

College of Natural Resources

The Population Factor and Climate Change

Malcolm Potts MB, BChir, PhD, FRCOG

Bixby Center Population, Health and
Sustainability, UC Berkeley

The Perfect Storm

“There is an intrinsic link between the challenge we face to ensure food security through the 21st century and other global issues, most notably climate change, population growth and the need to sustainably manage the world’s rapidly growing demand for energy and water. It is predicted that by 2030 the world will need to produce 50 per cent more food and energy, together with 30 per cent more available fresh water, whilst mitigating and adapting to climate change. This threatens to create a ‘perfect storm’ of global events.”

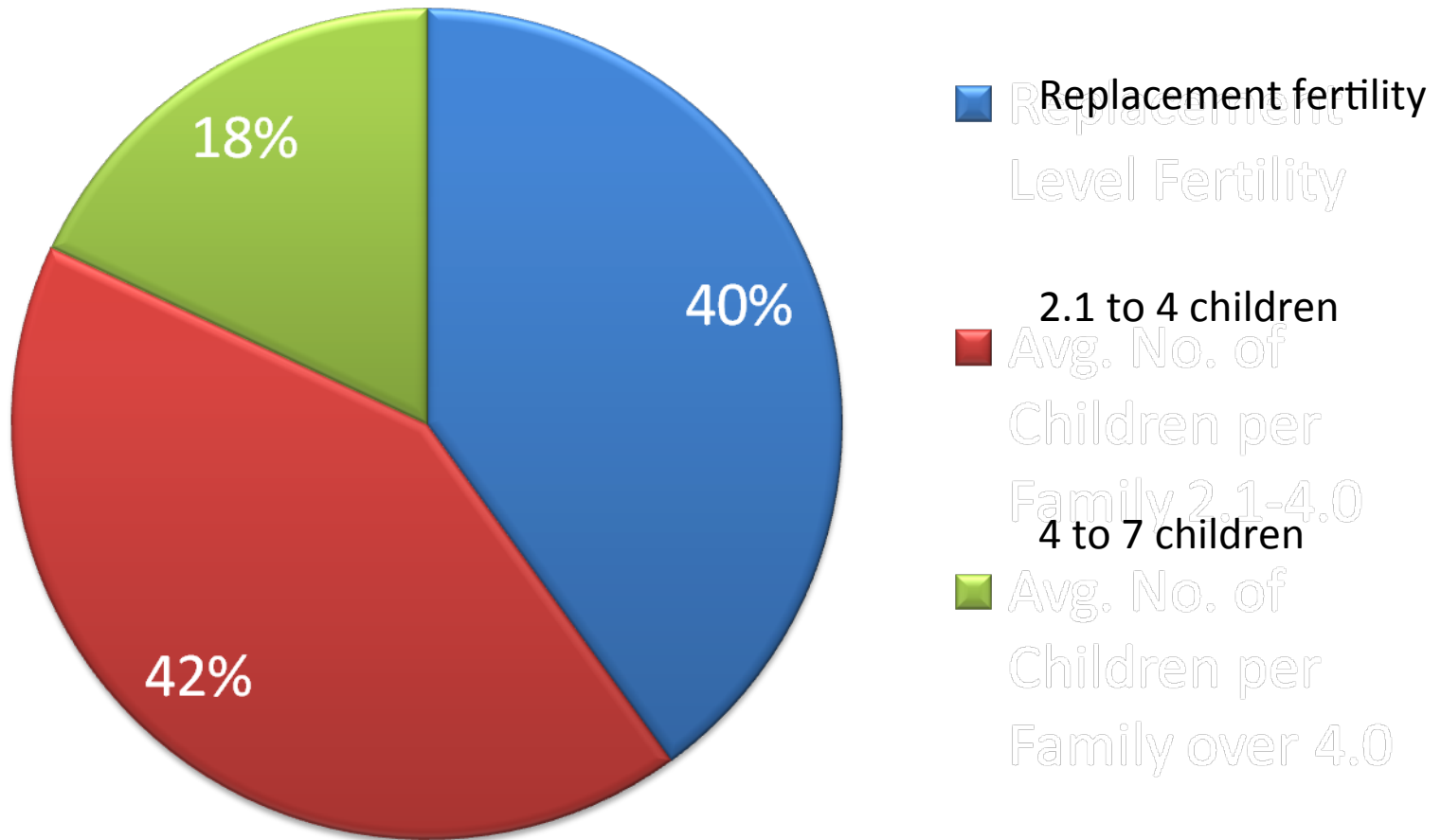
John Beddington, UK Government Chief Scientist
www.agricultureandfoodfordevelopment.org/inquiry

Take-away messages

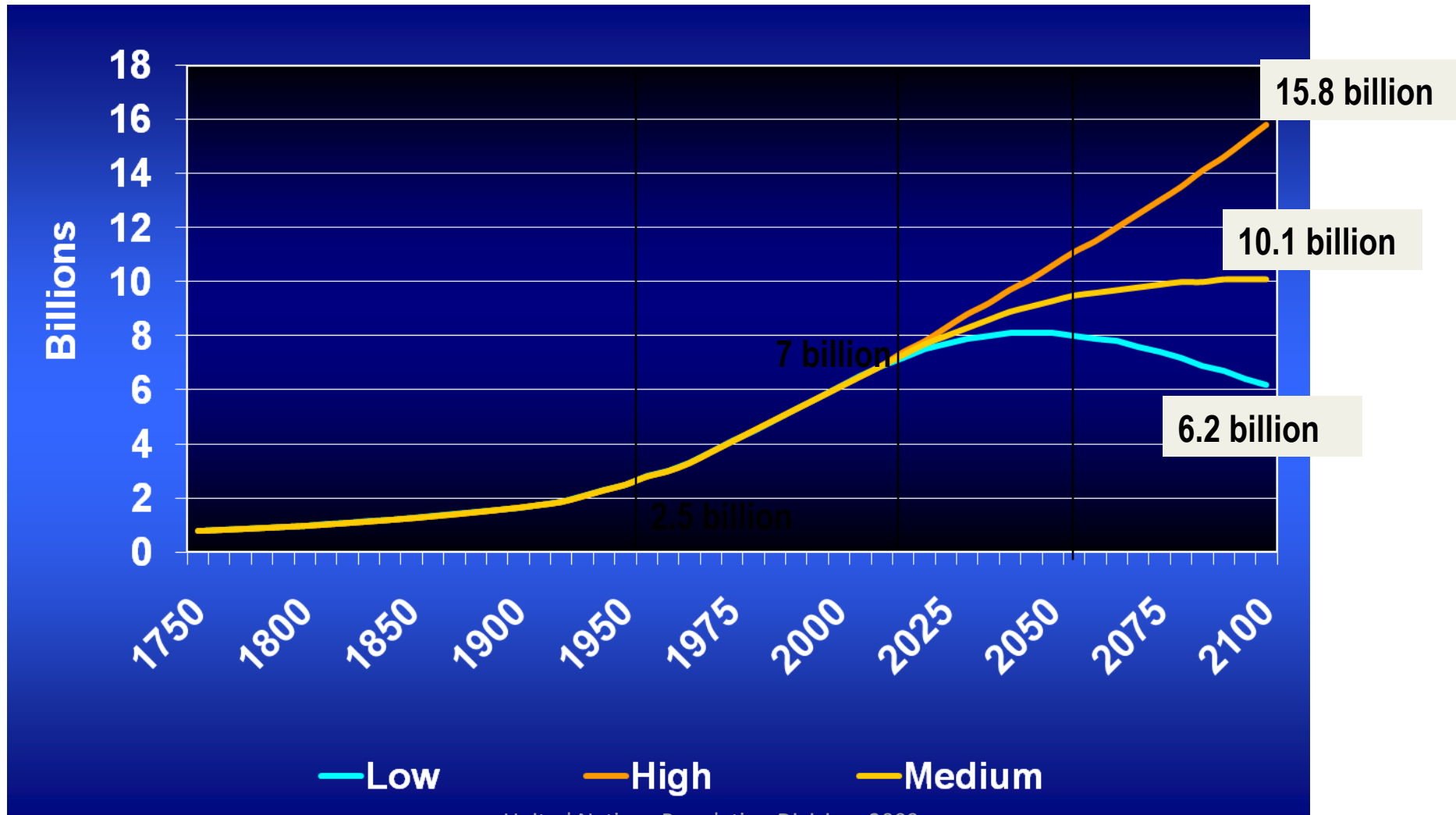
- **There is a large unmet need for family planning.**
- **There are many unjustified barriers that prevent women having the information and technology they need to separate sex from childbearing.**
- **When those barriers are removed family size falls.**
- **Population growth is a key factor in global warming and it is a variable open to change in a human rights framework.**

Global population projections

A demographically divided world



World population: 1750-2100



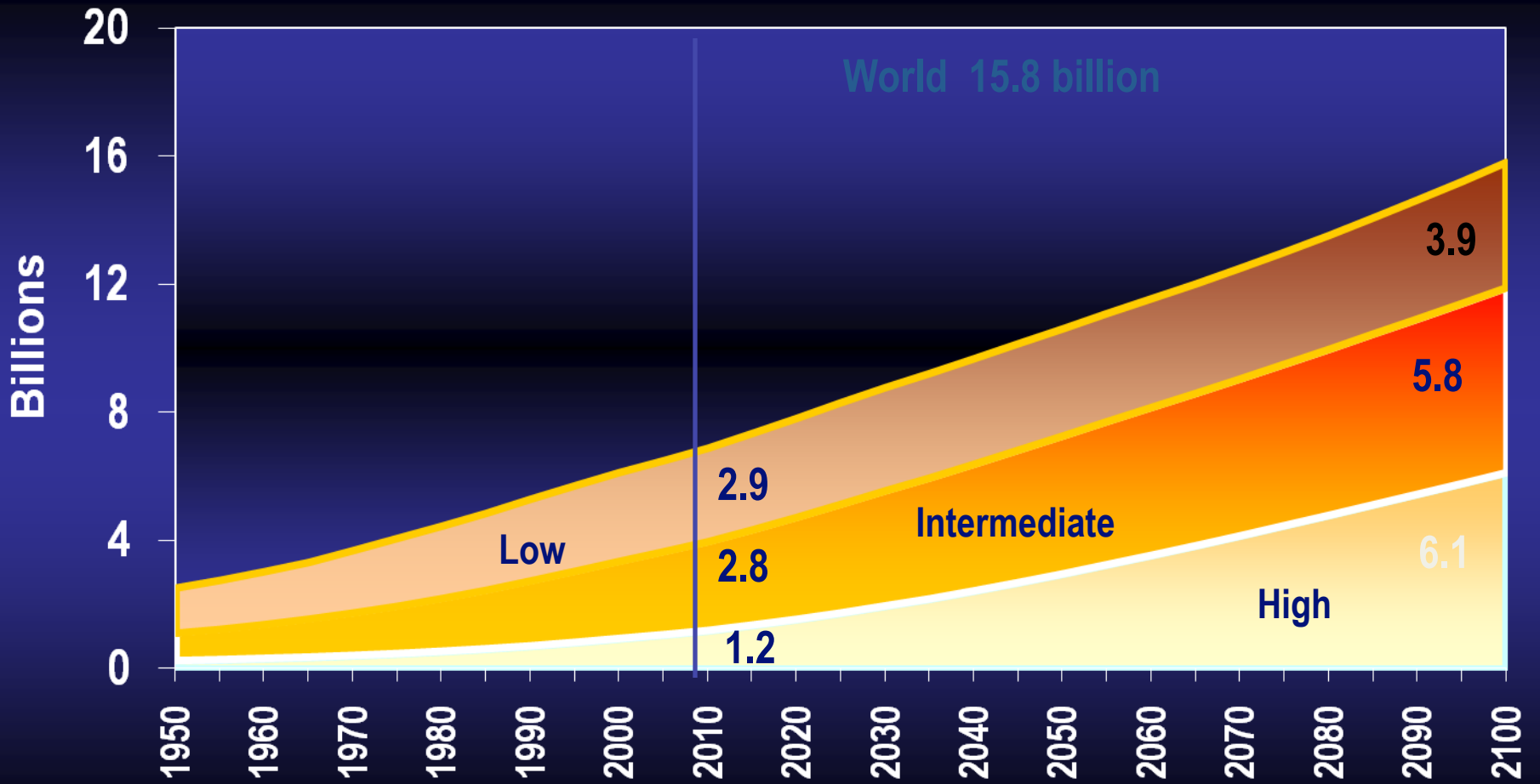
World Population Prospects:

