

# The Coming Global Demographic Imbalance

## National Security Implications of the Rapidly Changing Global Population Dynamic

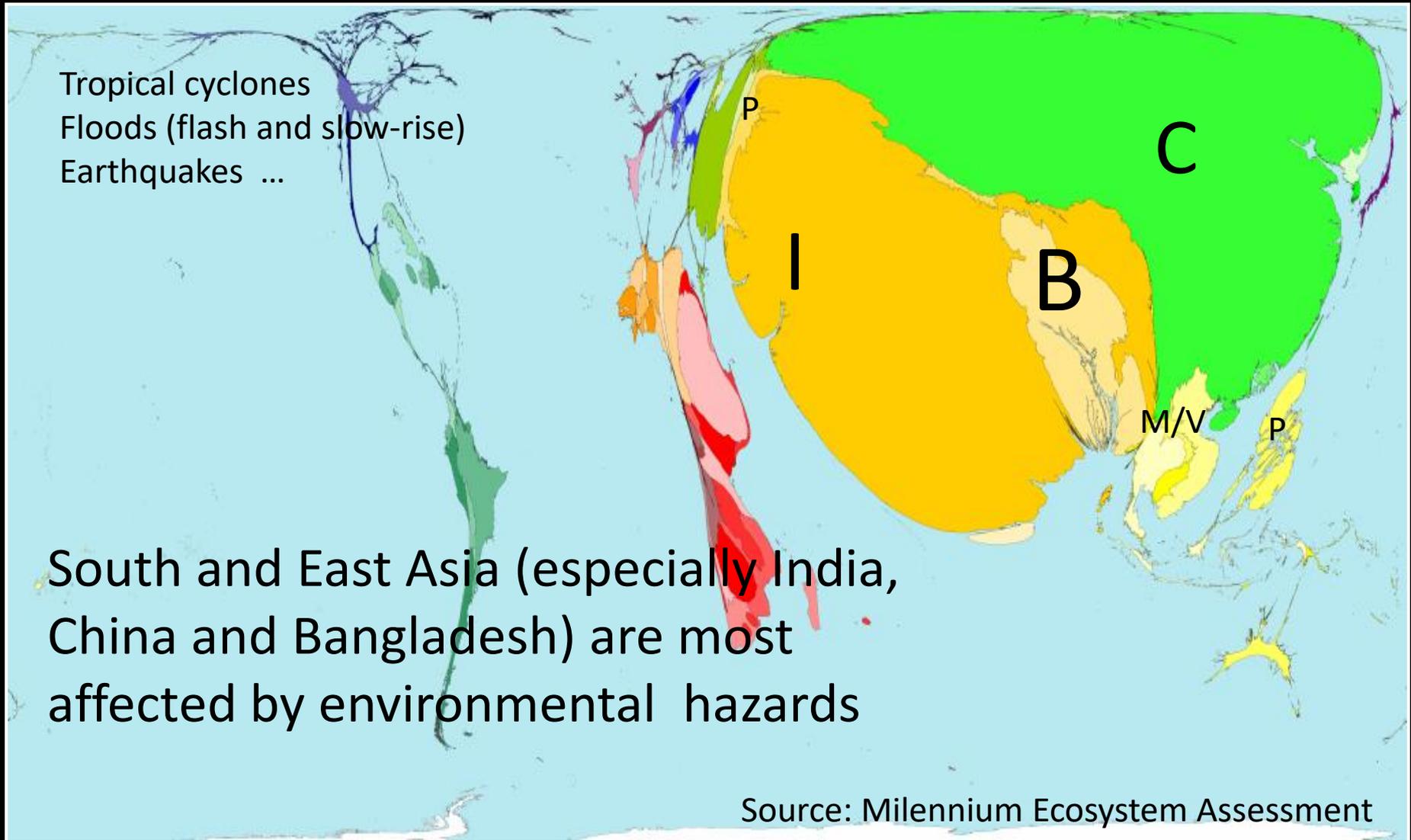
Peter J. Webster

Georgia Institute of Technology

Climate Forecast Applications Network



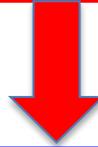
# Population affected by Environmental Hazards



