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Applied Systems Analysis
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Wittgenstein Centre

FOR DEMOGRAPHY AND
GLOBAL HUMAN CAPITAL

Population, Education and the Sustainable Development Goals

AAAS 2016

Wolfgang Lutz

Director, World Population Program, IIASA

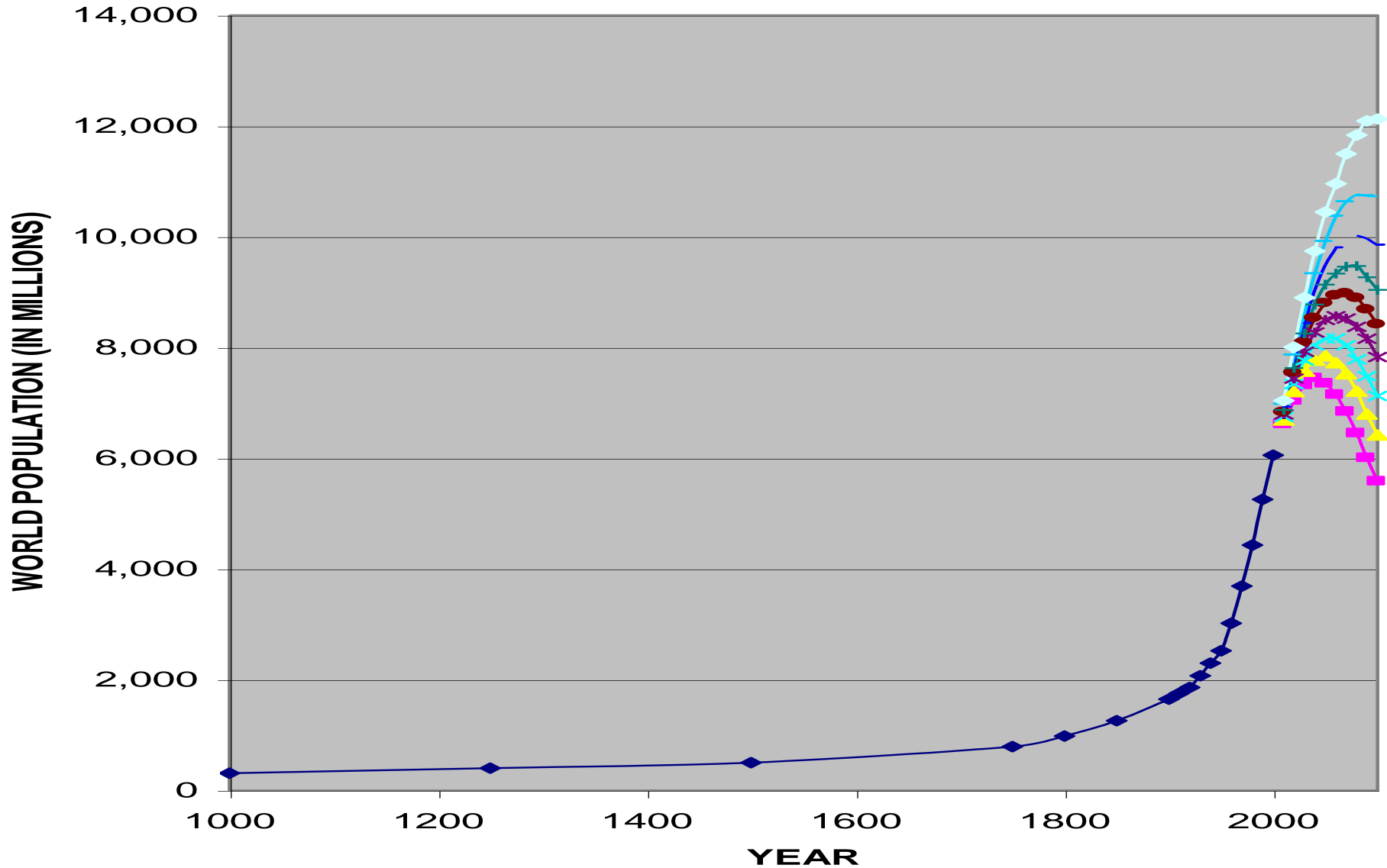
Founding Director, Wittgenstein Centre



IIASA, International Institute for Applied Systems Analysis

science for global insight

World Population from the year 1000 to 2100



World Population Growth

... is sometimes called the elephant in the room because it is not explicitly mentioned in the SDGs although it matter greatly ...

- ... through the number of consumers and their impact on the environment (at given levels of per capita consumption),
- ...through making it more difficult to expand education, improve health and reduce poverty,
- ... through more people with higher vulnerability being exposed to natural disasters and other environmental change,
- ... through possibly increasing the likelihood of conflict and uncontrolled mass migration...

Some SDG Targets are directly relevant to Population Trends

- Reproductive health
- Child mortality
- Universal primary and secondary education

Probabilistic world population projections:

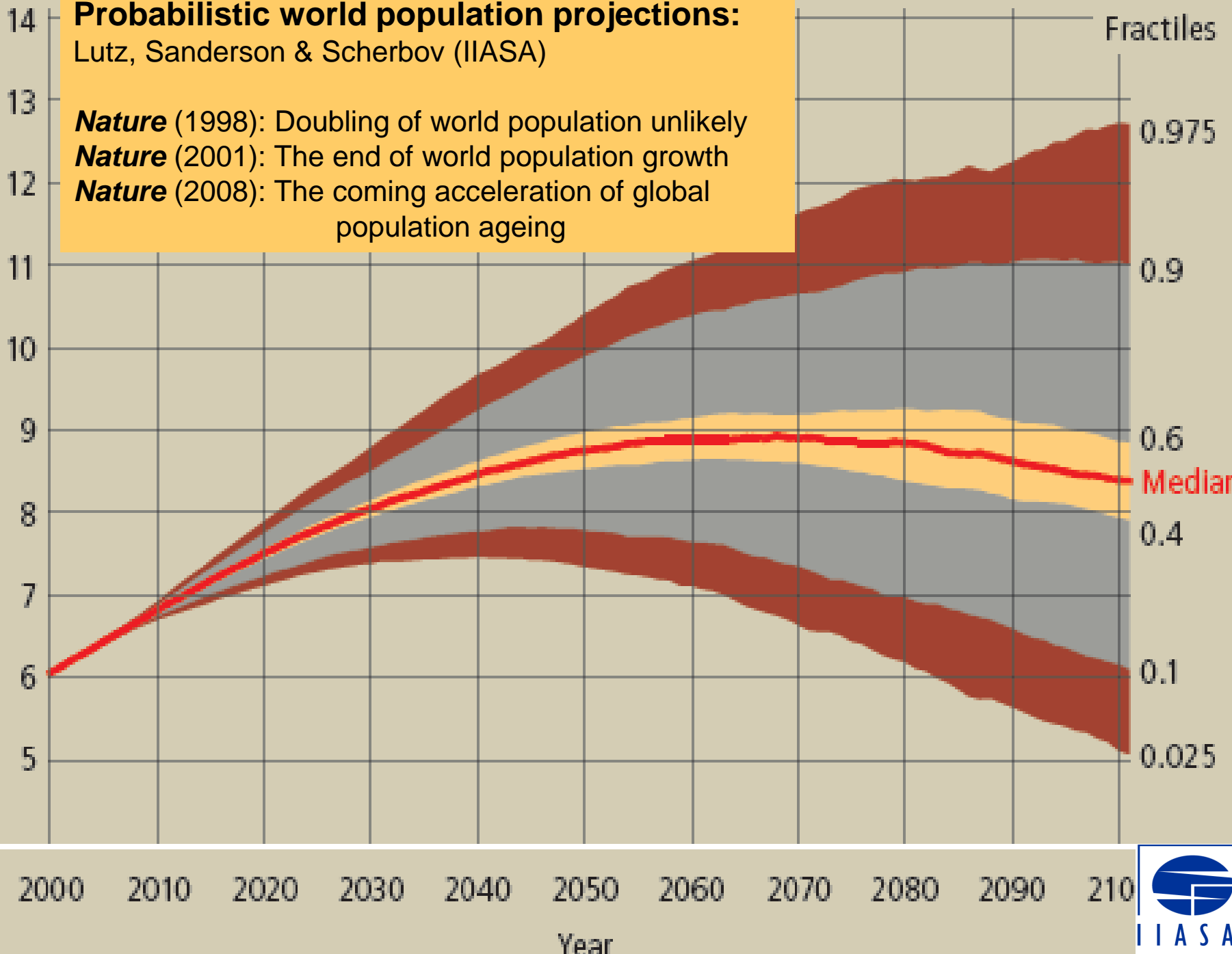
Lutz, Sanderson & Scherbov (IIASA)

