory on census day
- **de jure population** - people who legally “belong” to a given area, regardless of whether they were there on the day of the census
- **people included in the census on the basis of usual residence** - roughly defined as the place where a person usually sleeps

Census in India: A Brief History

- India has a very rich history of the census.
- Even the Rig Veda reveals that some kind of census was maintained even as far back as 800-600 B.C.
- The Arthashastra mentions the census as a measure of state policy for tax purposes.
- The ‘Ain-e-Akbari’ included comprehensive data of population, industry, wealth etc.

Census in India: Pre-Independence

- The first census in India was carried out in Allahabad in 1824 and Banaras in 1827-28 by James Princep.
- The first official nationwide census occurred in 1872. Starting from 1881, the census has occurred every 10 years.
- The census of 1872 collected information pertaining to name, age, religion, caste or class, race or nationality, education, literacy and occupation.
- Subsequent censuses were far more detailed and comprised questions like the following:
 - i. Number of children born to a married woman and number surviving.
 - ii. Her age at birth of first child.
 - iii. Are you in search of employment (for unemployed) and how long have been you in search of it?

Census in India: Post-Independence

- The first census of Independent India took place in 1951.
- The 1961 census introduced a Household schedule to collect information relating to persons engaged in cultivation and Household industry.
- The 1981 census was significantly different from the previous censuses. A new Household schedule was canvassed in this census, in addition to individual slips. The household schedule was divided into two parts. The first part collected information on religion, SC/ST status, language spoken, drinking water, electricity, toilets etc. In the second part, characteristics of each individual was collected.
- Starting from 2001, the individual slip has been dropped and only the Household schedule is canvassed. The questions which were canvassed in Household Schedule and Individual Slips in previous two censuses were put together in one schedule named as Household Schedule.

More on History of Census in India

[file:///Users/eshachatterjee/Downloads/DROP IN ARTICLE-05.pdf](file:///Users/eshachatterjee/Downloads/DROP%20IN%20ARTICLE-05.pdf)

Census in India: Houselisting & Housing Census Schedule 2021

* for cat. 1B
Scheduled Caste can be only from Hindus, Sikhs and Buddhists and not from any other religion. Scheduled Tribes can be from any religion.

www.ijerph.org

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10 of 10

Census in India: Houselisting & Housing Census Schedule 2021

residing in this household

11

Information relating to the head of the household	
Name of the head of the household	Do not fill columns 12 and 13 for institutional households
12 Sex: Male-1/ Female-2/ Transgender person-3	Do not fill columns 12 and 13 for institutional households
13 If SC* or ST* or Other: SC -1/ ST - 2 / Other - 3	

- Ownership status of this house:**
 Owned-1/ Rented but has own house elsewhere-2/
 Rented and doesn't own any house-3/ Any other-4
- Number of dwelling rooms #**
 exclusively in possession of this household (Record 0,1,2,3..)
- Number of married couple(s) living in this household (Record 0,1,2,3)**
- Main source of drinking water**
 (Give code from the list below)
- Availability of drinking water source: \$**
 Within premises-1/ Near the premises-2/ Away-3
- Main source of lighting:** Electricity-1/ Kerosene-2
 Solar-3/ Other oil-4/ Any other-5/ No lighting-6
- Access to latrine:**
 Yes: Exclusively for household use only-1/ Shared with other household-2/ Public latrine-3/ Not Open-4
 If '1' or '2' in col. 20, then **type of latrine**
 (Give code from the list below)
- Waste water outlet connected to:**
 Closed drainage-1/Open drainage-2/ No drainage-3
- Bathing facility available within the premises:**
 Yes: Bathroom-1/ Enclosure without roof-2/ No-3
- Availability of kitchen and LPG/PNG Connection:**
 (Give code from the list below)
- Main fuel used for cooking:** (If '1' to '6' in col. 24)
 (Give code from the list below)
- Radio/ Transistor:** Yes: Traditional radio set-1/
 On mobile/mobile/ smartphone-2/ On any other device-3/ No-4
- Television:** Yes: Doordarshan free dish-1/ Other
 DTH/Dish-2/ Cable connection-3/ Any other-4/ No -5
- Access to internet:** Yes: On laptop/ Computer-1/
 On mobile/mobile/ smartphone-2/ On any other device-3/ No-4
- Laptop/ Computer:**
 Yes:1/ No-2
- Telephone and Mobile phone/Smartphone**
 (Give code from the list below)
- Bicycle and Scooter/ Motorcycle/ Moped**
 (Give code from list below)
- Car/ Jeep/ Van:**
 Yes: 1/ No-2
- Main cereal consumed in the household:**
 Rice-1/ Wheat-2/ Jowar-3/ Maize-5/ Any other-6

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Census in India: Household Schedule

2011

Census of India 2011 Household Schedule													SIDE-A																	
Start Here		Location Particulars		State/UT		District		Taluk/Block/ P.S./Dw. Block/ G.O./Mandal		Enumeration Block Number & Sub-Block No.		To be copied from Abridged Household		Confidential when filled		Use only arabic numbers as indicated here		0 1 2 3 4 5 6 7 8 9		Type of Household			Normal1 Instrumental2 Houseless3							
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																	8(a)		8(b)											
																	8(a)		8(b)											

Census in India: Example

Q.15 Workers and non-workers

Q.16 Category of economic activity

Q.19

 Q.20 Non-Economic activity:

22(b)* Mode of travel

Name of the Person

Serial Number Signature

the Enumerator with Date: Six

Continued to

Household Schedule in 2011 included..

- Name of person
- Relationship to head
- Sex
- Date of Birth and Age
- Current Marital Status
- Age at marriage
- Religion
- Caste Group
- Disability
- Mother Tongue
- Other Language known
- Literacy Status
- Status of attendance
- Highest educational level attained

Household Schedule in 2011 included..

- Worked any time during last year
- Category of the economic activity
- Occupation
- Nature of the industry, trade or services
- Class of workers
- Non-economic activity
- Seeking or available for work
- Travel to place of work: (i) one way distance (ii) mode of travel

Household Schedule in 2011 included..

- Fill for person born outside this village/town: Birth Place, If within India, write the present name of village/town, district and State. If outside India, write the present name of the country
- Migration characteristics: Fill for person who has come to this village/town from elsewhere Place of last residence (a) if within India (b) at the time of migration
- Reason for migration
- Duration of stay in this village/town since migration
- Fertility Particulars - Children surviving Daughters(s) Son(s)
- Children ever born alive Daughters(s) Son(s)
- Number of children born alive during last one year
Daughters(s) Son(s)

Vital Statistics Data

- Data collected on births and deaths, and sometimes on marriages, divorces, and even abortions.

Main Sources of Vital Statistics in India

- Four key sources of vital statistics in India:
 - (a) the Sample Registration System (SRS)
 - (b) the Civil Registration System (CRS)
 - (c) Indirect estimates from the decennial census
 - (d) Indirect estimates from the National Family Health Surveys (NFHS).

Source:

<https://unstats.un.org/unsd/vitalstatkb/KnowledgebaseArticle50447.aspx>

x

BIRTH REPORT**Legal Information***This part to be added to the Birth Register***To be filled by the informant**

1. Date of Birth : (Enter the exact day, month and year the child was born e.g. 1-1-2000)

2. Sex : (Enter "Male, or " Female")
do not use abbreviation3. Name of the child, if any :
(If not named, leave blank)4. Name of the father :
(Full name as usually written)
UID No of Father (if any)

--	--	--	--	--	--	--	--

Name of the mother :
(Full name as usually written)
UID No of Mother (if any)

--	--	--	--	--	--	--	--

6. Address of parents at the time of Birth of the Child

7. Permanent address of parents:

8. Place of birth : (Tick the appropriate entry 1,2 or 3 below and give the name of the Hospital/Institution or the address of the house where the birth took place)

1.Hospital/ Institution Name & Address:

2.House Address :

3. Others:

9. Informant's name :

Address :

(After completing all columns 1 to 22, informant will put date and signature here.)

Date: Signature or left thumb mark of the informant

In the case of multiple births, fill in a separate form for each child and write 'Twin birth' or 'Triple birth' etc., as the case may be, in the remarks column in the box below left.

BIRTH REPORT**Statistical information***This part to be detached and sent for statistical processing***To be filled by the informant**

10. Town or Village of Residence of the mother : (Place where the mother usually lives. This can be different from the place where the delivery occurred. The house address is not required to be entered.)

a) Name of Town/Village :

b) Is it a town or village : (Tick the appropriate entry below)

1. Town 2. Village

c) Name of District :

d) Name of State :

11. Religion of the Family : (Tick the appropriate entry below)

1.Hindu 2. Muslim 3.Christian

4. Any other religion : (write name of the religion)

12. Father's level of education :
(Enter the completed level of education e.g. if studied upto class VII but passed only class VI, write class VI)13. Mother's level of education :
(Enter the completed level of education e.g. if studied upto class VII but passed only class VI, write class VI)14. Father's occupation :
(If no occupation write 'Nil')15. Mother's occupation :
(If no occupation write 'Nil')**To be filled by the informant**16. Age of the mother (in completed years) at the time of marriage :
(If married more than once, age at first marriage may be entered)

17. Age of the mother (in completed years) at the time of this birth :

18. Number of children born alive to the mother so far including this child :
(Number of children born alive to include also those from earlier marriage(s), if any)

19. Type of attention at delivery : (Tick the appropriate entry below)

1. Institutional – Government
2. Institutional– Private or Non-Government
3. Doctor, Nurse or Trained midwife
4. Traditional Birth Attendant
5. Relatives or others

20. Method of Delivery : (Tick the appropriate entry below)

1. Natural
2. Caesarean
3. Forceps/Vacuum

21. Birth Weight (in kgs.) (if available) :

22. Duration of pregnancy (in weeks) :

To be filled by the Registrar**To be filled by the Registrar**

Registration No. :	Registration Date :	Name	Code No.	Registration No. :	Registration Date :
Registration Unit :		District :		Date of Birth :	
Town/Village :	District :	Tahsil :		Sex : 1.Male 2.Female	
Remarks : (if any)		Town/Village :		Place of Birth : 1.Hospital/Institution 2.House	
		Registration Unit :			

Administrative Data

- Data collected for purposes other than demography, but useful for demographic analysis, such as:
 - Immigration data
 - School enrollment data
 - Tax returns
 - Moving company data

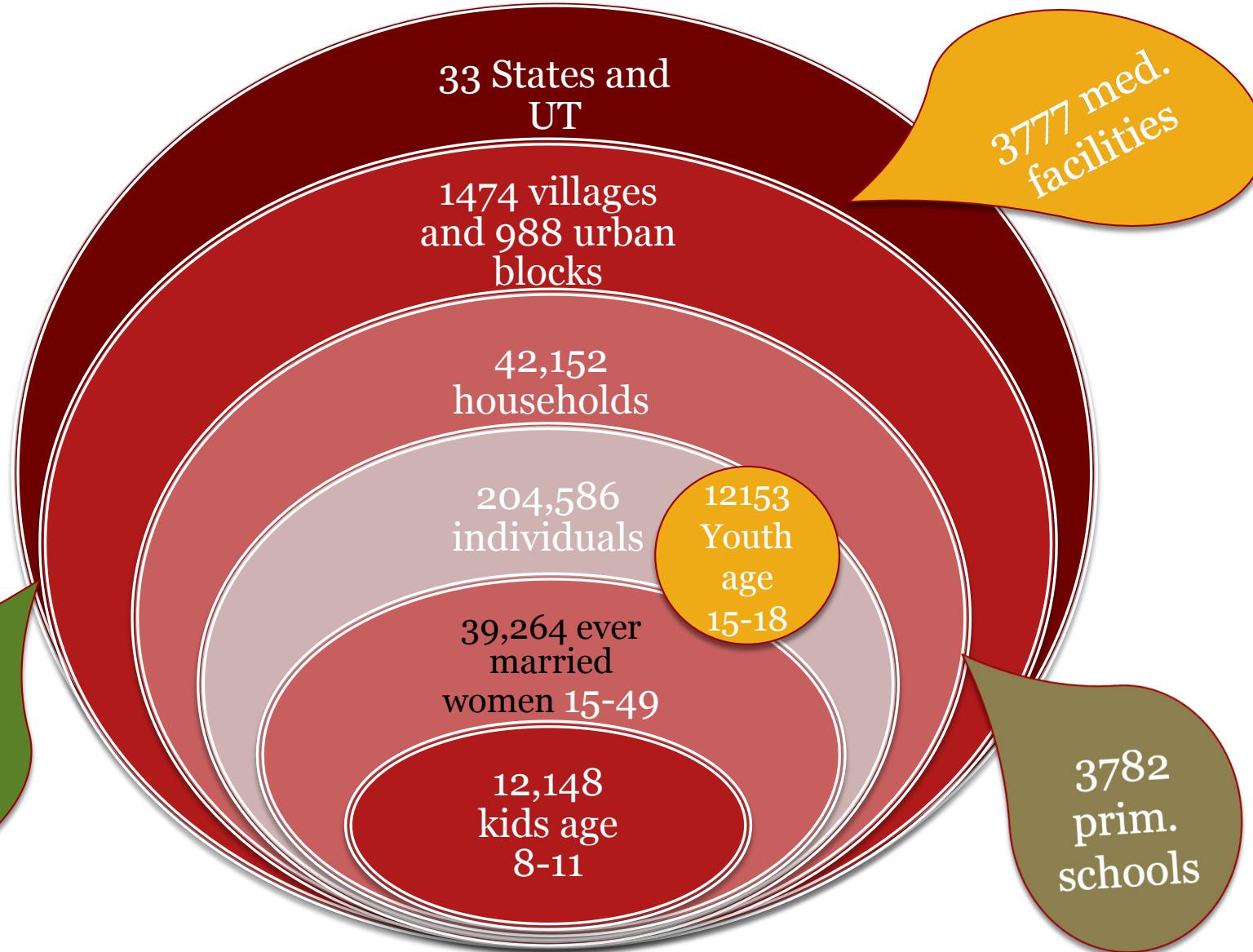
Administrative Data: Who collects this type of data in India?

- Subjects such as international trade have meaning only at the all-India level.
- There are sectors, which straddle across more than one State & for which statistics are collected directly by Central agencies such as railways, postal services and telecommunications.
- Statistics on both types of subjects are collected by the Central Administrative Statistical System.
- All other Administrative Statistics are collected by the State Statistical System.

Sample Surveys

- Sample Surveys are frequently used to obtain detailed demographic data.
- These surveys typically have extensive questionnaires designed to address problems in demography.
- However, they provide less extensive geographic coverage than a census

Example: India Human Development Survey(IHDS II)



17. Gender Relations

Eligible Woman No: 1 EW1No

Please tell me who in your family decides the following things?

DO NOT PROMPT

CODE ALL RESPONSES THAT ARE GIVEN AS "1" (OK TO INCLUDE RELATIVES NOT IN THE HOUSEHOLD)

IF MORE THAN ONE RESPONSE, ASK: Who has the most say in the decision?

MOST SAY:

RESPONDENT=1

HUSBAND=2

SENIOR MALE=3

SENIOR FEMALE=4

OTHERS=5

RESPON-	HUSBAND	SENIOR MALE	SENIOR FEMALE	APPLICABLE OTHERS	NOT NO ONE
---------	---------	----------------	------------------	----------------------	---------------

17.1 What to cook on a daily basis?

No=0 GR1a GR1b GR1c GR1d GR1e GR1f

→ GR1g

17.2 Whether to buy an expensive item such as a TV or fridge?

No=0 GR2a GR2b GR2c GR2d GR2e GR2f

→ GR2g

17.3 How many children you have?

No=0 GR3a GR3b GR3c GR3d GR3e GR3f

→ GR3g

17.4 What to do if you fall sick?

No=0 GR4a GR4b GR4c GR4d GR4e GR4f

→ GR4g

17.5 Whether to buy land or property?

No=0 GR5a GR5b GR5c GR5d GR5e GR5f

→ GR5g

17.6 How much money to spend on a social function such as marriage?

No=0 GR6a GR6b GR6c GR6d GR6e GR6f

→ GR6g

IF RESPONDENT HAS ANY CHILDREN:

17.7 What to do if a child falls sick?

No=0 GR7a GR7b GR7c GR7d GR7e GR7f

→ GR7g

17.8 To whom your children should marry?

No=0 GR8a GR8b GR8c GR8d GR8e GR8f

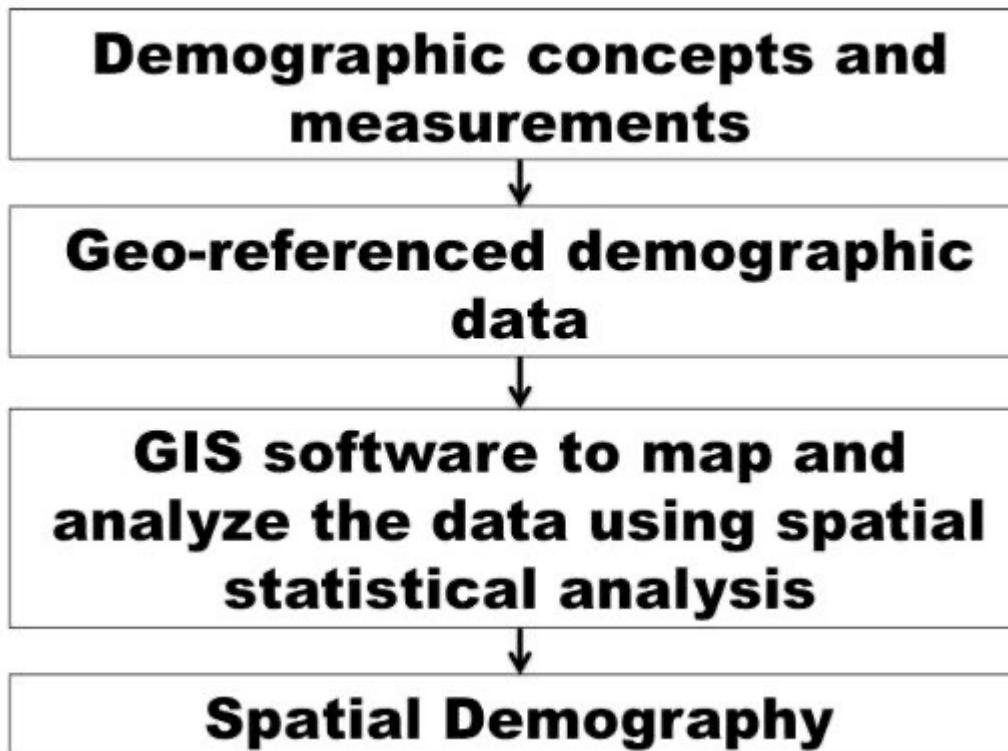
→ GR8g

Other Sample Surveys

- International Surveys:
 - Demographic and Health Survey (DHS): <http://www.dhsprogram.com>
 - Multiple Indicator Cluster Survey (MICS): <https://mics.unicef.org/surveys>
 - Demographic surveillance systems
- Country- Based surveys
- India
 - National Family Health Survey (NFHS)
 - National Sample Survey (NSS)
- USA
 - Current Population Survey (CPS)
 - American Community Survey (ACS)
 - Survey on Income and Program Participation (SIPP)
 - National Survey of Family Growth (NSFG)
 - National Health Interview Survey (NHIS)

Spatial Demography

- Demography is spatial in nature – people who are geographically closer tend to be more similar in various aspects.



Geographic Information Systems (GIS)

- Computer-based system that enables the integration of maps with geo-referenced data in innovative ways.
 - Geo-referenced data means that we know the location (GPS coordinates, census tract, zip code, city, state, country, etc.) where an event (e.g., a birth or death or census/survey questionnaire) occurred.
- Geo-referencing data to places on the map gives us the ability to combine different types of data for the same place, and for more than one time.
- It enhances our ability to analyze demographic changes over time and space.