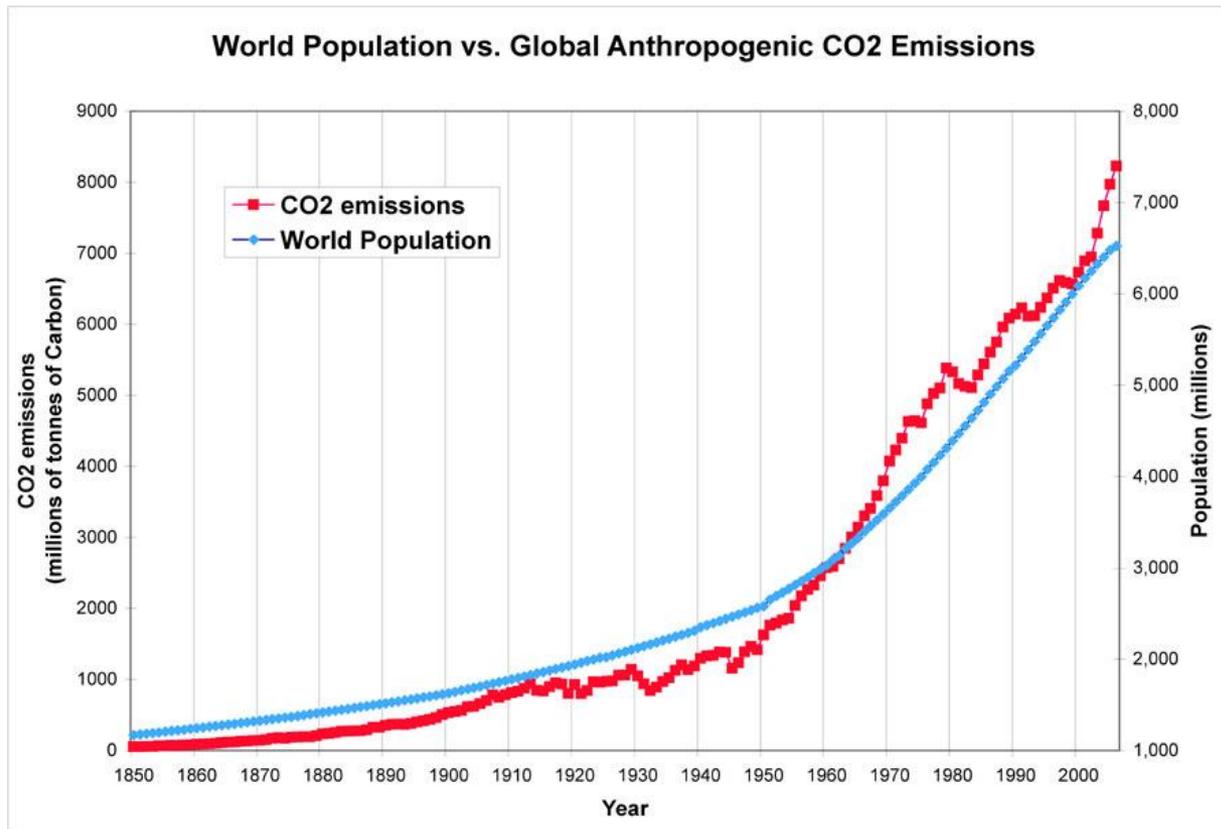
# Climate Forecast Applications in Bangladesh



Global population growth

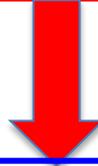


Climate change



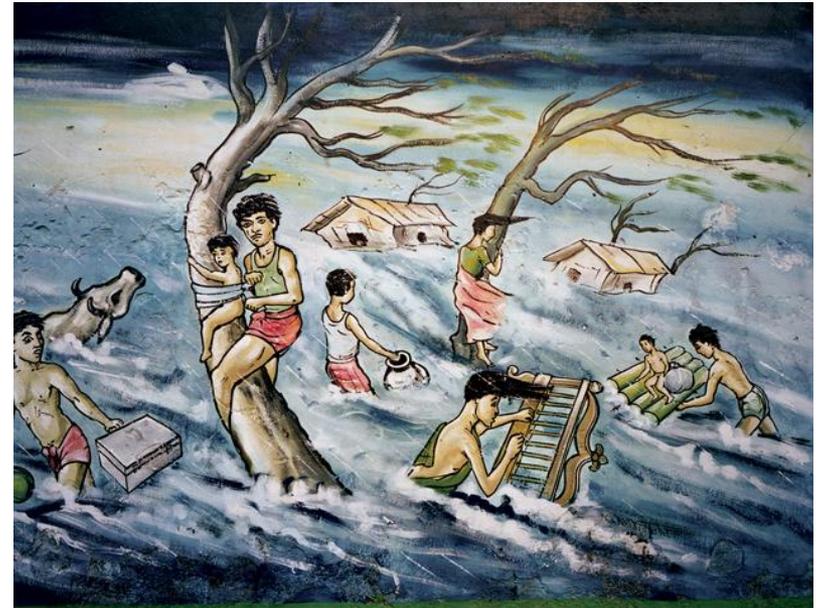
- By and large, atmospheric CO<sub>2</sub> concentration is strongly related to the global population and their activities.

Global population growth



Impact of environmental hazards

- Tropical cyclones, floods, droughts, earthquakes, tsunamies, volcanoes impact increasingly large numbers of people

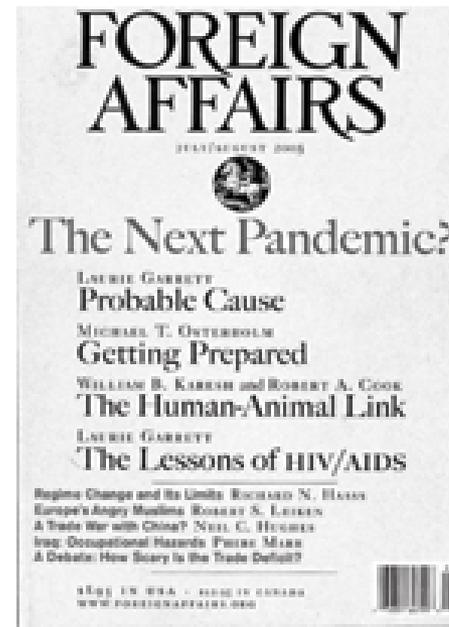
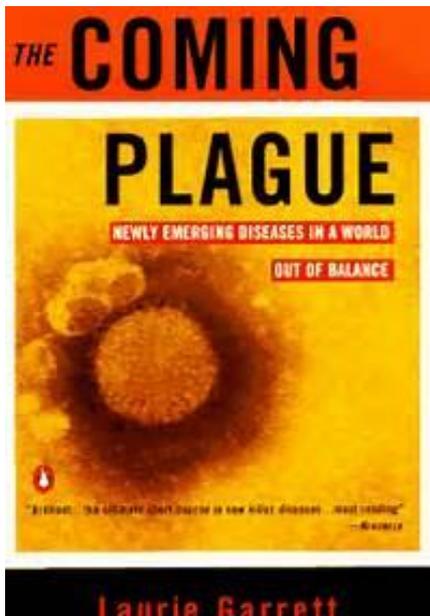