Nature (1998): Doubling of world population unlikely

Nature (2001): The end of world population growth

Nature (2008): The coming acceleration of global population ageing

Total World Population



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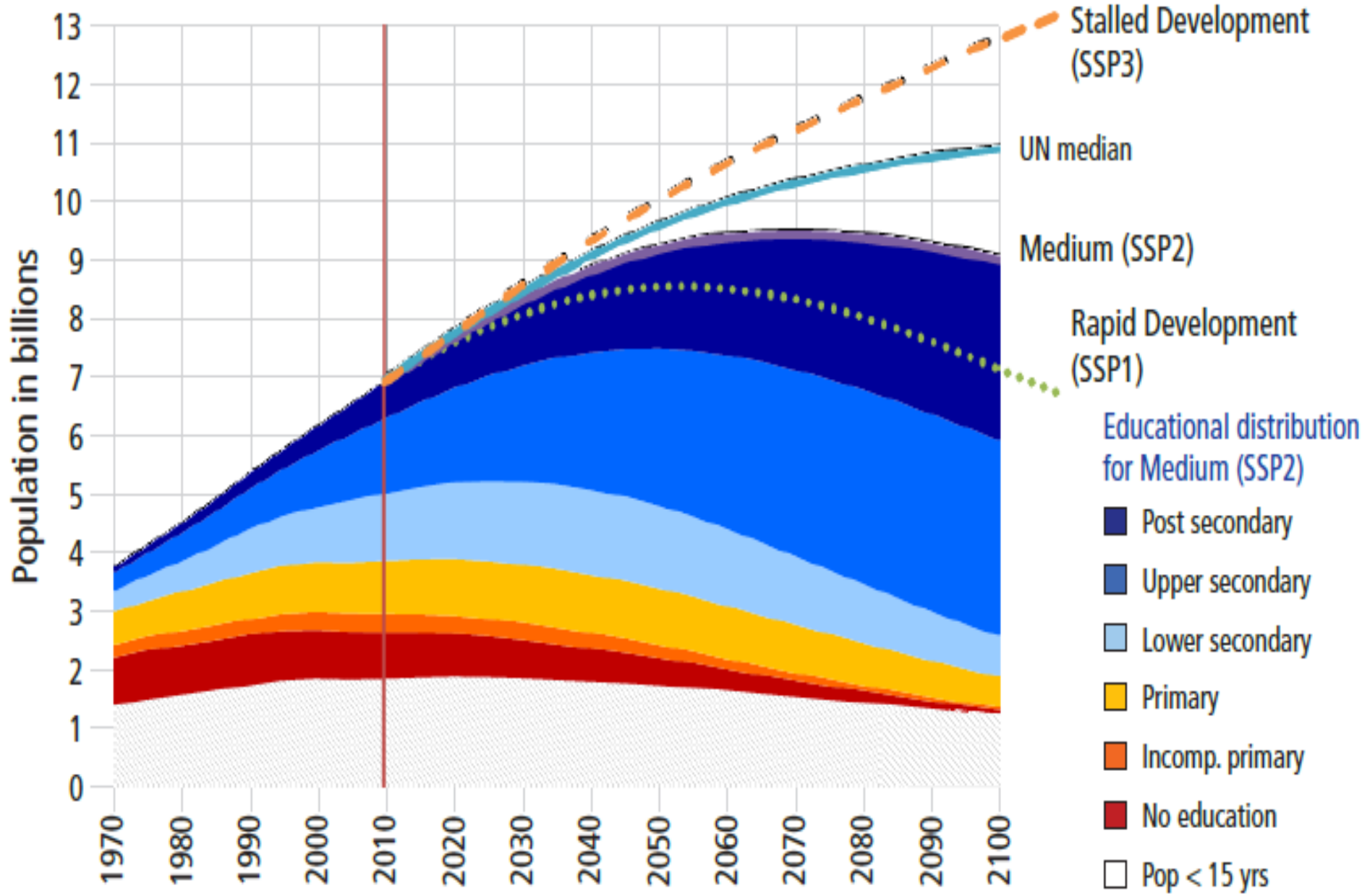


Chart 1. Historical trend and projections according to the medium scenario (SSP2) for the world population by six levels of educational attainment (see color coding). The additional lines superimposed

Education as an important goal in its own right

*In a global survey by the United Nations respondents consistently ranked “a good education” as **the most important issue that would make a difference in their life**, ahead of better healthcare and job opportunities.*

This is true for both women and men, all age groups, at all levels of national development, and all levels of individual education.

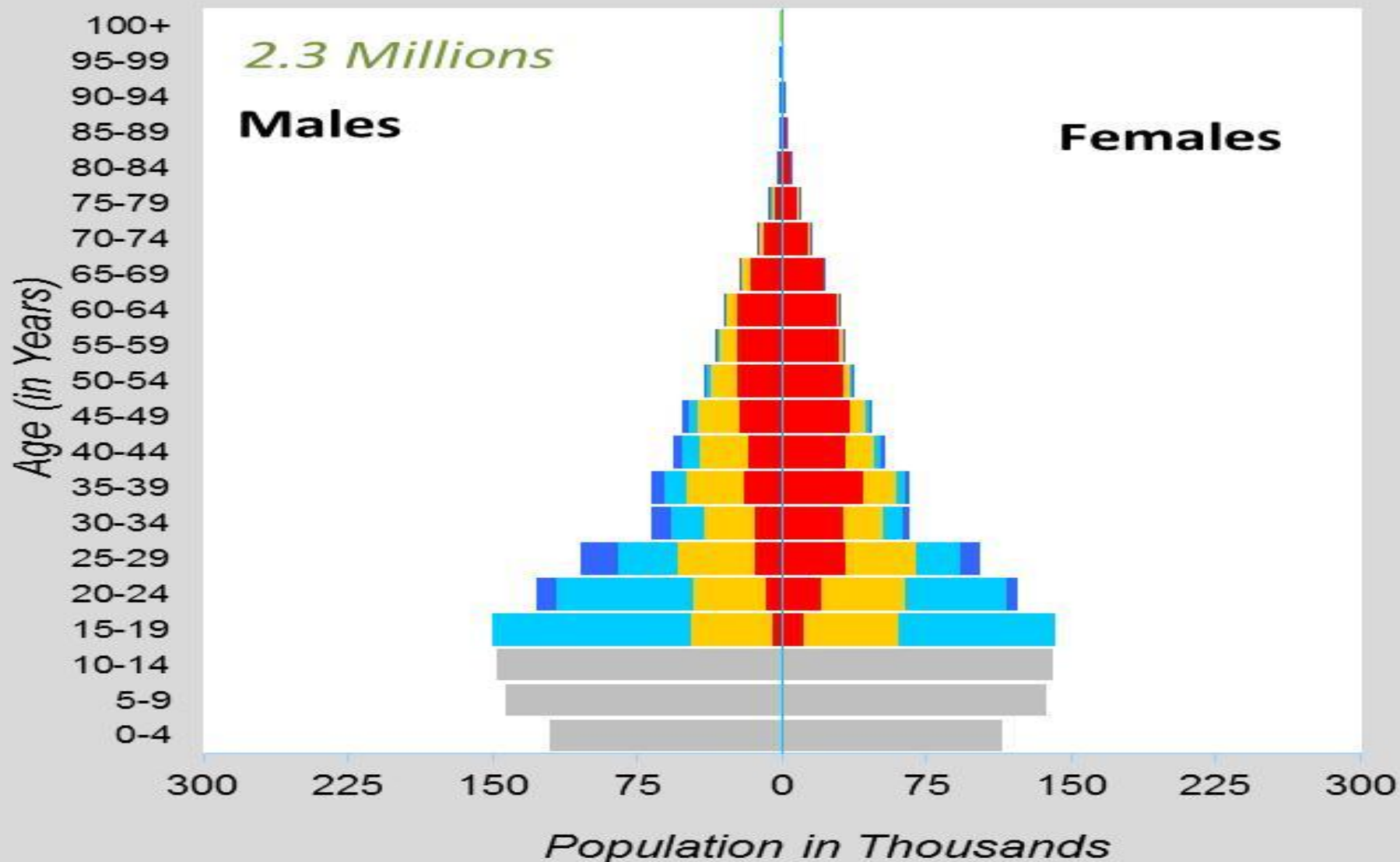
Adding education to age and sex in population analysis