SHRUG data

- Portal built on collection of over 600,000 geographic units called "shrids"(unique village/town-level identifier).
- These geographic units allow us to aggregate satellite & census-derived data to consistent geographical areas & represent them via an interactive web-based portal.
- Socioeconomic High-resolution Rural-Urban Geographic Platform for India (SHRUG) facilitates data sharing between researchers working on India.
- Some applications:
 - A) Where to target PHCs?
 - B) Importance of nearby towns
 - C) Impact of rural roads

Link SHRUGS data

- <https://www.devdatalab.org/shrug>
- <https://www.devdatalab.org/atlas#>

Other Methods of Collecting Data

- Mobile Phone Surveys: Such surveys have been crucial in the Covid-19 era.

<https://blogs.worldbank.org/opendata/we-conducted-50000-interviews-sub-saharan-africa-covid-19-vaccination-2020-heres-what-we>

<https://indianexpress.com/article/opinion/columns/coronavirus-india-covid-19-lockdown-ncaer-social-distancing-sonalde-desai-santanu-pramanik-6369957/>

- Such surveys are also a source of high frequency data.

<https://www.worldbank.org/en/news/video/2013/06/12/peru-pilot-survey-paves-way>

50,000 interviews on COVID-19 vaccination in Sub-Saharan Africa

- COVID-19 disrupted lives and brought in-person survey data collection to a halt
- Immunization against COVID : one of the most sustainable solutions to end the pandemic
- Access to vaccines unequal
- The poorest countries with the least means of domestic production or international procurement are most disadvantaged
- Sub-Saharan Africa: supply side constraints were high and demand for vaccines uncertain
- Data gap to inform the rollout of vaccination campaigns

50,000 interviews on COVID-19 vaccination in Sub-Saharan Africa

- [Living Standards Measurement Study \(LSMS\)](#) team partnered with national statistical offices to obtain 80 rounds of phone survey data across seven Sub-Saharan African countries
- Begun in September 2020, 27 rounds included a recurring module on COVID 19 vaccination
- Longitudinal phone surveys :
 - A) flexible,
 - B) rapidly administered, costs \$13 or less per completed interview, cost-effective
 - C) evidence collected was timely & tailored to specific information needs of vaccination campaigns in the region.

50,000 interviews on COVID-19 vaccination in Sub-Saharan Africa

- Main findings:
- A) **High vaccine acceptance but low coverage:** Low vaccination rates contrast with high levels of vaccine acceptance in SSA through the pandemic
- *'Vaccine acceptance ranged from near-universal acceptance in Ethiopia in 2020 to just below seven in ten people in Burkina Faso in 2021 and never dipped below 83% when averaged across the countries we study in any of the three years of data collection'*
- B) **Changes in individual's vaccine attitudes over time:**
- *'Across countries, three in ten respondents (29.8%) changed their attitude about COVID-19 vaccination'*

50,000 interviews on COVID-19 vaccination in Sub-Saharan Africa

- Information and outreach campaigns are necessary to maintain high levels of active demand for COVID-19 vaccines as supply-side barriers are lifted.
- *'To obtain high coverage levels, dispelling the concerns of those hesitant to get vaccinated can sway their opinions on COVID-19 vaccination'*
- LSMS-ISA household surveys served as sampling frames and supplied the survey infrastructure that the phone surveys leveraged for rapid and cost-effective deployment.
- Complementarity between phone and in-person surveys

Table 1. Modes of Mobile Phone Data Collection

	Phone	IVR	SMS
Type	Voice: Interviewer-administered	Voice: Self-administered	Text: Self-administered
Length	10-15 minutes 40-80 questions	~ 20 questions	~ 20 questions ~ 160 characters each
Literacy needed	No	No	Yes
Cost	Most expensive	Moderate	Least expensive
Speed	Slowest	Moderate	Fastest
How to implement	Work with local call centers, remote interviewers during COVID-19	Managed centrally through vendor or in-house	Managed centrally through vendor or in-house

Drones, Remote Sensing, and Mobile Phone Data and Surveys for Development in Crisis Contexts

- <https://www.youtube.com/watch?v=6fWzhXqzr7Y>

MORTALITY & FERTILITY KEY MEASURES

Today's Class

- Recap
- Commonly used measures of mortality
- Commonly used measures of fertility
- Dynamics of Population Change

Population Analysis: Demography

- **Demography:** The study of populations.
- Population dynamics are governed by births, deaths, and migrations.
- Demography is often treated as a branch of sociology because these factors are largely social and cultural in nature.
- Demographic work is usually statistical, relying on large-sample surveys and on official birth and death records.

MORTALITY MEASURES

Mortality Commonly used Measures

- Explain the uses of mortality statistics
- What do we mean by death & mortality
- What is lifespan & longevity?
- Measures of Mortality:
 - a) Crude Death Rate (and discuss it's limitations)
 - b) Age Specific Death Rates
 - c) Life Table
 - Life Expectancy
 - d) Special Indicators
 - Infant Mortality Rate
 - Maternal Mortality Ratio

Why would mortality statistics be useful?

- Needed as inputs into population projections which are useful for a number of policy measures
- Mortality statistics provide an important indicator of the health and well-being of a population
- Useful for summary measures such as life expectancy at birth
- Provide information about the nature and efficacy of health care delivery systems
- To be truly useful, however, it is important that information is not only collected on the numbers of deaths by age & sex, but also to be able to attribute death to its underlying cause.

Death

“the permanent disappearance of all evidence of life at any time after live birth has taken place (post-natal cessation of vital functions without capability of resuscitation).” - United Nations and World Health Organization

Resuscitation : ‘the action or process of reviving someone from unconsciousness or apparent death’

Death : ‘unique & universal event, & as a final event, clearly defined’

Mortality

Declining mortality is root cause of world population growth
(not rising fertility)

Most variations in mortality rates among societies are due to social, not biological, causes

Biological Components of Mortality

1. Lifespan
2. Longevity (has a social component too)

Lifespan

The oldest age to which human beings can survive

Oldest authenticated age of a human being was 122 years old – Jeanne Calment from France, died in 1997

Age exaggeration is common among older folks – there are many unsubstantiated reports of people living well past 100

One way to check age exaggeration is to compare census records with the age reported on a death certificate (especially if a birth certificate is unavailable)

Life expectancy for the world as a whole is estimated to be around 73 years in 2023

Longevity

Usually measured by life expectancy, the statistical average length of life

Greatly influenced by genetic factors

Despite our individual biological strengths and weaknesses, the actual levels of mortality for each sex at each age are most often a result of social factors

Lifespan & Longevity

Life span is the oldest age to which human beings can survive

Longevity is the age at which we actually die

Life span is almost entirely a biological phenomenon

Longevity has biological and social components.

Populations with high mortality are those with high morbidity, but this is not a one-to-one relationship—we may live longer even though not being very healthy.

Measures of Mortality

Crude Death Rates

Age-Specific Death Rates

Life Table Estimates

- Life expectancy

Special Indicators

- Infant mortality rate
- maternal mortality ratio

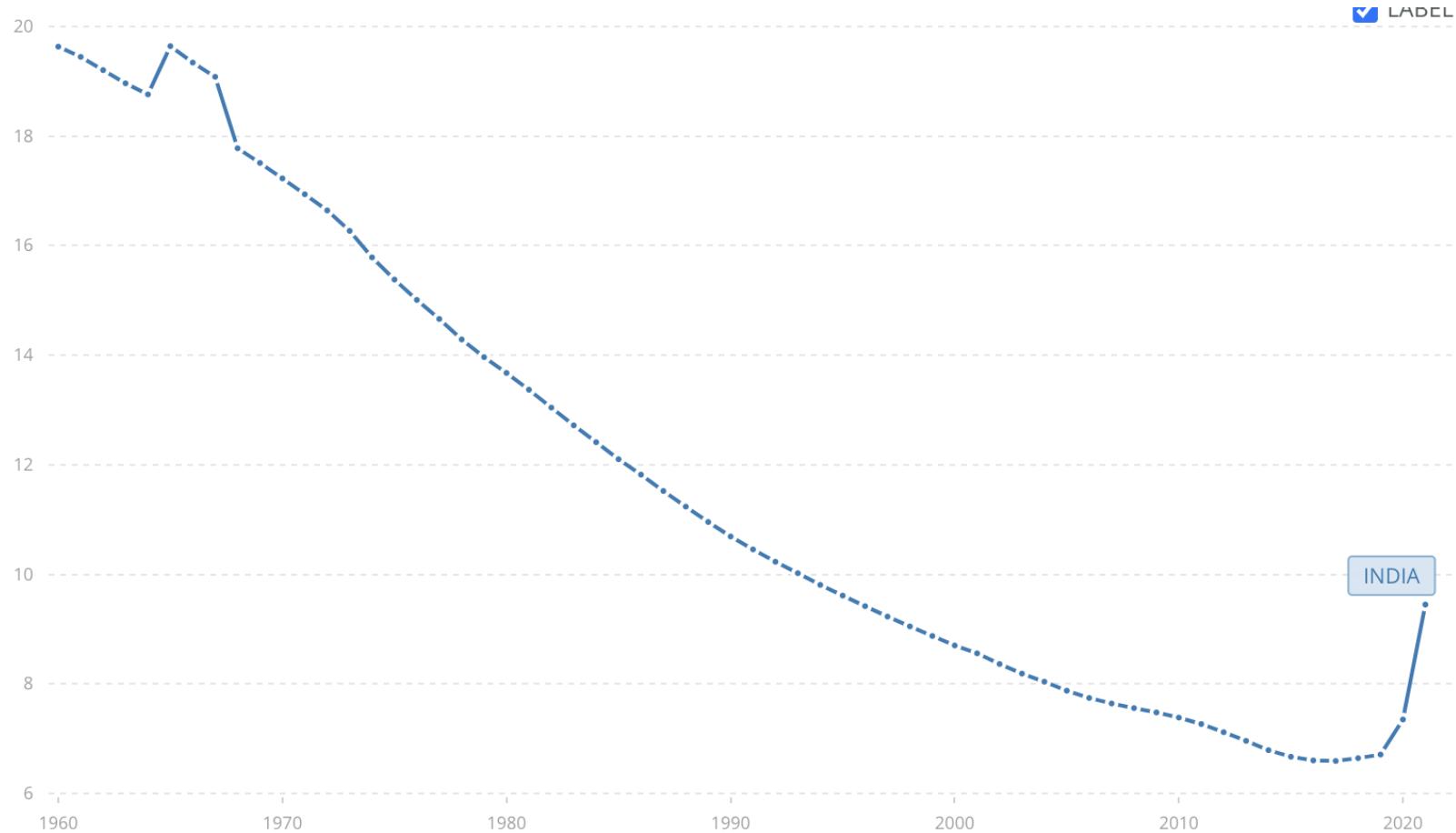
CRUDE DEATH RATE (CDR)

Crude Death Rate (CDR): total number of deaths in a year divided by the average total population

$$\text{CDR} = \frac{\text{total deaths in a year}}{\text{total average (mid-year)population in that year}} * 1000$$

Mid-year population is seen as a good approximation to the population exposed to risk of dying in the population over the course of the year, in the calculation of a crude death rate

CDR-Example India (Source: World Bank)



Example illustrating the limitation of CDR

Country	Year	CDR	Life Expectancy
Mexico	2013	4	77
Poland	2013	10	77

Example illustrating the limitation of CDR

Country	Year	CDR	Life Expectancy	Percentage Population Aged 65 and above
Mexico	2013	4	77	6%
Poland	2013	10	77	14%

Limitations of CDR

Risks of death vary by age, thus CDR is affected by distribution of population by age

Aging populations could have increasing CDRs , even though the health conditions are becoming better

LDCs with very young populations will often have lower CDRs than more developed countries even though their overall health conditions are poorer

CDR makes no allowance for the mortality pattern in a population by age.

- In most populations, mortality rates are very high in infancy, fall to a low-point in late childhood (around the age of 10), and increase with increasing age thereafter.

Limitations of CDR

- Differences between populations in the Crude Death Rate may reflect differences in their age structures rather than accurately reflect differences in individuals' propensity to die given their ages.

Thus, it is important that mortality comparisons across countries should always use mortality indicators that are adjusted for differences in age composition

Age-Specific Death Rates (ASDR)

ASDR: number of deaths in a year of people of a particular age (usually ages x to x+n) divided by the average number of people of that age in the population

$$\text{ASDR} = \frac{\text{\# of deaths in a year of people aged } x \text{ to } x+n}{\text{average \# of people in that year aged } x \text{ to } x+n} * 100,000$$

The denominator is taken as the (mid-year) population aged between x and x+n

Usually, n=5

CDR as weighted ASDR

- CDR is simply a weighted average of the age-specific death rates, where the weights are the proportions of the population at each age
- Relative sizes of different age groups determine their influence on the CDR
- As mortality varies greatly with age → a population's age structure strongly influences its CDR. Therefore, the measure is of limited use for comparing mortality in different populations

Life Table

'A powerful demographic tool used to simulate the lifetime mortality experience of a population, by taking that population's age-specific death rates and applying them to a hypothetical population of 100,000 people born at the same time' (cf The Johns Hopkins University and Henry Mosley 2006)

This was first used in 1662 by John Graunt to uncover patterns of mortality in London

Life Expectancy

‘Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.’ (World Bank)

Cohort Life Expectancy

- **Cohort life expectancy** : average life length of a particular cohort – (a group of individuals born in a given year)
- If we can track a group of people born in a particular year many decades ago & observe exact date in which each one of them died- we can calculate this *cohort's* life expectancy by simply calculating the average of the ages of all members when they died.

(Our World in Data)

Period Life Expectancy

- ‘Life expectancy in particular year : the age a person born in that year would expect to live if the average age of death did not change over their lifetime.’
- ‘Estimating average length of life for a *hypothetical* cohort assumed to be exposed, from birth through death, to the mortality rates observed at one particular *period* – commonly a year.’
- ‘This approach leads to what is known as ‘**period life expectancy**’ and it is the much more commonly used life expectancy metric. ’

- Used by UN, World Bank etc.
- (Our World in Data)

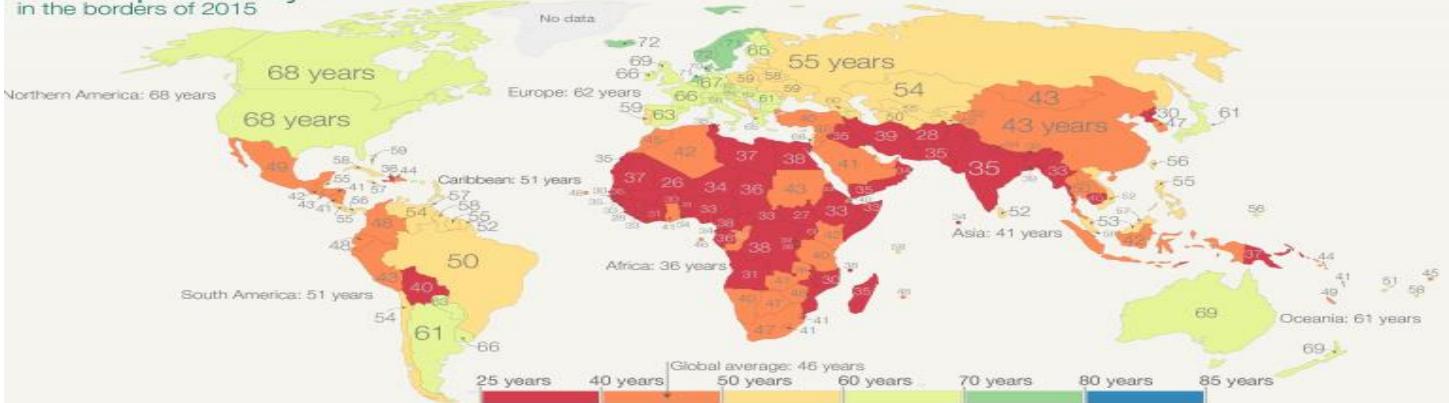
Life expectancy in 1800, 1950, and 2015

Our World
in Data

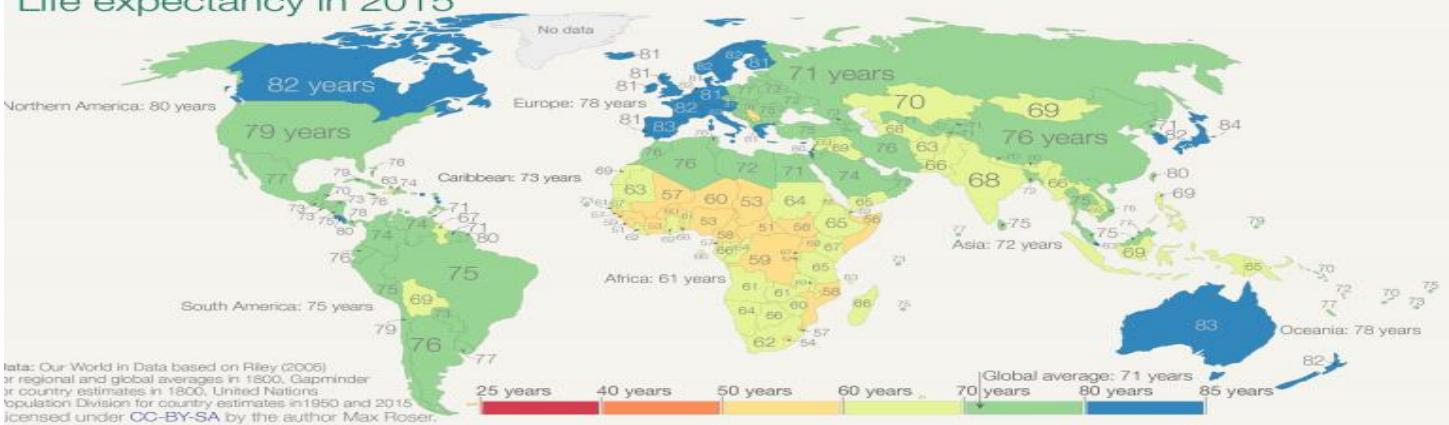
Life expectancy in 1800 in the borders of 2015