The 2008 Revision. Volume I: Comprehensive Tables

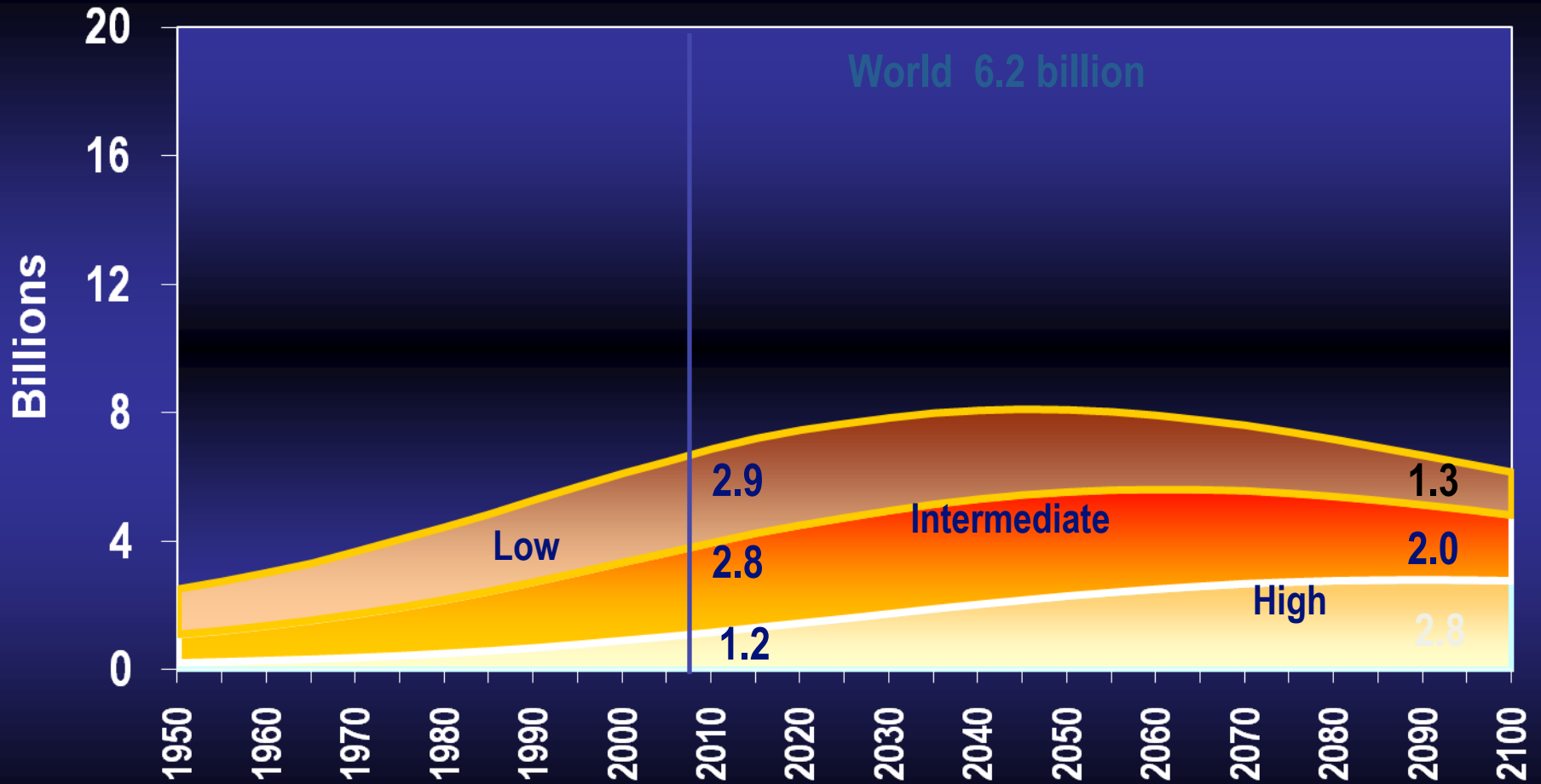
New York: United Nations Economic and Social Affairs .2009. page xxi.

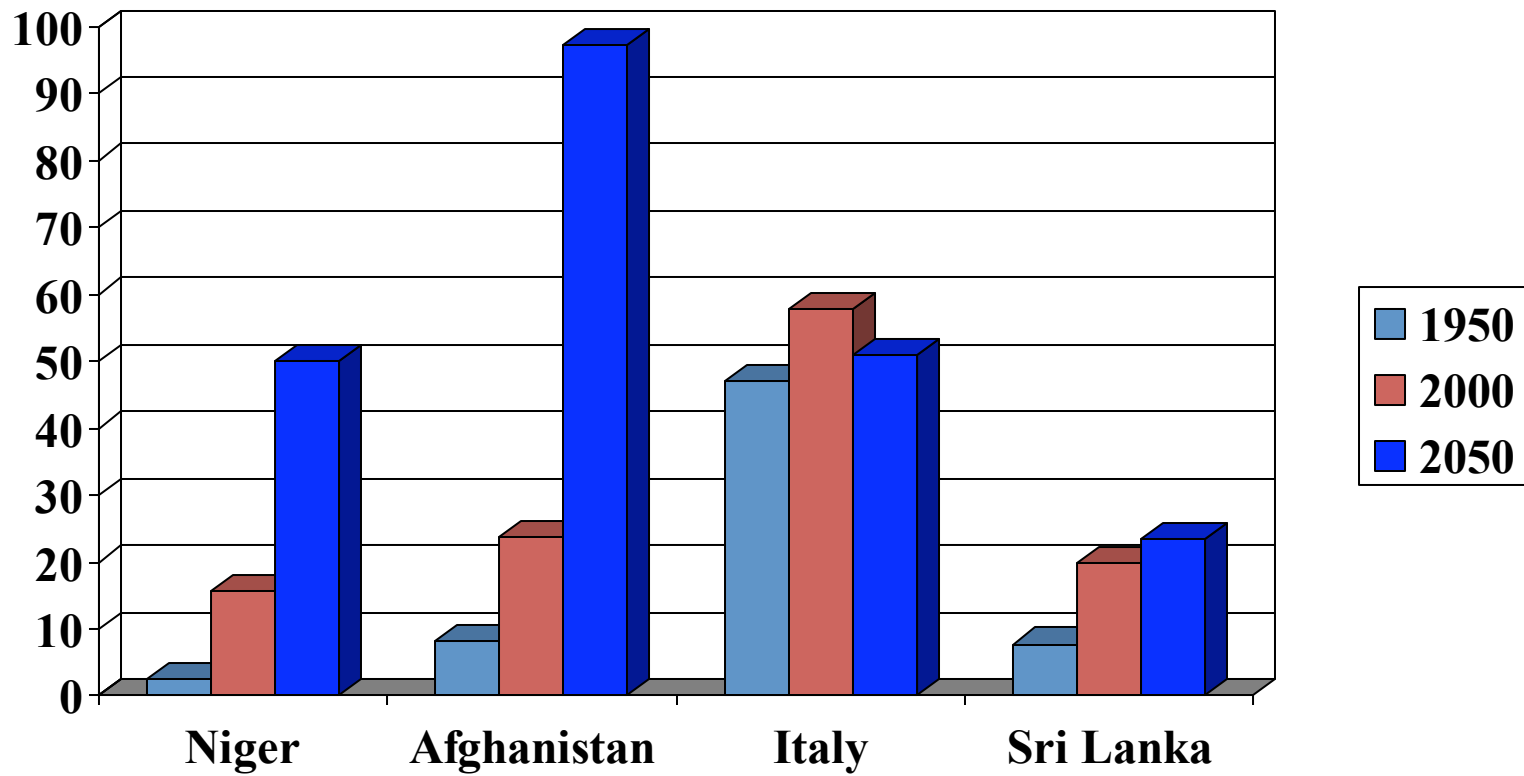
“According to the 2008 Revision fertility in the less developed regions as a whole is expected to drop from 2.73 children per woman in 2005-2010 to 2.05 children per woman in 2045-2050. The reduction projected for the group of 49 least developed countries is even steeper from 4.39 to 2.41 children per woman.”

