



Human Capital as Key to Global Development

Jesús Crespo Cuaresma, Anne Goujon,
Samir K.C. and Wolfgang Lutz

IIASA World Population Program





Outline

- The 21st Century: Expected end of world population growth and global aging
- Modeling the world's growing human capital 1970-2050
- Human capital, economic growth and development

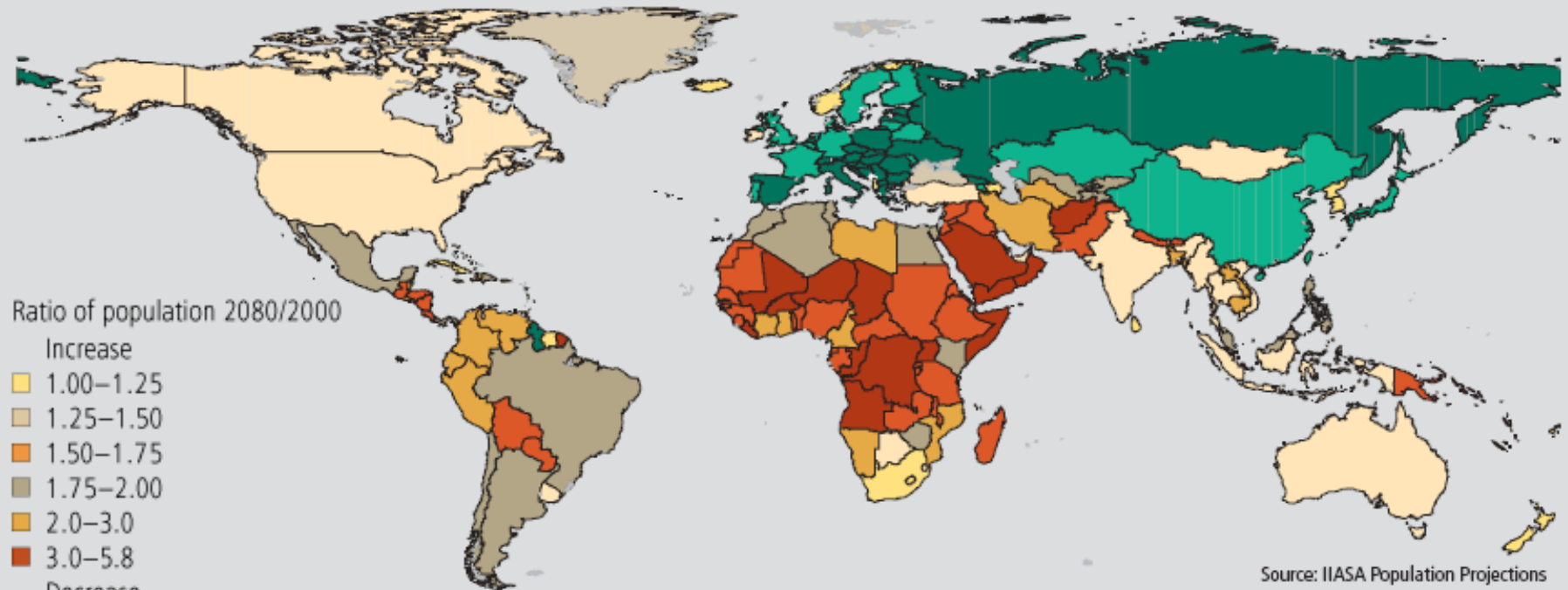


World Population Trends: The Big Picture

- While the 20th century was the century of **population growth** (with the world population increasing from 1.6 to 6.1 billion),
- the 21st century will be that of **population aging** (with the proportion above age 60 years increasing from currently 10% in 2000 to 25-45% by 2100).
- Today we live in a **demographically divided world** with some countries (Africa, Arab World) still growing very fast, while others are aging rapidly (Europe, East Asia) and some are already shrinking (Eastern Europe).

A Differentiated World

Expected Population Growth and Decline between 2000 and 2080

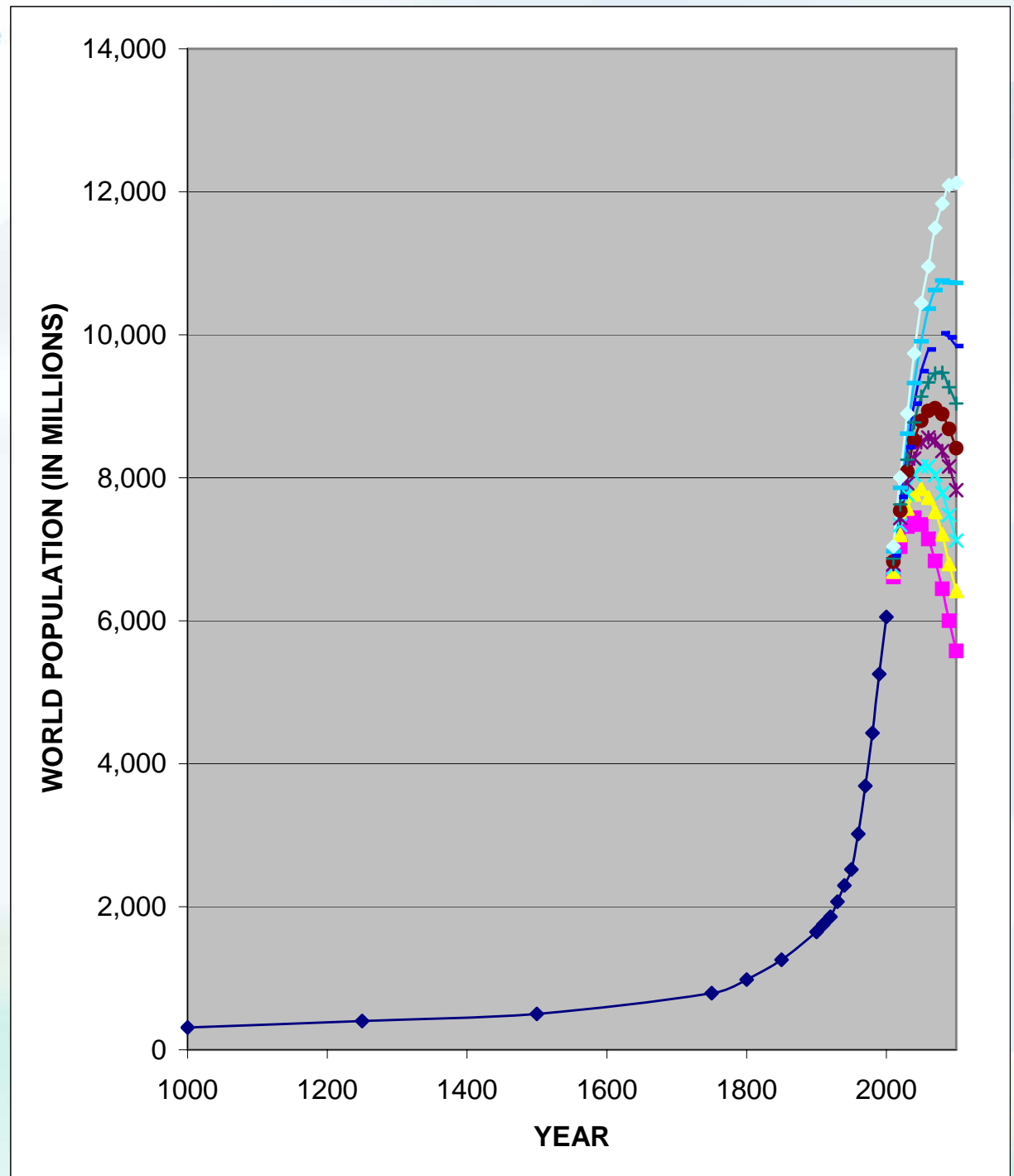




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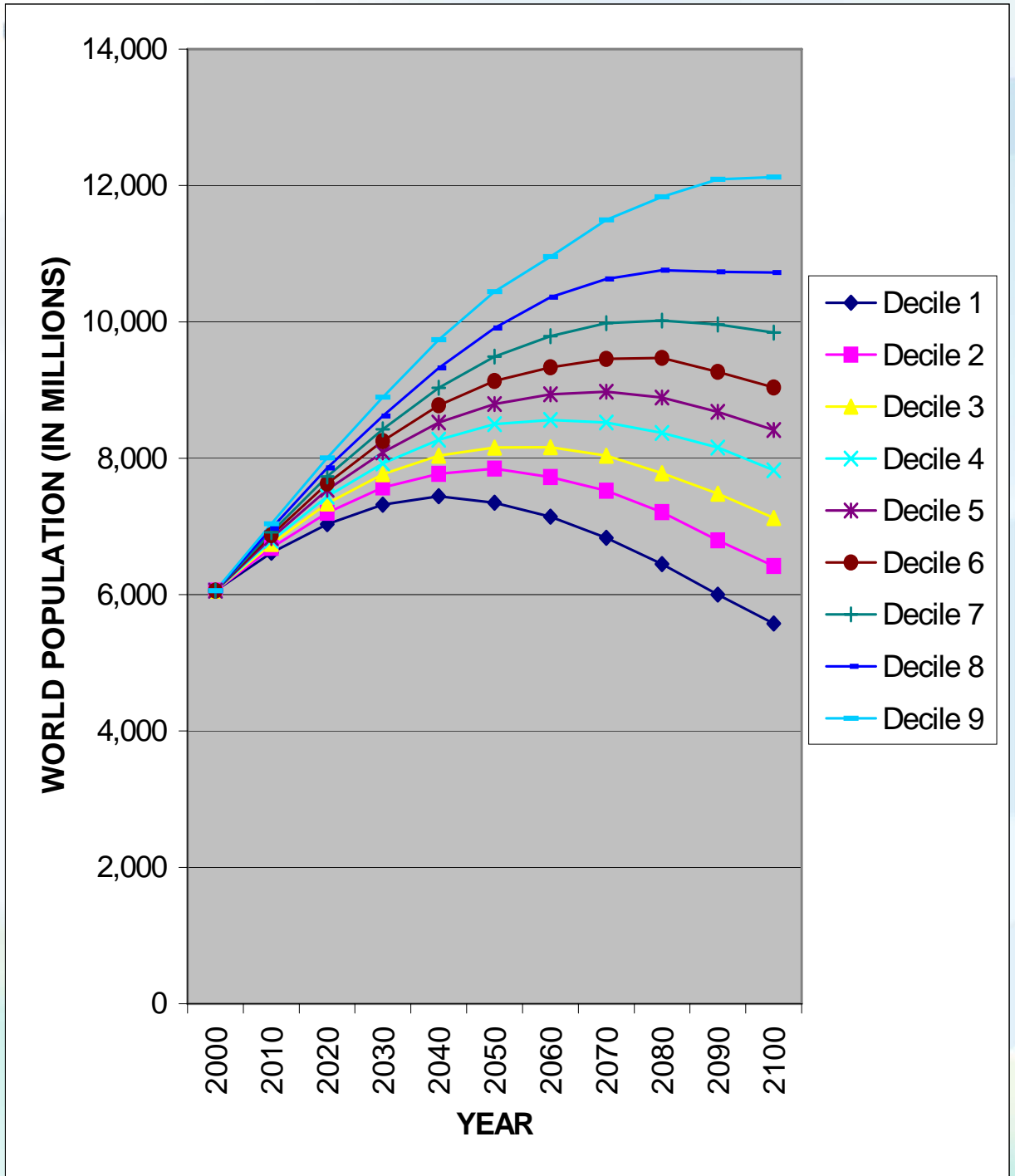
World Population from Year 1000 to 2100

Source of historical data: UN 2001;
Source of projections: IIASA, Lutz *et al.* 2004





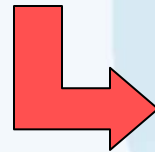
World Population from Year 2000 to 2100



Source: UN 2001; IIASA, Lutz et al. 2004

Forecasting the Population

- Projections depend on three components of change:
 - Fertility
 - Mortality
 - Migration
- The future paths of all three factors are uncertain.
- IIASA produces probabilistic population projections reflecting uncertainty in all three factors.



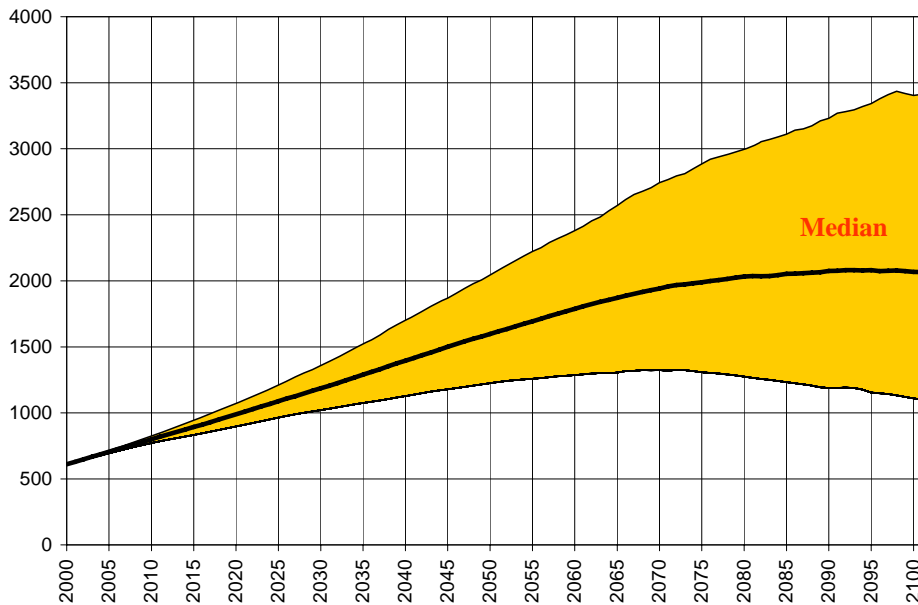
We estimate an 85-90 percent chance that the world population will peak and start to decline during this century.