Life expectancy in 1950 in the borders of 2015



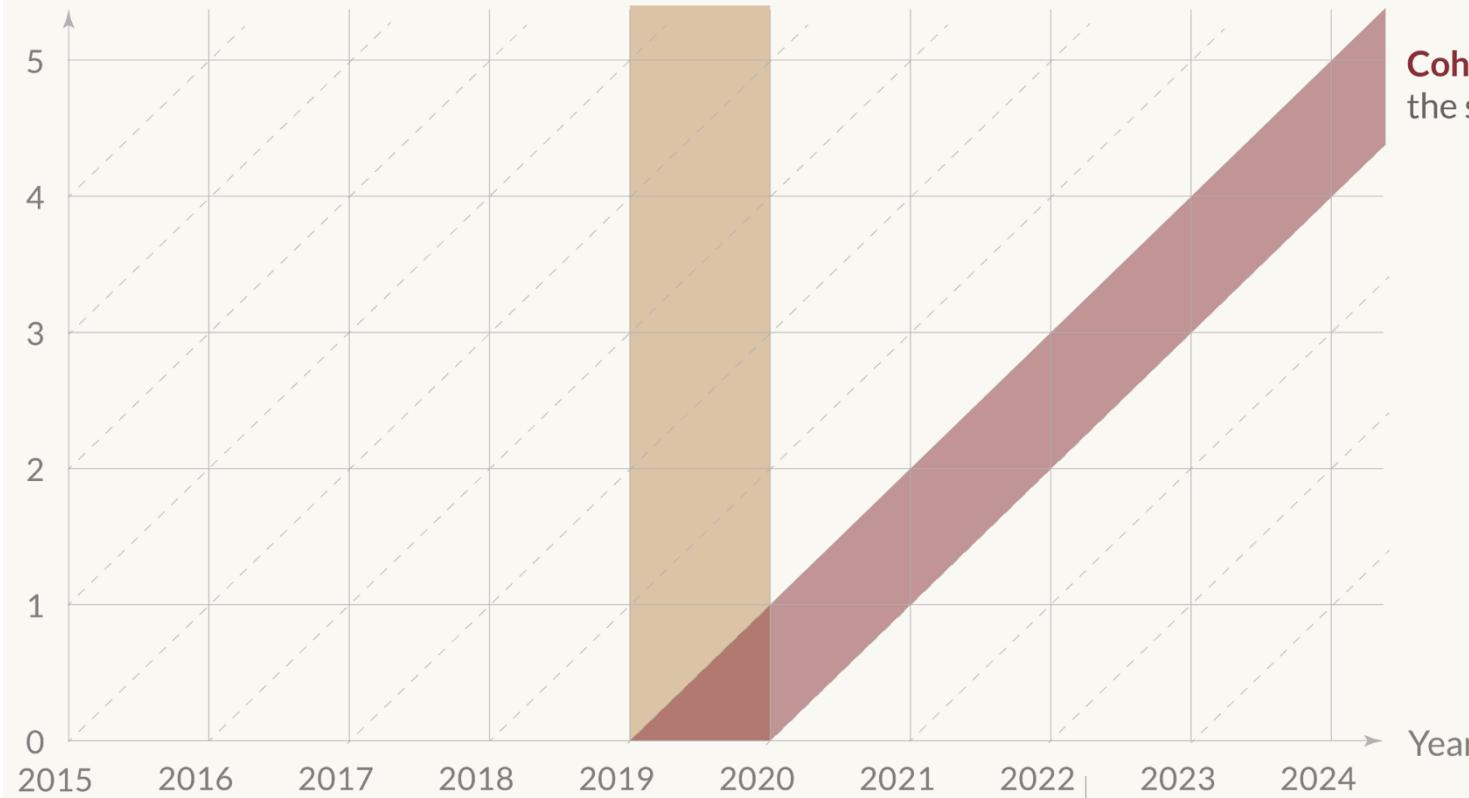
Life expectancy in 2015



Age

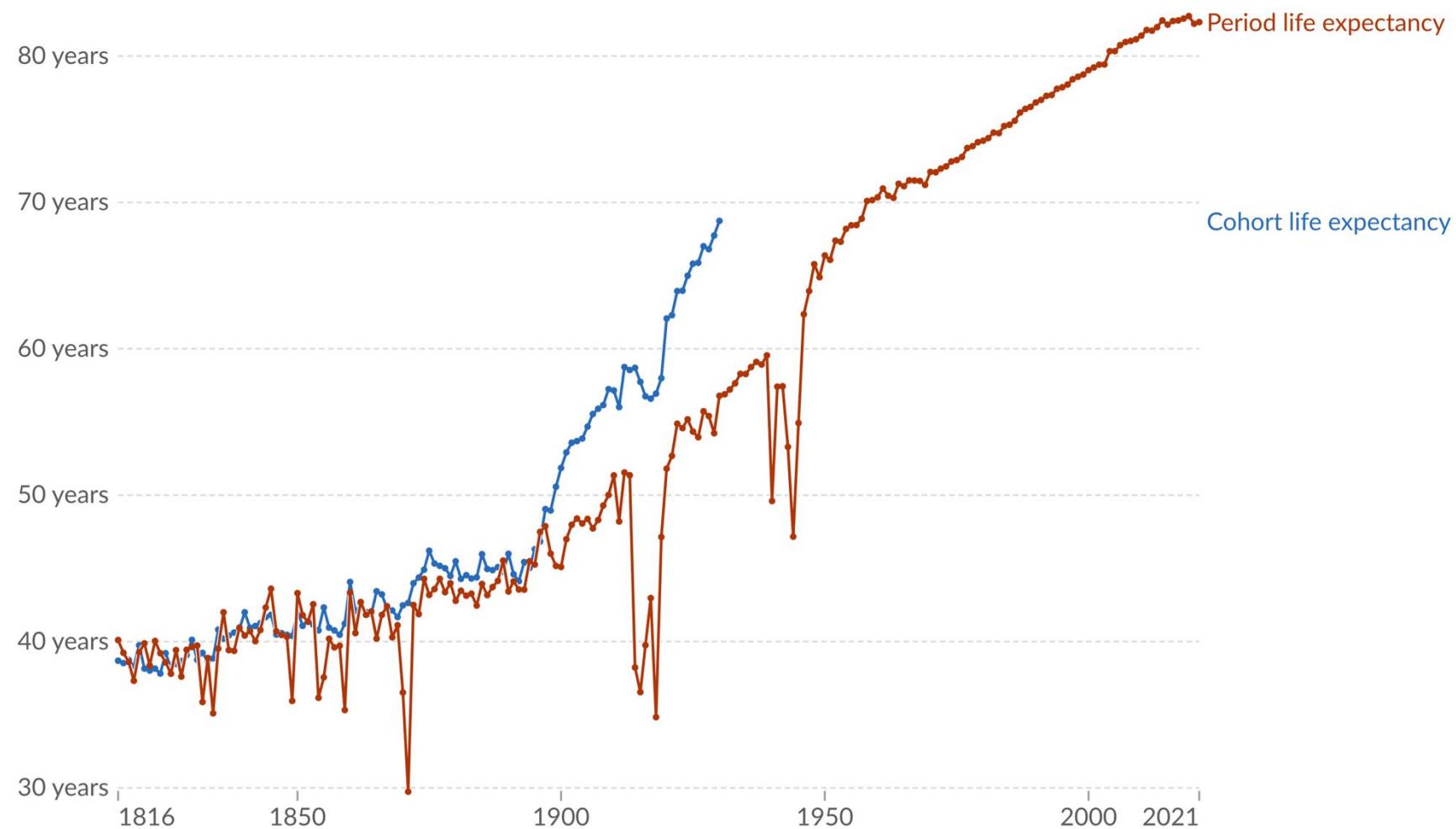
Period: a snapshot of a group of people at a given time

Cohort:
the same group tracked over time

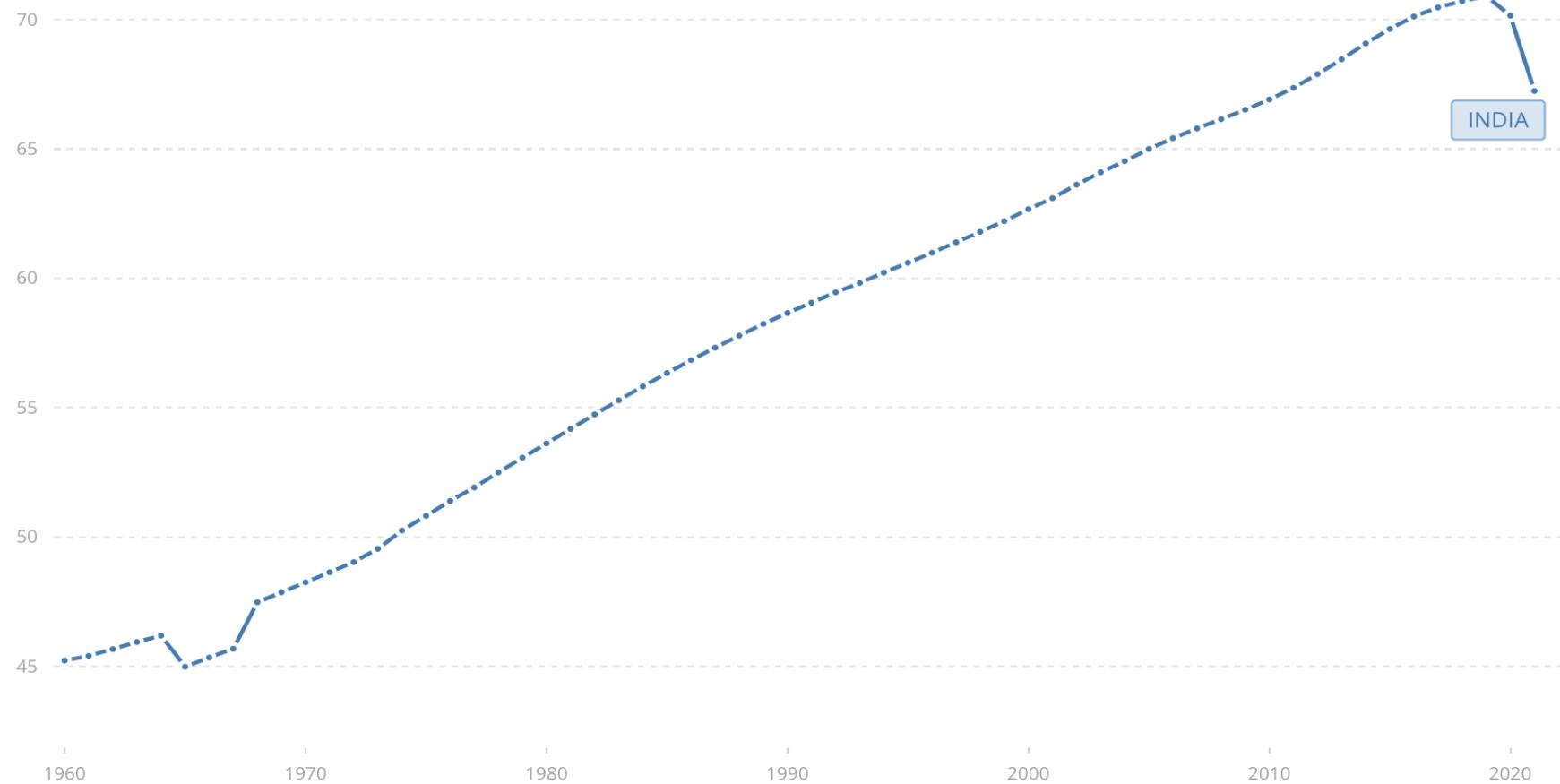


Period versus cohort life expectancy in France

Two different approaches to calculating life expectancy at birth are compared: period life expectancy¹ (based on death rates in one particular year) and cohort life expectancy² (based on average lifespans).



Life Expectancy at Birth (India) (World Bank Data)



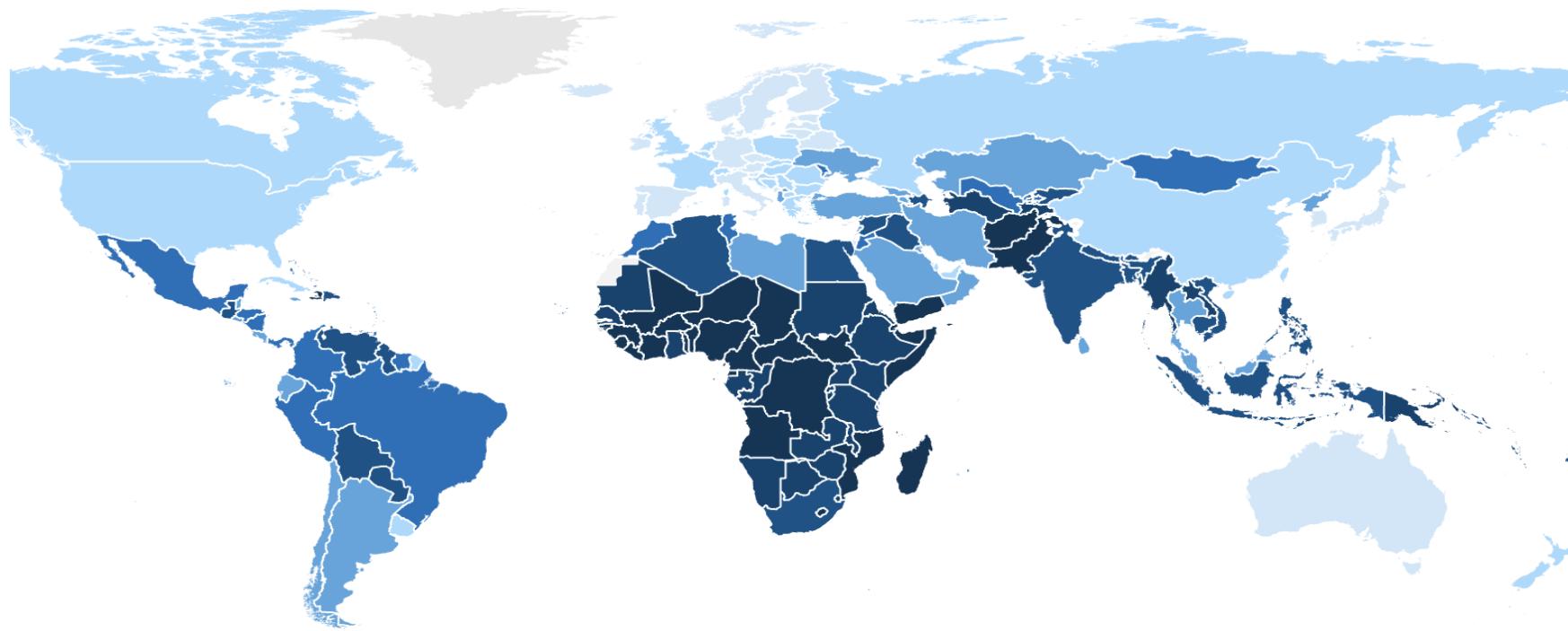
Infant Mortality Rate (IMR)

Infant Mortality: death of an infant before his or her first birthday

'IMR is the number of infant deaths for every 1,000 live births'(CDC)

$$\text{IMR} = \frac{\text{No. of deaths of an infant in a given year}}{\text{total live births in that year}} * 1000$$

Infant Mortality Rate (IMR) (Source: World Bank)



Rate per 1,000 live births

1

78

Data not available

Maternal Mortality Ratio (MMR)

Definition from UNICEF:

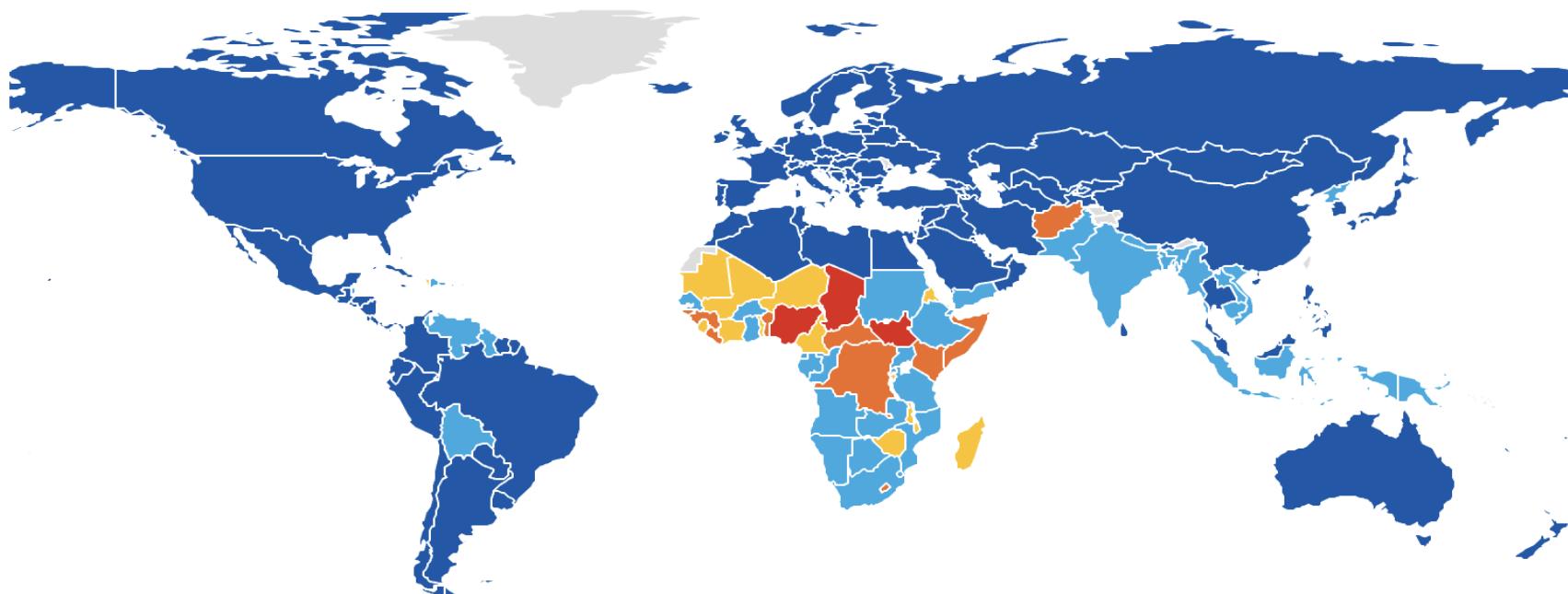
Maternal mortality refers to deaths due to complications from pregnancy or childbirth

Maternal mortality ratio (MMR) is the ratio of the number of maternal deaths per 100,000 live births

Between 2000 & 2020, the maternal mortality ratio dropped by about 34% worldwide—from 342 deaths to 223 deaths per 100,000 live births, according to UN inter-agency estimates

Sustainable Development Goals (SDG) decreasing global MMR to less than 70 per 100 000 births

Maternal Mortality Ratio (MMR) (maternal deaths per 100,000 live births) in 2020



- Very Low (<100)
- Low (100-299)
- High (300-499)
- Very High (500-999)
- Extremely High (>1000)

FERTILITY KEY MEASURES

Today's Class

- Commonly used measures of fertility
- Dynamics of Population Change

Today's Class

What is Fertility?

- Biological Component
- Social Component

Why is fertility more difficult to measure as compared to mortality?

Measures of Fertility

- Crude birth rate
- General fertility rate
- Age-specific fertility rate
- Total fertility rate

What is Fertility

In studies of demography, fertility is defined as the number of children born to a woman.

High-fertility society: most women have several children

Low-fertility society: most women have few children

2 components of fertility:

1. biological
2. social

Biological Component of Fertility

Fecundity: the physiological potential of women to bear children (people who cannot reproduce are infecund/sterile/infertile)

Natural fertility: the level of reproduction that exists in the absence of deliberate birth control

Childbearing age for women is normally 15 – 49 years, though births outside that age range can and do occur.

Total number of possible births for an average woman

Assume you and partner(s) are fully fecund;

First pregnancy at age 15; Little less than 9 months per pregnancy (to account for some pregnancy loss);

18 months between the end of one pregnancy and the start of the next;

Thus, a woman could have a child every 2.2 years between ages 15 and 49;

Which equals 16 live births

Total number of possible births for an average woman

No known society has ever had 16 births on average. Why?

- Health and mortality experience of mothers
- Poor nutrition (raises age at menarche, and also produces anovulatory cycles in which no egg is released)

“Natural fertility” may be closer to 6 or 7 children per woman (matching the high mortality)

The Hutterites have come the closest with 11 children per woman in the 1930s:

- Early age at marriage, good diet, good medical care, regularly engage in intercourse without contraception or abortion.

Social Component of Fertility

Whether children will be born and if so, how many, is largely a result of the social environment in which people live.

Watch video below: Fertility rate over the long term 1544-2017

<https://ourworldindata.org/grapher/fertility-rate-complete-gapminder>

<https://ourworldindata.org/grapher/children-born-per-woman-world-bank?time=2019>

How do we measure Fertility?

Why is Fertility more difficult to measure than Mortality?

The entire population is not subject to the risk of having a birth.

The event of birth occurs to both a child and parents, characteristics of child as well as the parents are needed.

Fertility is typically measured only in relation to the mother.

The same person may have more than one birth but may only die once.

There are minimum and maximum ages at which men and women are physiologically capable of reproduction

Why is Fertility more difficult to measure than Mortality?

Regarding the denominator of a fertility rate, not every woman is truly exposed to the risk of childbearing

Fertility behavior is more influenced by preferences, motivations, social status, etc., than is mortality

The female and male populations exposed to the risk of childbearing are not ordinarily decreased by having a birth

In at least one instance, deaths are more difficult to analyze than births: Birth affect only initial age of the age distribution, whereas deaths affect the entire age distribution

How is Fertility Measured?

Period measures include:

- Crude birth rate
- General fertility rate
- Age-specific fertility rate
- Total fertility rate

Cohort measure—Completed family size

Fertility intentions (Next Week)

Measuring Fertility

Basic goal is to estimate the number of children that women are having

Period vs. cohort Data:

- Period data: refer to a particular calendar year and represent a cross section of the population at one specific time
- Cohort data: measures the fertility of groups of women as they age through their childbearing years

Crude Birth Rate (CBR)

$$\text{CBR} = \frac{\text{Number of Live Births in Year } z}{\text{Mid-Year Population in Year } z} * 1000$$

Calculated for the entire population

The CBR for year **z** is the number of births in year **z** divided by the midyear population in the year **z**, multiplied by a constant of 1,000

Crude Birth Rate (CBR)

Crude because:

- a) doesn't take into account which people in the population were at actual risk of having births,
- b) ignores age-structure of the population, that can greatly impact no. of live births expected in a given year

In 2021 the CBR for the world was estimated to be 17 per 1000 (in 2010 it was 19.78 per 1000 and 21.649 per 1000 in 2000)

More Information can be found here:

<https://data.worldbank.org/indicator/SP.DYN.CBRT.IN>

General Fertility Rate (GFR)

$$GFR = \frac{\text{Number of Births in Year } z}{\text{Mid-Year Population of females aged 15–44 in year } z} * 1000$$

The numerator is the number of births in year z ; and the denominator is the midyear population of females in year z

The age range is from 15 – 44 years of age.