Global population growth



Communicable diseases

- More people, more contact
- Increased probability of interspecies mutation



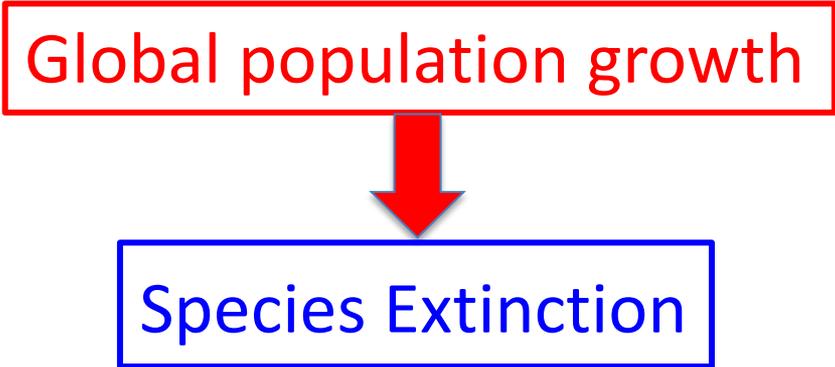
Global population growth



Unrest, warfare and migration

- Competition for resources
- Overpopulation and terrorism
- More refugees and destabilization

Global population growth



```
graph TD; A[Global population growth] --> B[Species Extinction]
```

Species Extinction

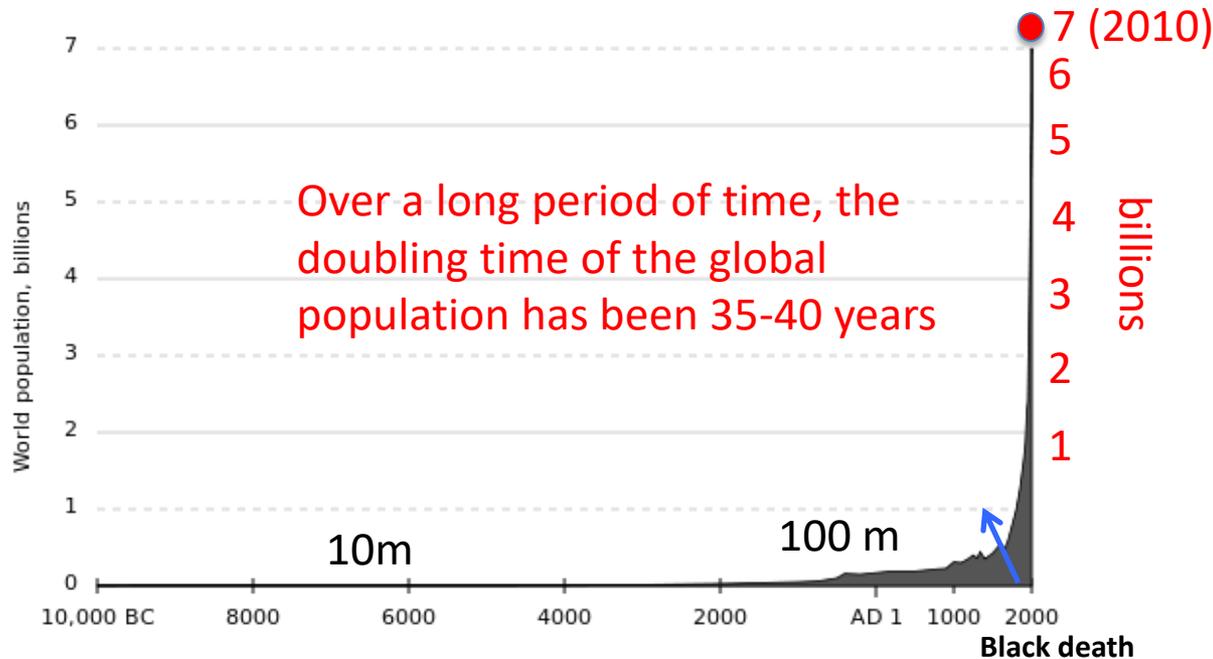
- Habitat degradation and closure of migration routes
- Adaptation timescale is far slower than land use changes
- Insecticide usage: destruction of pollinators
- Coexistence and co-dependency of species: If prey is lost, then the predator will also be lost

Are humans the present day meteorite?

In the beginning.....