High variant

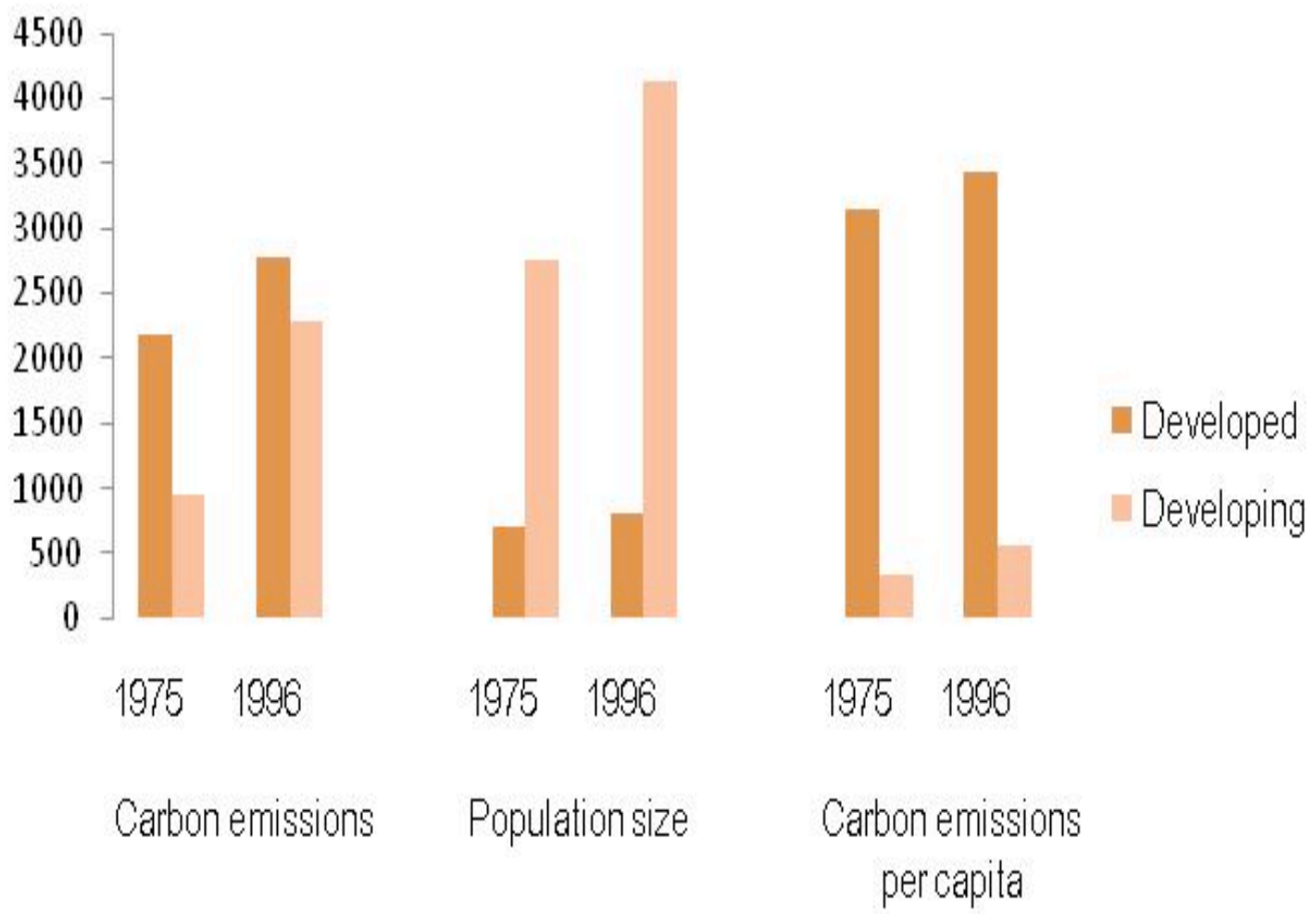


Low variant





Changing contributions to greenhouse gases



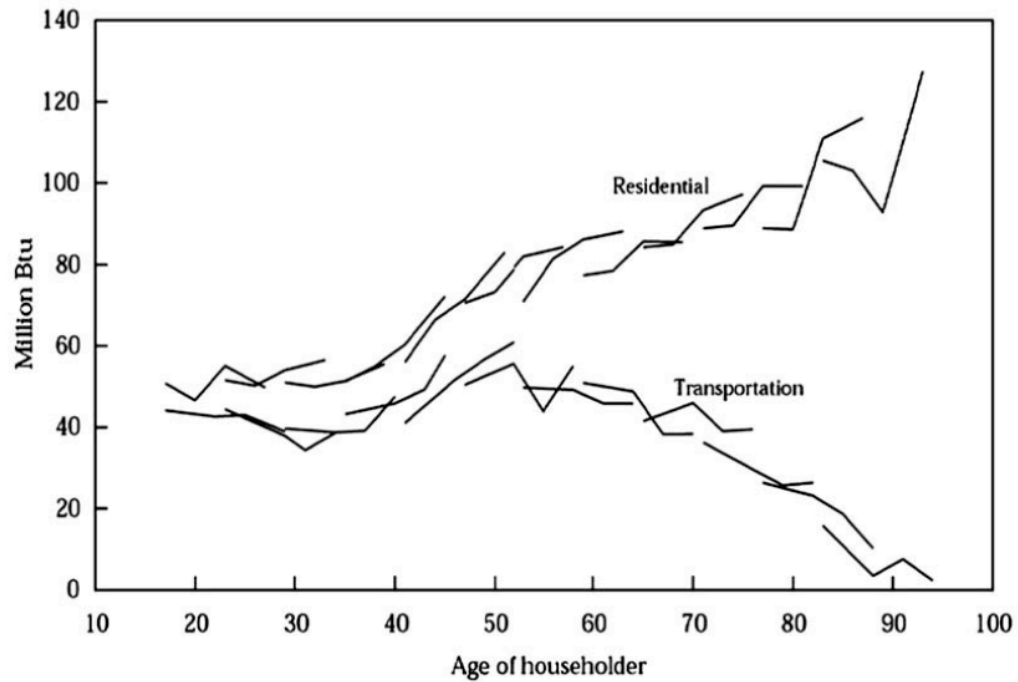
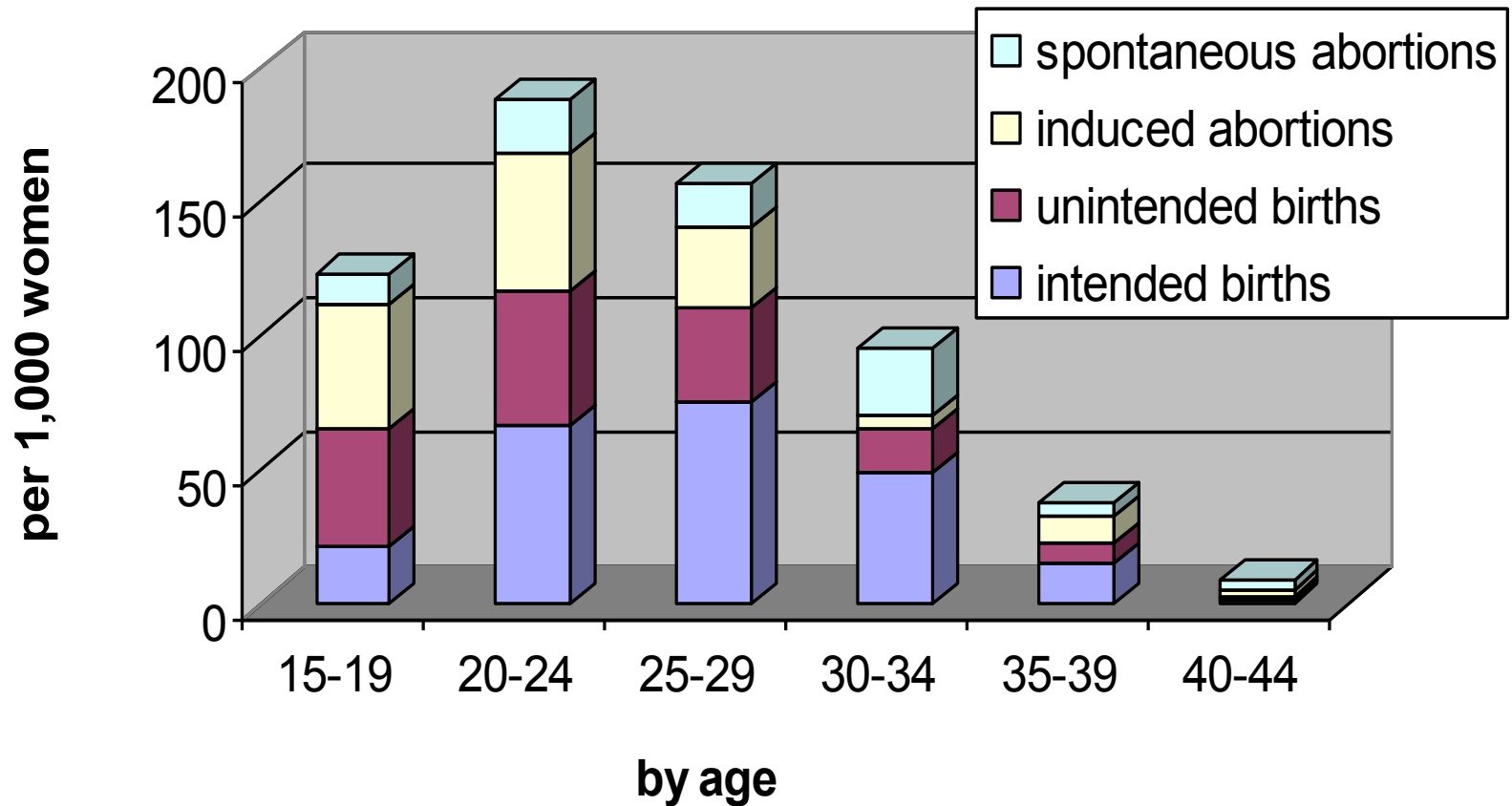


FIGURE 8. In the United States, residential energy use increased with the age of the householder (1987–97), while transport energy use decreased with the age of the householder (1983–94). Btu = British thermal units. Source of data and graph: O’Neill and Chen 2002, 66, figure 2.

The North – slowing climate
change

Unintended pregnancy: USA



Source: Health and Sexuality, Association of Reproductive Health Professionals, Fall 1991

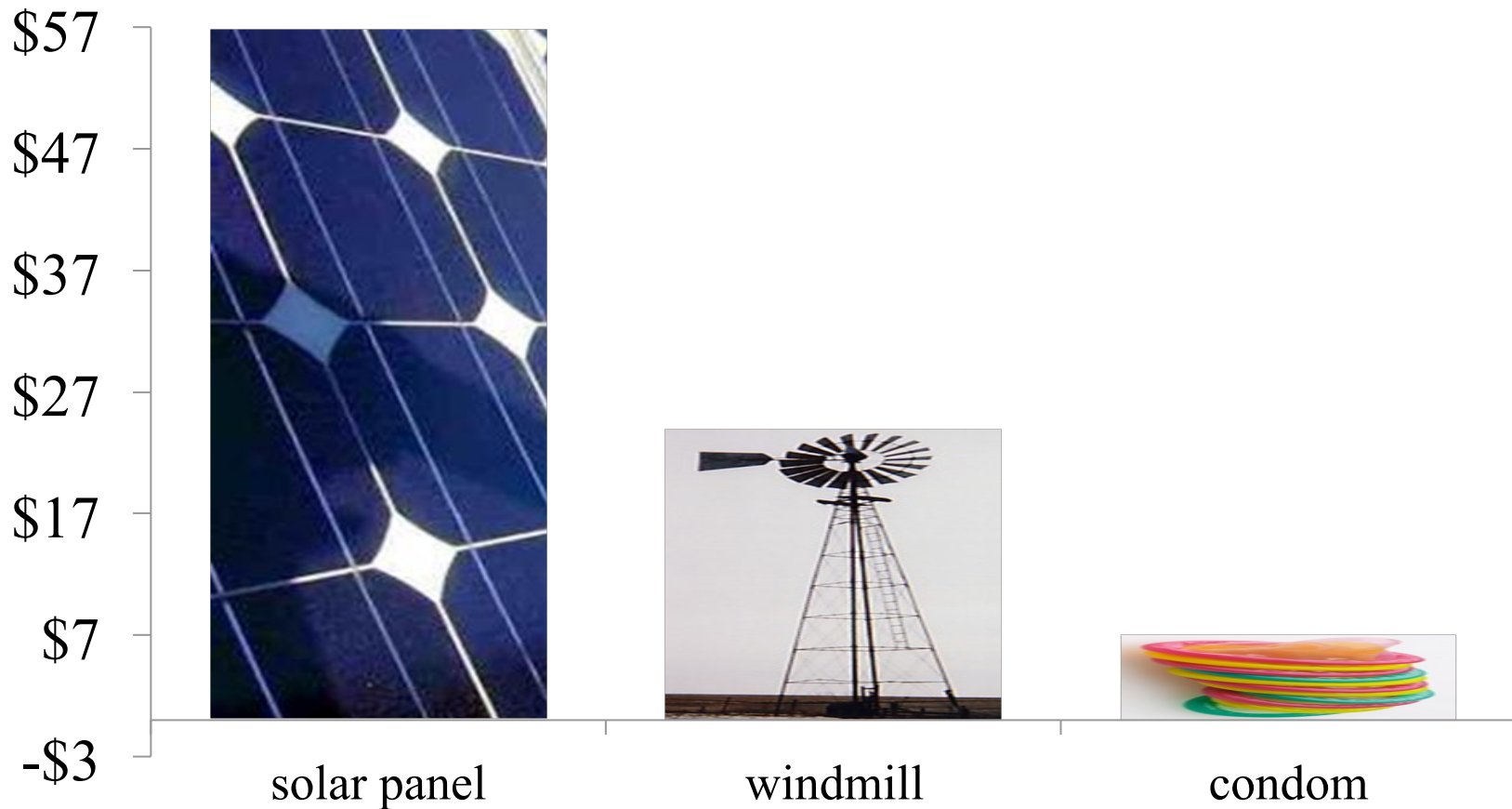
Family PACT

- One million women; \$404 million
- 205,000 unintended births (94,000 live births, 79,000 abortions, 30,000 spontaneous abortions, 2,000 ectopics 2from web site
- Savings in health care costs over 2yrs \$1.1 billion (\$2.76 on every dollar invested)
- Savings in health care costs over 5ys \$2.2 billion (\$5.33 on every dollar)