Improvements over CBR:

1. Uses info about the age and sex structure of a pop to be more specific about who is at risk of giving birth in a given year
2. More accurate picture of the actual level of reproduction

Age Specific Fertility Rate (ASFR)

$$\text{ASFR} = \frac{\text{Births in a year to women aged } x \text{ to } (x+n)}{\text{Total women aged } x \text{ to } (x+n)} * 1000$$

Usually five year age groups are used to calculate each ASFR.

Usually low to moderate in the 15-19 age group, highest in the 20's and then decline to moderate levels for women in their 30's; and very low for women over age 39

One of the most precise ways of measuring fertility

Data needed: births according to age of mother and distribution of total pop by age and sex

Total Fertility Rate (TFR): WHO Definition

- Average no. of births a hypothetical cohort of women would have at the end of their reproductive period if they were subject during their whole lives to the fertility rates of a given period and if they were not subject to mortality
- Expressed as births per woman
- Total fertility rate (TFR) is the sum of the age-specific fertility rates for all women multiplied by five
- The age-specific fertility rates are those for the seven five-year age groups

Total Fertility Rate (TFR)

$$TFR = \sum ASFR * n$$

Calculated by summing the ASFR's and multiplying the result by the width of the age interval of the ASFR's

n = usual width of the age-interval, Usually, n=5

Useful in interpreting the cumulative fertility implied by a given set of ASFR's

No. of children who would be born per woman (or per 1,000 women) if she/they were to pass through the childbearing years bearing children according to a current schedule of age-specific fertility rates.

Calculate TFR

<u>Age</u>	<u>Births</u>	<u>Population</u>
15 – 19	494,357	9,493,761
20 – 24	965,122	8,678,024
25 – 29	1,083,010	9,341,226
30 – 34	889,365	10,179,403
35 – 39	424,890	11,369,766
40 – 44	81,027	11,049,377
45 – 49	3,624	9,607,011
Total	3,941,395	69,718,568

Calculation of Age Specific Fertility Rates

<u>Age</u>	<u>Births</u>	<u>Population</u>	<u>ASFR</u>
15 – 19	494,357	9,493,761	52.1
20 – 24	965,122	8,678,024	111.2
25 – 29	1,083,010	9,341,226	115.9
30 – 34	889,365	10,179,403	87.4
35 – 39	424,890	11,369,766	37.4
40 – 44	81,027	11,049,377	7.3
45 – 49	3,624	9,607,011	0.4
Total	3,941,395	69,718,568	411.7

Calculation of Age Specific Fertility Rates

$$\text{TFR} = \Sigma \text{ASFR} * 5$$

$$= 411.7 * 5$$

$$= 2058.5$$

You can then divide the number by 1,000

$$\text{TFR}=2.058$$

Dynamics of Population Change (1 of 3)

- **Rates of population growth or decline (when net migration=0):** A measurement of population change calculated by subtracting the yearly number of deaths per 1,000 from the number of births per 1,000.
- The world population is increasing 1.1 percent each year (around 2016-2018), which is half the rate of fifty years ago.
- Although the population explosion is slowing, it will still result in several billion more people because population growth is exponential.

Dynamics of Population Change (2 of 3)

- **Exponential growth in population**
- **Doubling time:** The time it takes for a particular level of population to double.
- The formula used to calculate doubling time is 70 divided by the current growth rate.
- Virtually all industrialized countries have growth rates of less than 0.6 percent.

Dynamics of Population Change (3 of 3)

- The poorest countries in the world have the highest crude birthrates and therefore the fastest-growing populations.
- A young, poor population creates numerous social and economic challenges, including a lack of education and underemployment or unemployment.
- Poor countries consume far less than rich countries, but their more rapidly growing populations require additional resources.

DEMOGRAPHIC PERSPECTIVES

Today's Class

- Demographic Perspectives
 - Focus on Modern Theories of Population
- a) The Malthusian Perspective
- Causes and Consequences of Population Growth
 - Critique of Malthus
 - Neo-Malthusians
- b) The Marxist Perspective
- Causes and Consequences of Population Growth
 - Critique of Marx

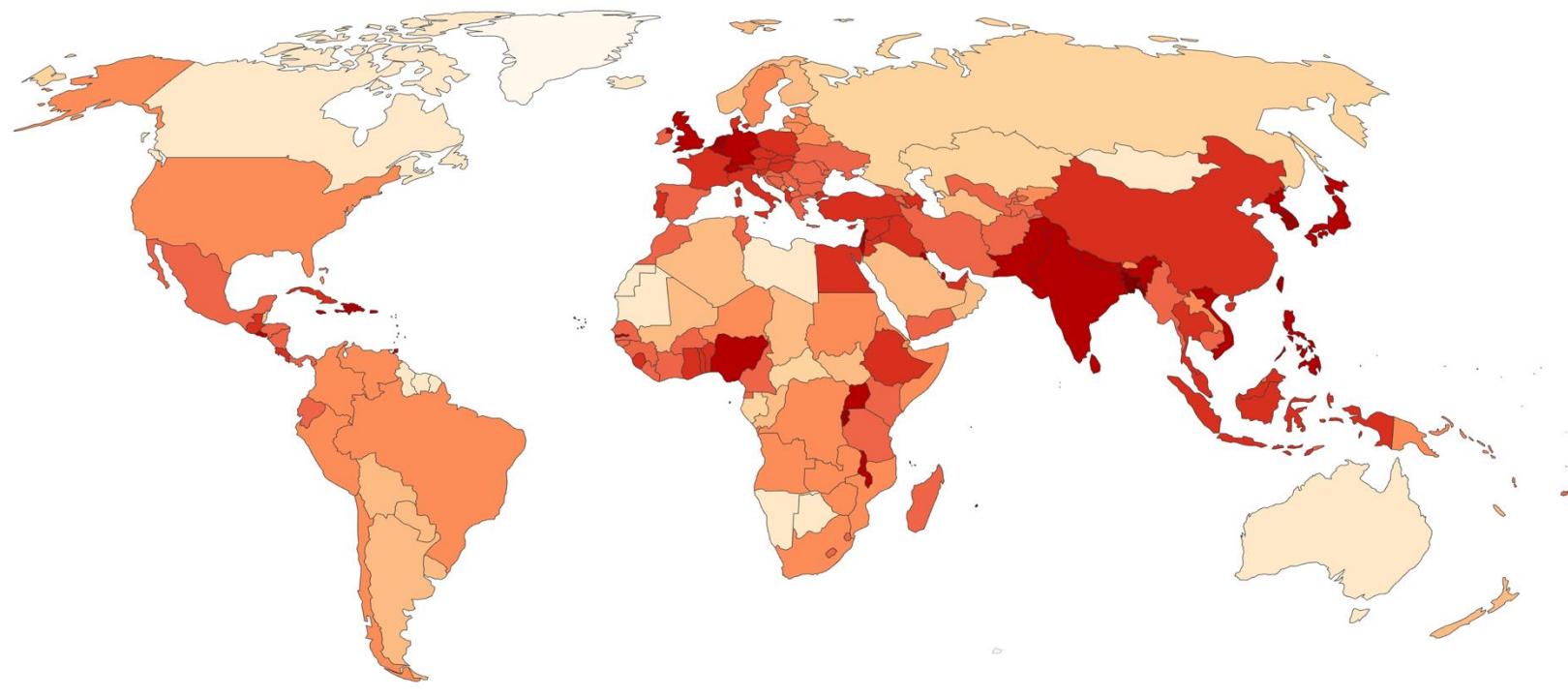
Today's Class

c) Prelude to Demographic Transition Theories
(Dumont/Durkheim)

d) Theory of The Demographic Transition
Critique of the Demographic Transition Theory
Reformulation of the Demographic Transition Theory
Theory of Demographic Change and Response
Cohort Size Effects
Is there something beyond demographic Transition?

Population density, 2022

The number of people per km² of land area



Source: HYDE (2017); Gapminder (2022); UN WPP (2022); UN FAO (2022)
OurWorldInData.org/world-population-growth • CC BY

Demographic Perspective

Definition: “a way of relating basic information to theories about how the world operates demographically”.

2 levels of population theory:

- Technical (biomedical and mathematical models that predict changes in components of demography such as fertility, mortality, age/sex structure of the population)
- Theoretical (relates demographic processes to real events in the social world)

2 Main Questions:

- What are the causes of population growth?
- What are the consequences of population growth?

Modern Theories of Population

Date	Demographic Perspective
1798	Malthus—population grows geometrically, food supply grows arithmetically; poverty is the result in the absence of moral restraint.
~1800	Neo-Malthusian—birth control measures are appropriate checks to population growth.
~1844	Marxist—each society has its own law of population that determines consequences of population growth; poverty is not the natural result of population growth.

Modern Theories of Population

Date	Demographic Perspective
1945	Demographic transition in its original form—the process whereby a country moves from high birth and death rates to low birth and death rates.
1962	Earliest studies suggesting the need to reformulate demographic transition theory.
1963	Theory of demographic change and response--demographic response made by individuals to population pressures is determined by the means available to them to respond; causes and consequences of population change are intertwined.

Modern Theories of Population

Date	Demographic Perspective
1968	Easterlin's relative cohort size hypothesis —the standard of living you experience in late childhood is the base from which you evaluate your chances as an adult
1971–present	Decomposition of the demographic transition into its separate transitions—health and mortality, fertility, age, migration, urban, and family and household.

The Malthusian Perspective

Human beings are impelled to increase the population of its species by a powerful “instinct,” the urge to reproduce.

The ultimate check to growth is lack of food (the “means of subsistence”)

However, population has the potential to grow geometrically while the food production only increases arithmetically.

The lack of food will ultimately put a stop to population growth eventually.

The Malthusian Perspective

Positive checks: the “something else” (beside starvation) that contributes to pop decline; more specifically, causes of mortality (for e.g. famine, war etc.)

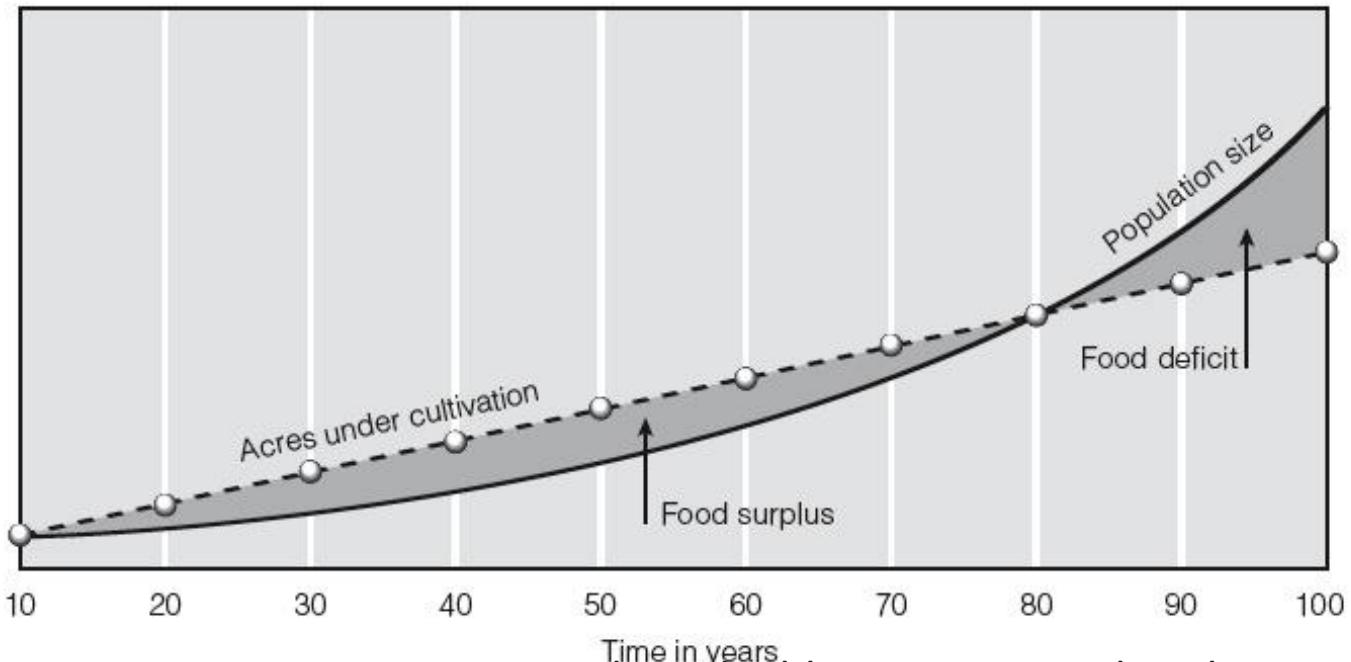
Preventive checks: any means of birth control

Moral restraint: postpone marriage, remain chaste before marriage

Malthus → moral restraint was the only acceptable means of “birth control”

These checks would prevent us from growing at our biological maximum

The basic (and wrong) Malthusian ideas about the growth of population and the food supply (Source: Weeks 12th Edition)



If we start with 100 acres supporting 100 people and add 100 acres per decade (arithmetic) while the population increases 3% per year (geometric) there will be a few decades of food surplus before growth overtakes increased cultivation, producing a food deficit.

Critiques of Malthus

Malthus was extremely pessimistic.

He believed that the urge to reproduce will drive population growth, which leads to poverty, since the means of subsistence can never keep up with population growth

Scholars have critiqued 3 main aspects of Malthus's theory:

1. Food production could not keep up with pop growth
2. Poverty inevitable result of pop growth
3. Moral restraint only acceptable preventive check

Critiques of Malthus

Assertion that food production could not keep up with population growth

- Charles Darwin's thinking was stimulated by this error in Malthus' reasoning. Humans were no different than all living organisms, including corn, in the ability to increase at a geometric rate. We are all competing for space and resources.

Marx and Engels rejected his conclusion that poverty was an inevitable result of population growth.

Belief that moral restraint (avoiding intercourse until marriage and only marrying when you can afford the subsequent children) was the only acceptable preventive check.

Neo-Malthusian Perspective

Reject the moral restraint of Malthus's argument, but accept most of his other conclusions

Neo-Malthusians agree that resources are limited, but argue that people should use birth control.

- Paul Ehrlich—*Population Bomb*
- Garrett Hardin—*Tragedy of the Commons*

Tragedy of commons:

<https://www.youtube.com/watch?v=CxC161GvMPc>

The Marxist Perspective

Instead of believing in the “natural” or “eternal” law of population, the Marxists believe that it is important to put it in a particular social and economic environment.

- For capitalism, the consequences are overpopulation and poverty.
- For socialism, population growth is readily absorbed by the economy with no side effect.

The Marxists rejected the notion that poverty can be blamed on the poor.

Poverty is not a “natural” consequence of population growth.

The problem lies in the distribution of goods, not the production.

The Marxist Perspective

In a capitalist society, the capitalists were skimming off some of the workers' wages as profits for themselves.

Therefore, they gained more wealth while the working class got poorer.

Marx argued that capitalism worked by using the labor of the working class to buy machines that would replace the laborer, which consequently led to unemployment and poverty.

The normal consequence of population growth should be a significant increase in production.

In a well-ordered society (unlike the capitalist society), if there were more people, there ought to be more wealth, not more poverty.

Critique of Marx

Marx argued that there would be no population problems under pure socialism.

He offered no guidelines for the transition period.

Instead, population problems exist in both the former Soviet Union and China

China's one-child policy

The rapid rise in population raised concerns from the leaders.

The family planning policy was launched in 1979, under the slogan of one child per couple. This became the largest family planning program in the world.

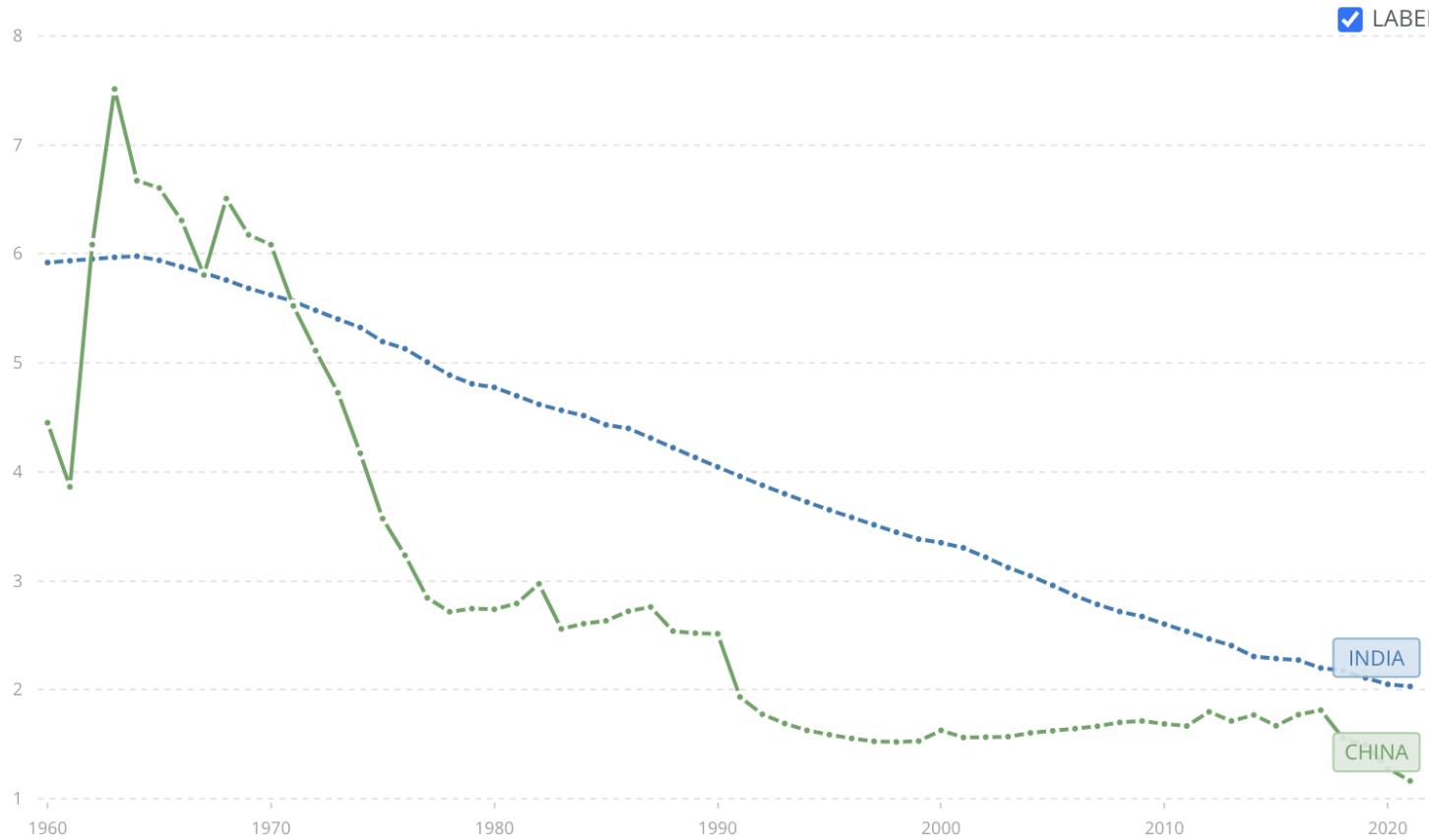
The state not only mandated a minimum age at marriage and a maximum number of children, but also promoted mandatory abortion, mandatory IUD insertion and retention and mandatory sterilization to achieve population goals.

China ended the one child policy in 2015.