Education is the most important source of observable population heterogeneity after age and sex.

This matters because:

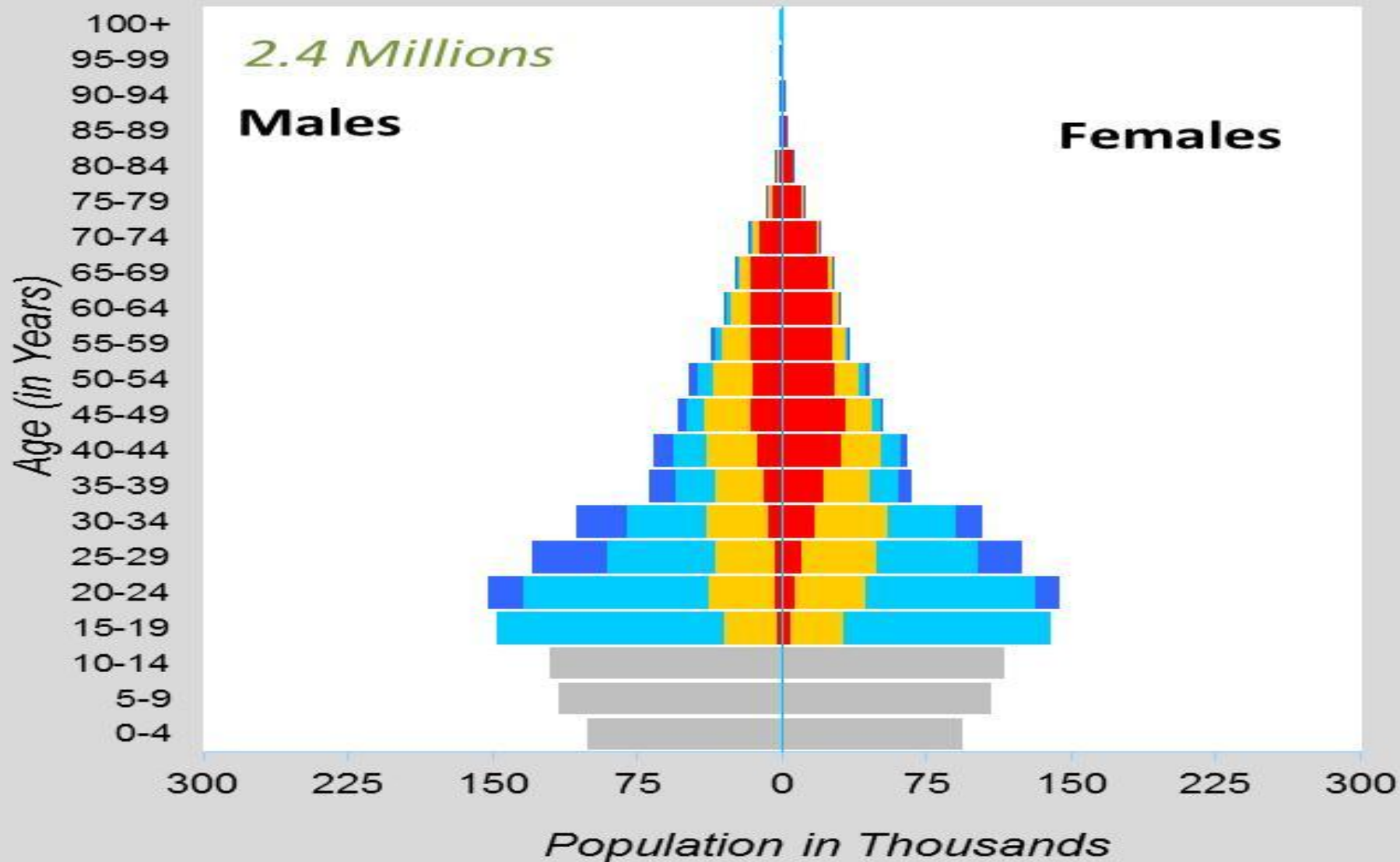
- Almost universally during demographic transition more educated women have fewer children, have lower child mortality, and more educated adults live longer. Changing education composition **changes population forecasts**.
- Education is a crucial determinant of individual **empowerment and human capital**, is a key driver of socio-economic development (public health, economic growth, quality of institutions and democracy, and adaptive capacity to climate change).