*God blessed them and said to them, "Be fruitful and increase in number; fill the earth and subdue it. Rule over the fish in the sea and the birds in the sky and over every living creature that moves on the ground."- Genesis 1:28*

● 10-11 (2100)

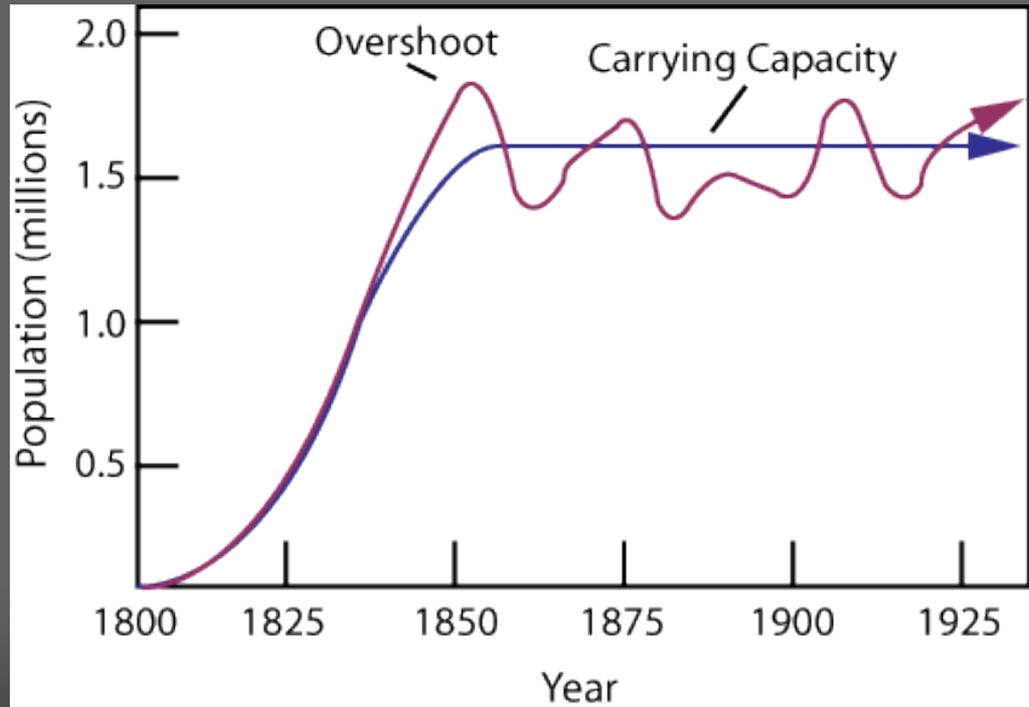


Maybe orders were exceeded?



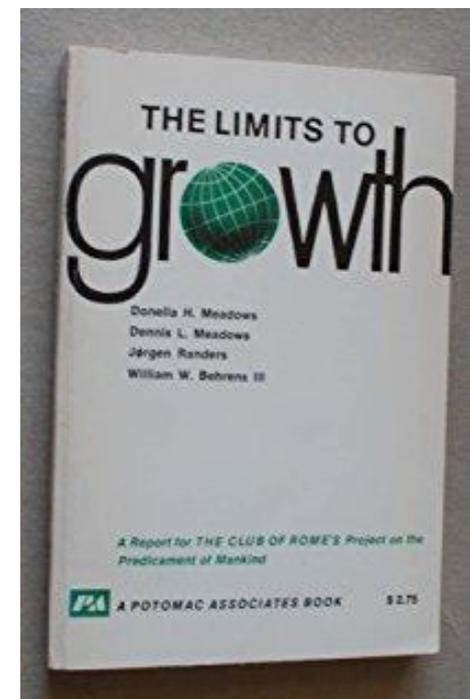
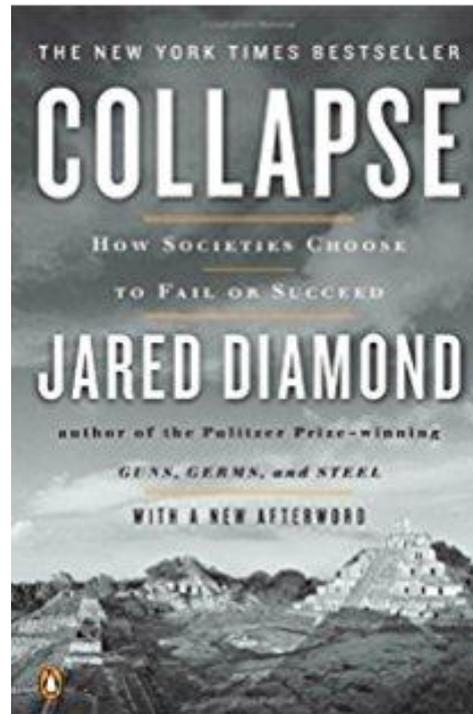
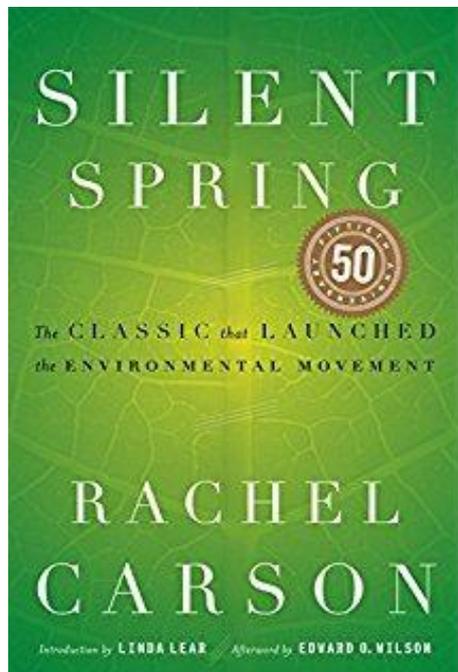
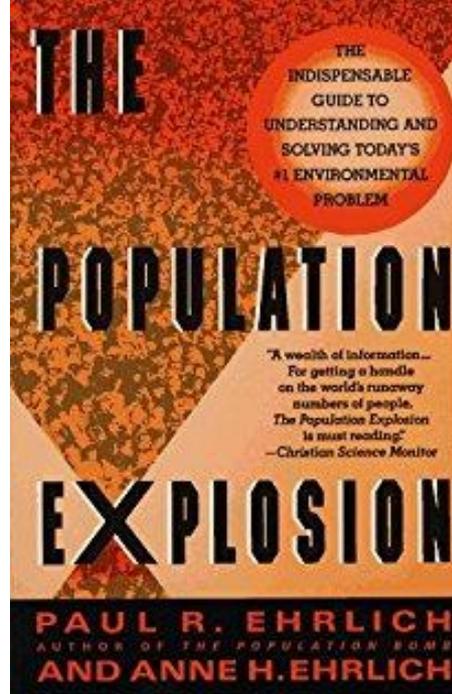
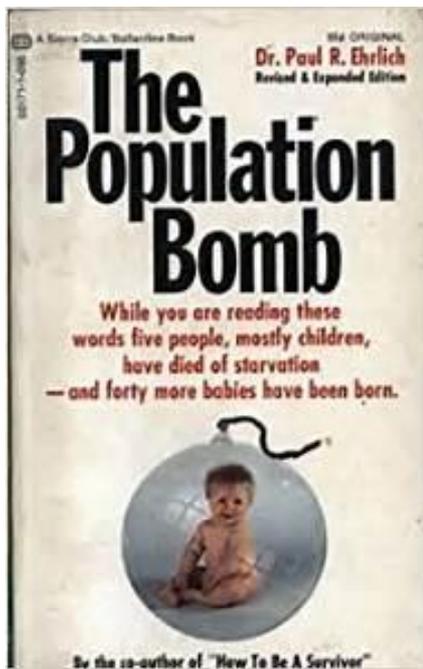
*Thomas Malthus*  
1766-1834