Video : [Invisible Lives: A Legacy Of China's Strict Family Planning Rules](#)

https://www.youtube.com/watch?v=flb_S5JJC4k

Total Fertility Rate: Trends



Source: World Bank

Why China's population is shrinking

<https://www.youtube.com/watch?v=gmehUgOy5ok>

Arsène Dumont

Late 19th century French demographer who felt he discovered a new principle of population called “social capillarity”.

- The desire of people to rise on the social scale, to increase their individuality as well as their personal wealth.

To ascend the social hierarchy requires that sacrifices be made, including using birth control to have a small family.

He was opposed to this idea because he thought that France's birth rate was too low.

Émile Durkheim

French sociologist who based an entire social theory on the consequences of population growth.

Population growth leads to greater division of labor and more societal specialization, because the struggle for existence is more acute when there are more people. This leads to greater economic well-being.

Demographic Transition Theory

Transition from high birth and death rates to low birth and death rates

3 groups of countries (Thompson 1929):

Group A: transition complete – population stabilizing

Group B: transition underway

Group C: transition not yet begun

Growth Patterns of each country group (Norstein 1945):

Group A: incipient decline

Group B: transition growth (also known as population explosion – Kingsley Davis 1945)

Group C: high growth potential

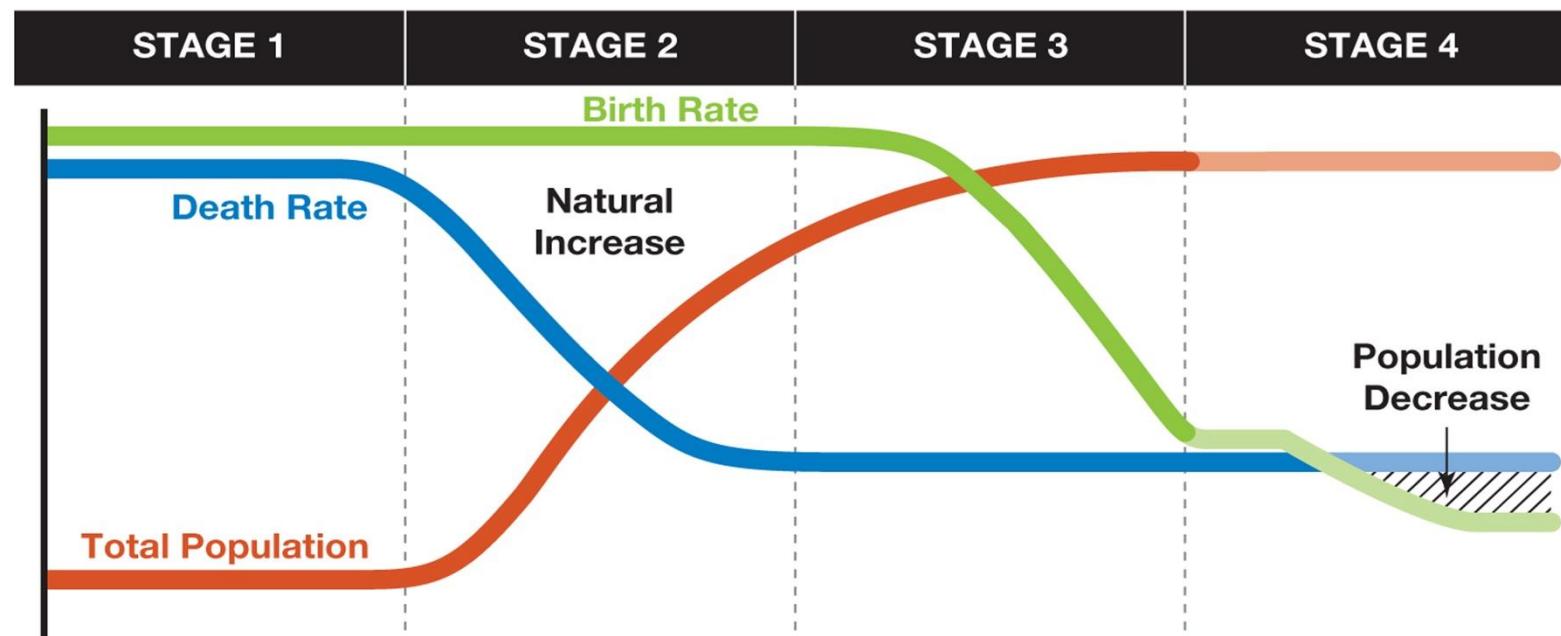
Demographic Transition Theory

Original model divided roughly into three stages:

1. Birth and death rates are high.
2. Transition from high to low birth and death rates. The growth potential is realized as death rate drops before the birth rate drops, resulting in rapid population growth.
3. Death rates are as low as they are likely to go, while fertility should go down to a level equal to the death rate.

The Demographic Transition (Source: Giddens et al.12th Edition)

Figure 19.1
DEMOGRAPHIC TRANSITION



Both birthrates and death rates are high. Population grows little, if at all.

Death rates fall while fertility remains high, resulting in a phase of marked population growth.

Birthrates drop and population stabilizes.

Birthrates continue to drop while death rates remain stable. Population grows very slowly or, in some cases, declines.

Modernization Theory underlies the Demographic Transition

Premodern times, human society governed by “tradition”, but industrialization and economic changes forced society to alter traditional institutions.

Traditional Societies= fertility and mortality are high

Modern Societies = fertility and mortality are low

In between is demographic transition

This theory allowed demographic transition to move from a description of the world to a theory or demographic perspective

Modernization Theory underlies the Demographic Transition

Modernization theory:

- Industrialization forces societies to alter traditional institutions.
- Death rates declined as the standard of living improved.
- Decline of birth rate lagged that of mortality decline because the social and economic institutions that favored high fertility required time to adjust to the lower levels of mortality.

Application in the non – European countries - mortality decline has preceded fertility decline and has led to population growth. However, theory offers little insight about the pace and timing of fertility decline.

Modernization Theory underlies the Demographic Transition

Macro-level theory that sees human actors as being buffeted by changing social institutions.

Individuals did not deliberately lower their risk of death to precipitate the modern decline in mortality.

Society wide increases in income and improved public health infrastructure brought about this change.

Critique of Demographic Transition Theory

Ethnocentric: the path that developed countries took to develop is the same path that developing countries should take.

Many things vary

- birth rates much higher in developing countries compared to birth rates prior to transition in developed countries
- Levels of mortality also higher
- Transition occurred due to internal economic development, not as a result of foreign intervention
- Modernization did not provide the most accurate picture of what actually occurred in developed countries

Reformulation of Demographic Transition Theory

Widely different social, economic, and demographic conditions in European countries during fertility decline (not single model)

- Fertility in Spain declined in contiguous areas in spite of very different levels of development
- Fertility decline in Belgium was faster in French speaking areas than Flemish areas

Economic development is sufficient, but not necessary for fertility decline.

Secularization also common as precursor to fertility decline

- Movement from religious-based belief to a reliance on the self for one's own well-being
- Behavioral change spreads rapidly through social networks

Theory of Demographic Change and Response

This theory was advocated by Kingsley Davis. The main theme of this theory was that people respond to demographic changes in terms of personal gains.

Decreasing death rates and a greater number of surviving children puts pressure on resources.

Parents respond to this by working harder and longer.

If there are not enough local jobs to go around as children grow up so they migrate elsewhere.

This new generation of grown up children limit family sizes to avoid putting pressure on resources and gaining more prosperity.

Cohort Size Effects

Demographic metabolism: Proposed by Norman Ryder in 1965. Over time, each age group in society is replaced by the next younger age group of people. To the extent that the new cohort is different from the one preceding it, society will change over time

Easterlin's relative cohort size hypothesis: The standard of living you experience in late childhood is the base from which you evaluate your chances as an adult.

- If you can improve your income as an adult compared to your childhood level, you are more likely to marry early and have several children.
- If young people relatively scarce & business good, they will get high wages, and be more comfortable about marrying and having children
- Conversely, if young people are abundant in supply, even if business is good, stiff competition, difficult to maintain certain standard of living, thus delayed marriage & smaller family sizes.

Application of Demographic Metabolism

nature
climate change

PERSPECTIVE

PUBLISHED ONLINE: 2 MARCH 2017 | DOI: 10.1038/NCLIMATE3222

Forecasting societies' adaptive capacities through a demographic metabolism model

Wolfgang Lutz and Raya Muttarak*

In seeking to understand how future societies will be affected by climate change we cannot simply assume they will be identical to those of today, because climate and societies are both dynamic. Here we propose that the concept of demographic metabolism and the associated methods of multi-dimensional population projections provide an effective analytical toolbox to forecast important aspects of societal change that affect adaptive capacity. We present an example of how the changing educational composition of future populations can influence societies' adaptive capacity. Multi-dimensional population projections form the human core of the Shared Socioeconomic Pathways scenarios, and knowledge and analytical tools from demography have great value in assessing the likely implications of climate change on future human well-being.

Education..

- Influences cognitive function, attitudes, & behaviors & equips us with better social and economic opportunities
- Reduces vulnerability via mediating factors for e.g. improved socioeconomic status & social capital
- Provides better access to loans & credits & more assets & social networks that give a wider range of coping strategies
- Facilitates decision-making related to disaster risk reduction measures such as construction practices & location decisions
- Increases options to diversify livelihood and sources of income when facing climate pressure. E.g. migration as an adaptation strategy to cope with livelihood disruptions due to environmental change involves more educated members

Education

- At the community & household level:
 - a) helps people maintain welfare and level of consumption after being affected by disaster shocks
 - b) lowers likelihood of damages to residential property & economic losses
 - c) increases likelihood of carrying out adaptation actions such as changing crop types, planting & harvesting dates, methods of farming and using improved type of seed among better educated household

Application of Demographic Metabolism

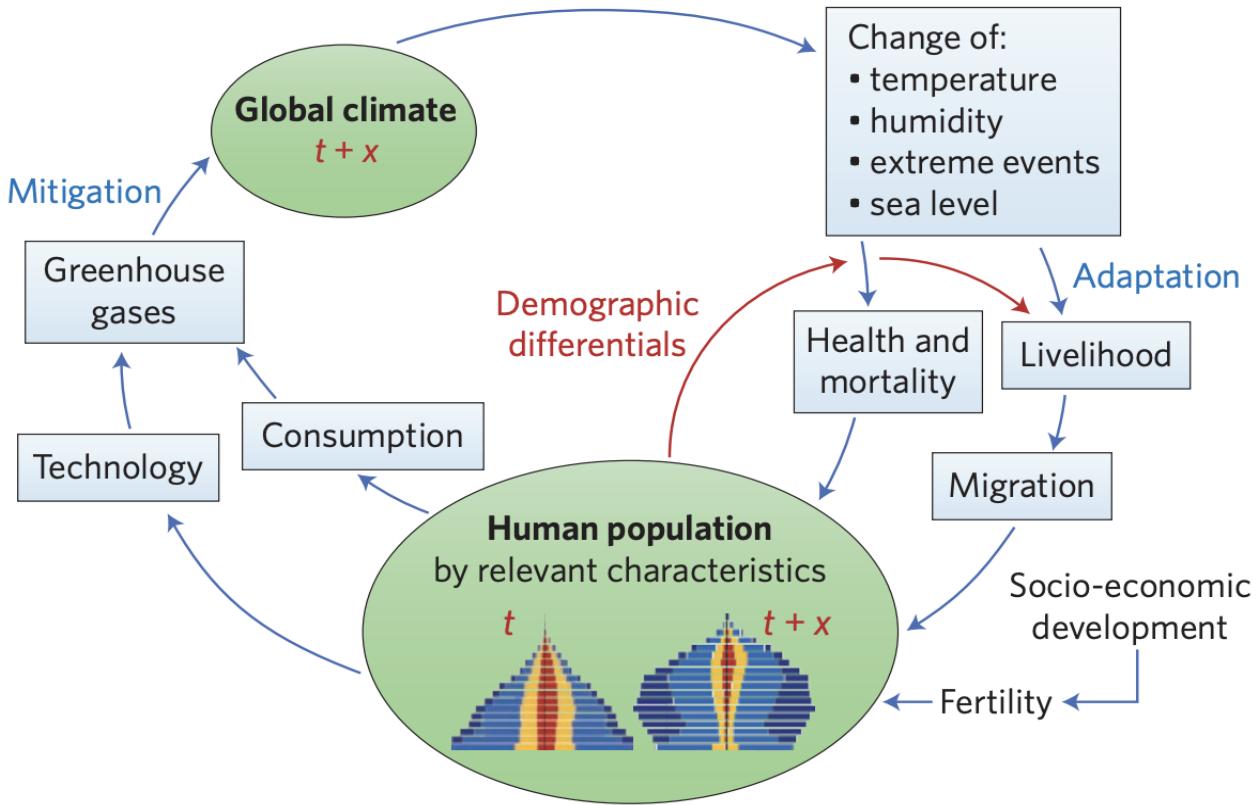


Figure 1 | Circular link between human population and global climate systems.

Application of Demographic Metabolism

PERSPECTIVE

NATURE CLIMATE CHANGE DOI: 10.1038/NCLIMATE3222

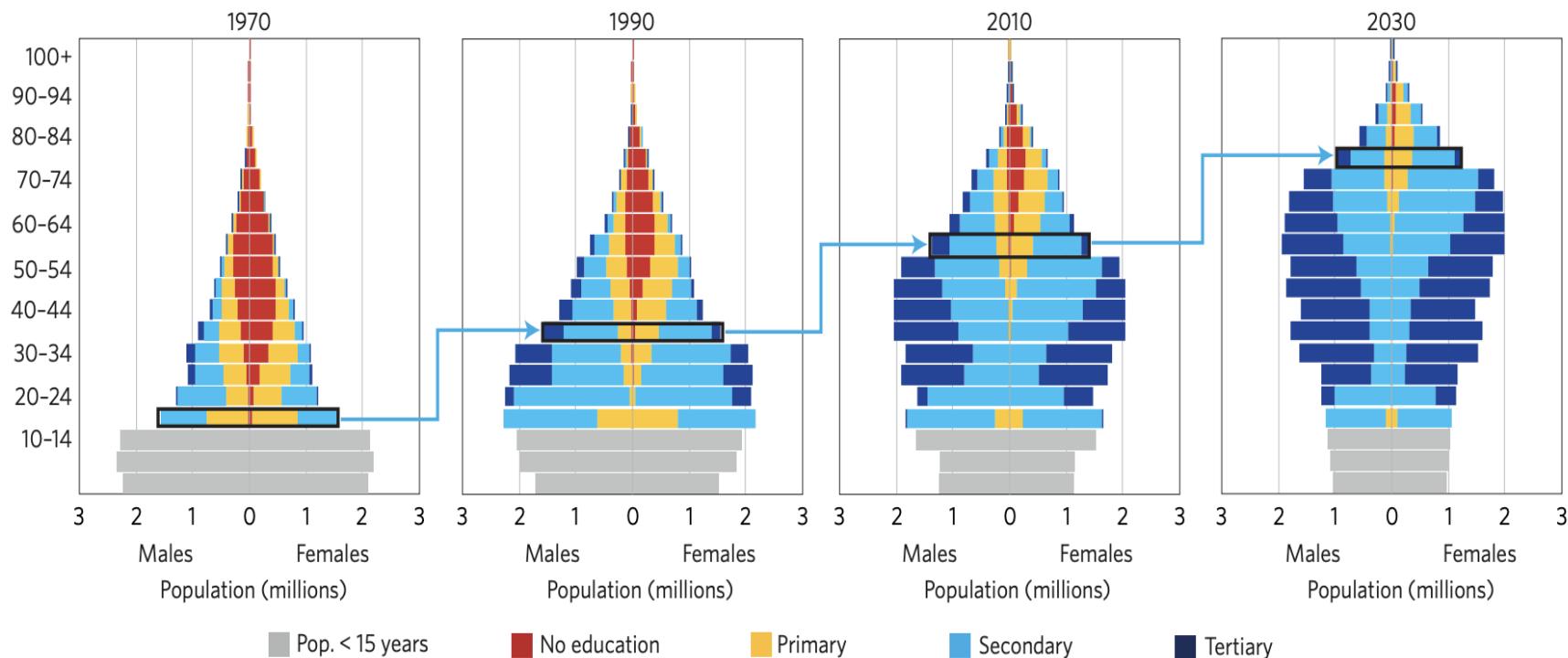


Figure 2 | Age and education pyramids for the Republic of Korea 1970-2030 in 20-year intervals. Colours indicate highest level of educational attainment. Children aged 0-14 are marked in gray. The blue line links the identical birth cohorts at different points in time when they are of different ages but maintain their highest education attainment level as it is typically established before age 30.

Beyond the Demographic Transition

Original assumption was that populations seek homeostasis—stability in size with birth rates equal to death rates. When reached, the transition would end.

However, we see that, over the past few decades new patterns have emerged of persistent below-replacement fertility—labeled the “Second Demographic Transition.”

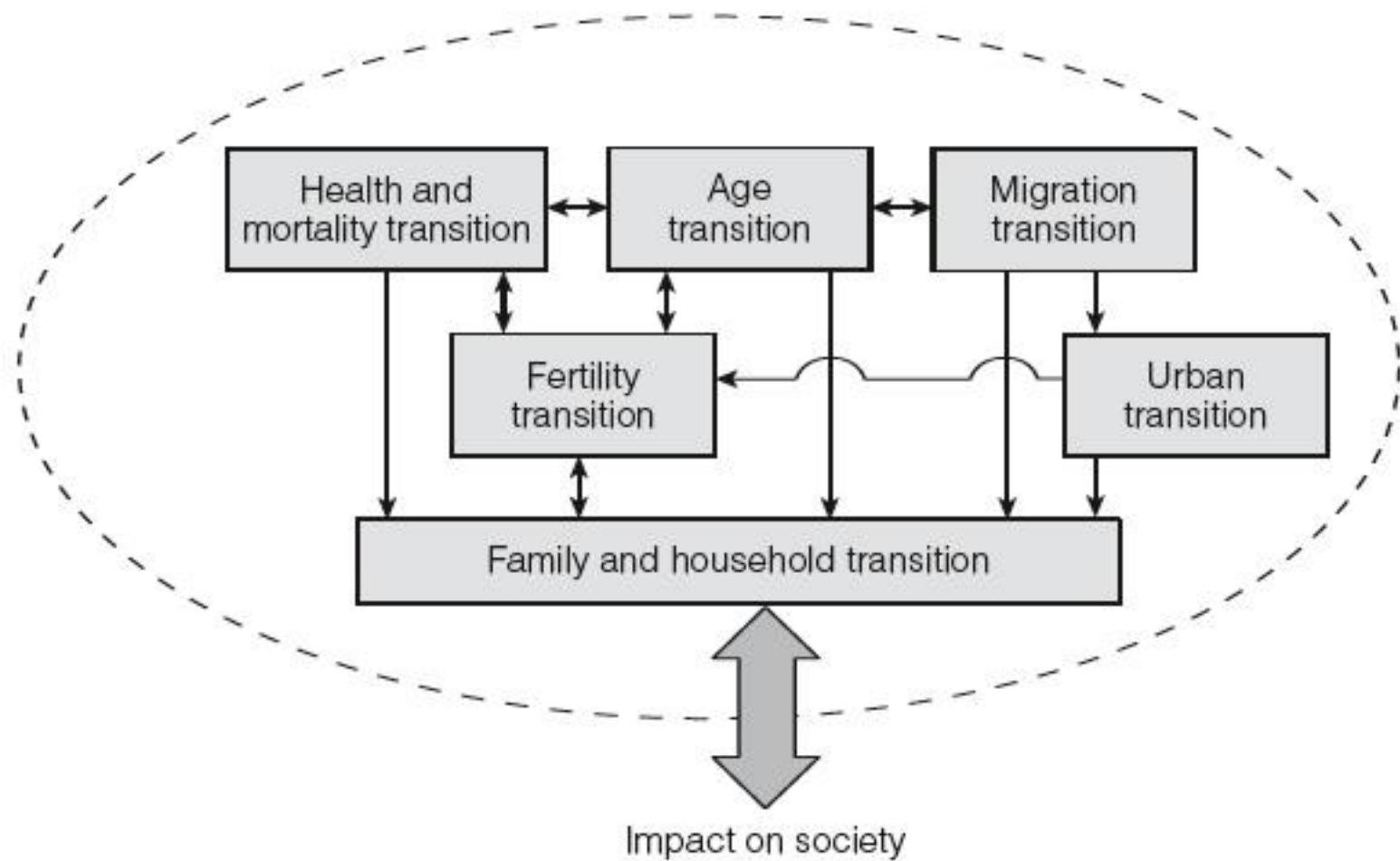
In richer countries fertility has declined beyond replacement levels, Dirk van de Kaa suggested that the change was not just having fewer children, it was also about personal freedom to do what they want to do particularly for women

This transition would be associated with a postponement of marriage, rise in single living, cohabitation etc. (for e.g. Lesthaeghe and Neels 2002)

Second Demographic Transition?