Singapore - 1970 BP



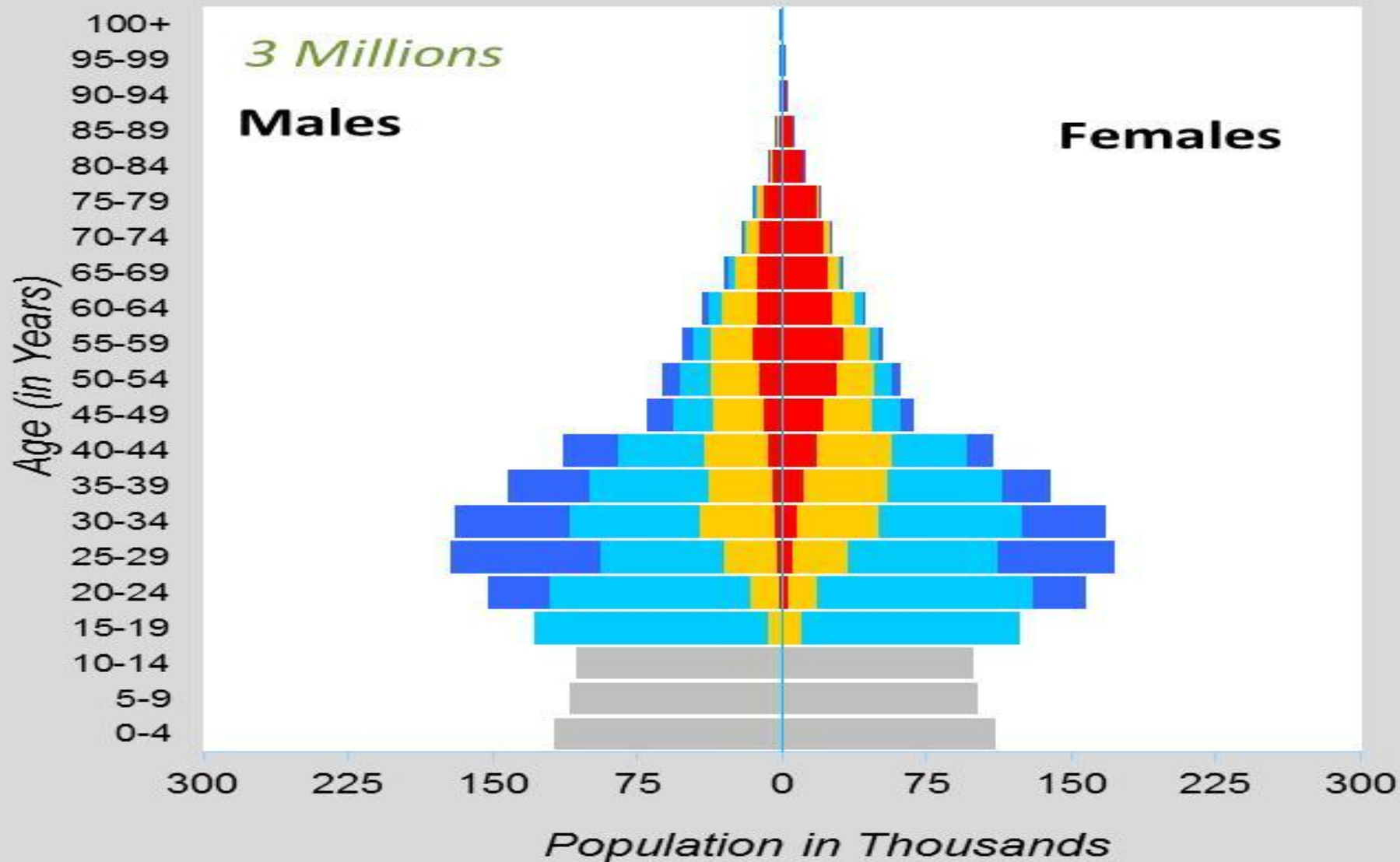
■ No Education ■ Primary ■ Secondary ■ Tertiary

Singapore - 1980 BP



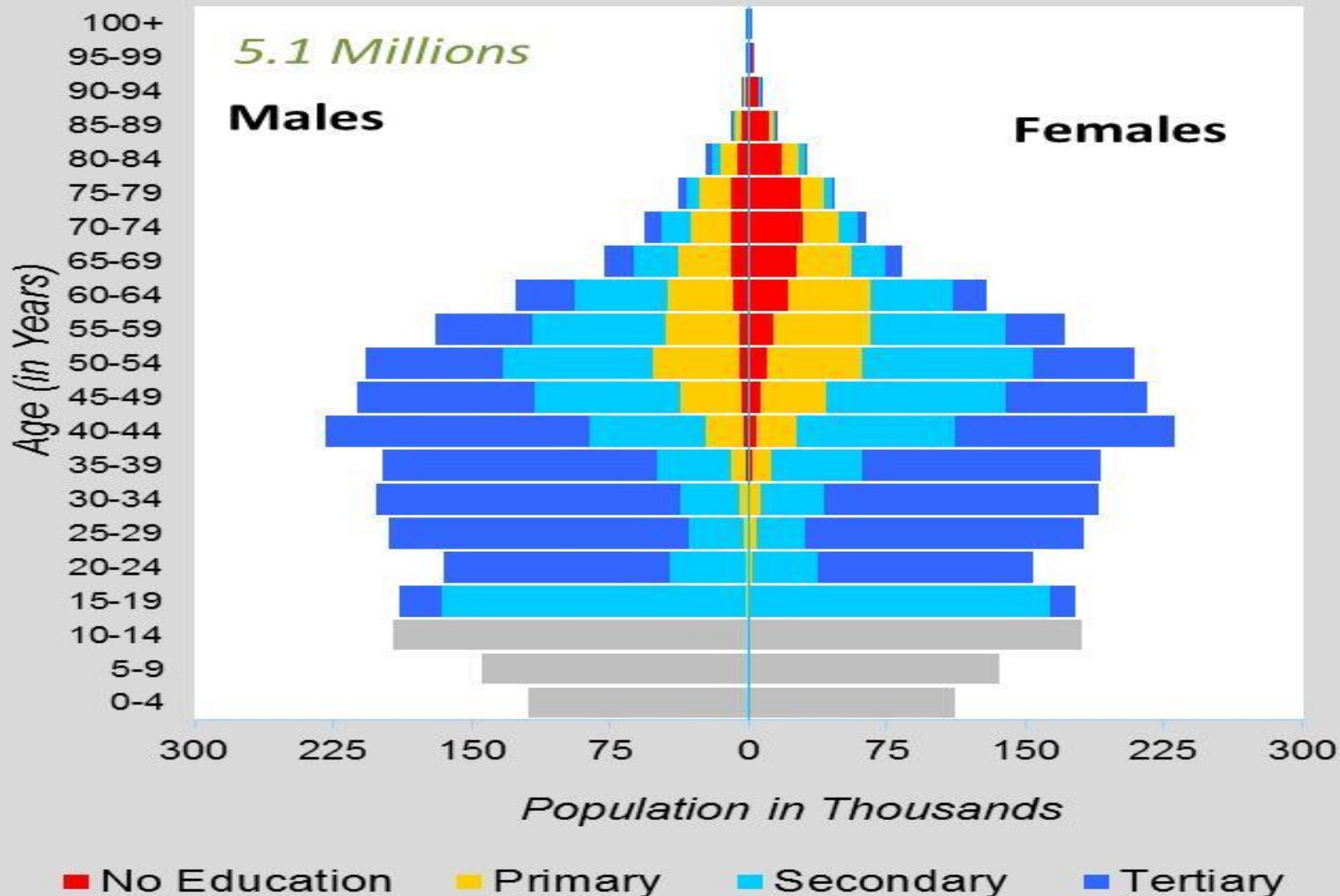
■ No Education ■ Primary ■ Secondary ■ Tertiary