Family PACT and global warming

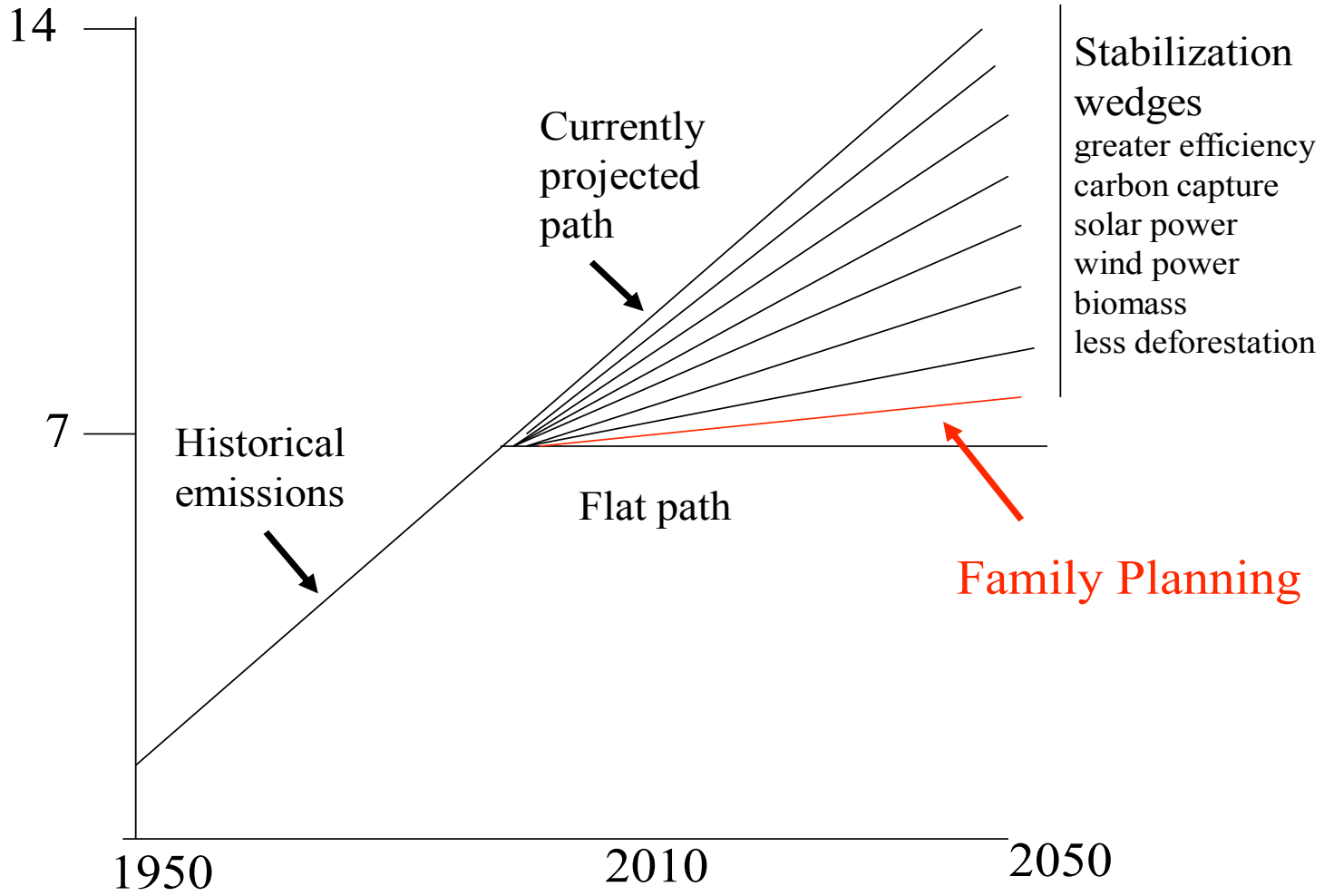
- 100,000 births averted saves
- $100,000 \times 78$ (expectation of life) \times carbon per 19.6 tonnes emissions = 152 million tonnes
- \times price of carbon ($\$5/\text{tonne}$) = \$760 million
- \times price of carbon ($\$50/\text{tonne}$) = \$7.6 billion

Cost Verses Tonne of Carbon Averted



Strategy	\$ cost of abating one tonne of CO ₂
Family Planning	\$7
Wind	\$24
Solar	\$51
Coal (new power station)	\$57
Coal (retrofitted power station)	\$83
Electric Vehicles	\$131

Thomas Wire LSE.



The South – primarily adapting to
climate change

California

- **Population 0.037 billion**
- Expectation of life 78 yrs
- One person lifetime carbon output = 1560 tonnes
- Total carbon output averted by meeting unmet need for family planning
= 156 million tonnes

India

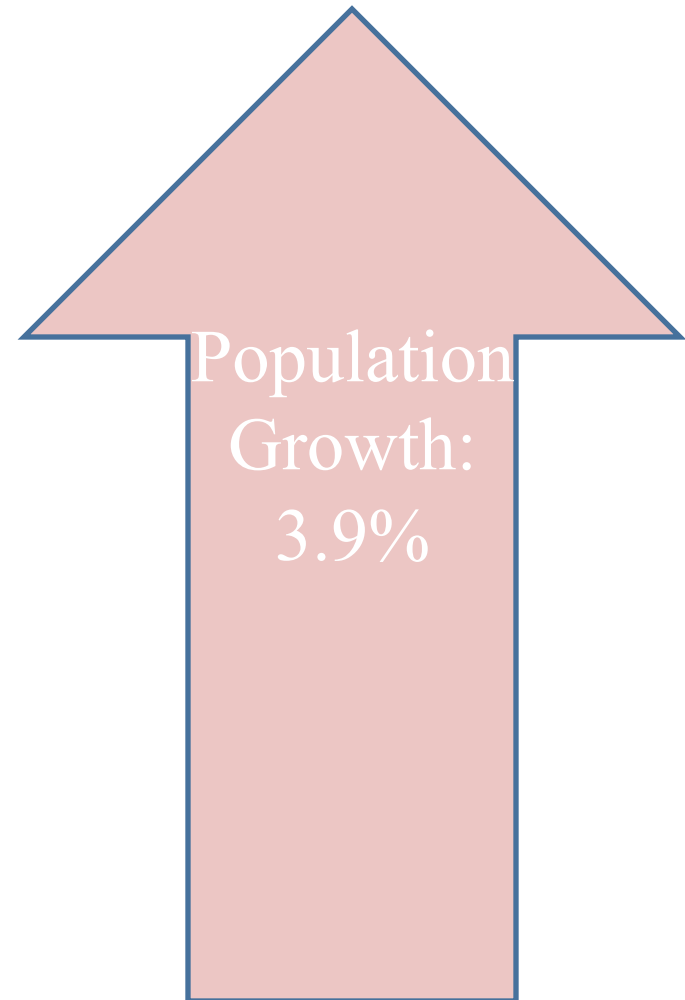
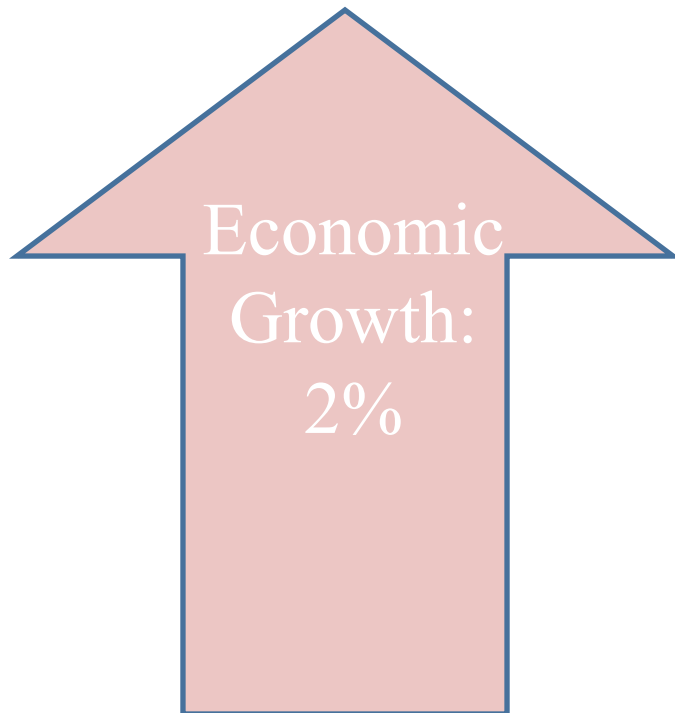
- **Population 1.24 billion**
- Expectation of life 63 yrs
- One person lifetime carbon output 63 tonnes
- Total carbon output averted by meeting unmet need for family planning
= 195 million tonnes

- Developed countries have per capita CO₂ emissions 10 to 50 times those of developing countries.
- CO₂ emissions are growing up to 10 times faster in developing countries.
- The population in developing countries is about 4 times that in the developed countries and is growing much faster.

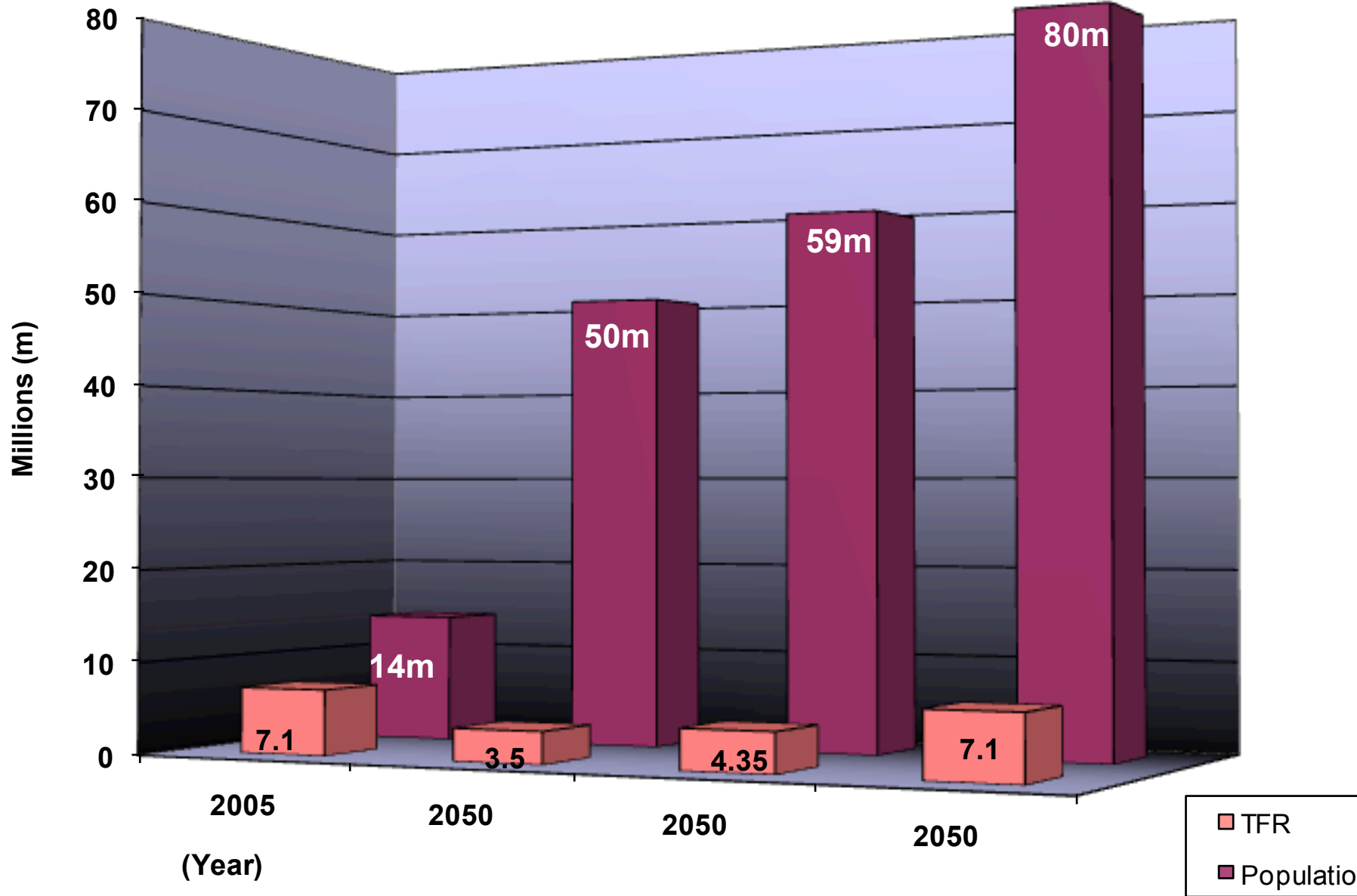
.