Worry about population growth is not a recent concern

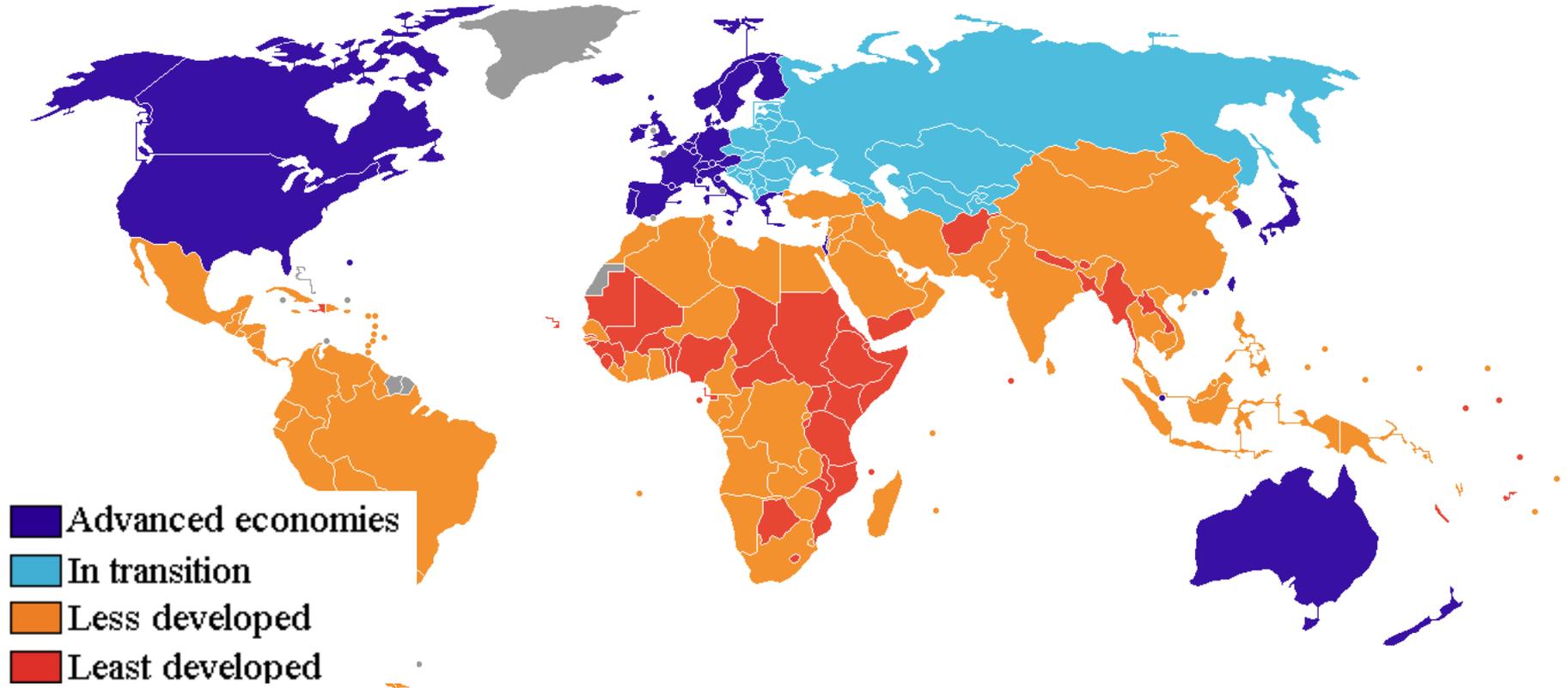


Copyright 2007 Jay Sanders and Michael Edelstein

- Population expansion based on subsistence and increasing the food supply for larger population. No accumulation of wealth.
- Early US, Europe until Industrial Revolution: wealth accumulation and reduced population growth rate.