- **Second demographic transition:** A new demographic model that calls for fertility rates that may continue to fall because of shifts in family structure.
- Key influences include delayed marriage, delayed childbearing, rising rates of cohabitation, high, steady rates of divorce, and the relative ease of obtaining effective means of birth control.
- These circumstances arguably lead to lower birthrates, because under such conditions, many people may prefer not to have children.

Demographic Transition as a set of Transitions



Transitions

Health & Mortality transition: shift from deaths at younger ages due to communicable disease to deaths at older ages due to degenerative disease

Fertility transition: shift from “natural” (high) fertility to controlled (lower) fertility

Migration transition: growth in the number of young people in rural areas will lead to an oversupply of young people looking for jobs, which encourages people to leave in search of economic opportunity.

Urban transition: begins with migration from rural to urban areas and morphs into urban “evolution” as most humans are born in, live in, and die in cities.

Age Transition: changing numbers and percentages of people at each age and sex as mortality and fertility decline, and as migrants flow in and out—the “master transition” because it forces change in societies.

Family & Household Transition: structural changes that accompany family life in light of these other transitions

FERTILITY TRANSITION

Today's Class

Role of the social components of fertility in explaining actual levels of fertility

What is Fertility Transition?

Proximate Determinants of fertility

Preconditions for fertility decline

Explaining motivations for fertility with the demand-supply framework

Role of Education in fertility transition

Innovation/Diffusion & Cultural Perspective

Link between fertility transition & reproductive health

Contraceptive use & fertility

Fertility Transition in India

Social Component of Fertility - Explaining Actual Levels of Fertility

For most of human history, fertility was high because of the need to replenish society, especially to combat high infant mortality.

Motivating women/couples to have children:

- Children as security and labor
- Lower status for women leads to a desire for sons
- Children as essential for status and prestige

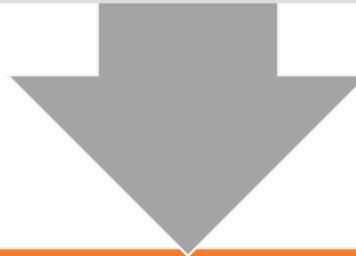
Accomplished by

- Having children early and often
- No tolerance for contraception/abortion/infanticide

What is the Fertility Transition

The shift from high fertility, with minimal individual control, to low fertility, which is entirely under a woman's control.

A shift from “family building by fate”
to “family building by design.”



It involves a later start to childbearing and an earlier end to childbearing.

“Not too early, not too close, and not too many.”

Bongaarts (1978)

Proximate Determinants of Fertility

I. Exposure factors

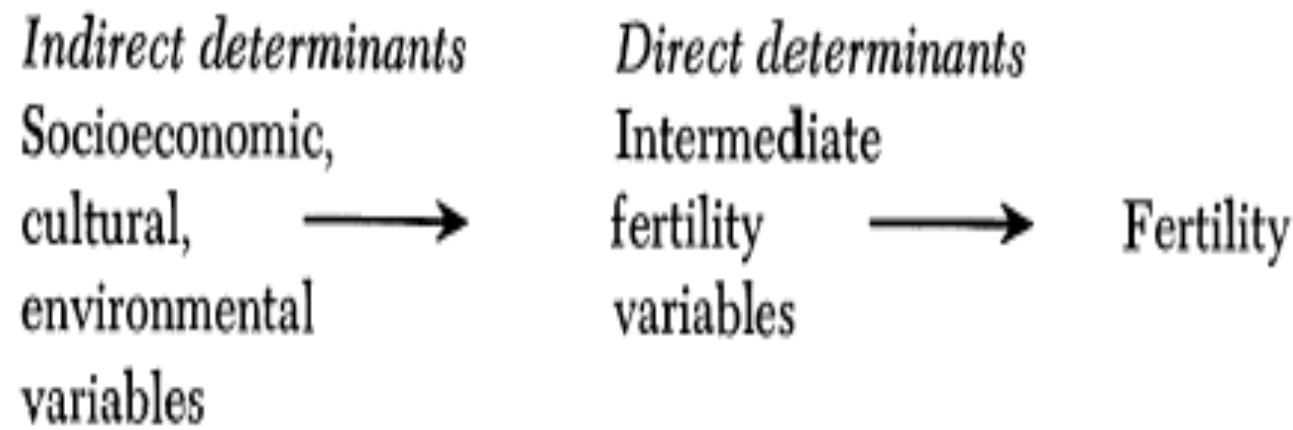
- 1. Proportion married

II. Deliberate marital fertility control factors

- 2. Contraception
- 3. Induced abortion

III. Natural marital fertility factors

- 4. Lactational infecundability
- 5. Frequency of intercourse
- 6. Sterility
- 7. Spontaneous intrauterine mortality
- 8. Duration of the fertile period



Have any children?

Money

Location specific cost & environment

Health condition of the women

Career – often women

Marriage and partner

Family pressure

Religion & norms

Peer groups

Benefits of children and financial support or burden

Leave

Child Mortality

Preconditions for a Substantial Fertility Decline (ready, willing, and able) Ansley Coale

1. Acceptance of calculated choice as a valid element in marital fertility (fertility within conscious choice of the individual). **Ready**
2. Perception of advantages from reduced fertility (motivation for limiting fertility). **Willing**
3. Knowledge and mastery of effective techniques of birth control (controlling reproduction). **Able**

Explaining motivations for fertility with the Supply-Demand Framework

Easterlin and Becker's economic framework emphasizes the need for households to balance the demand for children (what are they good for?) with the supply of them.

When the supply begins to exceed the demand, then the motivation to limit fertility emerges.

- Mortality declines and children cannot be afforded.
- And/or the opportunity costs of children rise (from what are they good for, to how good are they?).

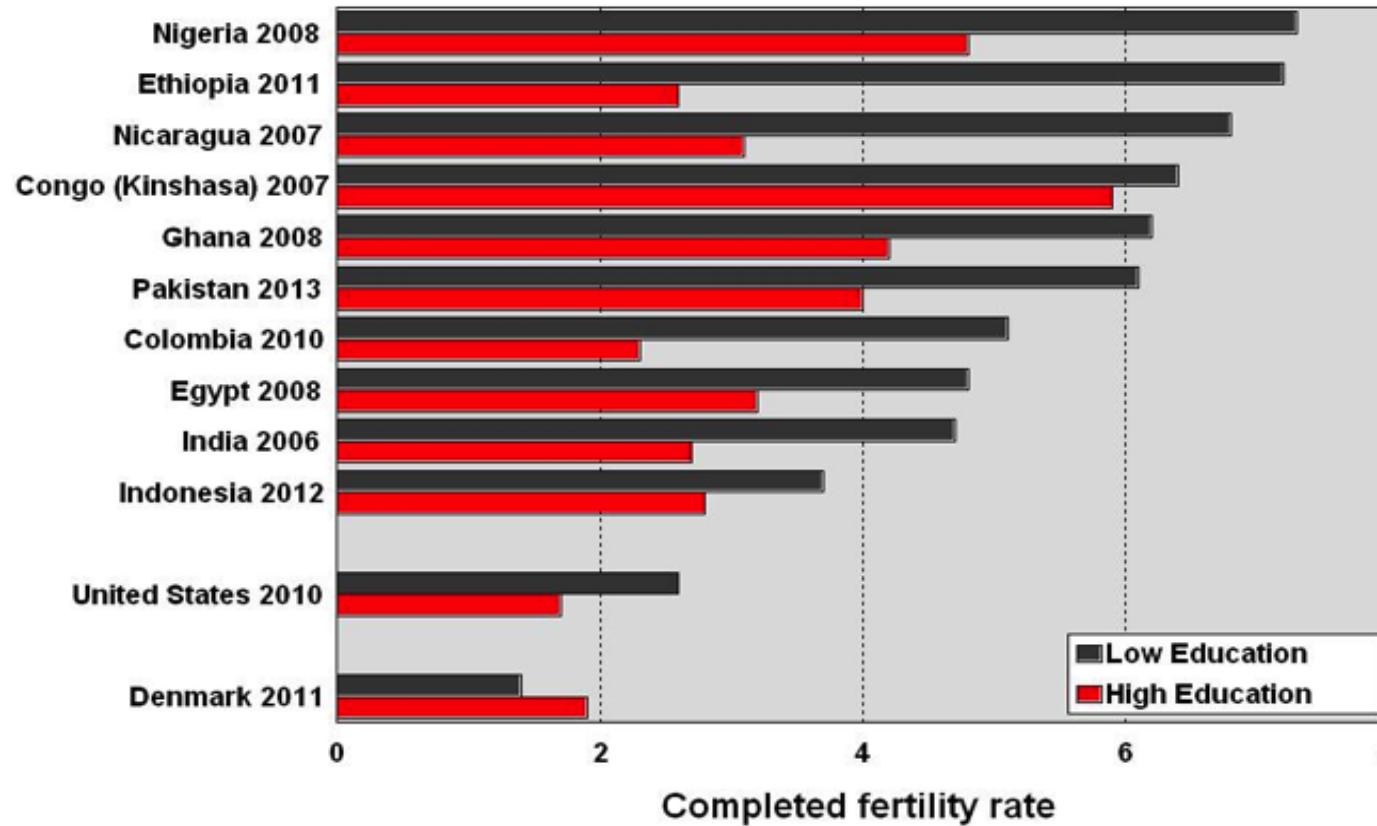
When is a society ready for the Fertility Transition?

3 intermediate factors that are related to a society's readiness to enter the fertility transition:

1. Number of surviving children that families can accommodate or find valuable
2. Onset and speed of mortality decline (many view this as most important precondition for onset of the fertility decline)
3. Availability and cost of contraception

Factors that impact the onset and speed of the fertility transition: (A) Demand for children; (B) Supply of children; (C) Costs of fertility regulation

The Education of Women Is an Important Part of the Fertility Transition



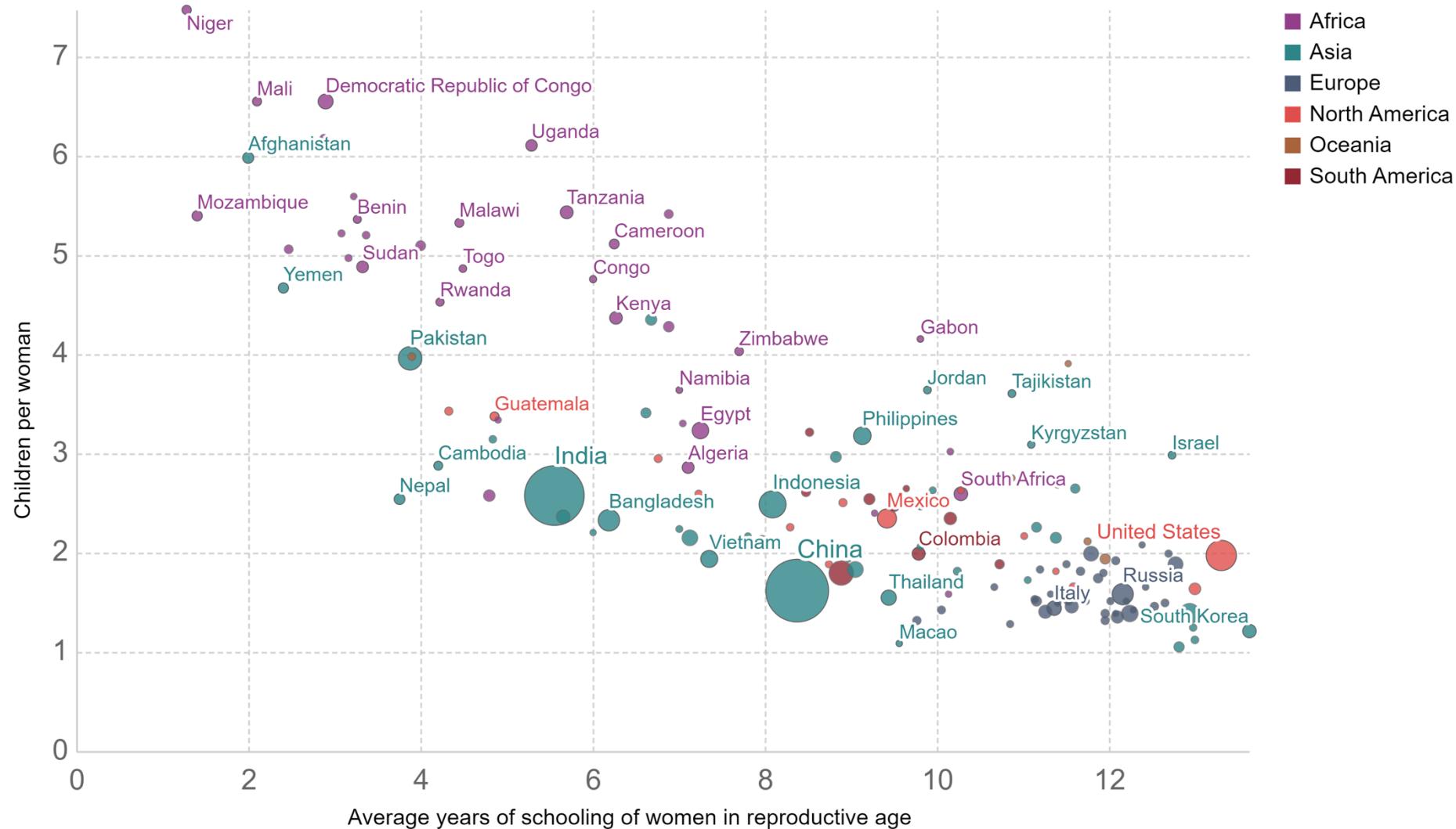
Education leads to fertility differentials within each population due to changes in the opportunity costs of children.

Fertility differential is greater in some countries viz. Ethiopia than others viz. Congo

Differential is reversed in some countries e.g. Denmark which have very low levels of fertility.

Women's educational attainment vs. number of children per woman

Shown on the x-axis is the average number of years of schooling of women in the reproductive age (15 to 49 years). On the y-axis you find the 'total fertility rate' – the number of live births per woman in reproductive age.



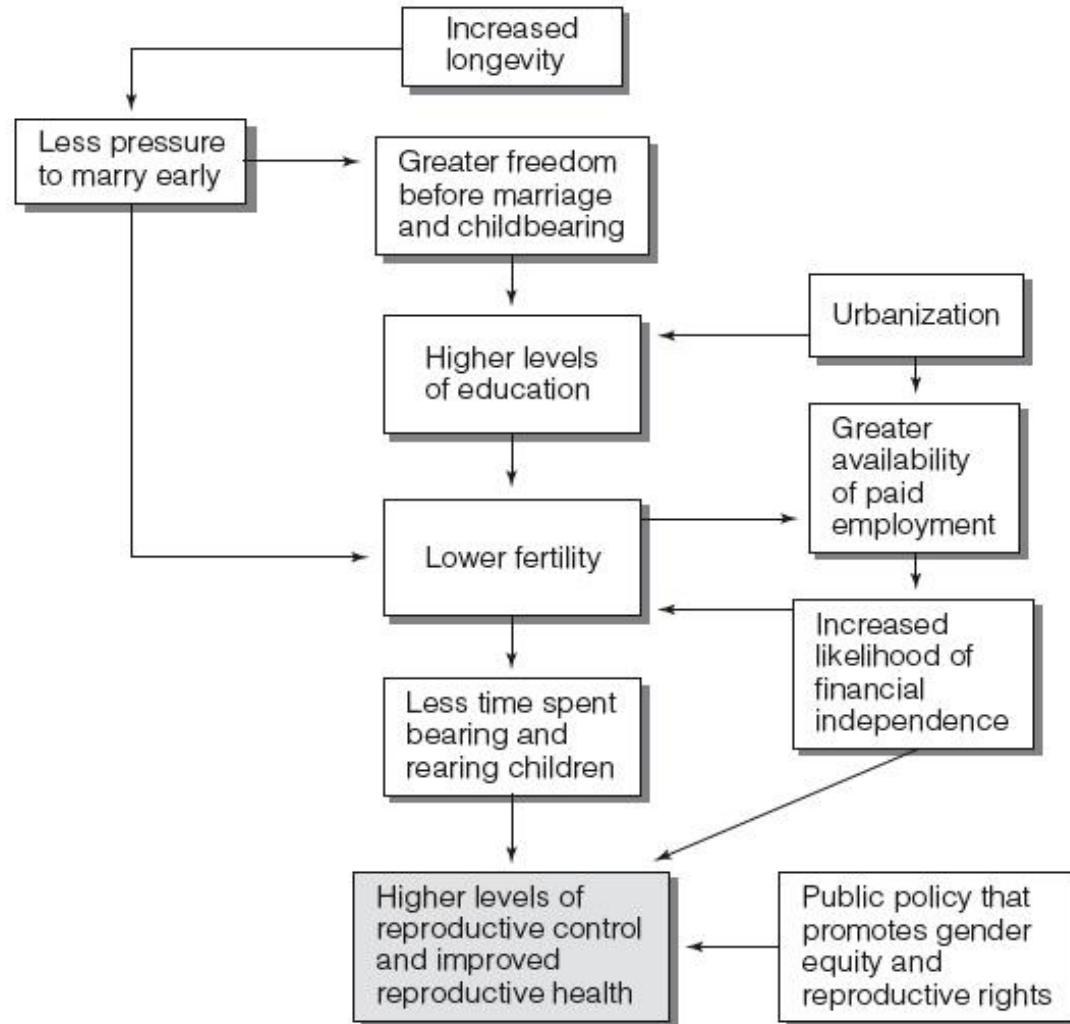
The Innovation/Diffusion and “Cultural” Perspective

- Many changes in society are result of diffusion of ‘innovations. e.g. trends in fashion, fads
- Fertility decline is produced by the diffusion of new ideas and knowledge about fertility regulation rather than by changes in socioeconomic factors, a hypothesis that we will call ideation theory
- Ideation’, defined ‘as new ways of thinking that diffuse in a society by means of social interaction’, was introduced by demographers as an alternative explanation of fertility transition

The Innovation/Diffusion and “Cultural” Perspective

- Cultural innovation takes place in higher social strata as a result of privilege, education, and resources; lower social strata adopt new preferences through imitation
- Rigid social stratification or closure of class or caste inhibits downward cultural mobility and thus inhibits diffusion of low fertility ideas

The Link between Fertility Transition and Reproductive Health



Modern Approaches to Fertility Control

Proportion married—limiting exposure to intercourse.

Use of contraceptives.

Induced abortion.

Involuntary Infecundity from Breastfeeding.