Crisis in the Sahel

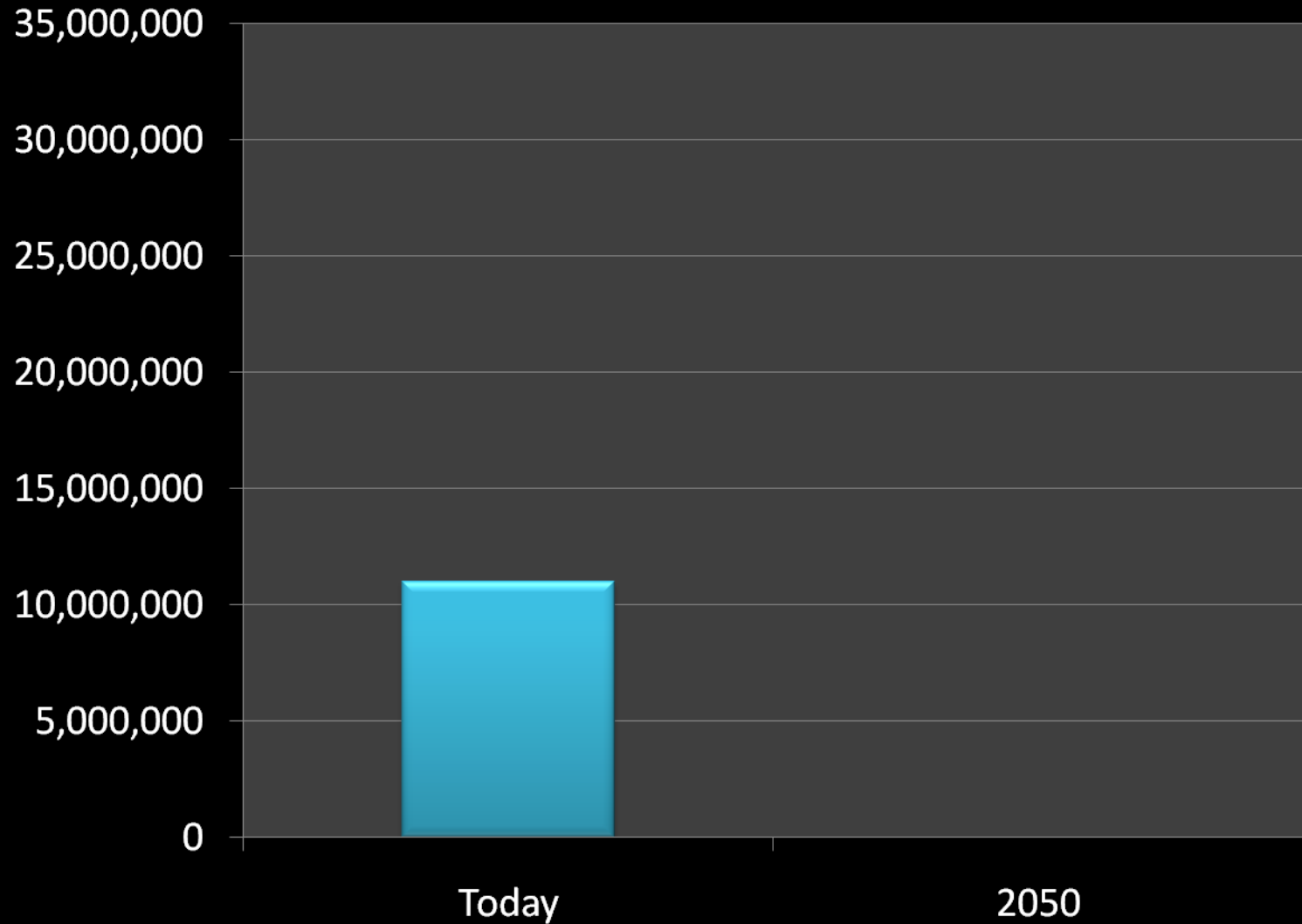
Niger, West Africa



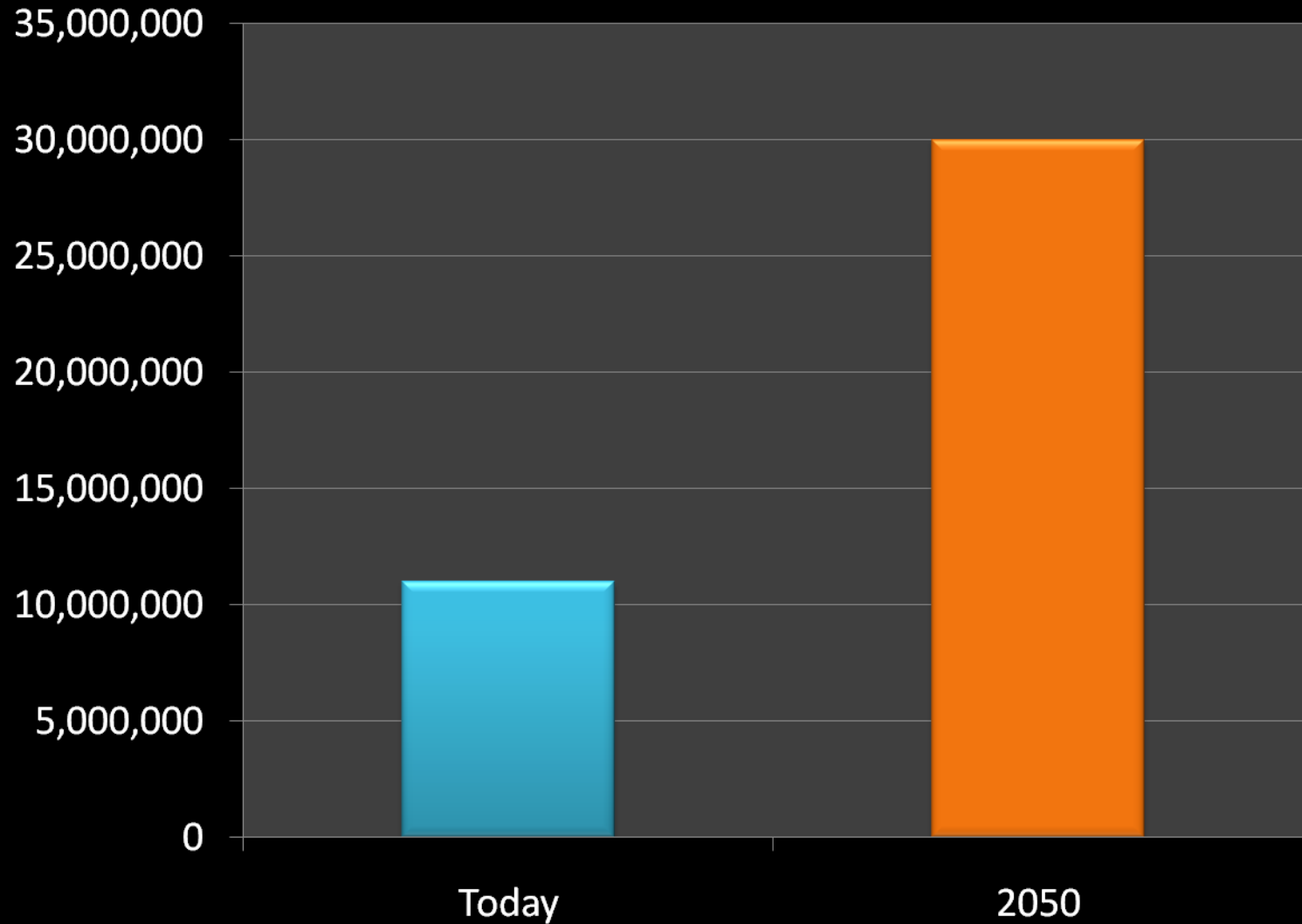
Niger Population: TFR vs. Population



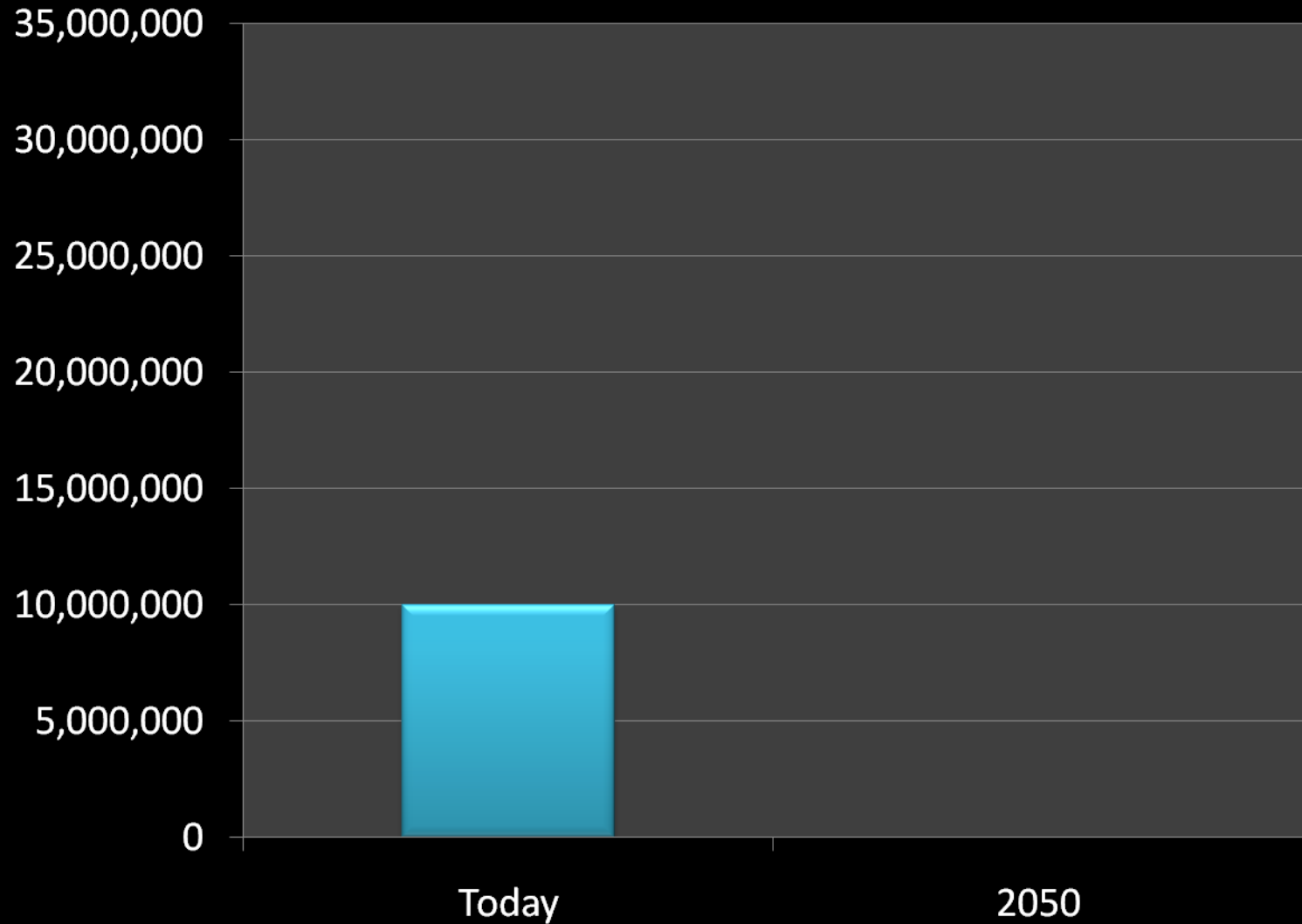
Chad



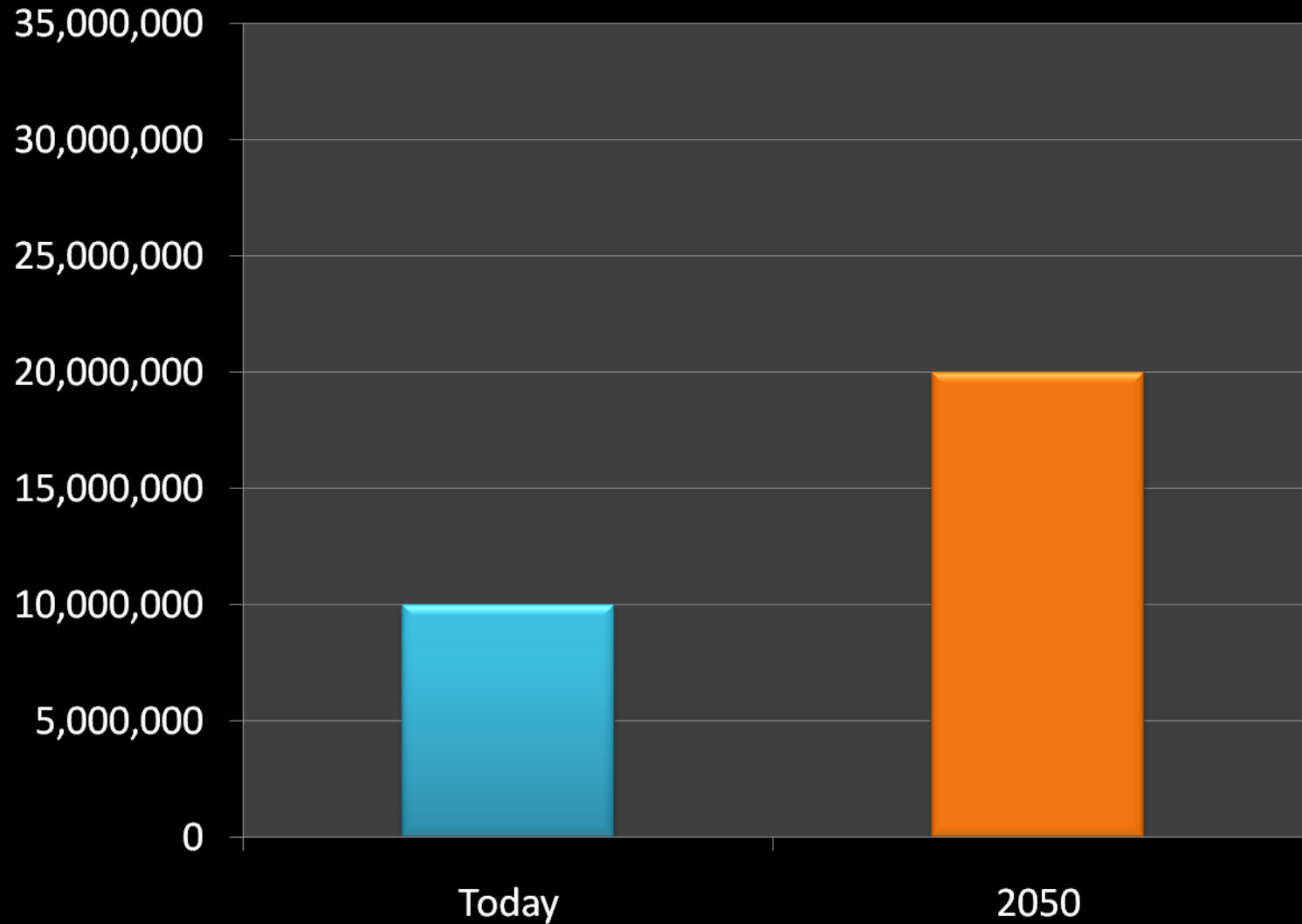
Chad



Somalia



Somalia



United Nations Environment Program

“... the Sahel is almost inevitably heading towards an environmental disaster.”