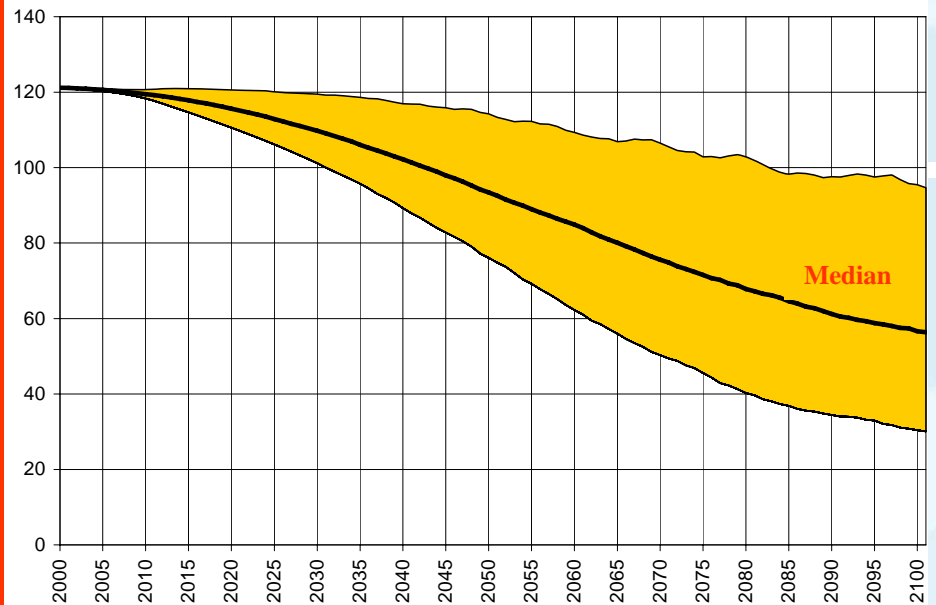
Contrasting Demographic Paths

Total Population (in millions) 95% Confidence Interval

Sub-Saharan Africa



Eastern Europe



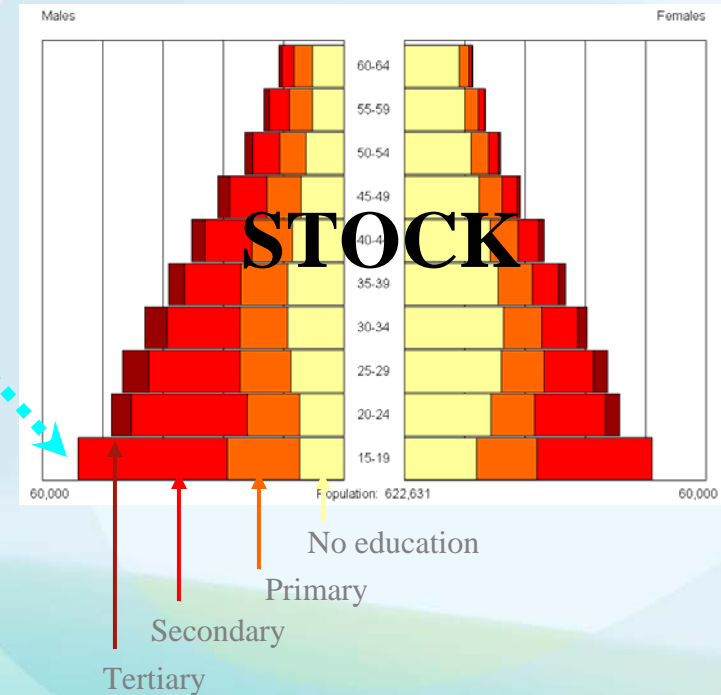
Source of projections: IIASA, Lutz, Scherbov & Sanderson (2007)

The World's Growing Human Capital 1970-2050

- From enrolment to levels of educational attainment



FLOWS



Reconstruction of Past Levels of Education

- **What?**
 - Population by **age** (15-19, 20-24,... 65+), **sex** and 4 **categories** of educational attainment (no education, some primary education, junior secondary education, tertiary education), every **five years** between **1970 and 2000**, for **120 countries**
- **Why?**
 - Lack of consistent (across countries and time) series on education
 - Test **if** and **how** education matters for economic development, based on detailed education data



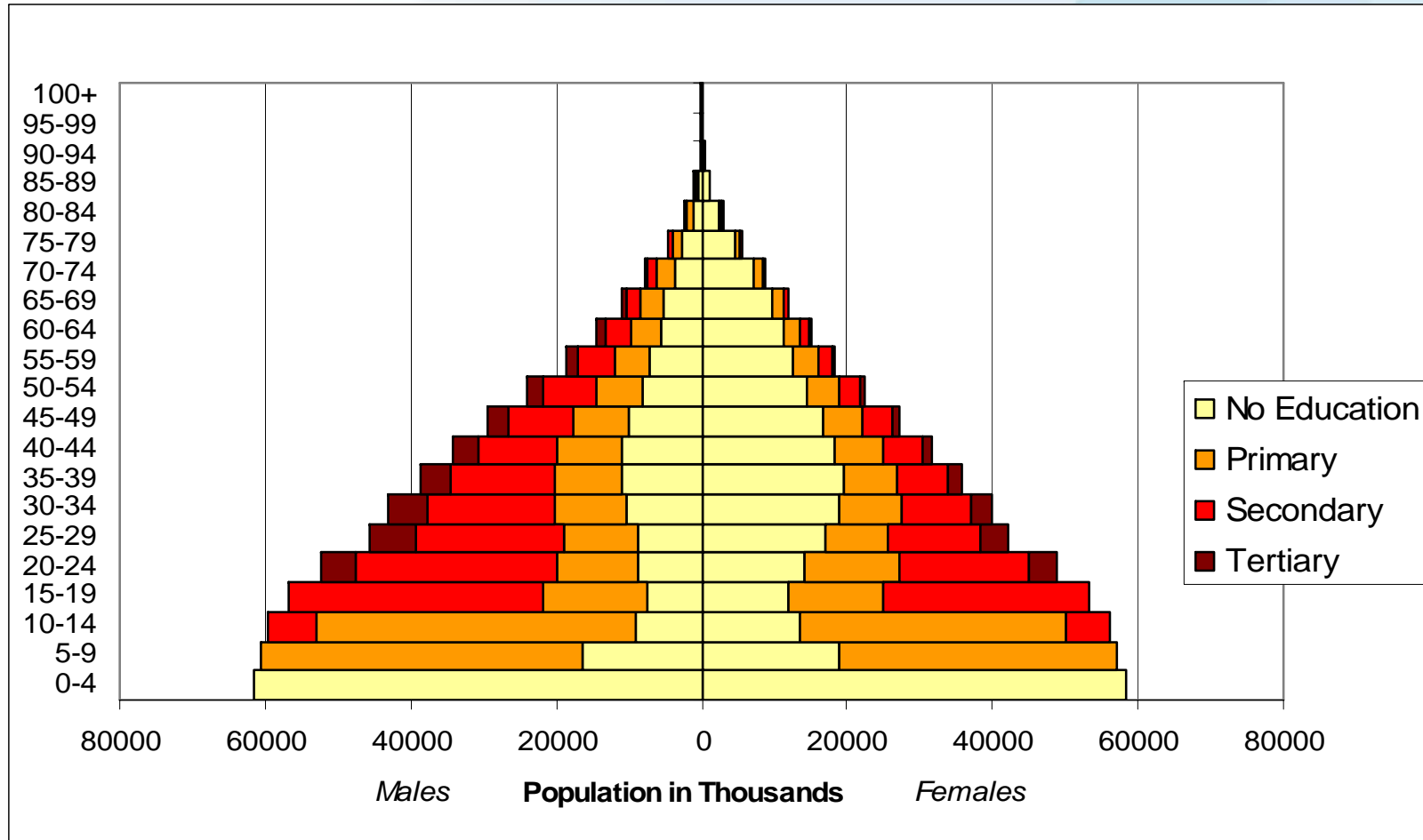
Projection of Future Levels of Education

- **What?**
 - Population by **age, sex** and **4 categories** of educational attainment, between **2000 and 2050**, for **120 countries**, for **several scenarios**
- **Why?**
 - Show the momentum of population and education change in development planning
 - Assess according to present pace of improvements the likelihood of the realization of certain education/development goals