Singapore - 1990 BP

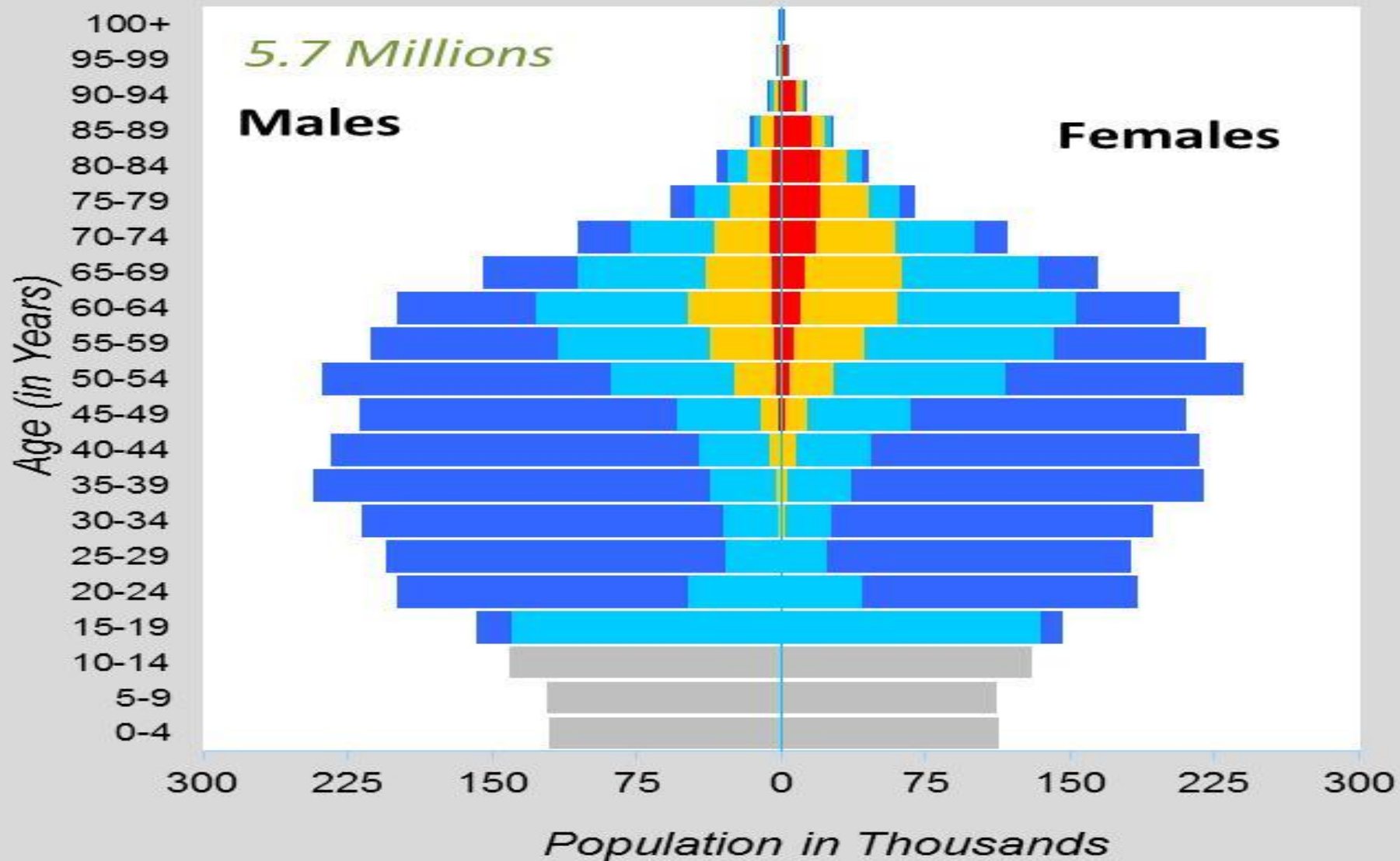


■ No Education ■ Primary ■ Secondary ■ Tertiary

Singapore - 2010



Singapore - 2020 SSP2



■ No Education ■ Primary ■ Secondary ■ Tertiary



REVIEW

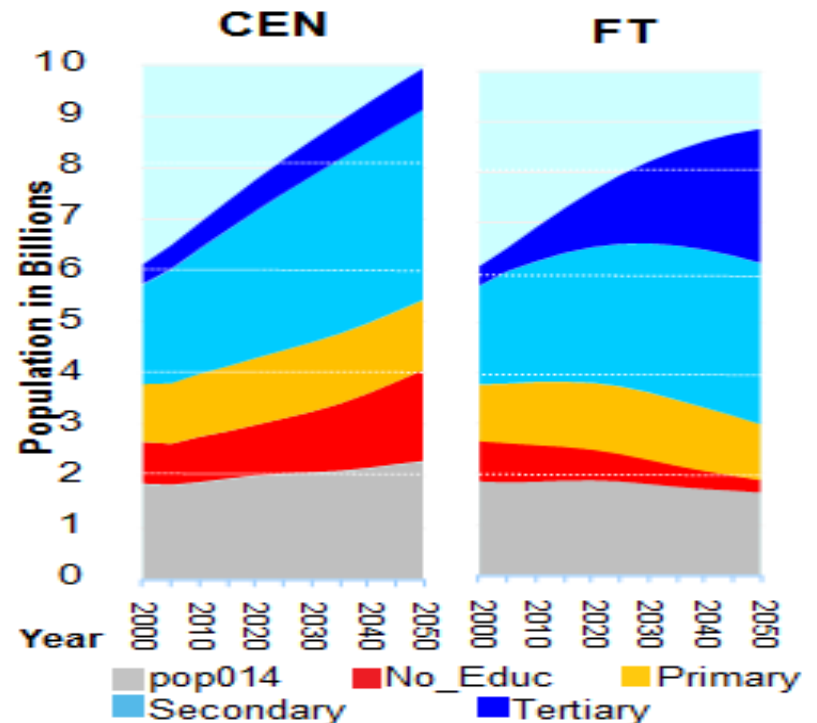
Global Human Capital: Integrating Education and Population

Wolfgang Lutz^{1,2,3,4*} and Samir KC^{1,2}

Almost universally, women with higher levels of education have fewer children. Better education is associated with lower mortality, better health, and different migration patterns. Hence, the global population outlook depends greatly on further progress in education, particularly of young women.

Assuming identical education-specific fertility trends, different education scenarios make a difference of more than 1 billion people by 2050.

- CEN gives the world population trend according to the most pessimistic scenario assuming that no new schools will be built
- FT gives the most optimistic scenario assuming that countries can achieve the rapid education expansion that South Korea achieved



Adding Education to Age and Sex: What is the education effect?

We have good reasons to assume “functional causality” from education to health, fertility and behavior. Education is not just a proxy for SES (Socio-Economic Status).

- Every learning experience builds new synapses in our brains and makes us “physiologically different” (Eric Kandel)
- Enhancement of cognitive skills
 - change risky behavior
 - extend personal planning horizon
 - learn from past damage
- Better access to relevant information
- Higher income at the individual and household level

ECONOMICS

The Demography of Educational Attainment and Economic Growth

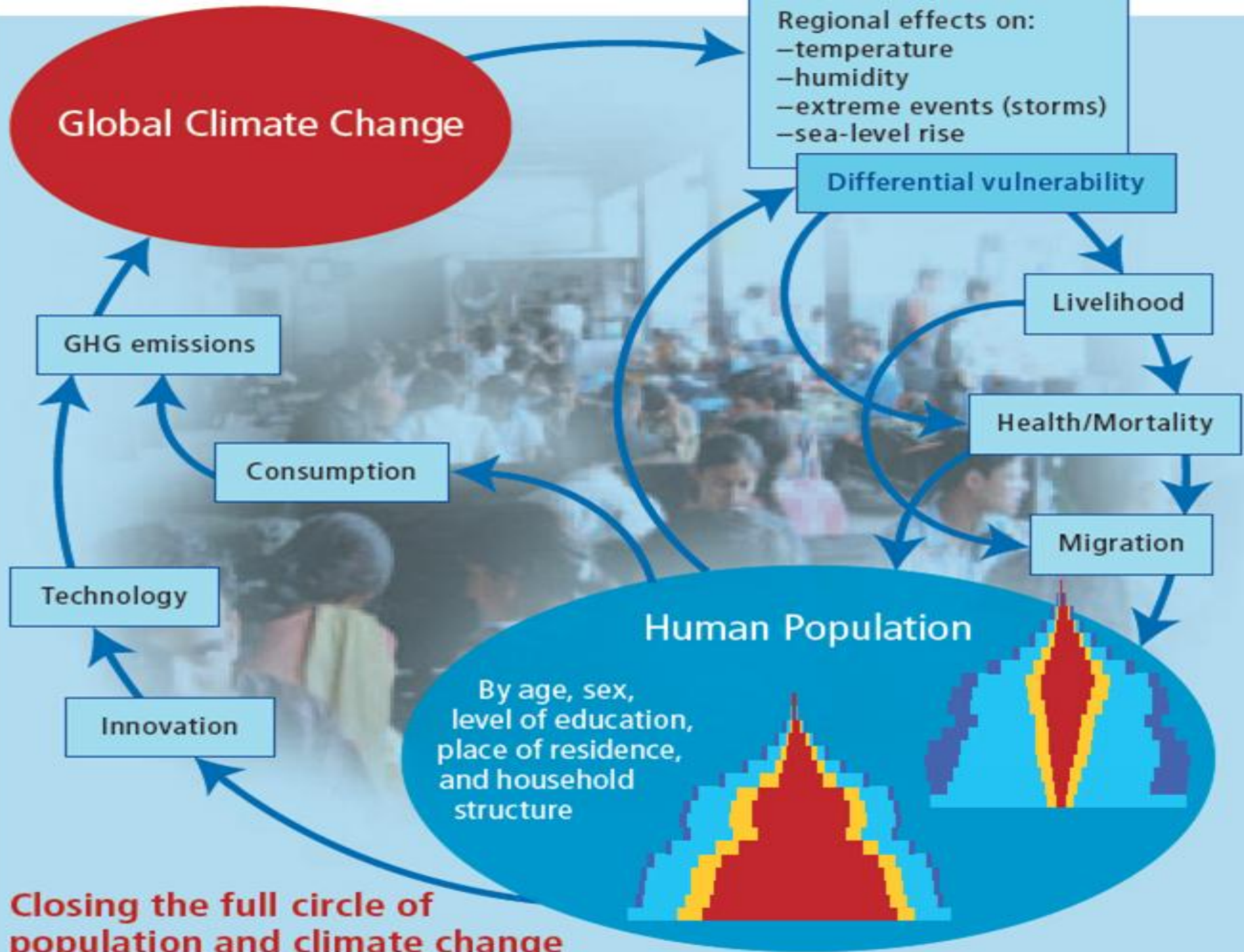
Complementing primary education with secondary education in broad segments of the population is likely to give a strong boost to economic growth.