“Meeting the first MDG of halving the number of poor and hungry people by 2015 is “mission impossible.”

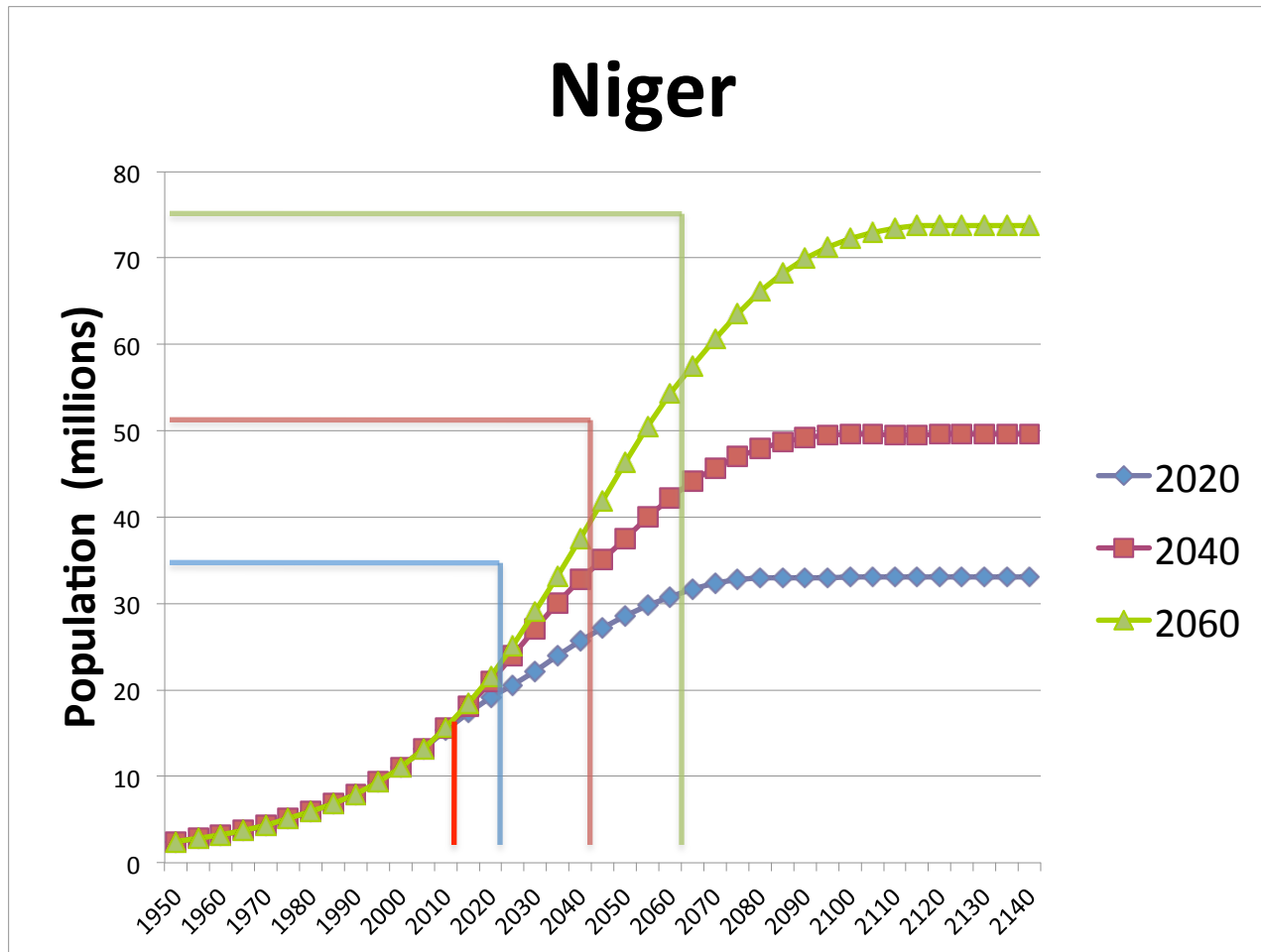
Dadaab refugee camp, Kenya



1,500 new refugees each day



The year in which a country reaches replacement level fertility has a major impact on its ultimate population size.