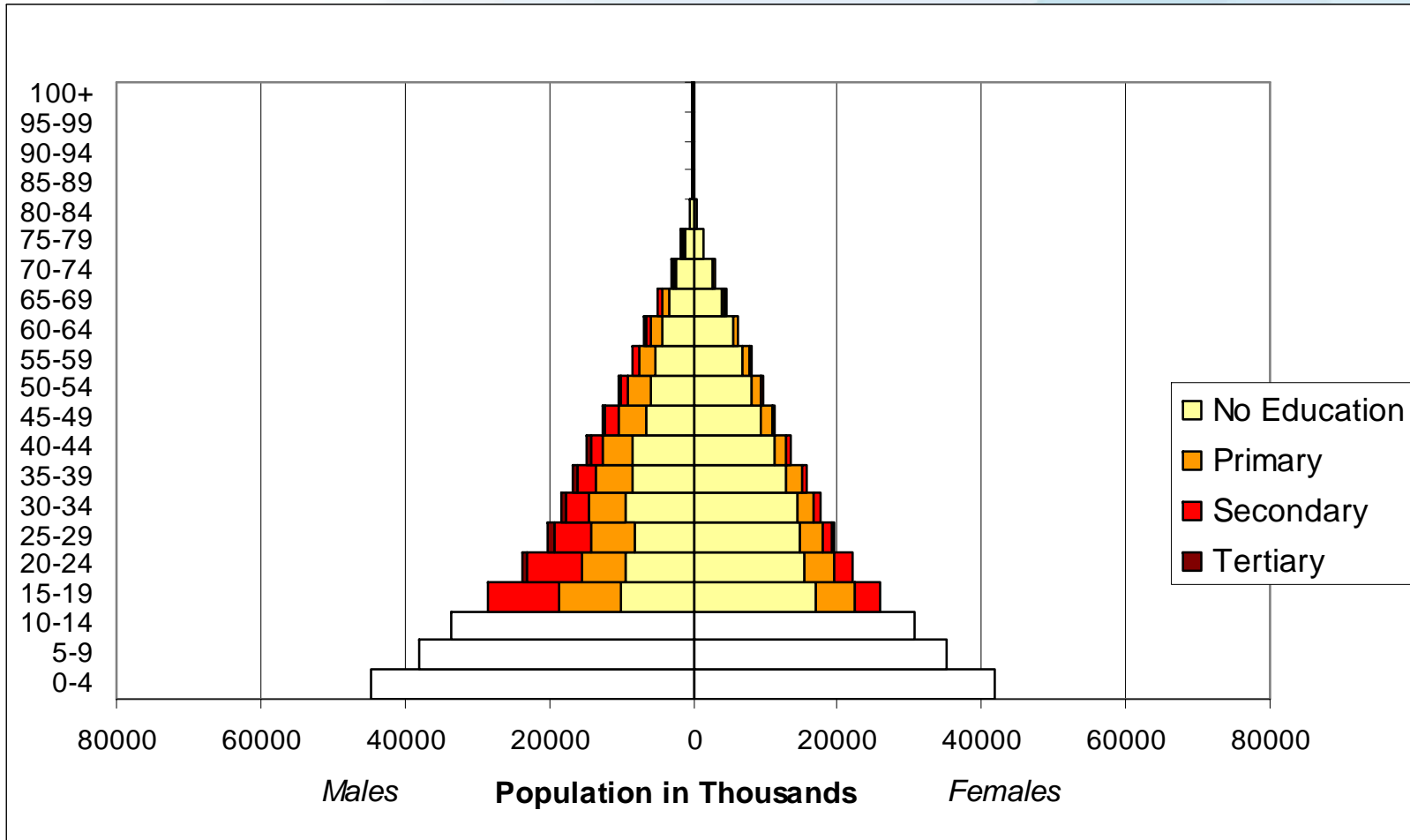
India – Age Pyramid with Education 2005

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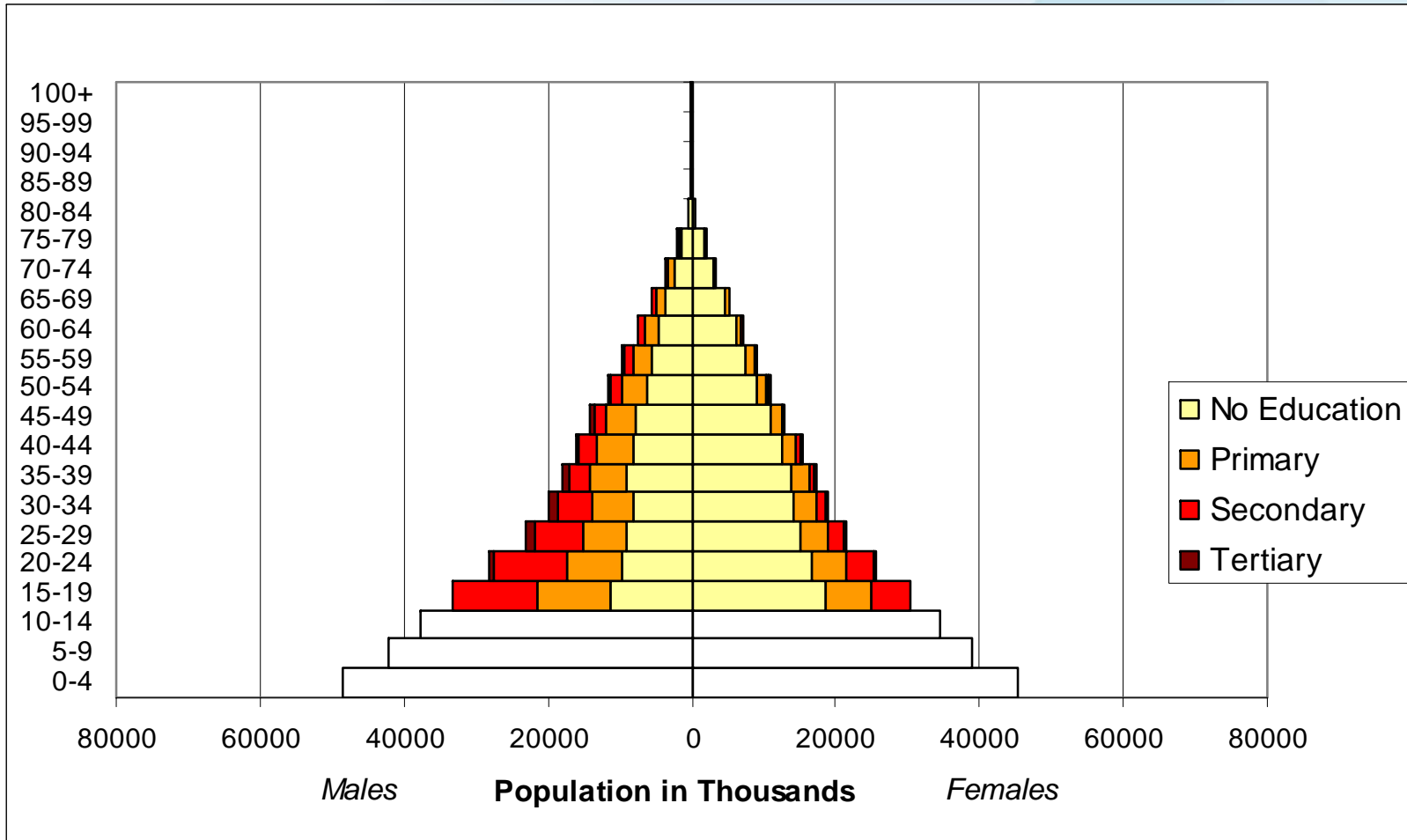
Source: Lutz, Goujon, K.C. and Sanderson 2007

India in 1970



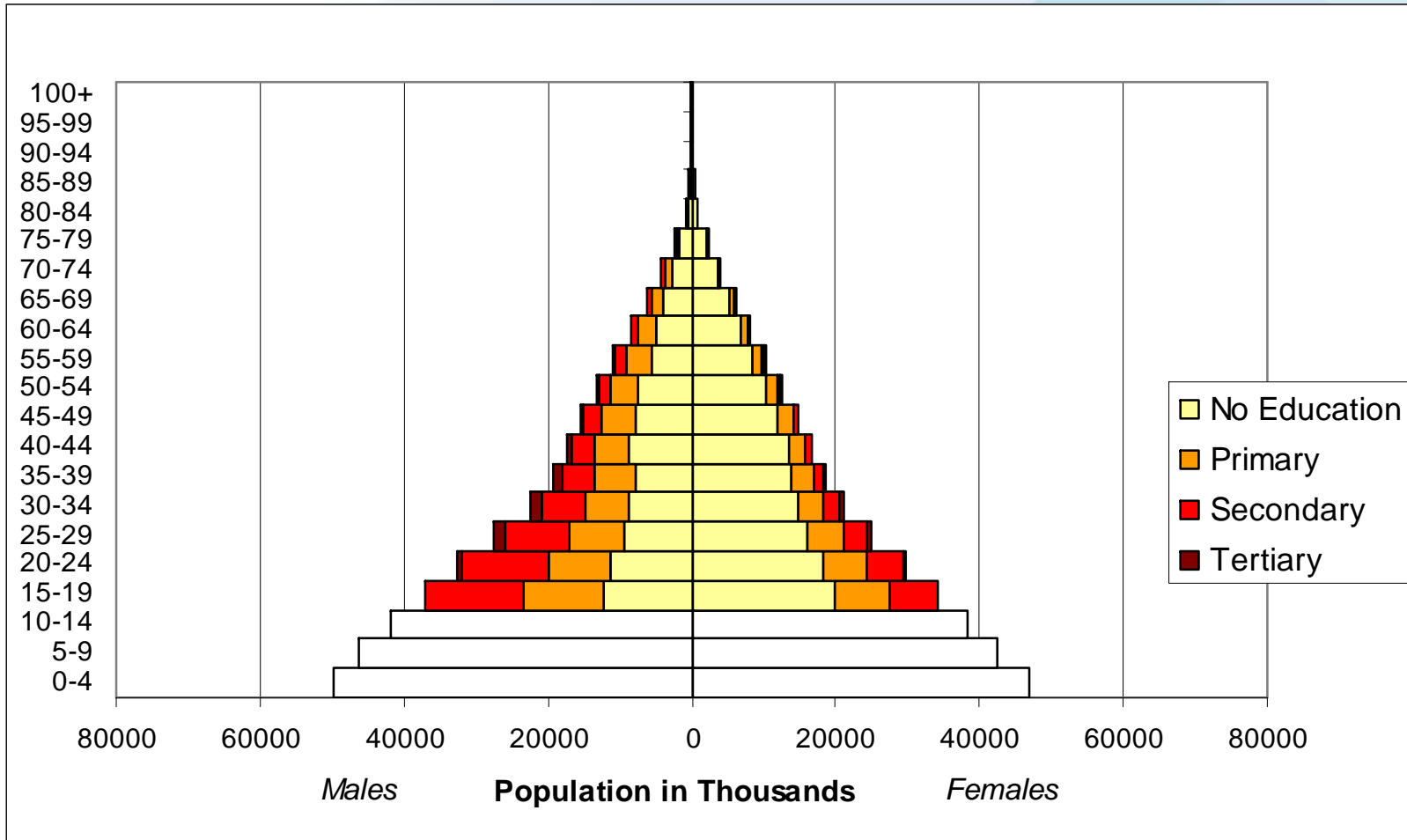
Source: Lutz, Goujon, K.C. and Sanderson 2007

India in 1975



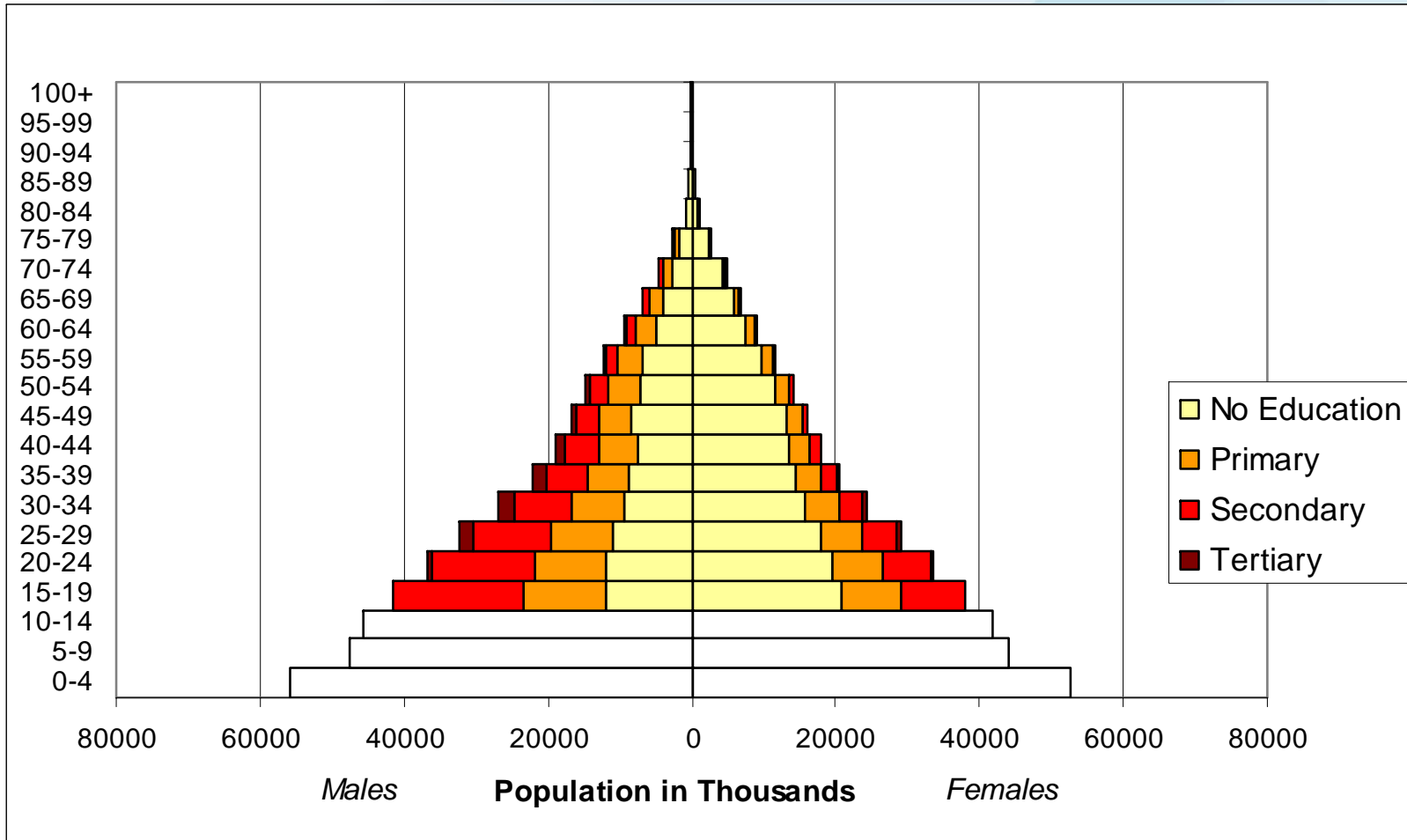
Source: Lutz, Goujon, K.C. and Sanderson 2007