Wolfgang Lutz,^{1*} Jesus Crespo Cuaresma,² Warren Sanderson³ (all IIASA)

2015: Sustainable Development Goal 4:

.... *quality* **primary and secondary**
education

for **all girls and boys**



ENVIRONMENT AND DEVELOPMENT

Universal education is key to enhanced climate adaptation

Fund more educators rather than just engineers

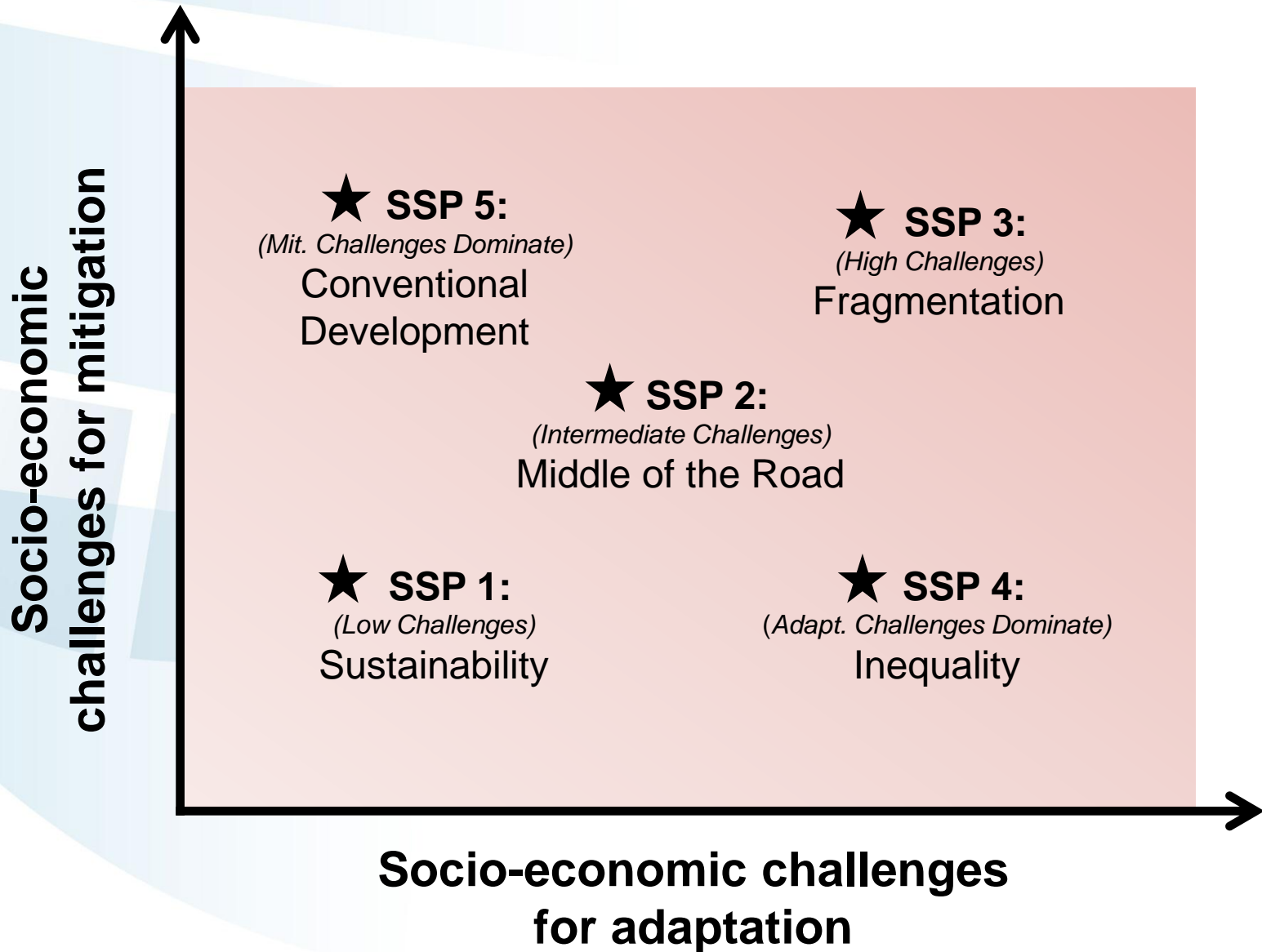
By Wolfgang Lutz, Raya Muttarak,
Erich Striessnig*

Over the coming years, enormous amounts of money will likely be spent on adaptation to climate change. The international community recently made pledges of up to \$100 billion per year by 2020 for the Green Climate Fund. Judging from such climate finance to date, funding for large proj-

the best available information on the number of disasters and reported fatalities from around the world (5).

EDUCATE FEMALES, REDUCE FATALITIES. Because the literature on disaster vulnerability has conventionally emphasized economic growth while disregarding education, our statistical analysis focuses on the relative assessment of these two factors as measured by Gross Domestic Product (GDP)