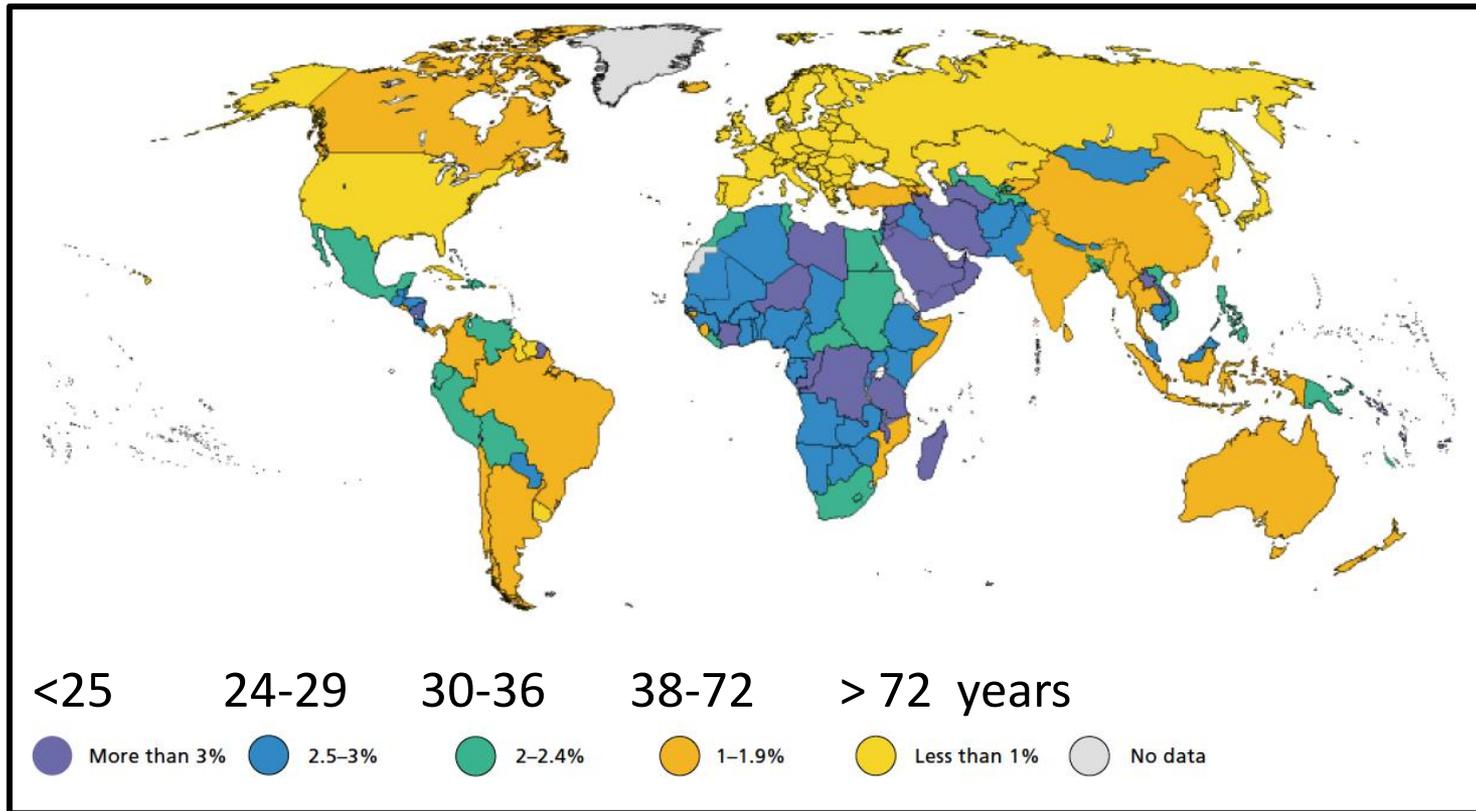


It is not just a matter of how many, it is a question of who and where



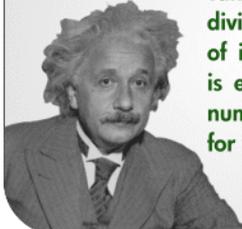
World Bank definition: Country “developing”  
if gross national Income/capita < \$11,905/year  
US \$47K, India \$1600, Pakistan \$1500,