Source: Karra, M., & Wilde, J. (2023). *Economic Foundations of Contraceptive Transitions: Theories and a Review of the Evidence.*

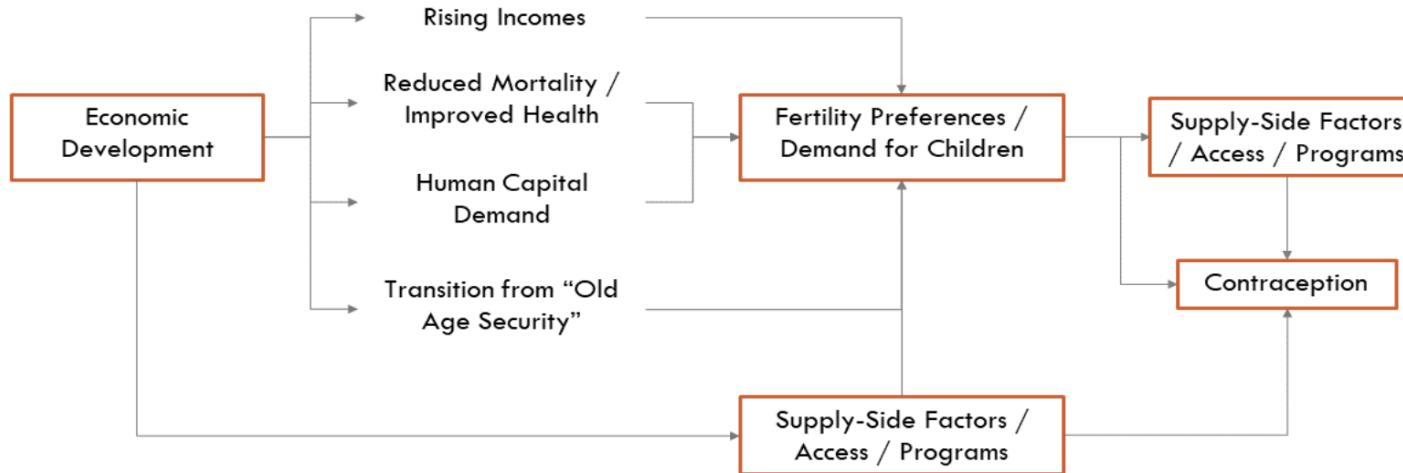


FIGURE 3.1. Theory of Change - Economic Development to Contraception, via Fertility Preferences and the Demand for Children

Source: Karra, M., & Wilde, J. (2023). *Economic Foundations of Contraceptive Transitions: Theories and a Review of the Evidence*.

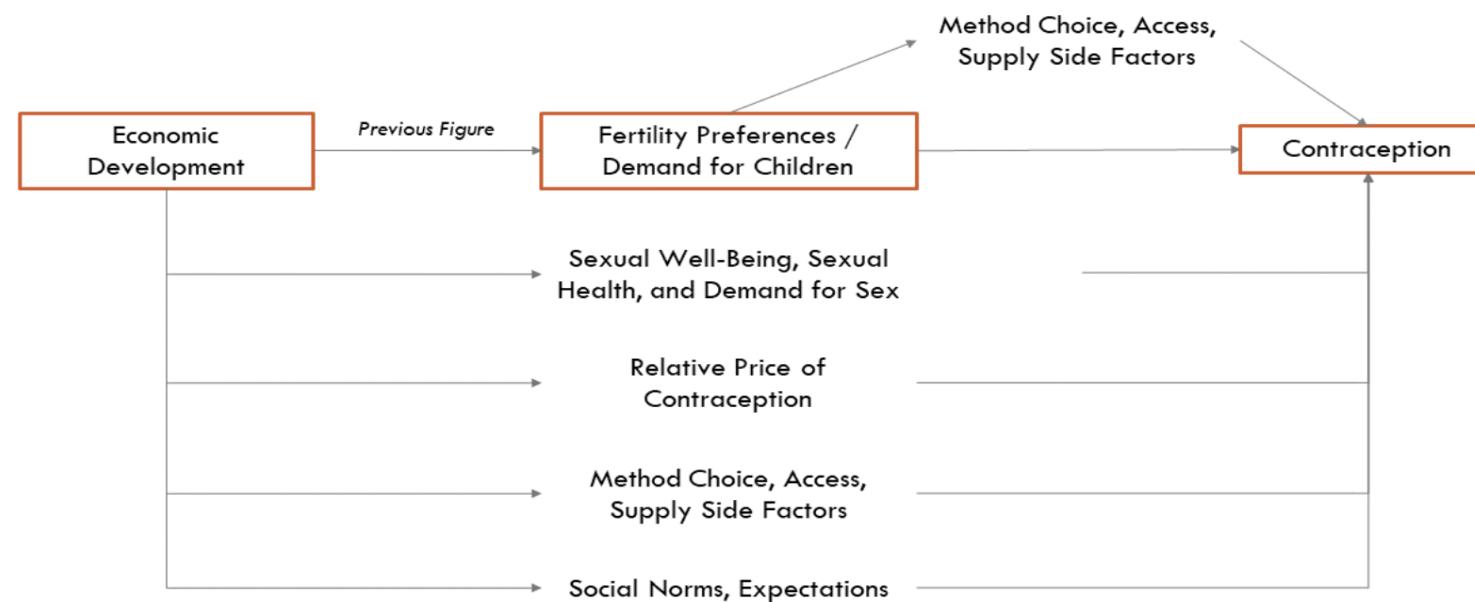


FIGURE 3.2. Theory of Change - Economic Development to Contraception, with Other Channels

Transitions Beyond Fertility Change

Development-contraception nexus can also be realized via alternative mechanisms independent of fertility (both desired & achieved)

A) Income effects that may be independent of fertility: increases in income & improved economic conditions directly relax credit constraints & improve purchasing power of all goods, including contraception

B) The changing nature of sexual partnerships: Behavior driving second demographic transition (SDT) : disassociation of traditional partnership formation & childbearing, driven by cultural shifts toward postmodern attitudes & norms such as individuality and self-actualization

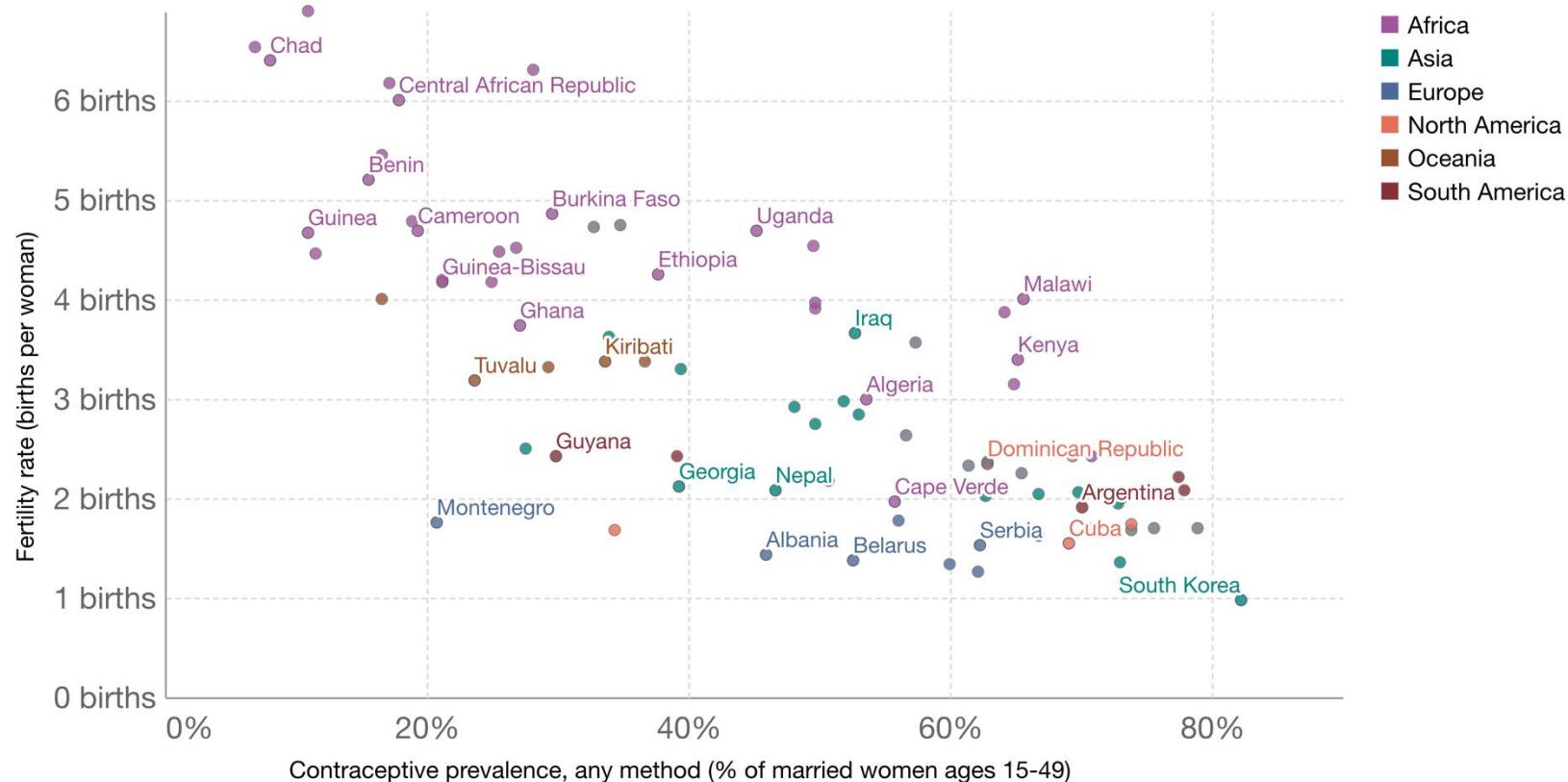
C) Increased contraceptive use that are driven by other welfare related outcomes that are not directly captured by income: additional health and welfare impacts that are conferred through the use of contraception: e.g. prevention of HIV and other sexually transmitted infections; 'use of oral contraceptives and hormonal contraceptives like the IUD have also shown to treat heavy menstrual bleeding, dysmenorrhea, pelvic pain, acne, and endometriosis and even may lower the risk of endometrial cancers'

Contraceptive Usage leads to Lower Fertility

Children per woman vs. contraceptive prevalence, 2021

Our World
in Data

Contraceptive prevalence is the percentage of women who are practicing, or whose sexual partners are practicing, any form of contraception. It is usually measured for women aged 15-49 who are married or in union.



Source: United Nations Population Division and others (via World Bank), Data compiled from multiple sources by World Bank

Note: The total fertility rate is the number of children that would be born to a woman if she were to live to the end of her child-bearing years and give birth to children at the current age-specific fertility rates.

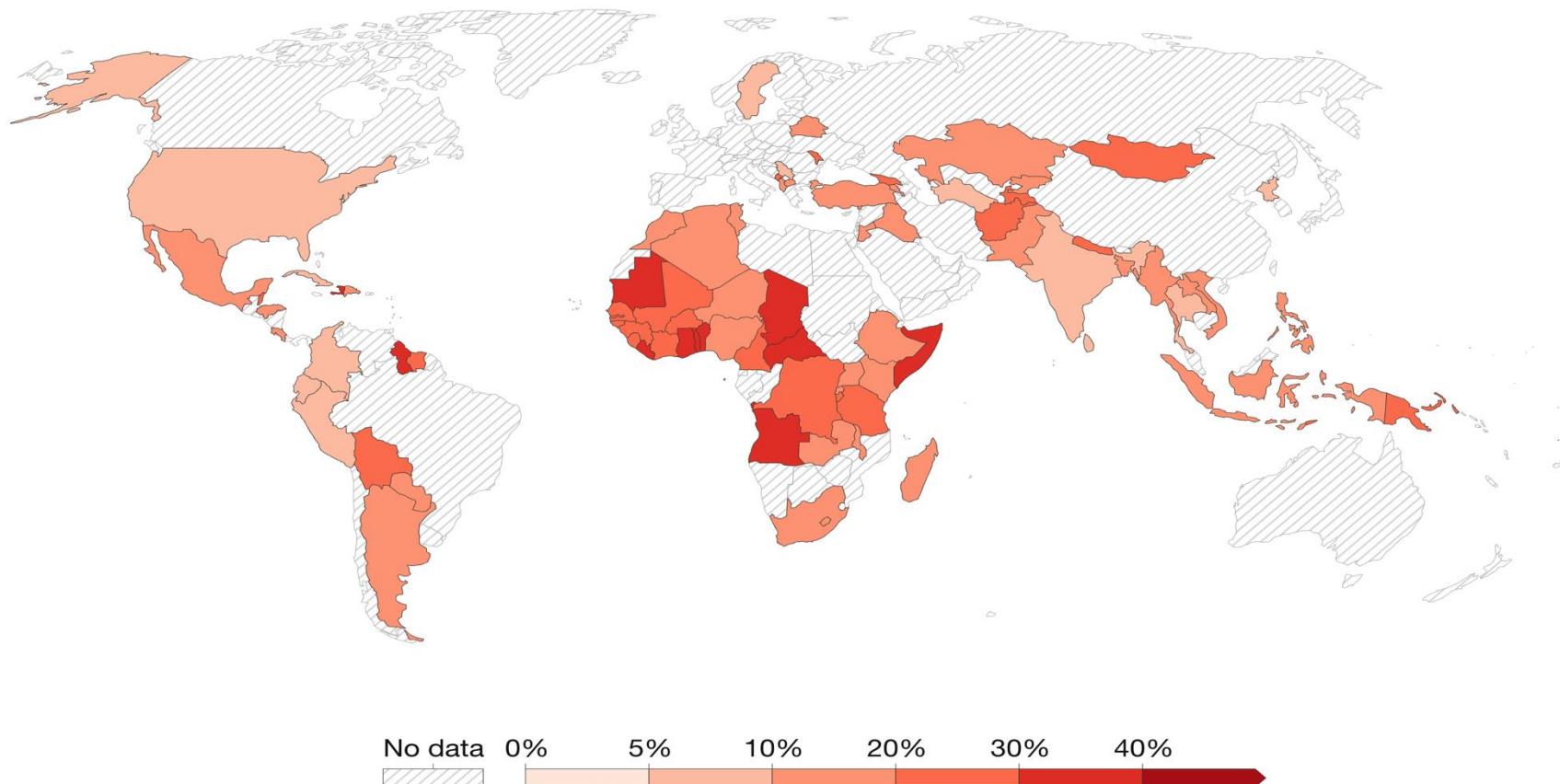
OurWorldInData.org/fertility-rate • CC BY

Unmet Need for Contraception

Unmet need for contraception among married women of reproductive age, 2021

Our World
in Data

Fertile, married women of reproductive age (ages 15-49) who do not want to become pregnant and are not using contraception.



Source: Data compiled from multiple sources by World Bank

OurWorldInData.org/fertility-rate • CC BY

Watch the video:

Family Planning in Senegal - A Pathway for Progress

https://www.youtube.com/watch?v=Lg6OTJKMwM&fbclid=IwAR1KwtDt5L_OKGCorhjcwXYHtK31LyPyLi_NdaIElxTusYIOxlcBJos7vw

Fertility Transition in India

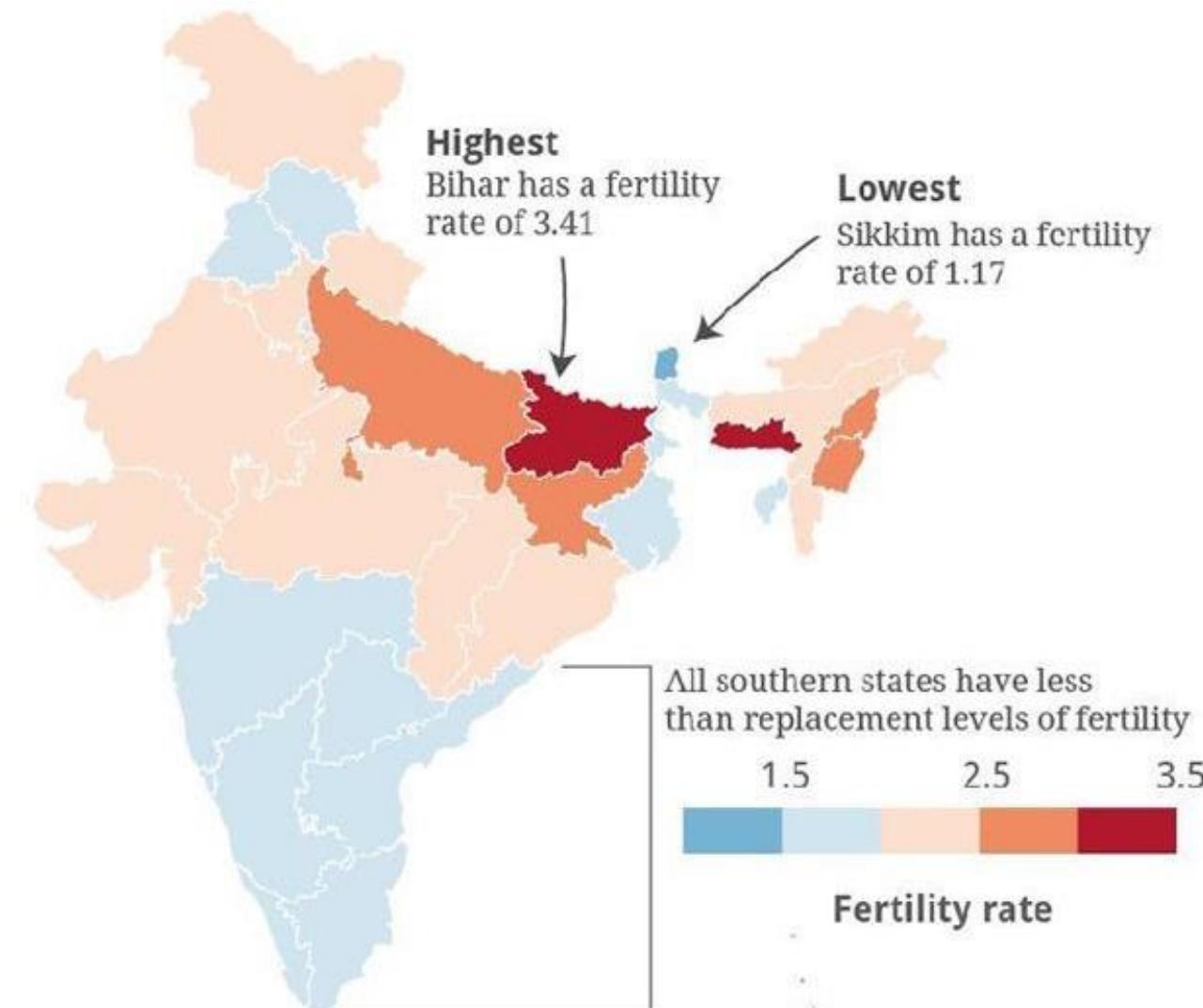
India's total fertility rate has fallen from 5.9 in 1960 to 2.2 in 2018.

The female literacy rate has increased from 15.35% to 70.3% in the same period.

The infant mortality rate (per 1000 births) has fallen from 161 to 28 in the same period.

Contraceptive use by women have increased from about 14% in 1970 to 54% in 2016.

Fertility Rates in India: 2016

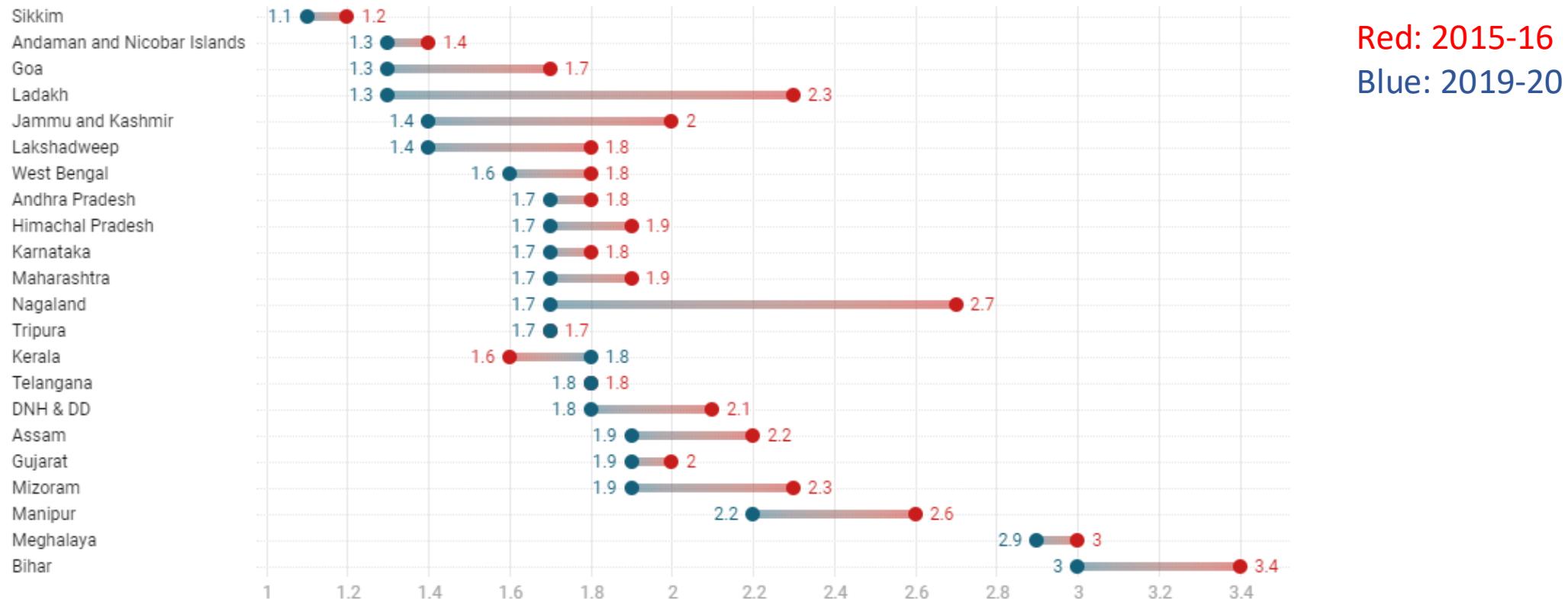


Data: NFHS 4 – 2015-2016

Fertility Rates in India is declining

Change in TFR by states/UTs of India, 2015-16 to 2019-20

TFR (Total Fertility Rate) refers to the average number of children per woman in a population.