India in 1980



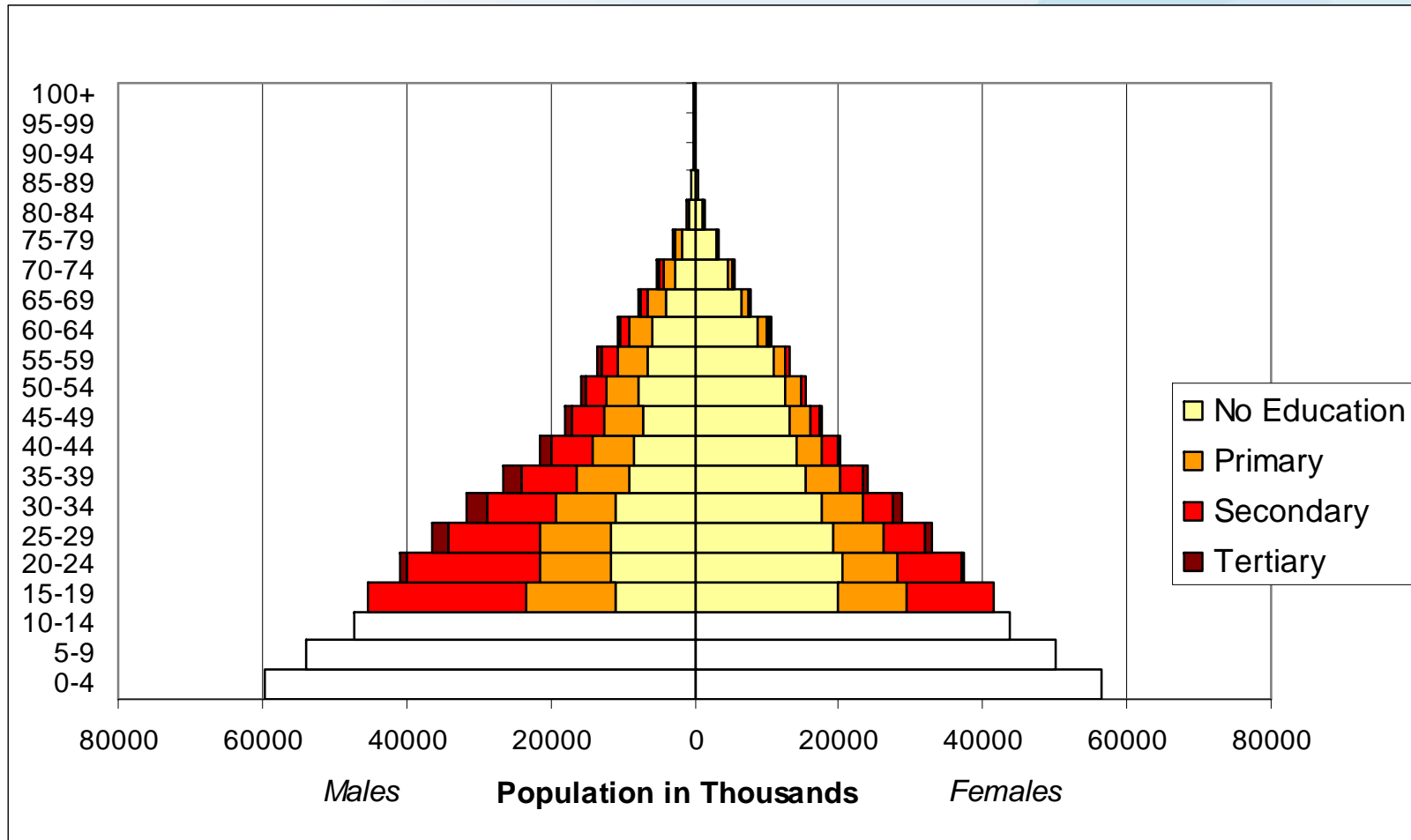
Source: Lutz, Goujon, K.C. and Sanderson 2007

India in 1985



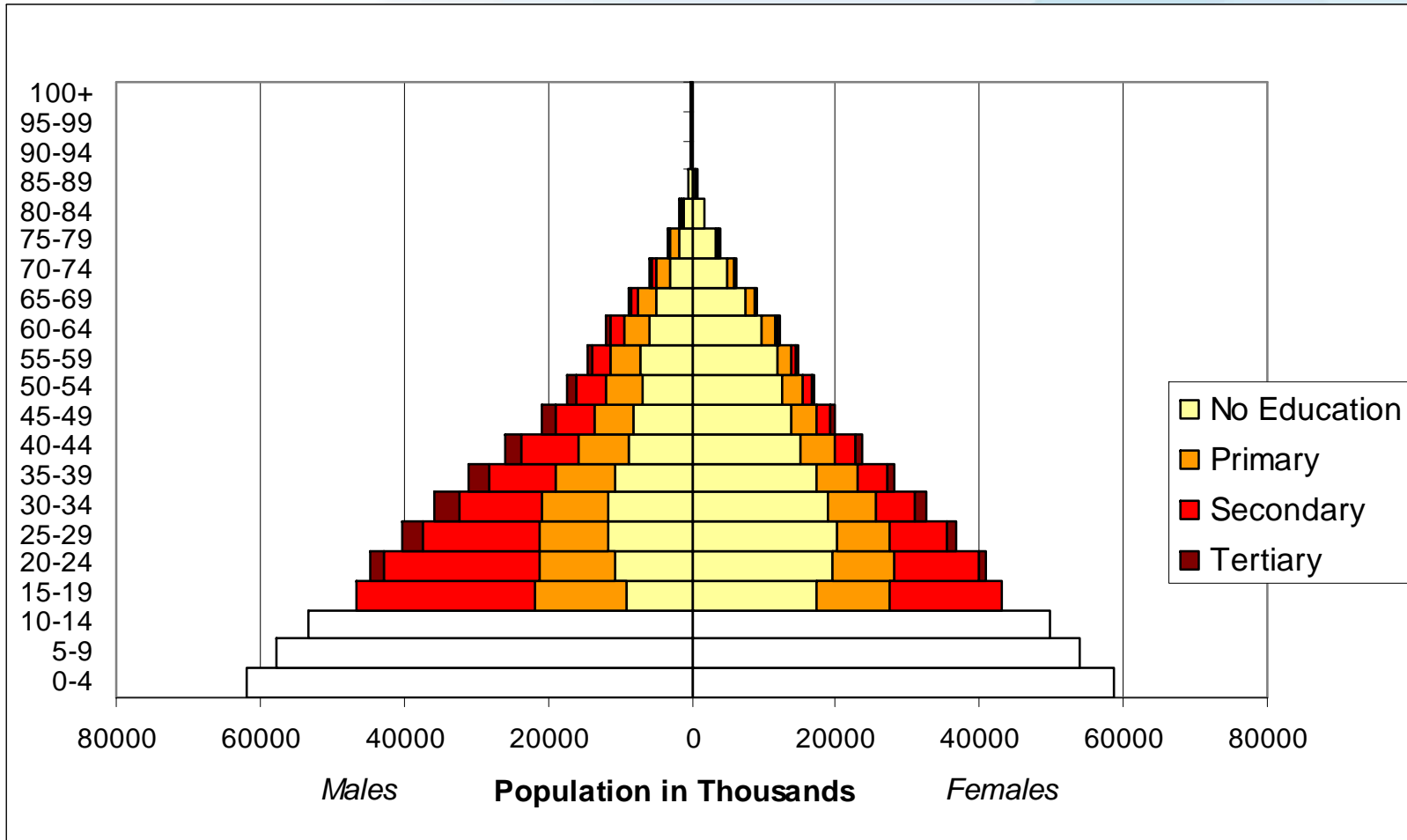
Source: Lutz, Goujon, K.C. and Sanderson 2007

India in 1990



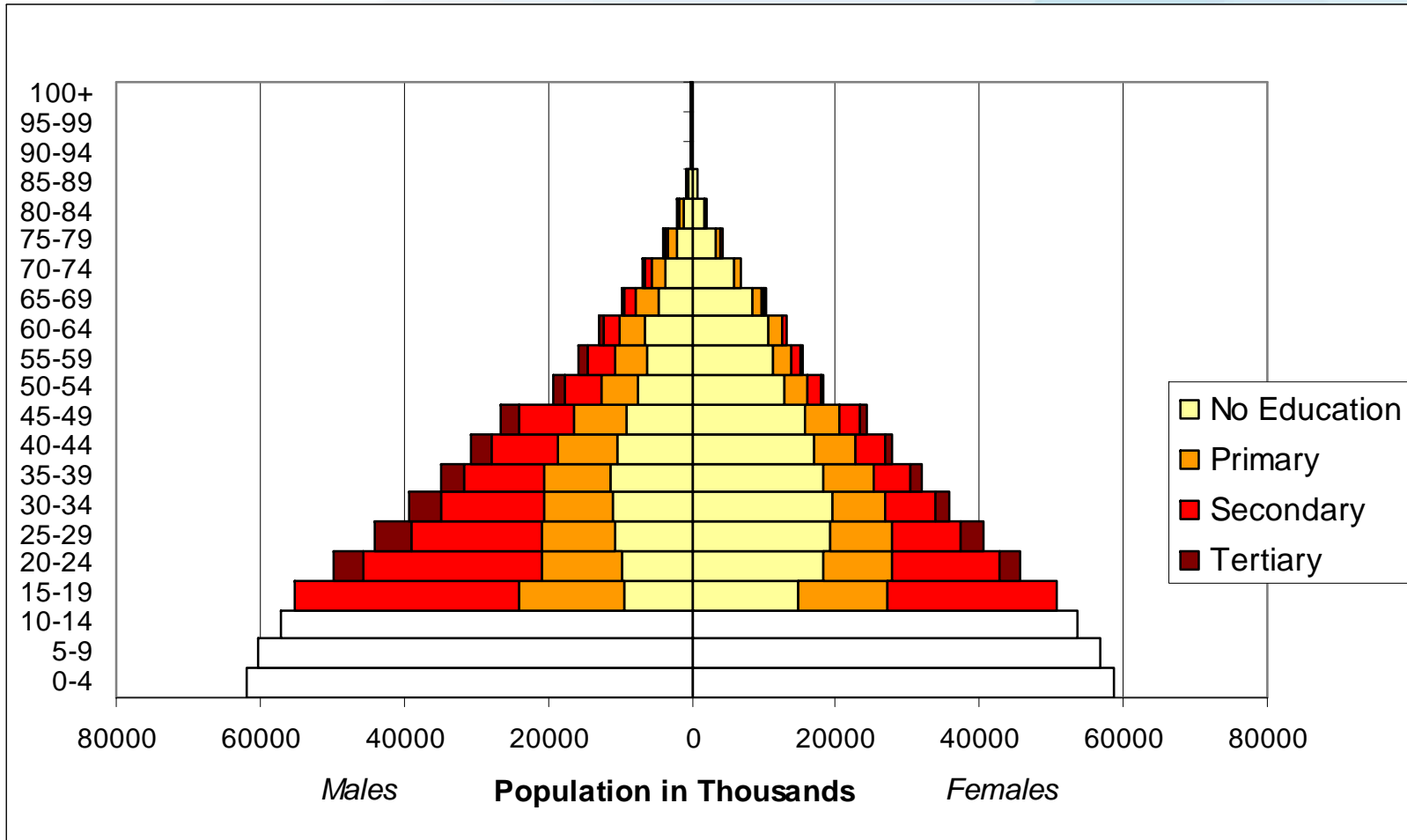
Source: Lutz, Goujon, K.C. and Sanderson 2007

India in 1995



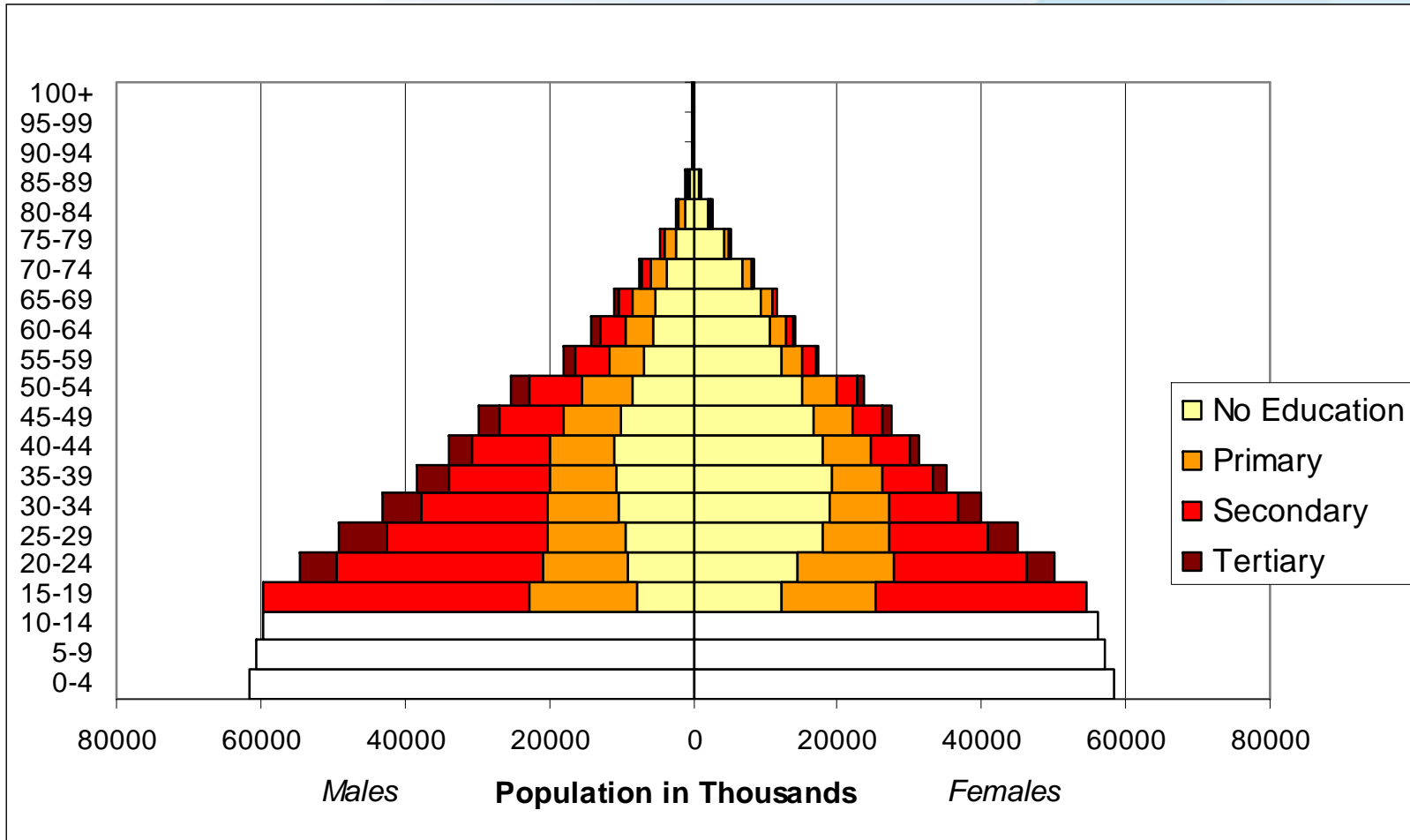
Source: Lutz, Goujon, K.C. and Sanderson 2007