# Doubling Times of Population by Country



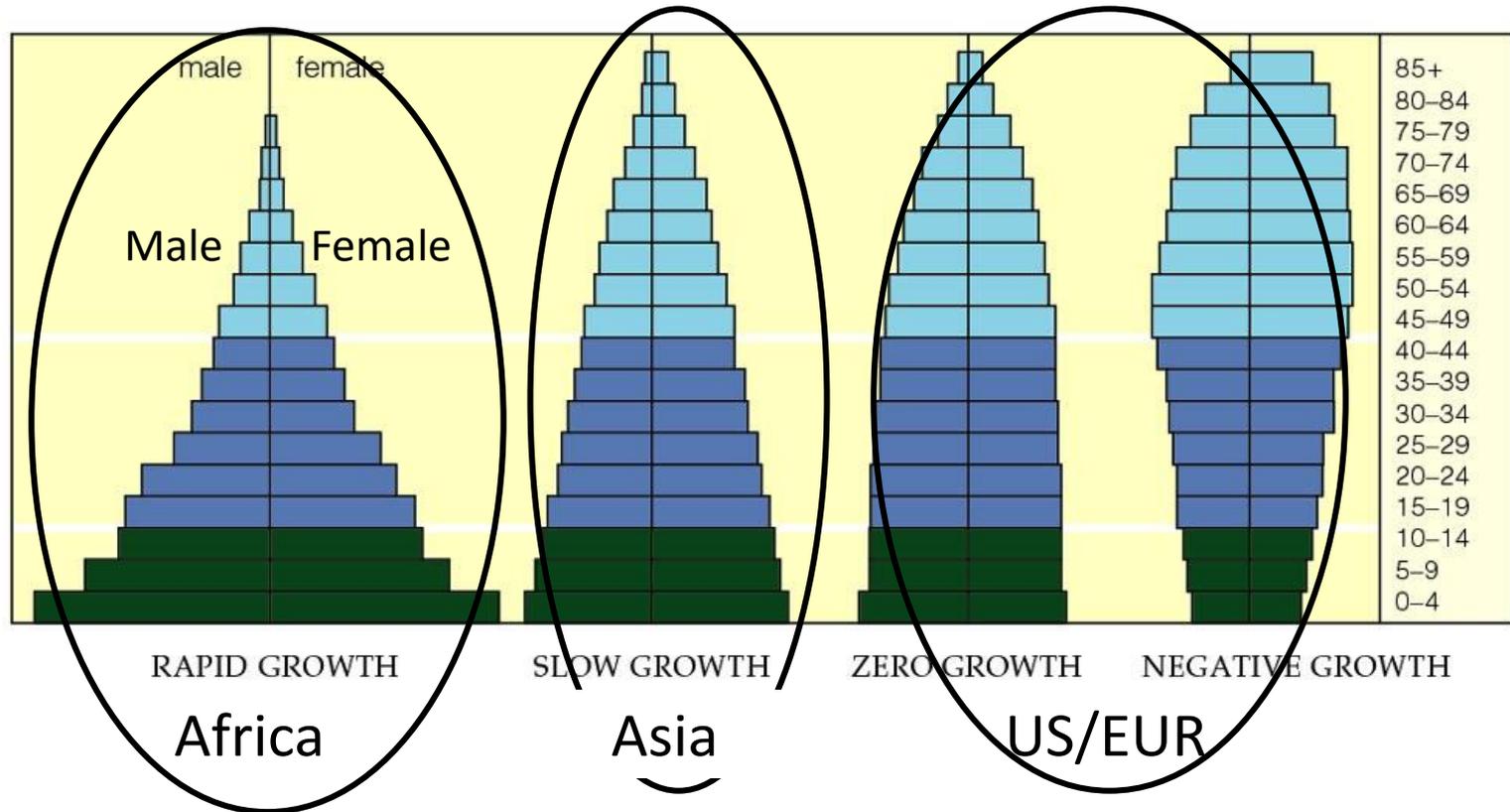
- Countries that have the largest populations are those that have the largest % population growth
- Many of these countries are markedly different socially, religiously, politically and (perhaps) aspirationally.

**Rule of 72**



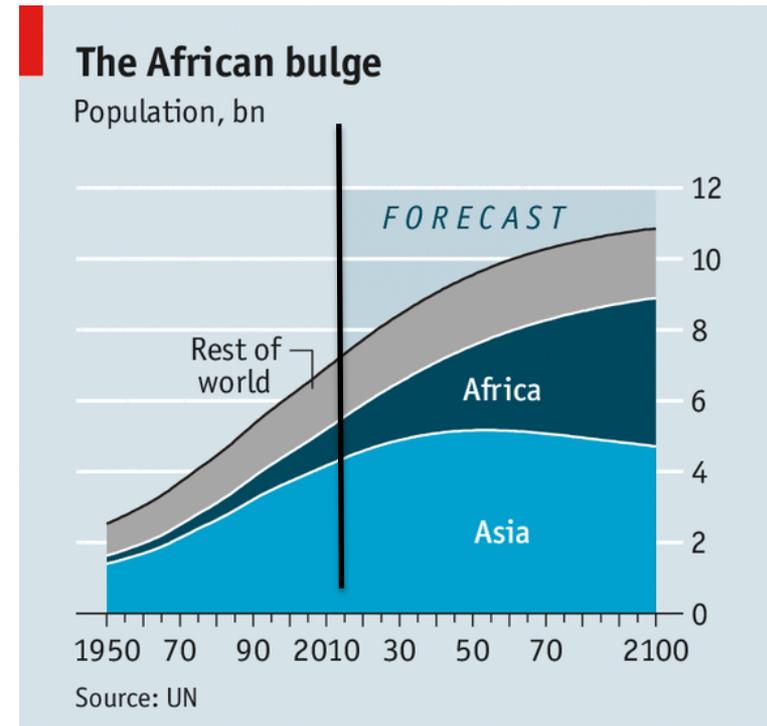
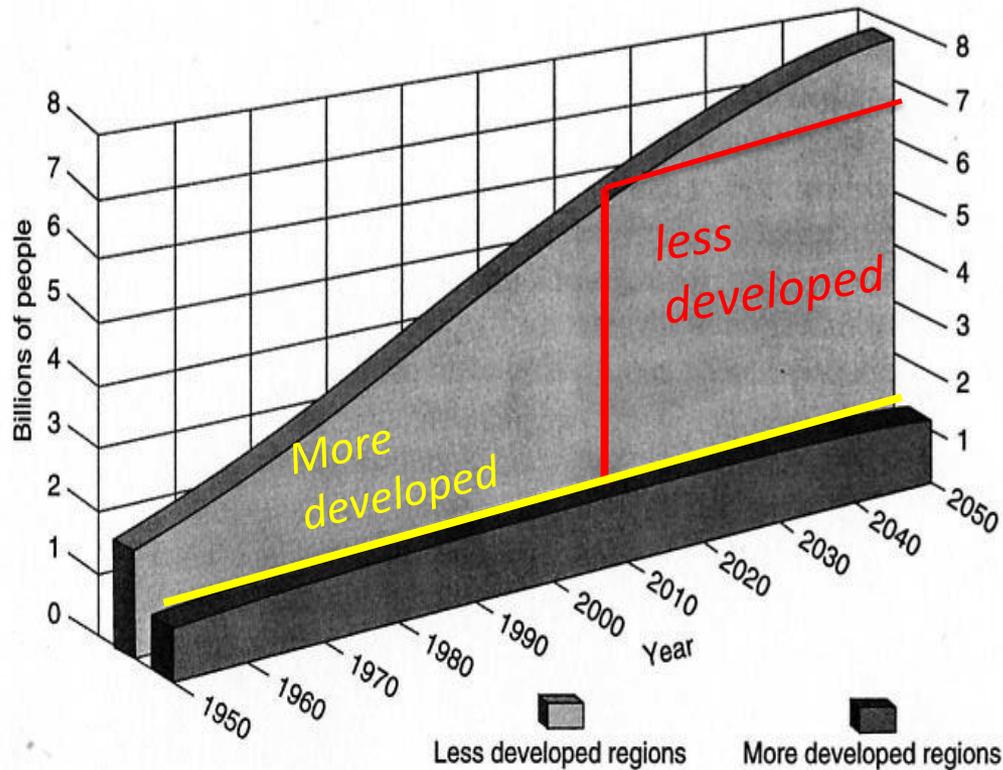
Take the number 72 and divide it by the annual rate of interest that your money is earning to determine the number of years it will take for your money to double.