Shared Socioeconomic Pathways (SSP) Logic



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EXECUTIVE SUMMARY



WORLD POPULATION & HUMAN CAPITAL IN THE TWENTY-FIRST CENTURY

EDITED BY
WOLFGANG LUTZ | WILLIAM P. BUTZ | SAMIR KC



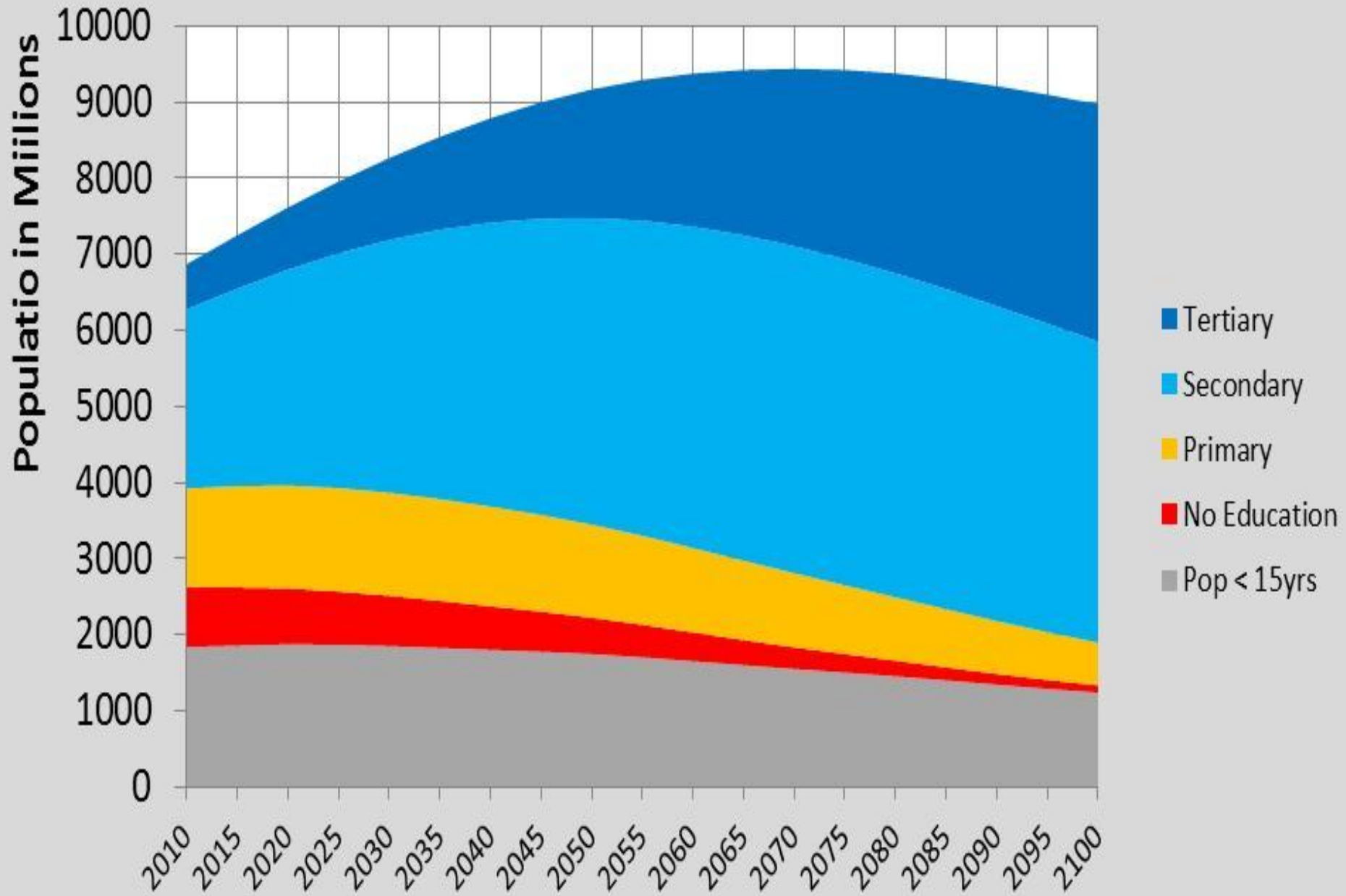
DEDICATED TO THE MEMORY OF NATHAN
KEYFITZ ON THE OCCASION OF HIS 100TH BIRTH
YEAR, 2013.

Oxford University
Press

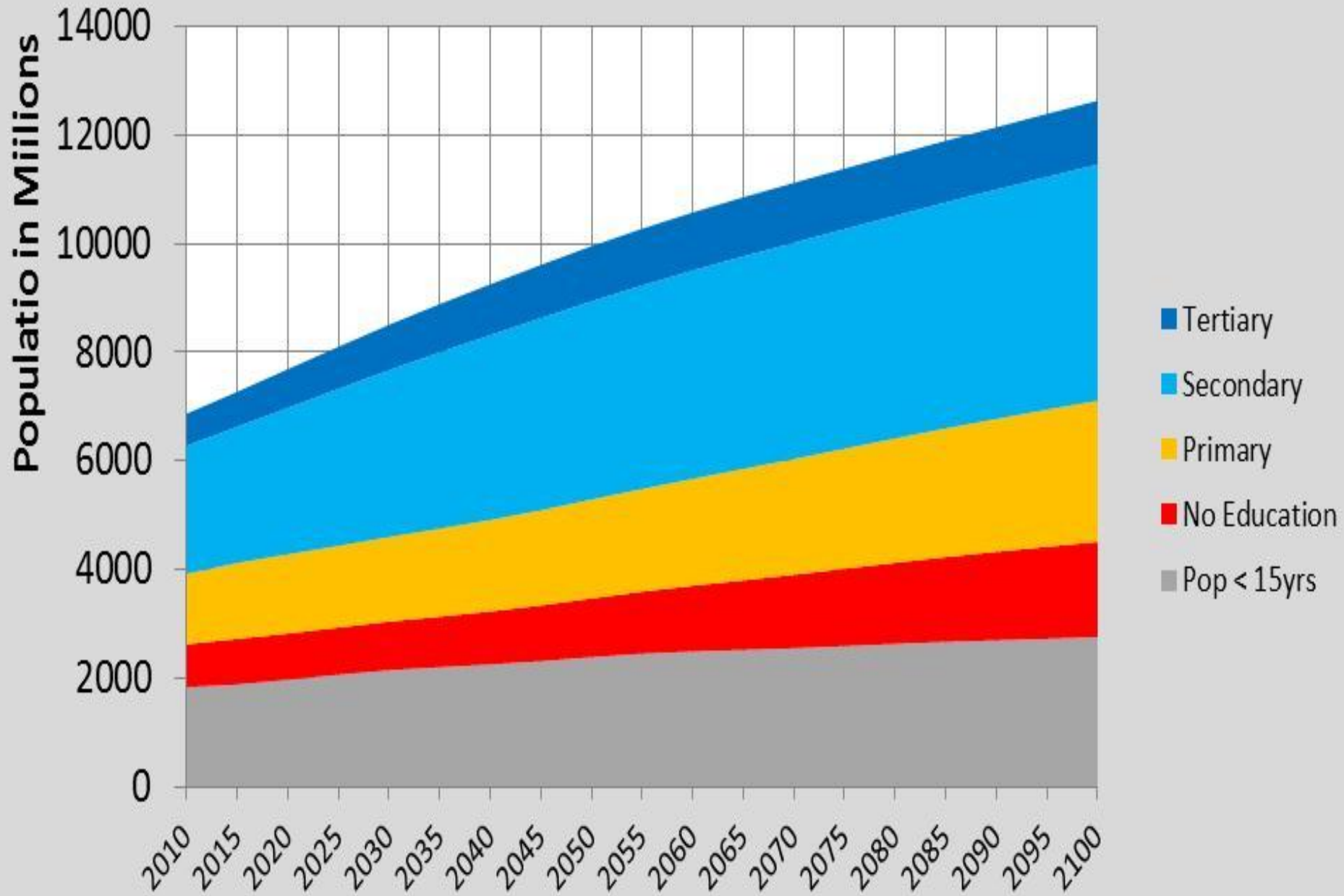
2014

1056 pages,
26 lead authors,
46 contributing authors,
550 expert assessments,
191 country tables