India in 2000



Source: Lutz, Goujon, K.C. and Sanderson 2007

India in 2005

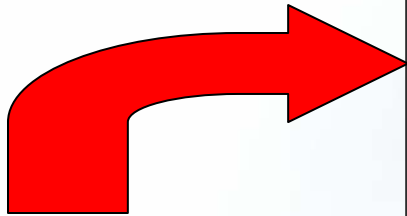


Source: Lutz, Goujon, K.C. and Sanderson 2007

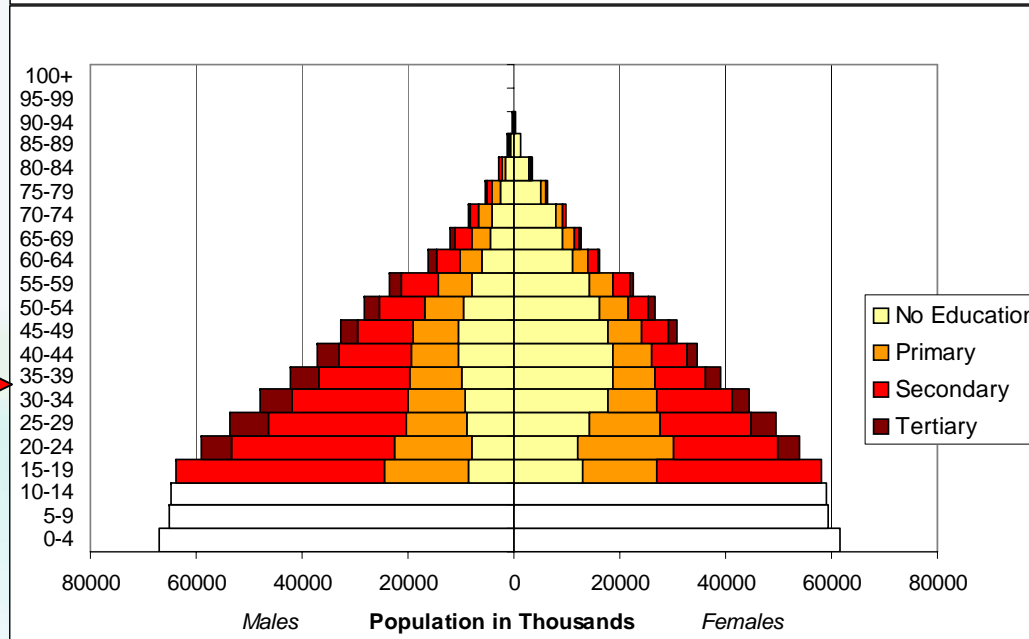
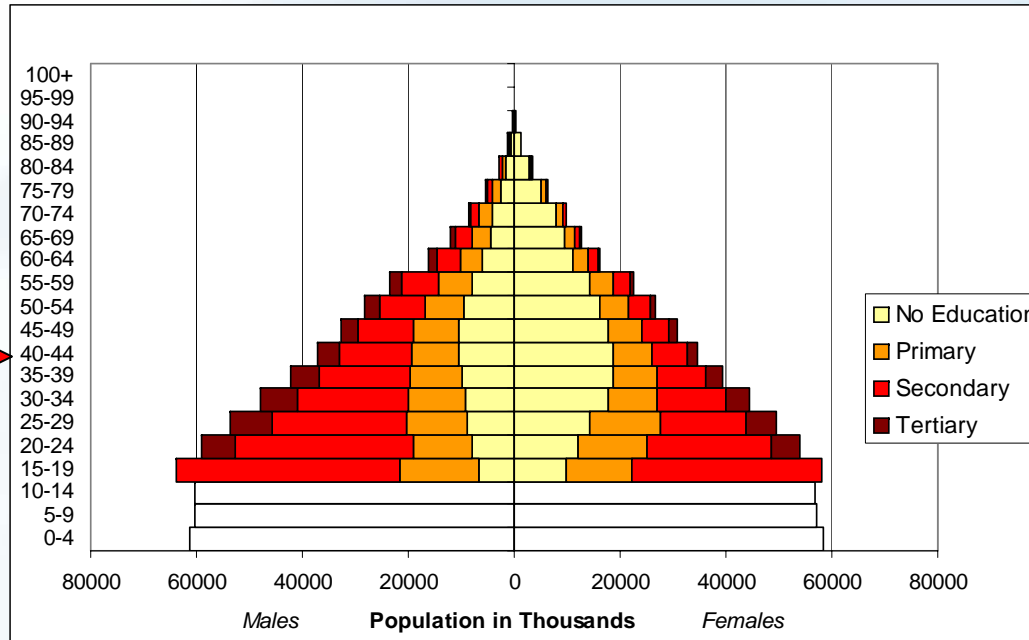
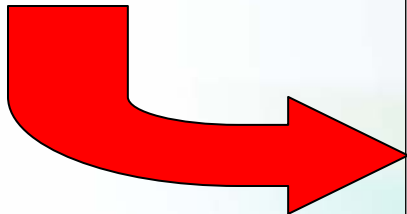
India in 2010

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Goal Scenario



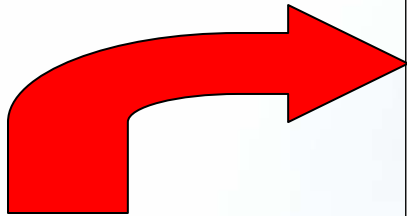
Constant Enrolment Scenario



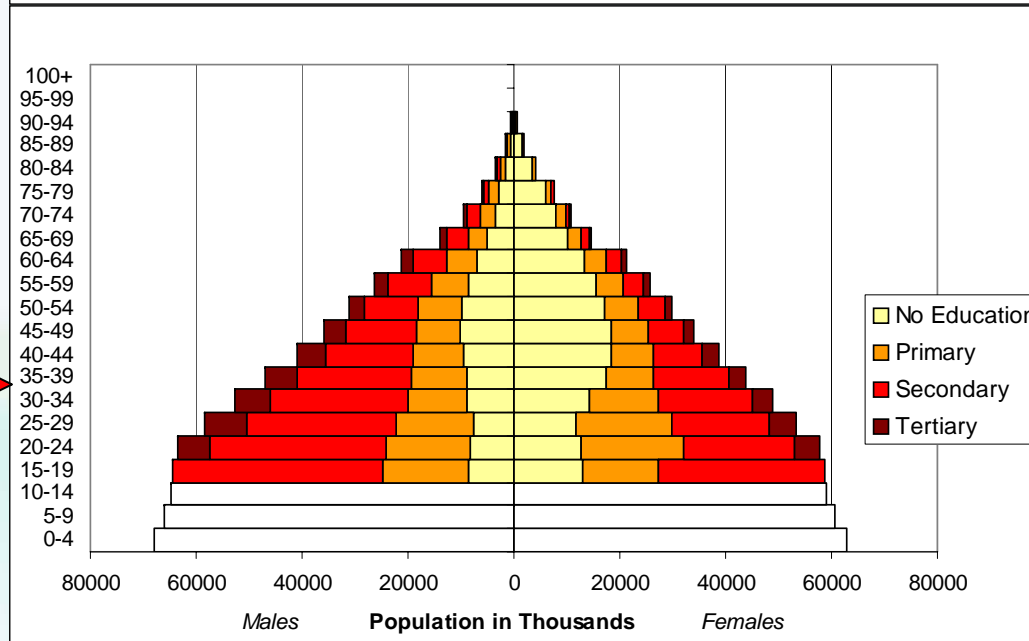
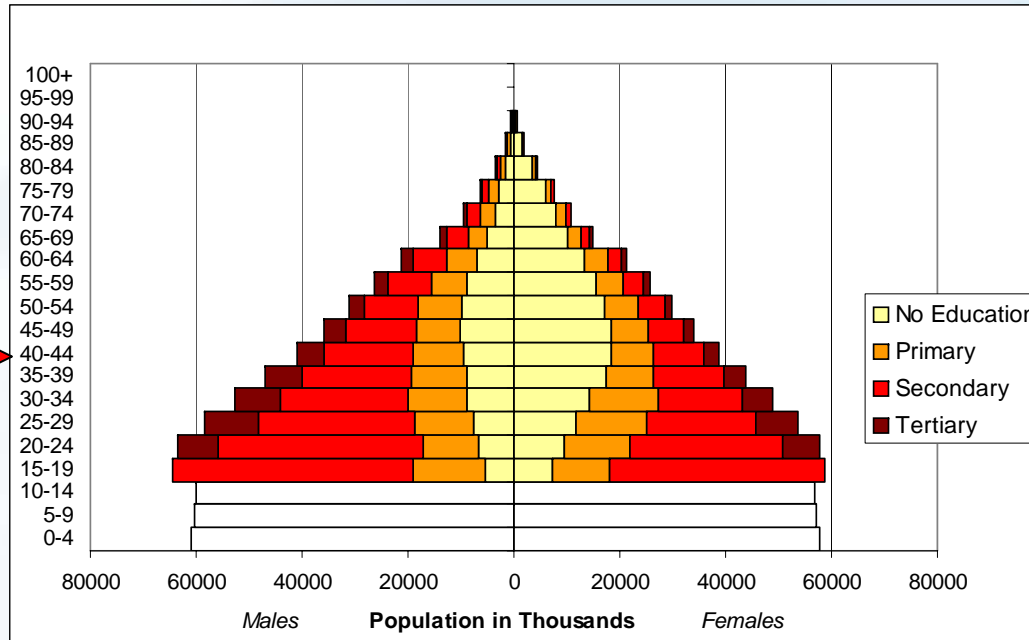
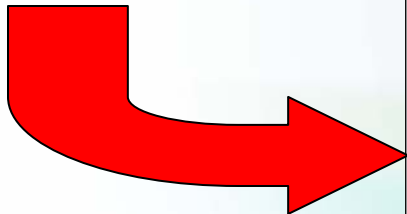
India in 2015

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Goal Scenario

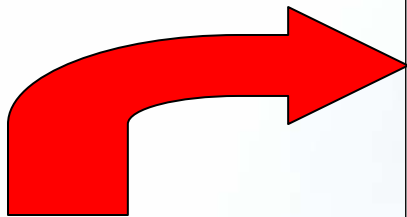


Constant Enrolment Scenario

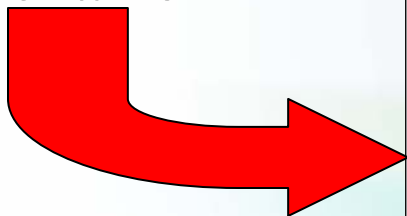


India in 2020

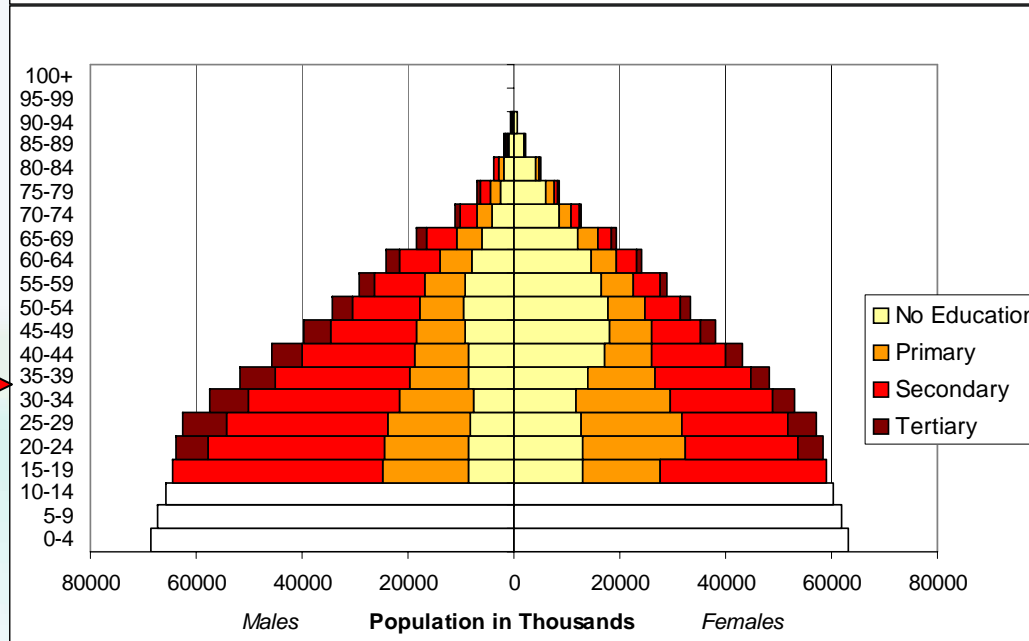
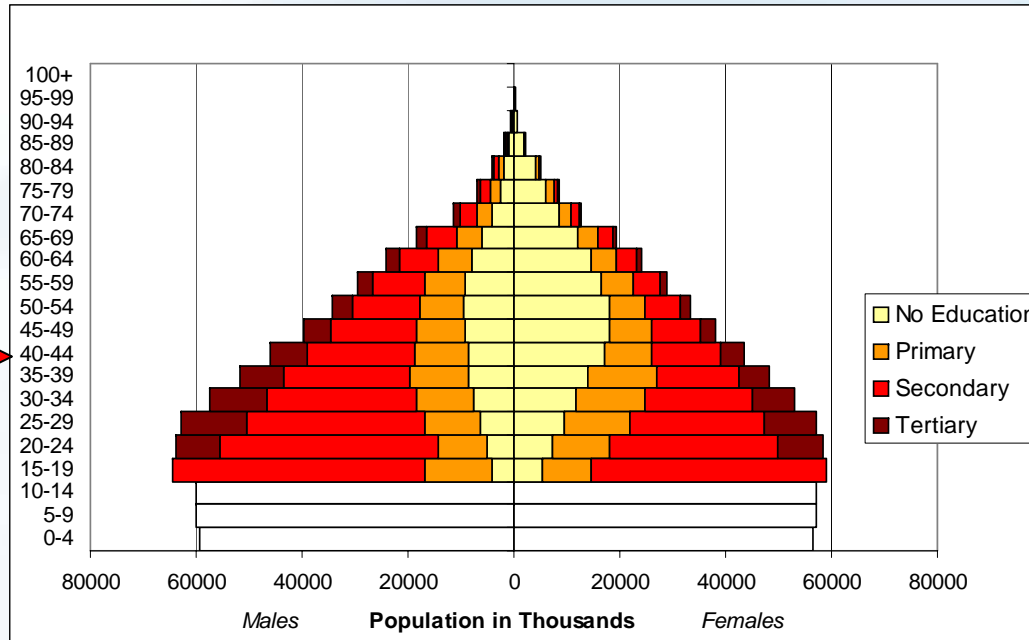
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Goal Scenario