Red and blue circles, respectively, denote the TFR in the years of 2015-16 and 2019-20. Chart includes states and UTs surveyed in the first phase of NFHS-5.

Chart: Authors • Source: [NFHS-5 \(2019-20\)](#) and [NFHS-4 \(2015-16\)](#) • Created with [Datawrapper](#)

For Fertility Transition in India

Refer: James, K. S., & Sekher, T. V. (2023). India's Population Change. *India Population Report*, 1.

Chapter 3 Fertility and Family Planning Explaining Transition and Thinking about Post-Transitional Regimes Chander Shekhar, Srinivas Goli, and Rakesh Mishra

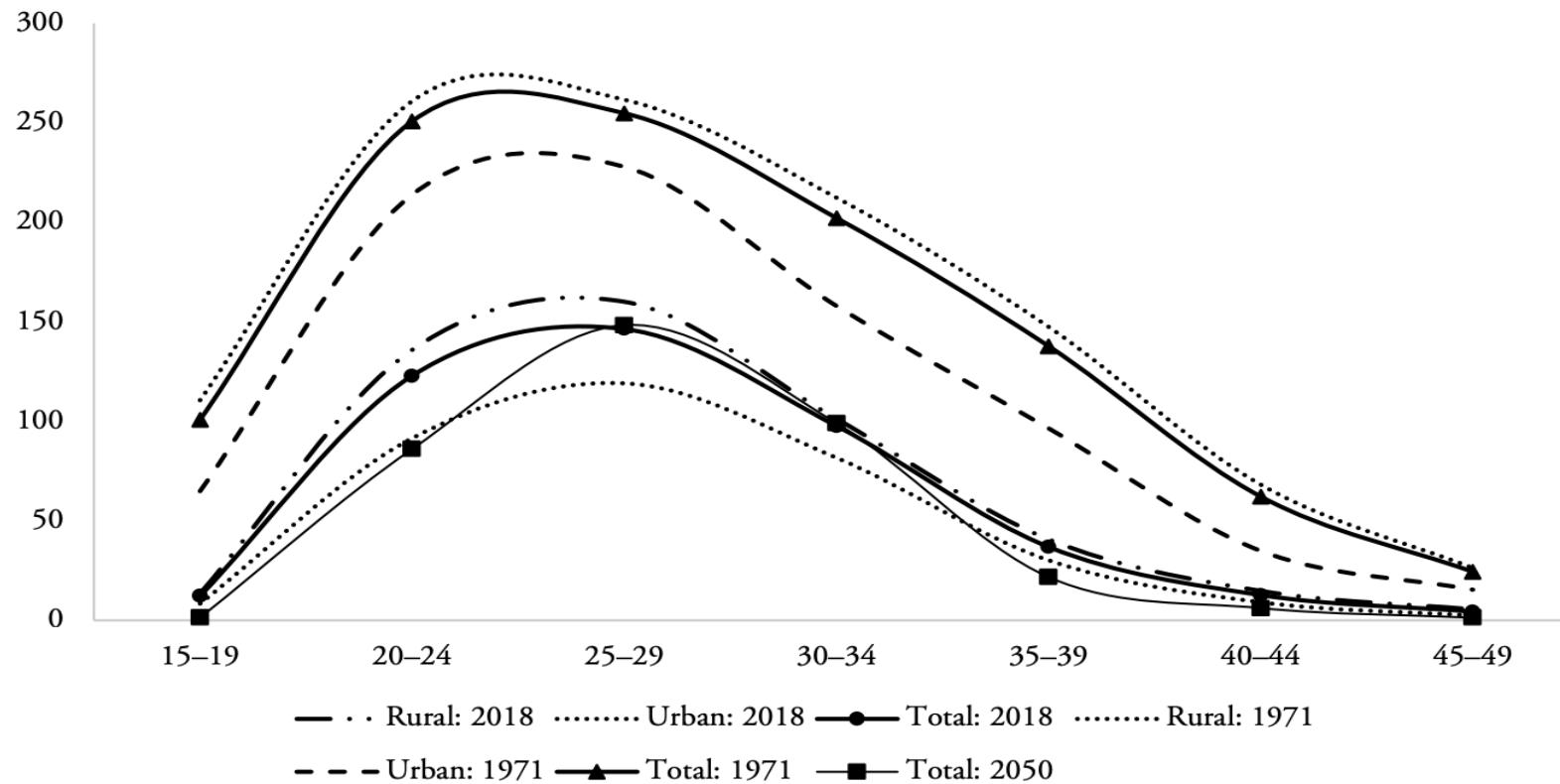


Figure 3.5 Age-specific fertility rates by residence in India, 1971–2050

Source: ORGI (1971–2013, 2018).

Undesired Births in India

Despite decline in fertility, high rates of unintended pregnancy, and poor maternal health.

50% of estimated 48.1 million pregnancies in India in 2015 were unwanted or mistimed (study in Lancet Global Health)

Lower likelihoods of having undesired births are associated with having:

- (A) Greater Education
- (B) Greater Income
- (C) Greater exposure to mass-media, more networks in the formal sector
- (D) Greater decision-making ability for women
- (E) Greater connection of women to the maternal and child health system

Update on National Family Planning Program

(Source: <https://pib.gov.in/PressReleseDetail.aspx?PRID=1883140>)

The Government accords top priority to the National Family Planning Program, guided by the tenets of the National Population Policy 2000 & National Health Policy 2017, to address the unmet need for Family Planning. Steps taken:

1. Expanded Contraceptive Choices

2. Mission Parivar Vikas (MPV) implemented in 13 states for substantially increasing access to contraceptives and family planning services.

3. Compensation scheme for sterilization acceptors which provides compensation for loss of wages to the beneficiary and also to the service provider team for conducting sterilization.

4. Post-partum Intra-uterine contraceptive device (PPIUCD) services are provided post delivery.

5. Scheme for Home Delivery of contraceptives by ASHAs at doorstep of beneficiaries.

6. Family Planning Logistics Management Information System (FP-LMIS) to ensure last mile availability of family planning commodities across all the levels of health facilities.

Update on National Family Planning Program..(Dec 2022)

- 1.The Total Fertility Rate (TFR) declined to **2.0** in **2019-21** (NFHS 5) which is below replacement level.
- 2. 31 out of 36 States/ UTs** have achieved replacement level fertility (NFHS 5).
- 3.The **Modern Contraceptive usage** has increased to **56.5%** (NFHS 5).
- 4.The Unmet Need for Family Planning** has decreased to **9.4%** (NFHS 5).
- 5.The **Crude Birth Rate (CBR)** has declined to **19.5** in 2020 (SRS).

MEASUREMENT BRIEF: FERTILITY PREFERENCES

Today's Class

Background

What are fertility preferences?

- Definition and Terminology
- How do we measure fertility preferences for individuals?

What do we mean by Unwanted Births?

- Definition and Terminology
- How do we measure unwanted births?

Measurement Assessment: Fertility Preference & Unwanted Births

- Challenges
- Other Measures
- Future Directions

Background

How are fertility preferences & unwanted births measured in the Global South

Fertility preferences impact : use of contraception & future fertility behavior

Unintended pregnancies & unplanned births associated with adverse health related, social, & economic outcomes for women and their families

Most unintended pregnancies occur in developing regions

UN SDG 5: Attain Gender Equality & Empower all women (one target: ensure universal access to sexual and reproductive rights by 2030)

Background

UN SDG Goal 3: Ensure healthy lives and promote well-being for all at all ages by 2030

Includes lowering:

- A) global maternal mortality to 70 per 100,000 live births
- B) neonatal mortality to 12 per 1,000 live births
- C) under-5 mortality to 25 per 1,000 live births

Important to measure fertility preferences; helps understand:

- A) Fertility Patterns
- B) Fertility Differentials across groups
- C) Motivations behind childbearing
- D) How to prevent unwanted births
- E) Impact of birth intendedness on maternal & child health

What are fertility preferences?

--Definition and Terminology (Note: Questions on fertility preferences usually administered to women of reproductive age groups (typically 15-49 years) & in some surveys to men too).

Two key measures:

A) Desire for More Children :

DHS asks currently married women and men aged 15-49:

'Whether they wanted more children and, if so, how long they would prefer to wait before the birth of the next child. Women and men who are sterilized are assumed not to want any more children.'

What are fertility preferences?

B) Ideal Family Size

WFS, older multinational surveys (between 1974-1987), asked:

“If you could choose exactly the number of children to have in your whole life, how many would that be?”

DHS asks questions to men and women aged 15-49.

Respondents with no living children were asked: ‘If you could choose the exact number of children you would like to have in your lifetime, how many would you have? ’

Respondents with living children were asked: ‘If you could go back to the time when you had no children and choose the exact number of children you would like to have in your lifetime, how many would you have chosen?’

What are fertility preferences?

WFS Criticism: More sensitive to the no.of children women have already had, specifically women at higher parities -a reflection of rationalizing the number of children women have had.

WFS version would show higher correlation with existing no. of children respondents already have compared to DHS question - since this asks women to go back to a time when they did not have any children; though it still doesn't fully solve the problem.

Table 1. Larger Demographic Surveys Measuring Fertility Preferences

Survey	Who was interviewed	Topics on which questions were asked
World Fertility Survey (WFS)	Ever-married women in child-bearing ages ending at 50.	Included questions on: a) Desired family size b) Whether more children were wanted c) The wanted status of the most recent birth or pregnancy d) The number of additional children wanted
Demographic and Health Survey (DHS)	Following are the sub-samples interviewed for questions on the right. a) Currently married women and men age 15-49 b) Current pregnancies and births in the 5 years before the survey to women age 15-49 c) Women and men age 15-49 d) Captures the demographic impact of fertility that would prevail in 3 years preceding the survey if all unwanted births were prevented.	a) Desire for more Children b) Need for Family Planning Services c) Ideal Number of Children d) Wanted Fertility Rates
Multiple Indicator Cluster Surveys (MICS)	Women aged 15-49	Following questions were asked on the desire for the last birth a) Was there a live birth in the last 2 years? Copy name of last birth listed in the birth history to here and use where indicated: b) When you got pregnant with (name of the last born child), did you want to get pregnant at that time? [Yes; No] c) Number of births [Only one; Two or more] d) Did you want to have a baby later on, or did you not want any children? [Later; No more/None]

What is Unwanted Fertility?

'Pregnancies that occur at a time when a woman or a couple did not wish to have another birth are regarded as unwanted. That is, child wantedness is determined directly, and entirely, on the basis of parental fertility preferences. To be more precise, at issue are fertility preferences at the time of conception; this is the phenomenon of interest if the ultimate goal is to assess the potential impact of more perfect fertility control'

(Casterline and El-Zeni (2007: 731))

What is Unwanted Fertility?

Based on the assumption that pregnancy is a conscious decision, unintended and intended pregnancies can be defined as follows by Santelli et al. 2003:

Unintended pregnancies: Pregnancies reported to have been either unwanted (they might have occurred when women/couples desired no children, or no more children) or mistimed (when pregnancies occurred prior to the time they were desired).

Intended pregnancies: If pregnancies are reported to have happened at the “right time” or later than desired (because of infertility or difficulties in conceiving).

NFHS India:

Unwanted birth: Any birth in excess of the number of children a woman reported as her ideal number

Wanted birth: Any birth less than or equal to the number of children a woman reported as her ideal number.

WANTED TOTAL FERTILITY RATE

On an aggregate level total fertility rate (TFR) is one of the most commonly used indicators of fertility. Country level data from surveys such as the DHS often report Wanted Total Fertility Rate (WTFR). The statistic that is presently used in the DHS was originally suggested by Lightbourne to be used in the WFS. It is calculated in a way similar to TFR, except that the numerator is limited to births that are less than or equal to the number desired. Responses such as “it’s up to God” on questions on ideal number of children are considered wanted. Thus, WTFR gives us the average number of children a woman would have at the end of her childbearing years if she had children at the current age-specific fertility rates, excluding unwanted births. DHS includes WTFR and TFR for three years prior to the survey, by certain chosen background factors. (<https://www.dhsprogram.com/data/DHS-Survey-Indicators-Fertility-Preferences.cfm>)

Articles that give more in-depth alternate measures of wanted and unwanted fertility; and estimates of global, regional and subregional trends in unintended pregnancy and its outcomes are:

Bongaarts, J. (1990). The measurement of wanted fertility. *Population and Development Review*, 487-506.

Casterline, J. B., & El-Zeini, L. O. (2007). The estimation of unwanted fertility. *Demography*, 44(4), 729-745.

Bearak, J., Popinchalk, A., Alkema, L., & Sedgh, G. (2018). Global, regional, and subregional trends in unintended pregnancy and its outcomes from 1990 to 2014: estimates from a Bayesian hierarchical model. *The Lancet Global Health*, 6(4), e380-e389.

MEASUREMENT ASSESSMENT: CHALLENGES

Measures of fertility preferences not able to properly consider uncertainty, ambivalence & complexity surrounding childbearing

MEASUREMENT ERROR: Respondents often give ambiguous responses to questions that ask them about the ideal number of children that they want.

Large surveys often provide cross-sectional data & thus use ‘retrospective recall technique’ for measuring unwanted & unintended births: susceptible to ex-post revisions.

MEASUREMENT ASSESSMENT: CHALLENGES

Measure of unwanted fertility: At a point looks at ideal number of children that respondent wants & compares it to the no. of living children at time of conceptions for the births that are recorded in birth history data : rationalization bias

Prospective techniques avoid the problem of ‘ex-post rationalization’. But since fertility preferences could change over time and reports are obtained months or years before a pregnancy, may not exactly reflect ‘wantedness at conception’

Other Measures: Fertility Preferences

Coomb's Scale: Collects information on the hierarchy of desired family sizes

Single-item measure takes into account very little variation in fertility desires

Measuring first & second choices with this technique also increases the understanding of acceptability of childlessness amongst respondents

This method has been adopted by scholars who work in context of developing countries

PMC full text:

[Popul Stud \(Camb\). Author manuscript; available in PMC 2017 Mar 3.](#)

Published in final edited form as:

Popul Stud (Camb). 2016 Mar; 70(1): 115–133.

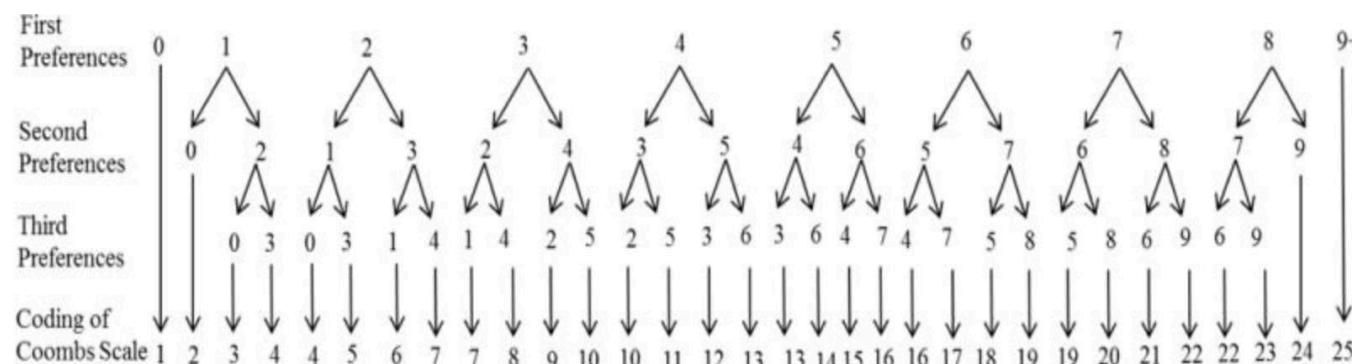
Published online 2016 Mar 3. doi: [10.1080/00324728.2016.1140806](https://doi.org/10.1080/00324728.2016.1140806)

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Figure 1

Author Manuscript

A
Coding of the Coombs Scale



An external file that holds a picture, illustration,
etc.
Object name is nihms756765f1.jpg

Other Measures: Fertility Preferences

Emotional Response to Fertility

Emotional responses to a pregnancy or birth are as important as other measures of fertility preference that measure subsequent childbearing

Emotions can be evaluated retrospectively (by asking a respondent about their response to a past pregnancy for e.g. Santelli et al. 2009; however this measure would also be susceptible to ex-post rationalization), or prospectively (this measure would try to understand the respondent's happiness about the possibility of becoming pregnant)

Other Measures: Fertility Preferences

London Measure of Unplanned Pregnancy (LMUP)

Six-item scale that takes into account 'contraceptive use, intention, desire to have a child, discussion/agreement with partner, & behaviour change in preparation for pregnancy'(Cleland et al. 2020)

Total score 12

Increase in the score indicates a higher degree of pregnancy intention

One interpretation: score 0–3 as an indicator of unplanned pregnancy, scores of 4–9 to represent uncertain states and scores of 10–12 as planned pregnancy

Box 1 Questions of the original version of the London Measure of Unplanned Pregnancy (24)

Question 1. At the time of conception:

- 0 Always used contraception
- 1 Inconsistent use
- 2 Not using contraception

Question 2. In terms of becoming a mother:

- 0 Wrong time
- 1 OK but not quite right
- 2 Right time

Question 3. Just before conception:

- 0 Did not intend to become pregnant
- 1 Changed intentions
- 2 Intended to get pregnant

Question 4. Just before conception:

- 0 Did not want a baby
- 1 Mixed feelings about having a baby
- 2 Wanted a baby

Question 5. Before conception:

- 0 Had never discussed children
- 1 Discussed but no firm agreement
- 2 Agreed pregnancy with partner

Question 6. Before conception:

- 0 No actions
- 1 Health preparations (1 action^a)
- 2 Health preparations (≥ 2 actions^a)

^aHealth preparations included the following actions: taking folic acid supplements, stopping or reducing smoking, stopping or reducing alcohol consumption, healthy eating, and seeking medical advice before conception.

Future Directions

Adopting a life course perspective when studying fertility preferences

Theoretical framework accounting for multiple aspects of fertility preferences and also completely accounts for the role of ambivalence & uncertainty.

Improving retrospective evaluation (e.g. through measures such as LMUP)

The role of fecundability in impacting desires and understanding weak or fluid desires to delay childbearing needs more attention

Future Directions

Though a greater number of studies are interviewing both partners about fertility desires, this should preferably always be the case

Larger number of follow-up interviews (e.g., through telephone) should be collected in longitudinal studies in order to reduce the gap in timing between the measuring of fertility desires and a pregnancy occurring.

Questions in the DHS do not allow for proper detection of reasons for postponement. This short-coming could be addressed through some additional questions.

Focus on new prospective measures of emotions & expectations near pregnancy points in order to better understand an individual's motivations and provide them with services they need.