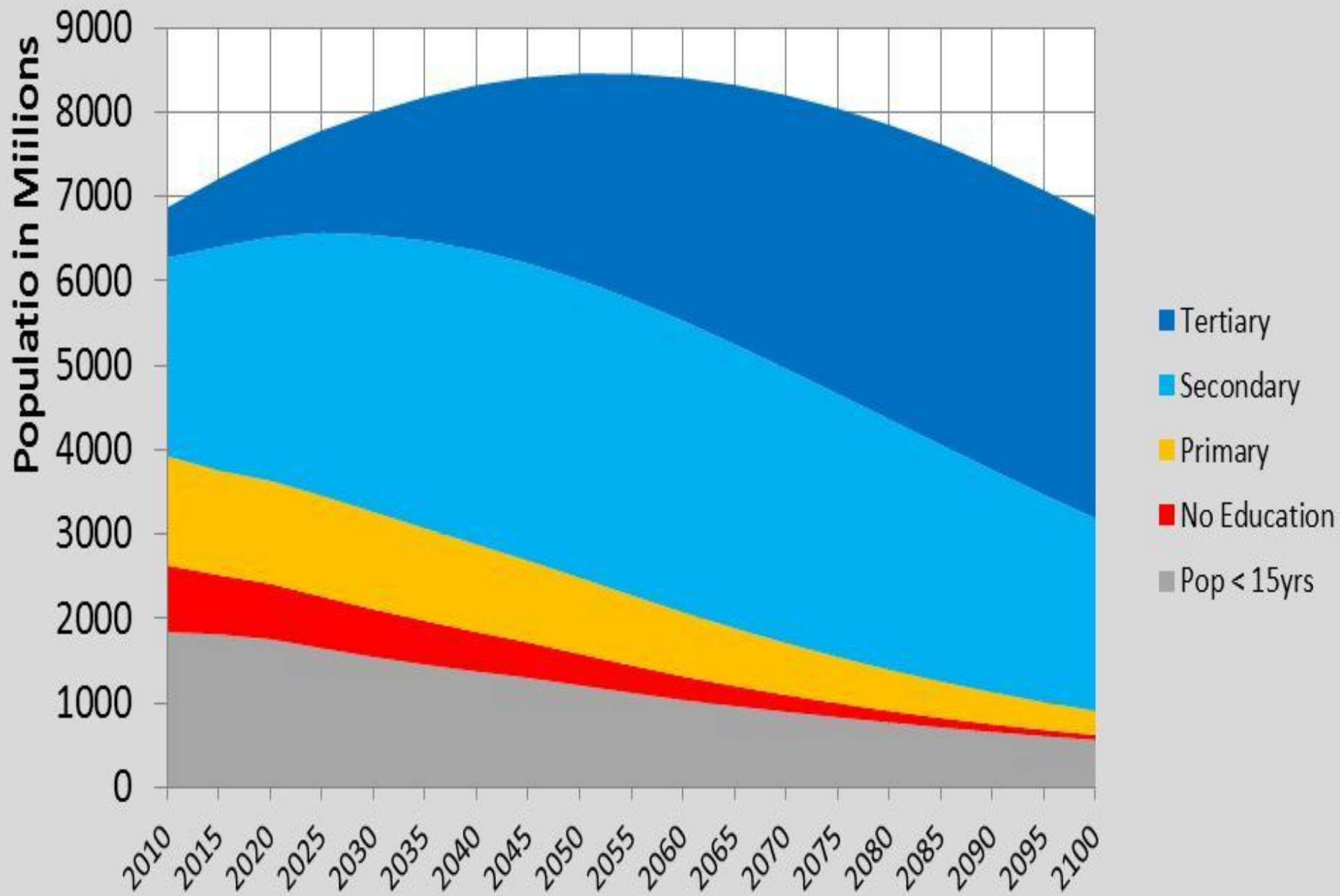
World SSP2



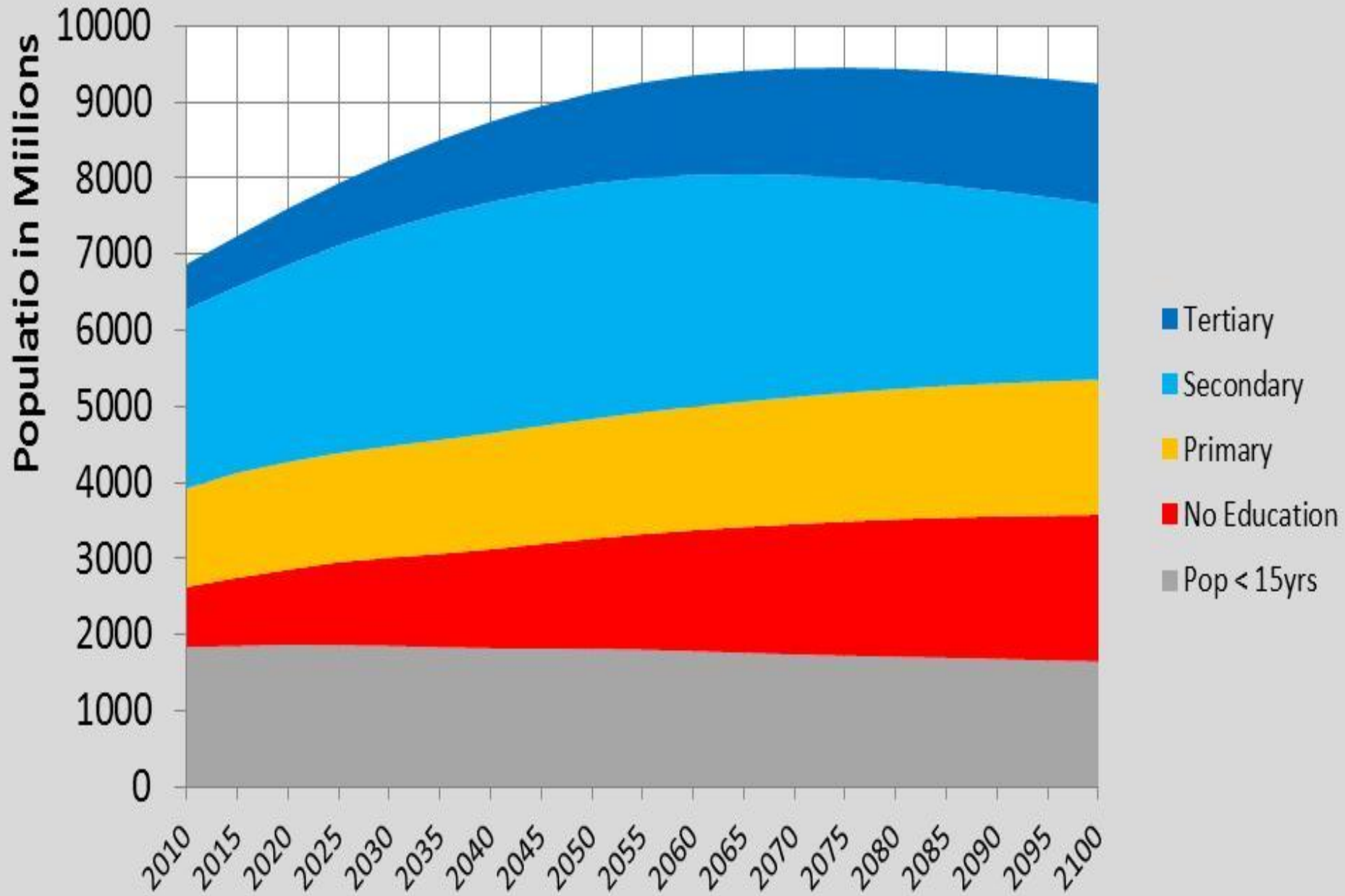
World SSP3



World SSP1



World SSP4



Toward Constructing a SDG Population Scenario

- Translating the health and education targets into fertility and mortality assumptions
- Child mortality targets
- Reproductive health targets
- Effect of education targets on mortality and fertility

World Population: UN2015 probabilistic projections (dotted lines) and SDG scenarios