Constant Enrolment Scenario

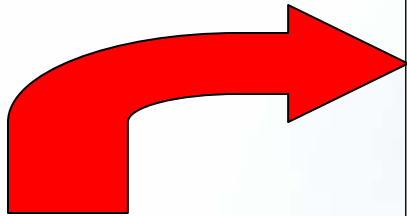


Source: Lutz, Goujon, K.C. and Sanderson 2007

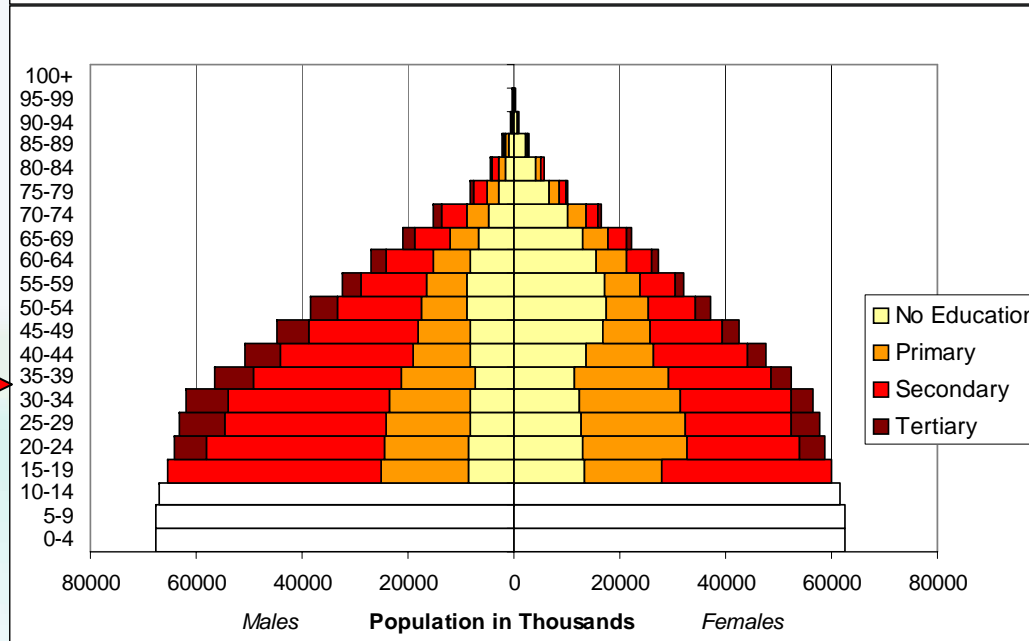
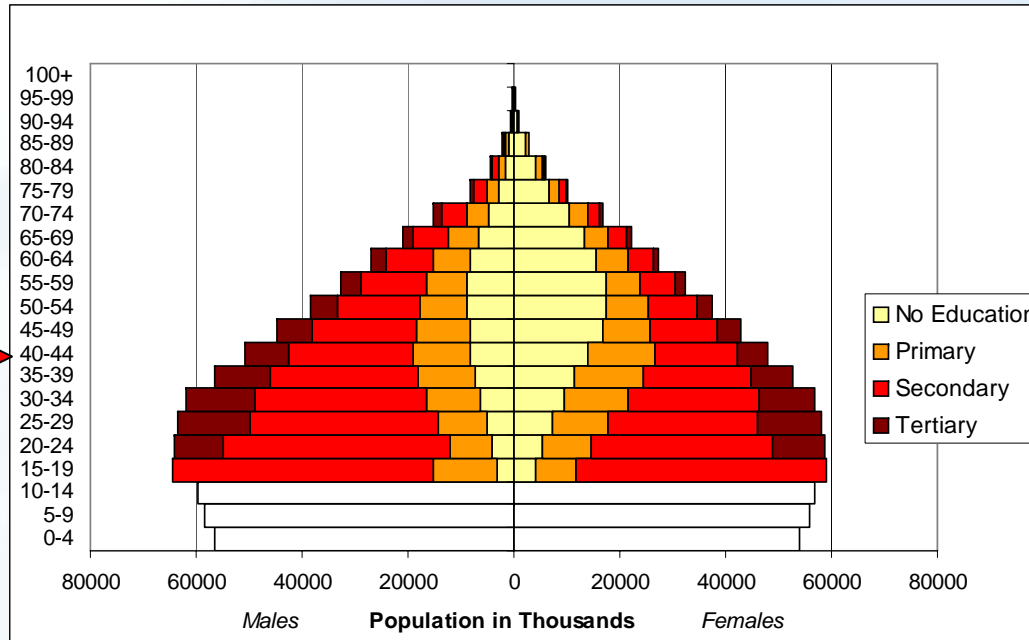
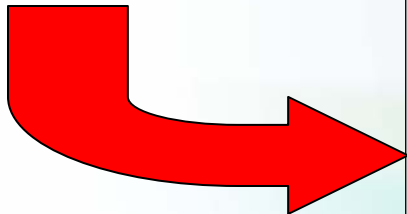
India in 2025

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Goal Scenario



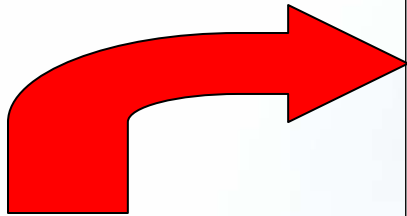
Constant Enrolment Scenario



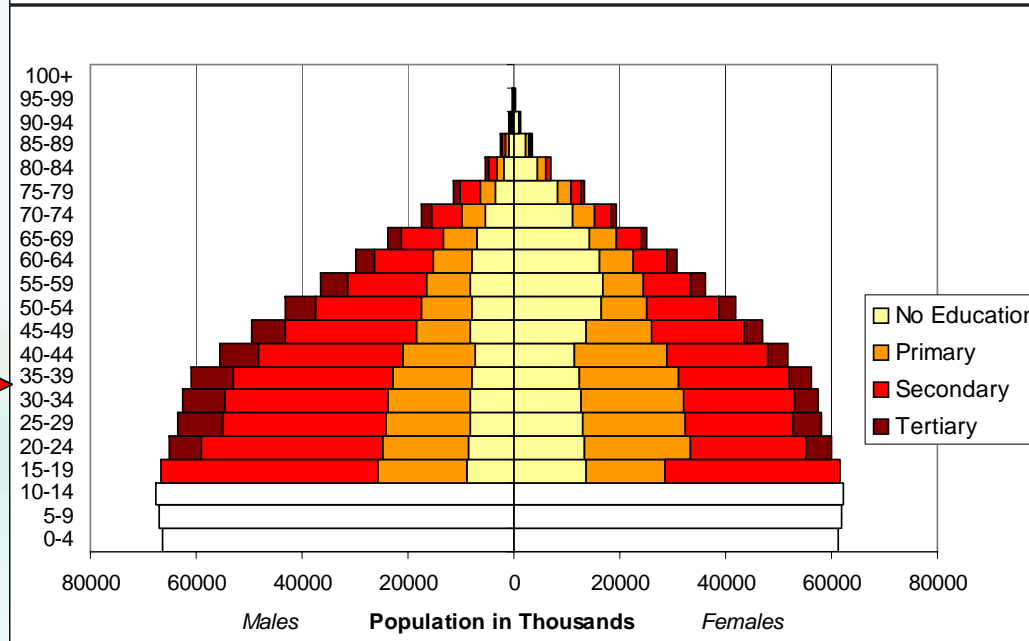
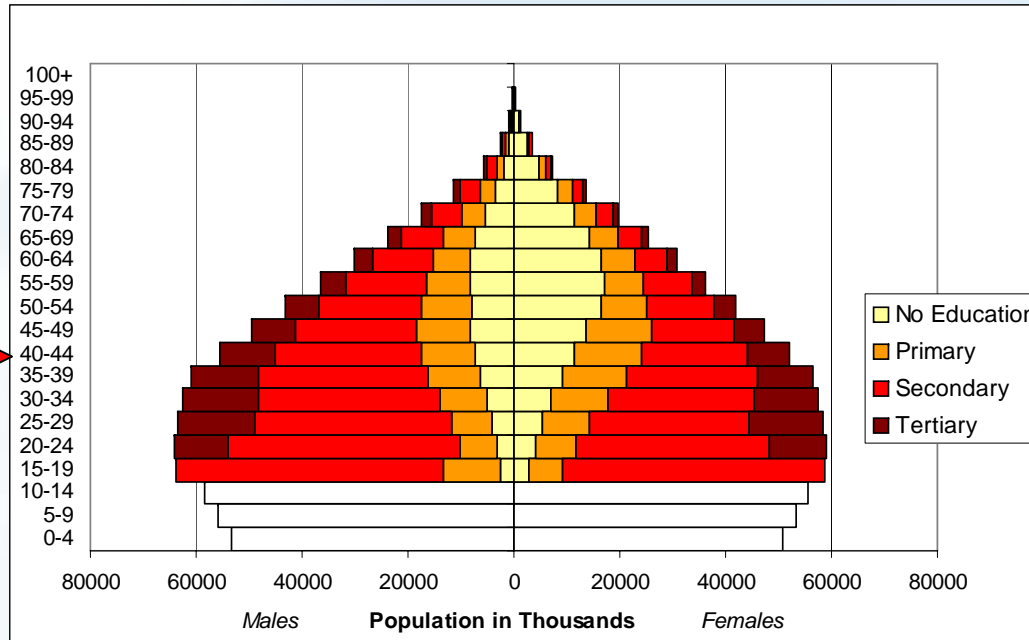
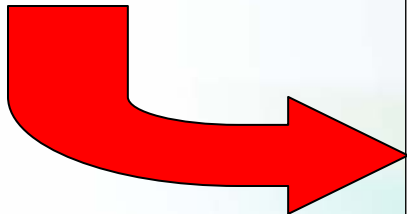
India in 2030