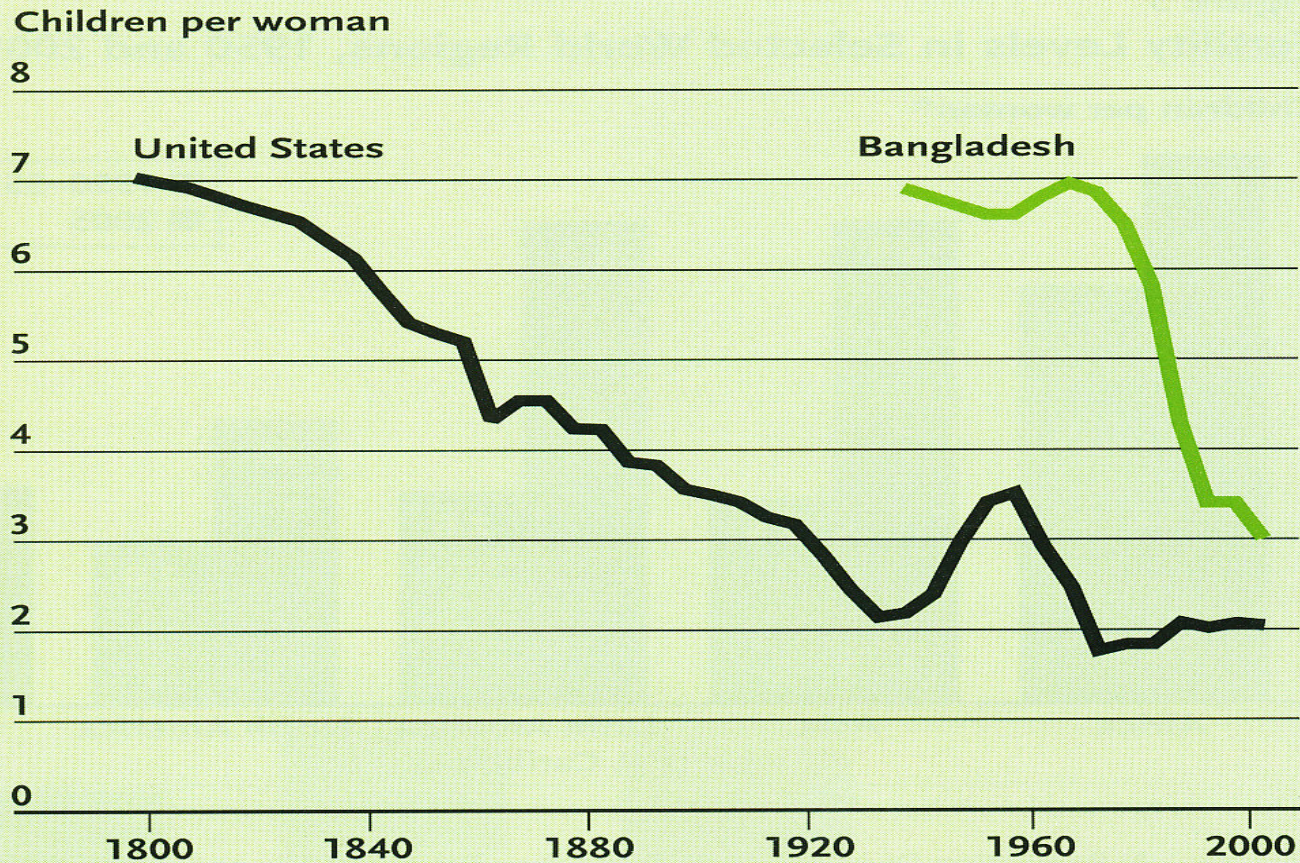


Total fertility rate: **6.86 (2010-15)**

Unmet need for family planning: **2.5% (2006)**

The power of voluntary family planning

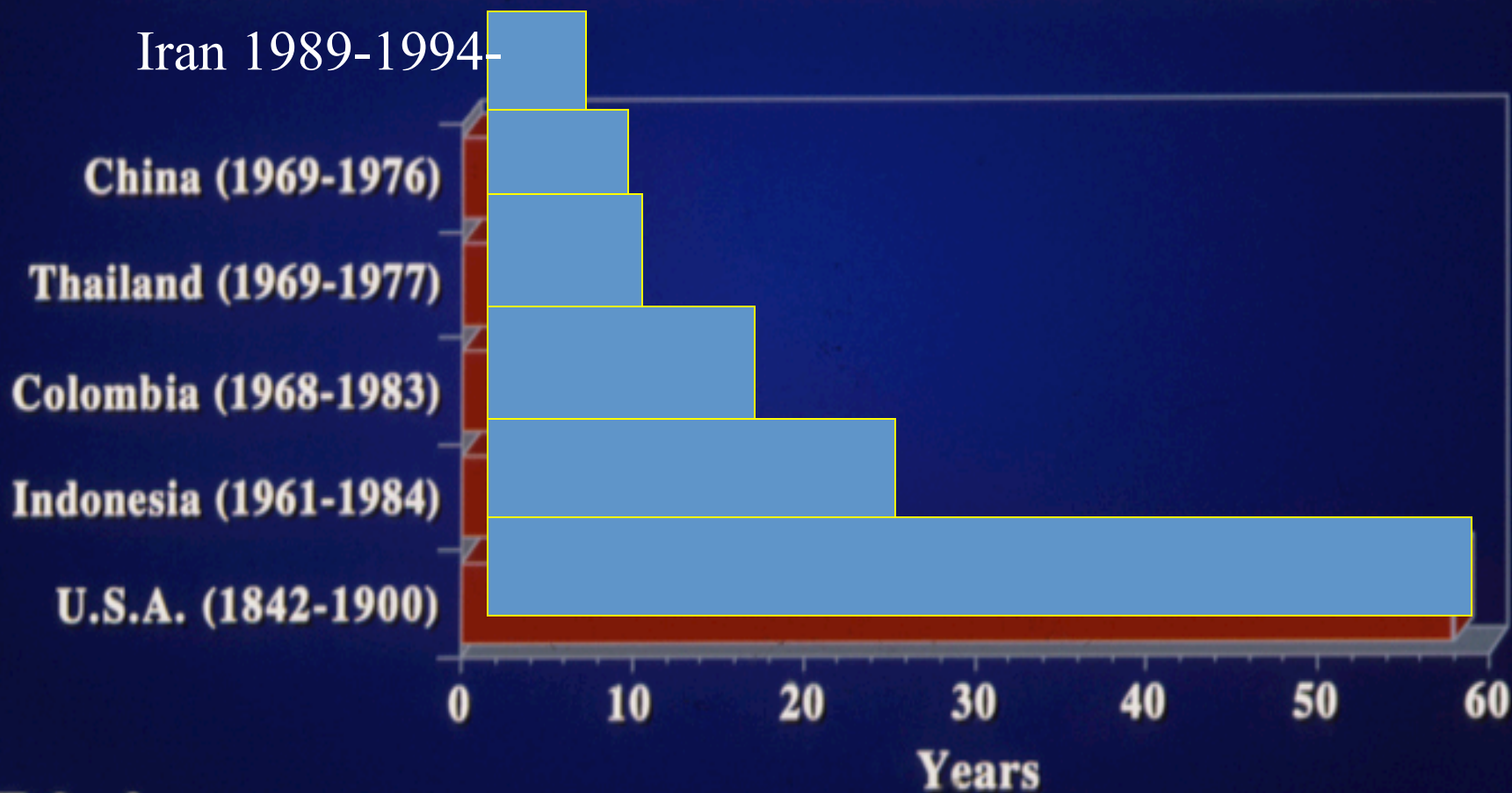
Figure A
Fertility Decline in Bangladesh and the United States, 1800–2000



Note: The fertility rate is the average total number of children a woman would have given current birth rates.

Sources: United States: A. Coale and M. Zelnik, *New Estimates of Fertility and Population in the United States* (1963); and the National Center for Health Statistics. Bangladesh: UN Economic and Social Commission for Asia and the Pacific and Demographic and Health Surveys.

Time Taken for Fertility to Decline (Total Fertility Rate of 6.0 to 3.5)



Barriers to fertility regulation

- **Prices are too high.**
- **Outlets are unreachable.**
- **Medical rules make getting contraception difficult.**
- **Misinformation – the dangers of contraception.**
- **Community workers are not permitted to provide contraceptives.**
- **Method choices are limited**
- **Gov't services are poor.**
- **Pills are on prescription for reasons not evidence-based**
- **EC using existing birth control pills: No one has bothered to inform most women.**
- **Safe abortion is hard for poor women to obtain.**
- **Advertising about family planning isn't allowed.**
- **Religions constrain providers**
- **Mothers-in-law are in charge.**
- **Young brides lack power.**
- **Unmarried young females are excluded from services.**



When barriers are removed, family size falls

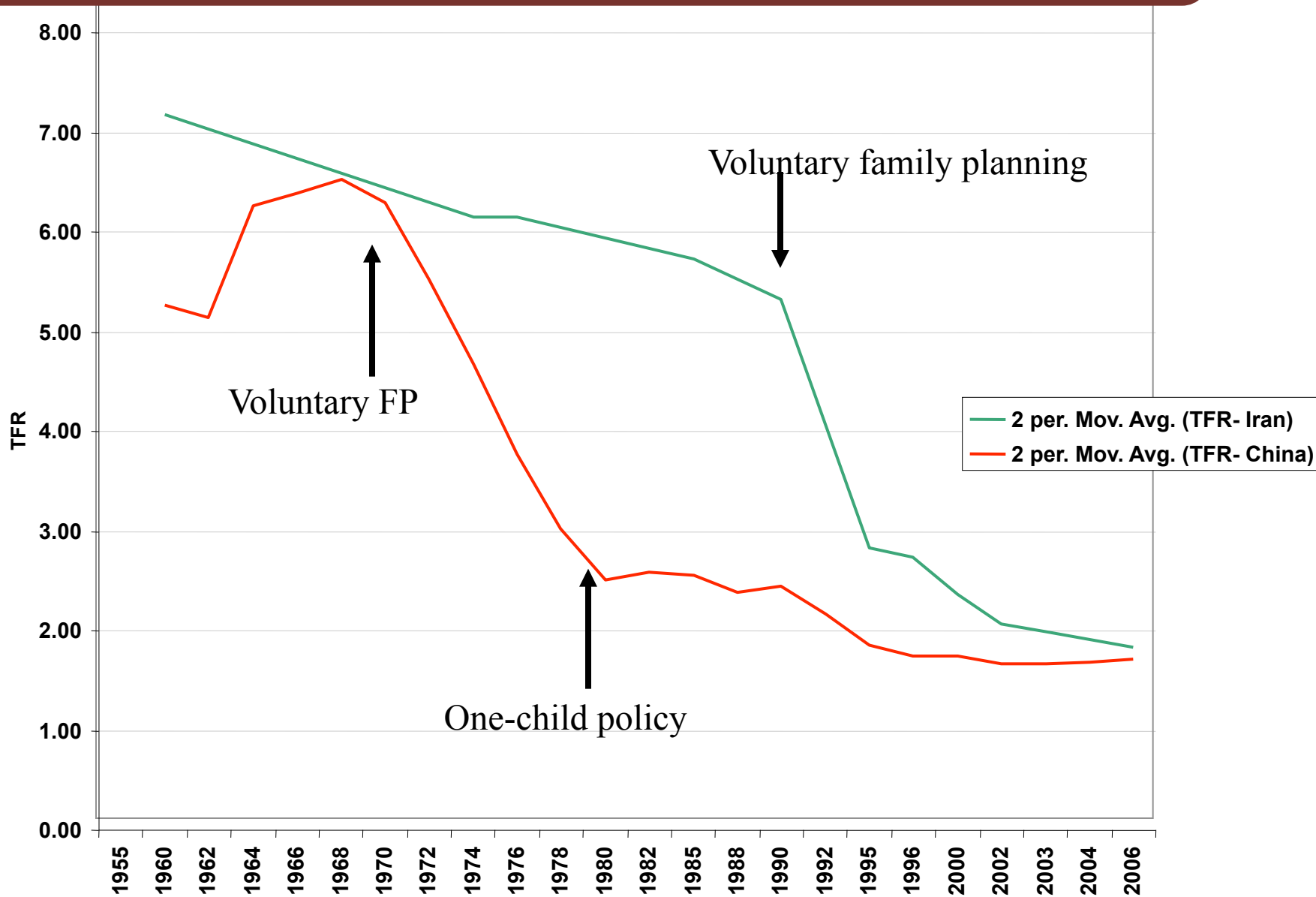
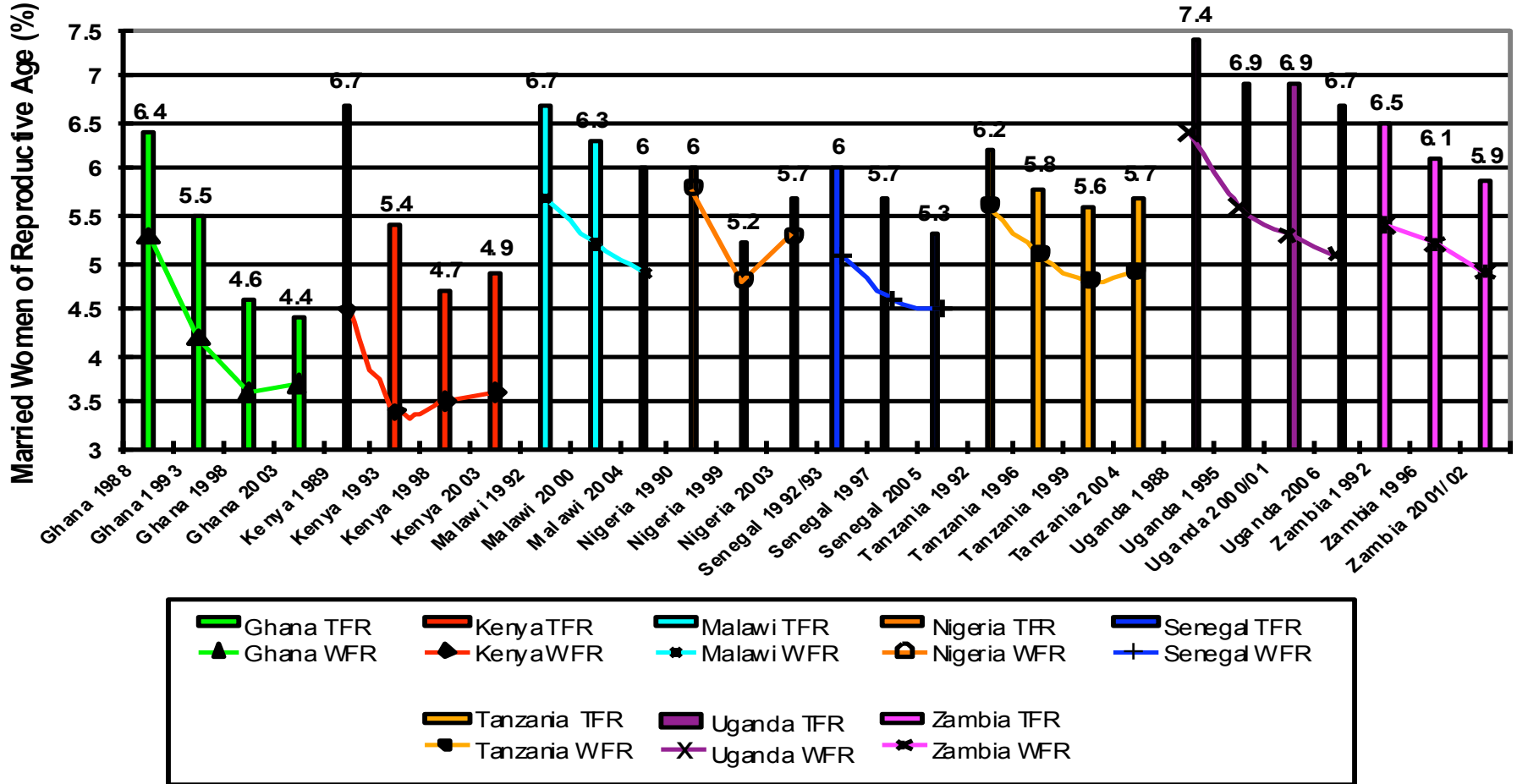