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Goal Scenario



Constant Enrolment Scenario

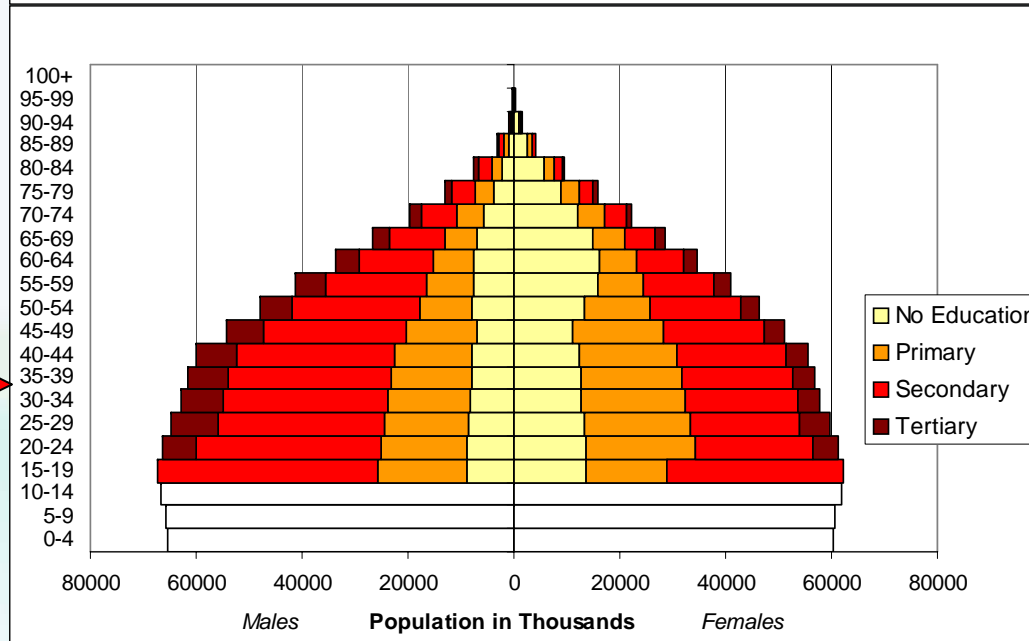
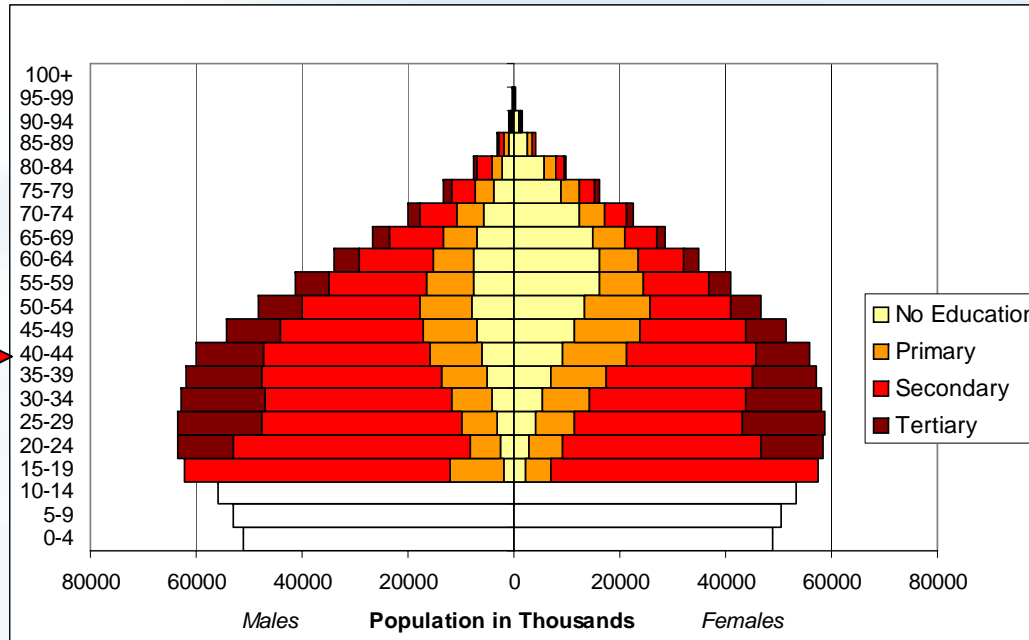


India in 2035

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Goal Scenario

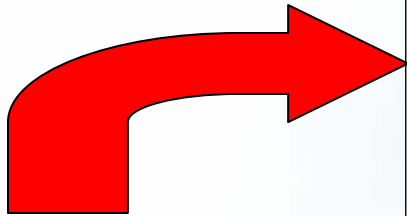
Constant Enrolment Scenario



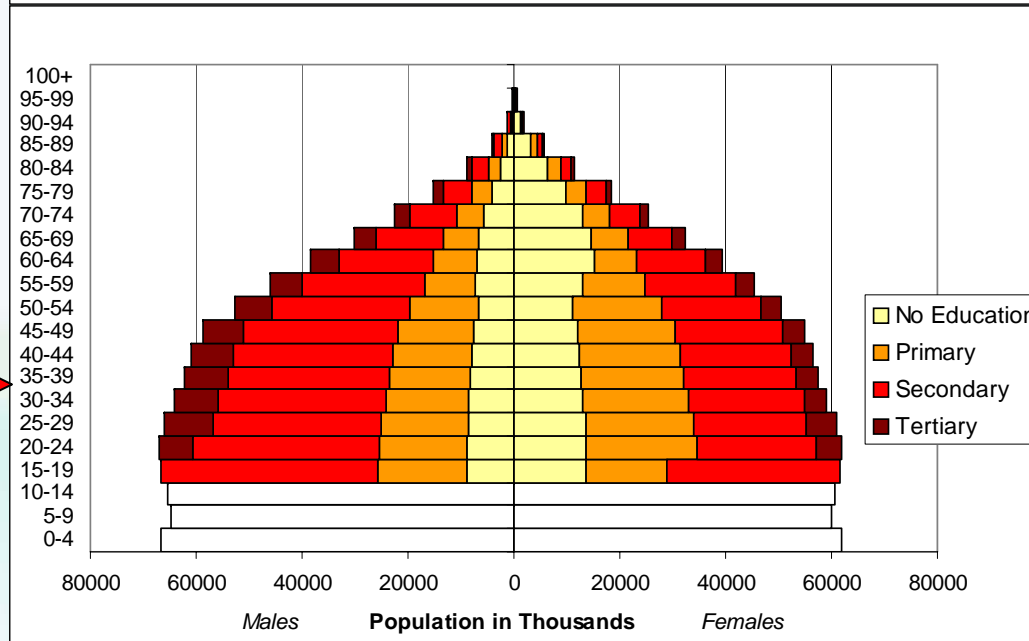
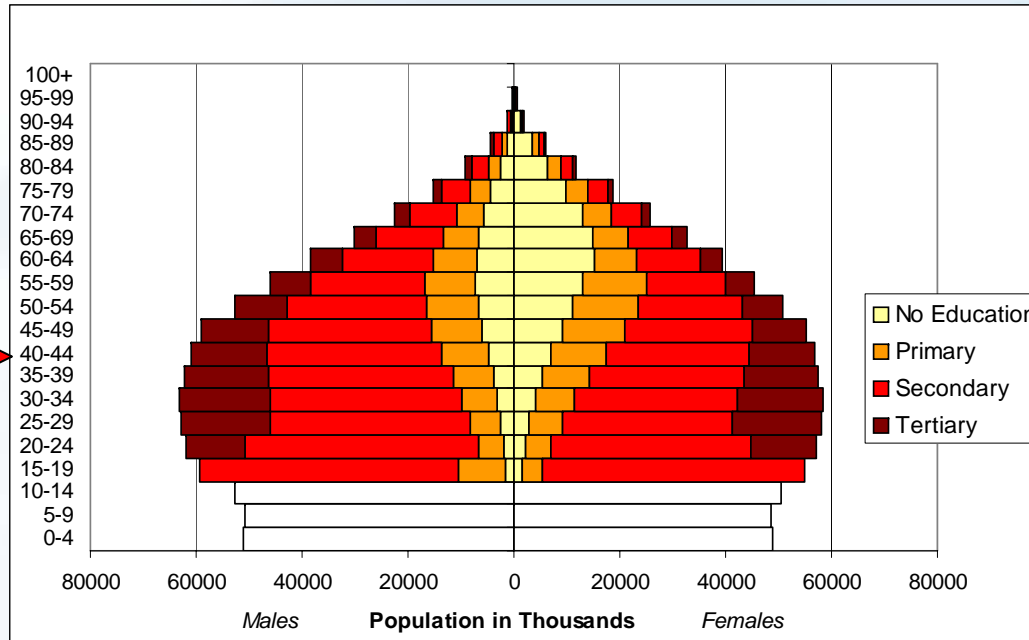
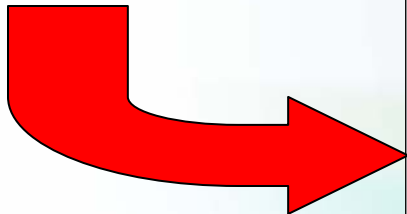
India in 2040

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Goal Scenario



Constant Enrolment Scenario

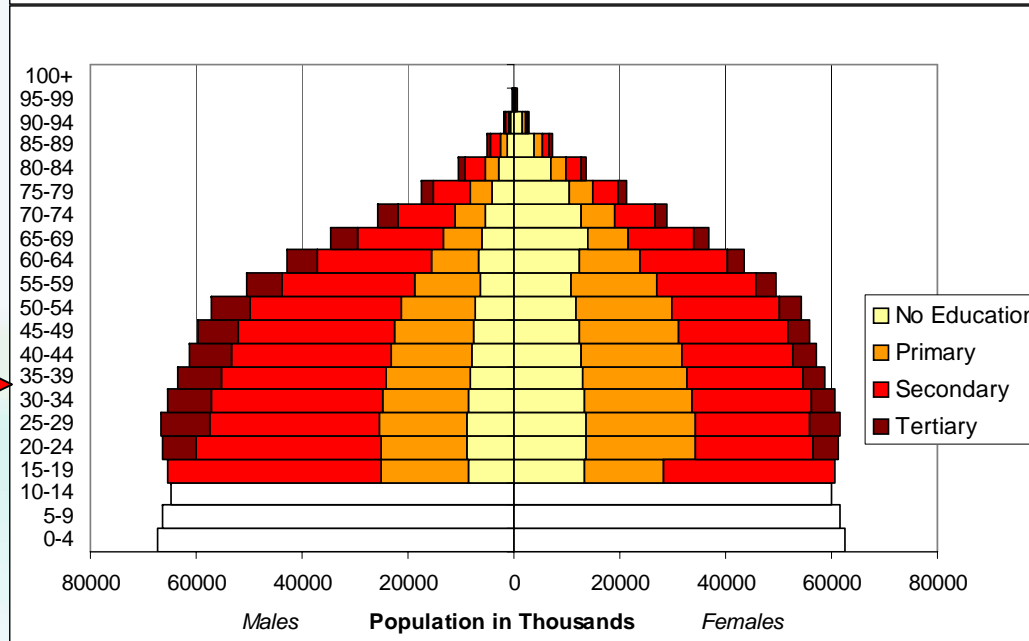
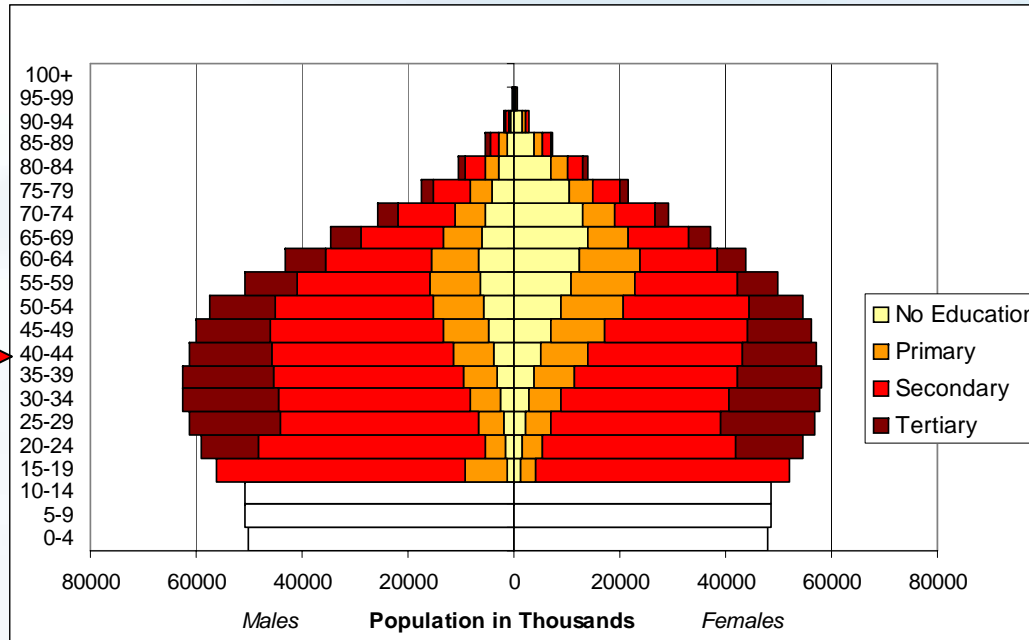