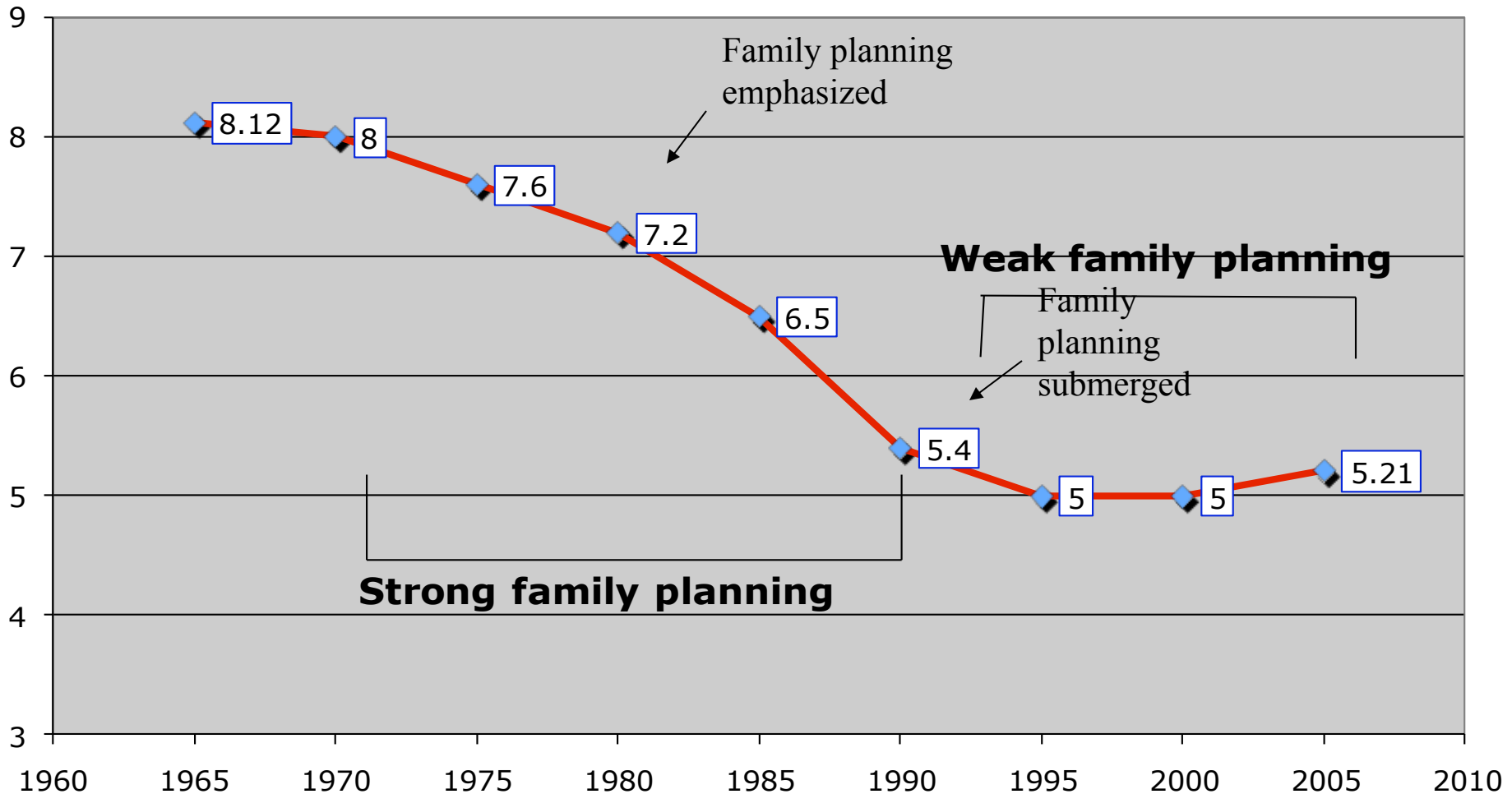
Figure 2. Total and Wanted Fertility Rates in Ghana, Kenya, Nigeria, Malawi, Senegal, Tanzania, Uganda, and Zambia, 1988-2006



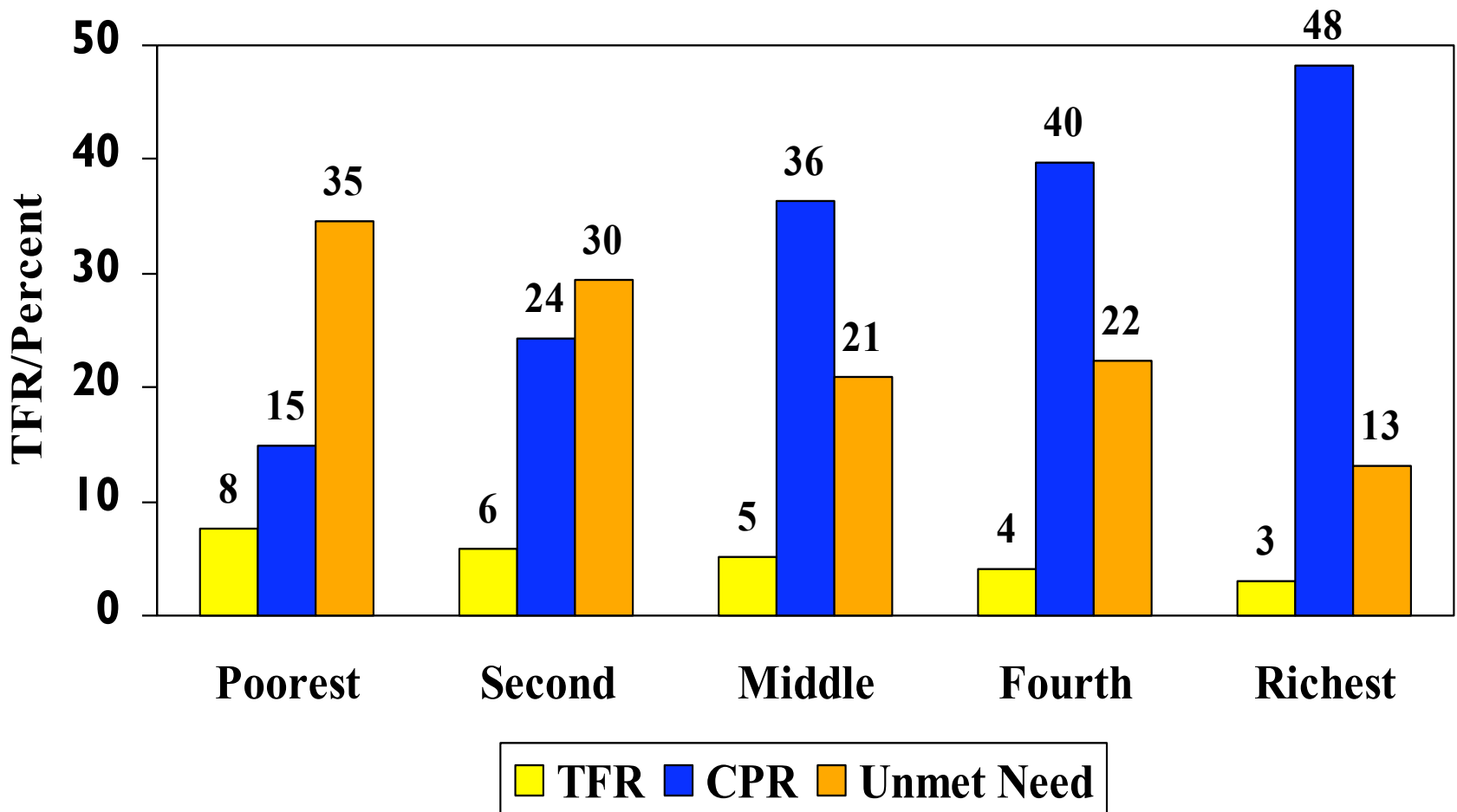
Source: Various National DHS Final Reports

When barriers increase, family size rises

Total Fertility Rate Kenya



TFR, CPR & Unmet Need: Differences Across Socioeconomic Groups

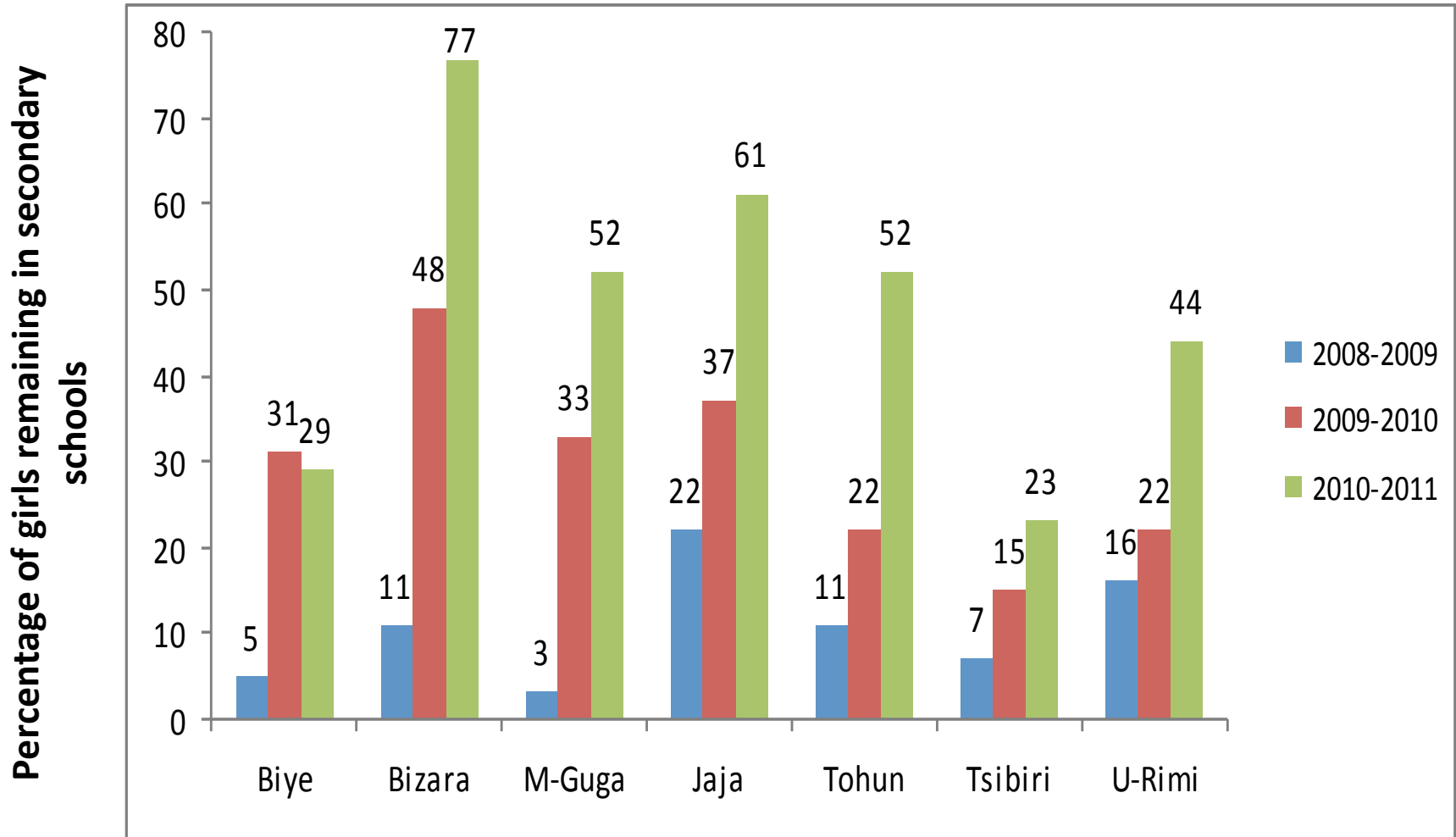


Source: Kenya DHS 2003

Child Marriage



Communities with a girls' education program





UC Berkeley

- College Natural Resources
- Bixby Center Population, Health and Sustainability
- Area Studies
- Others?

- **Sahel Monitoring and Policy Institute**

- Potts, M & Marsh, L. 2010. THE POPULATION FACTOR: How does it relate to climate change? www.bixby.berkeley.edu
- Jiang, L., & Hardee, K. 2009. How Do Recent Population Trends Matter to Climate Change? Population Action International.
- Campbell, M.M., Sahin-Hodoglugil, N.N., Prata, N. and Potts, M., 2006. Barriers to fertility regulation: a review of the literature. *Studies in Family Planning* **37**:87-98.
- Center for Reproductive Health Research and Policy, 2002. Family PACT Program Evaluation. *Cost-Benefit Analysis for Calendar Year (CY)*. Family PACT.
- Wire, T. 2009. FEWER EMITTERS, LOWER EMISSIONS, LESS COST REDUCING FUTURE CARBON EMISSIONS BY INVESTING IN FAMILY PLANNING; A COST/ BENEFIT ANALYSIS. <http://www.optimumpopulation.org/reducingemissions.pdf>
- FamilyPACT. http://www.familypact.org/_Resources/Documents/FS_060614_BenefitsofFP_FactSheet_Final.pdf
-