India in 2045

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Goal Scenario

Constant Enrolment Scenario

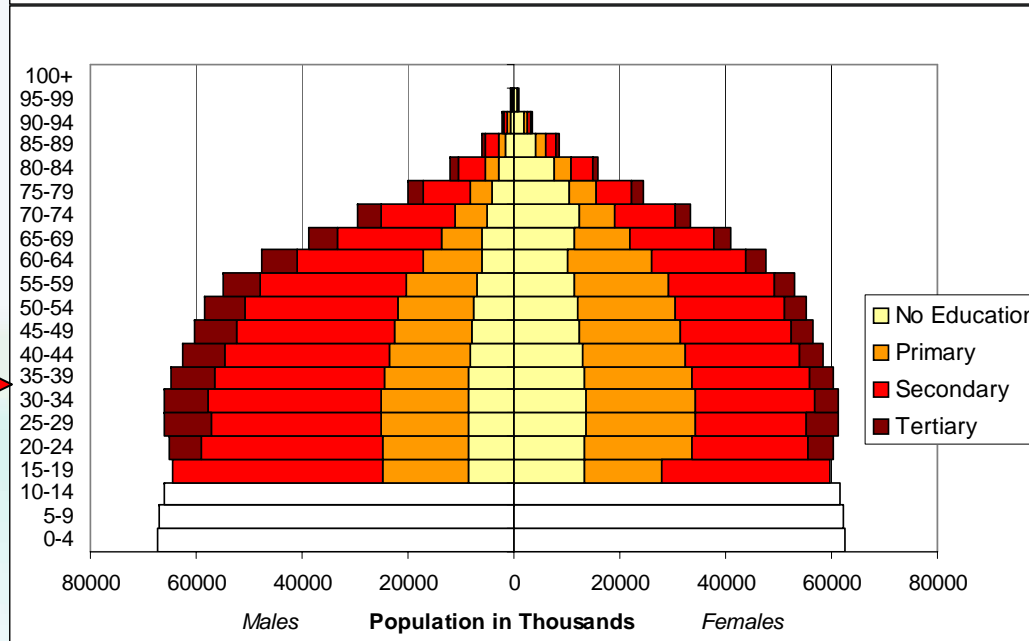
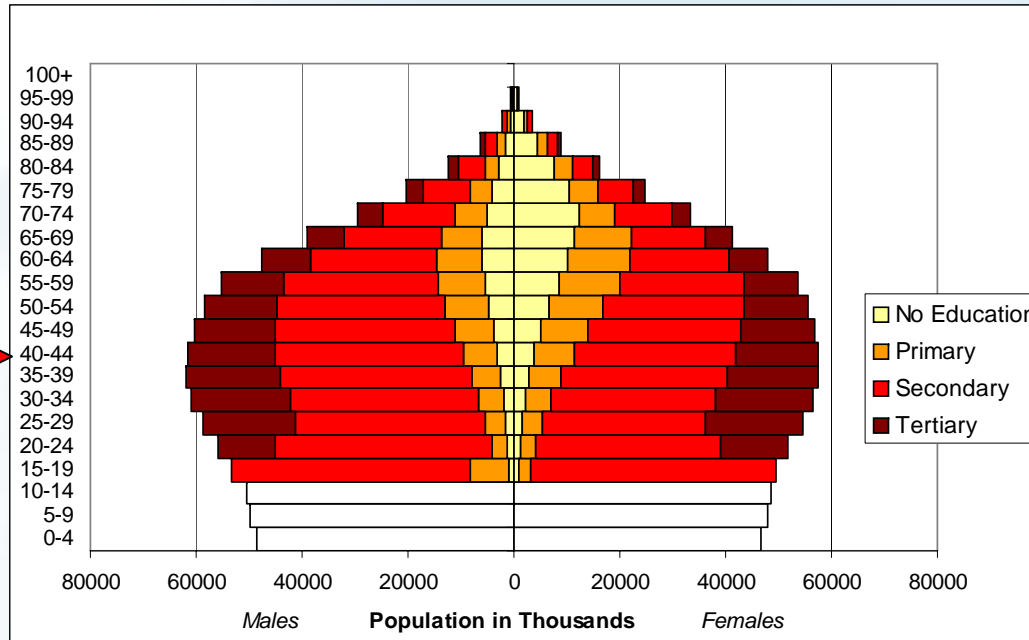


India in 2050

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Goal Scenario

Constant Enrolment Scenario

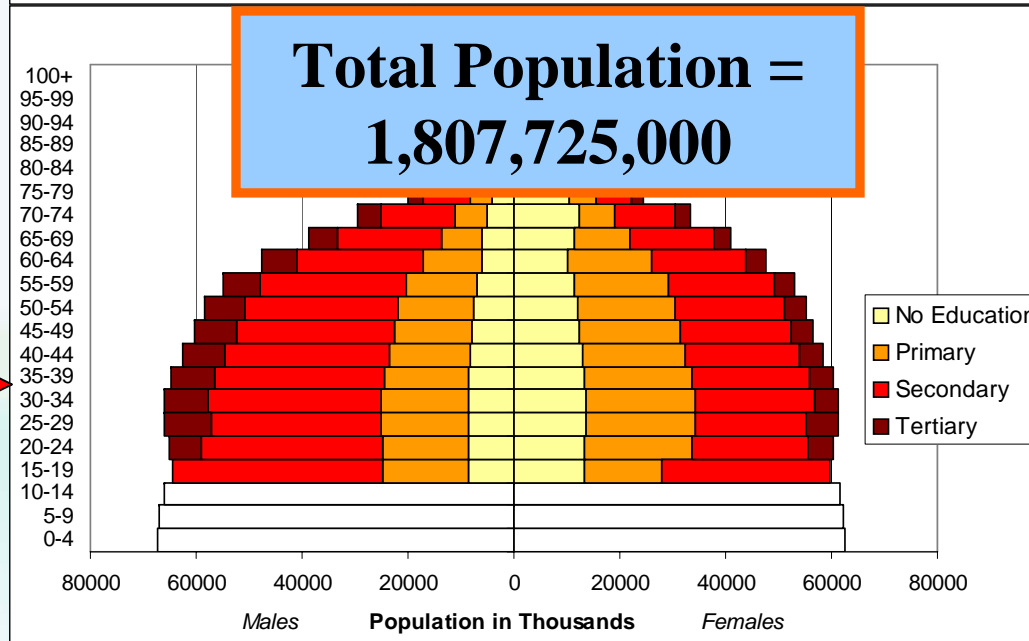
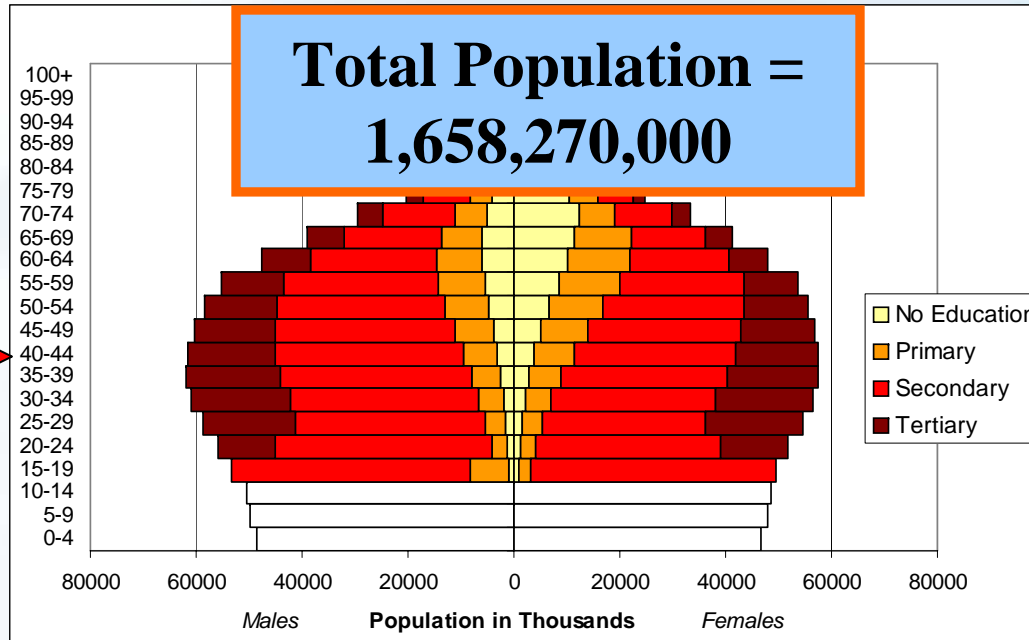


India in 2050

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Goal Scenario

Constant Enrolment Scenario



Source: Lutz, Goujon, K.C. and Sanderson 2007



What do we mean by Development?

Human Development Index (HDI) has three dimensions: Education, Life Expectancy and Income

More broadly defined:

- Empowerment through education at different levels
- Lower infant mortality, greater longevity, better health
- Higher economic growth and standard of living
- Better governance and civil liberties

Fertility Differentials by Education for countries in demographic transition

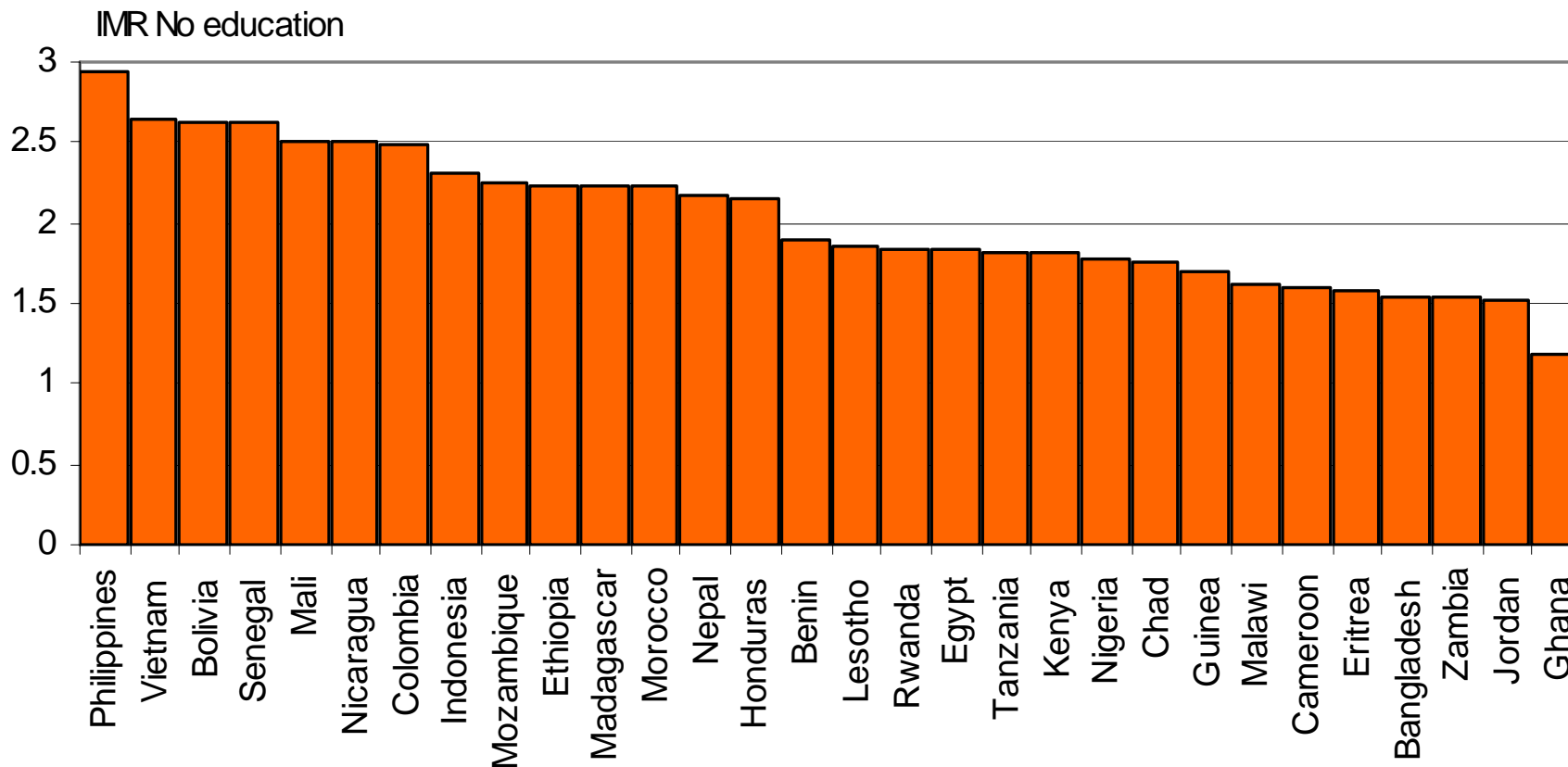
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	Total fertility rates by women's highest educational level			
	No education (A)	Primary	Secondary and higher (B)	Difference (A)-(B)
Bolivia 2003	6.8	4.9	2.5	4.3
Ethiopia 2005	6.1	5.1	2.0	4.1
Nepal 2001	4.8	3.2	2.2	2.6
Armenia 2005	3.1		1.7	1.4

Source: Macro-International, Demographic and Health Surveys, 2007

Infant Mortality (IMR) by mother's education

Factor by which IMR is higher for uneducated women than for women with secondary or higher education



Source: Macro-International, Demographic and Health Surveys, 2007

Education and economic growth

- Unlike earlier growth regressions, new econometric analyses using our newly reconstructed data now show **consistently positive and significant effects** of education on economic growth rates.
- The fact that our data has age and educational attainment distributions allows for more specific studies of their relative impact on economic growth.

We Found That:

- The educational attainment of **younger adults** is key to explaining differences in income across all countries.
- For the poor countries, it turns out that not only universal primary education, but also **secondary education** of broad segments of the population boosts economic growth.

Conclusions

- While global population growth is expected to level off, Africa and Western Asia will still experience massive growth.
- The speed of global aging will accelerate over the coming decades, posing many new challenges.
- Human capital is indeed a key determinant of human wealth and wellbeing.

Policy Implications

1. Invest in education as early as possible because of the lag between investments and benefits
2. Add secondary education goals to that of universal primary education in the discussion of future development priorities





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