# Differential Demographic Pyramids



- Demographic pyramids show relative age and sex of a population.
- Most of Africa and Middle East are in rapid expansion.
- Mature western nations steady growth or decrease.
- US population has a replacement of 2.2 babies/mother. Increase is due to immigration
- Japan and eastern Europe declining populations.

# Recent UN Reassessment of Population Projections



Quite recently (2015), the UN updated its projections of population having not accounted for Central Africa adequately. 9B became 11B by 2100



versus



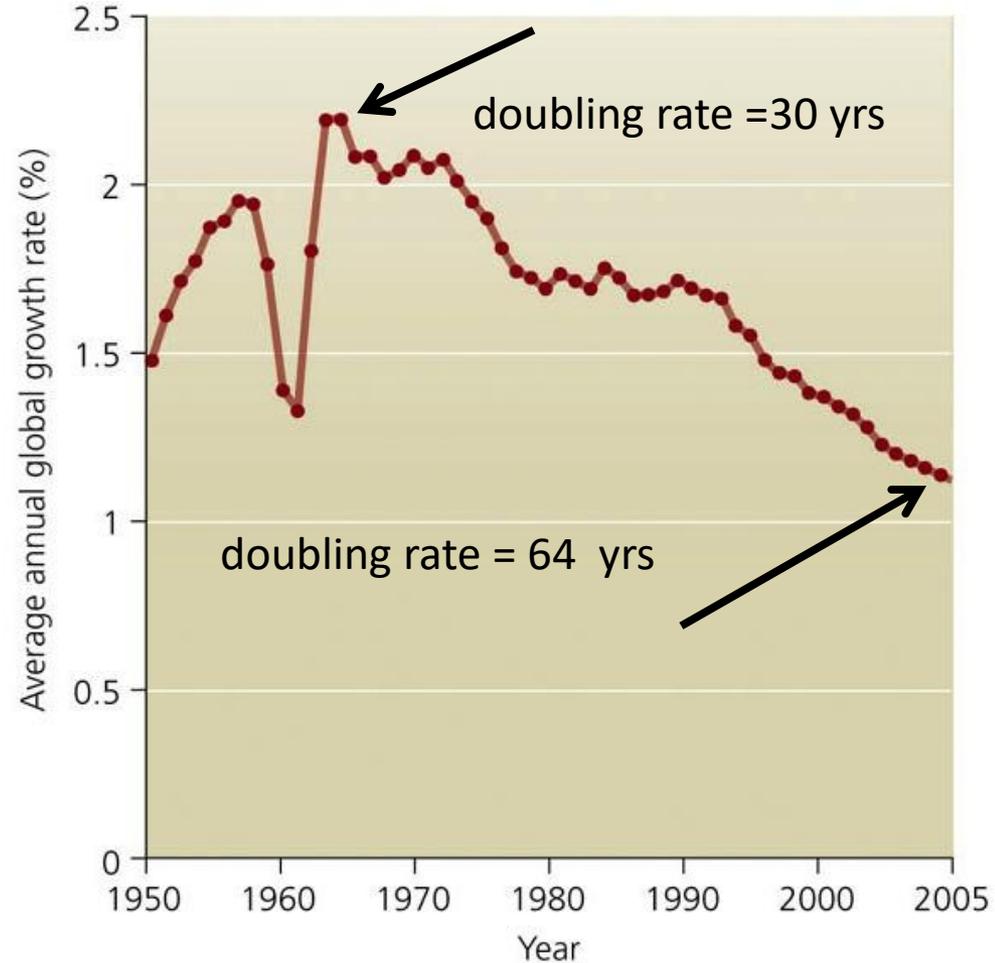
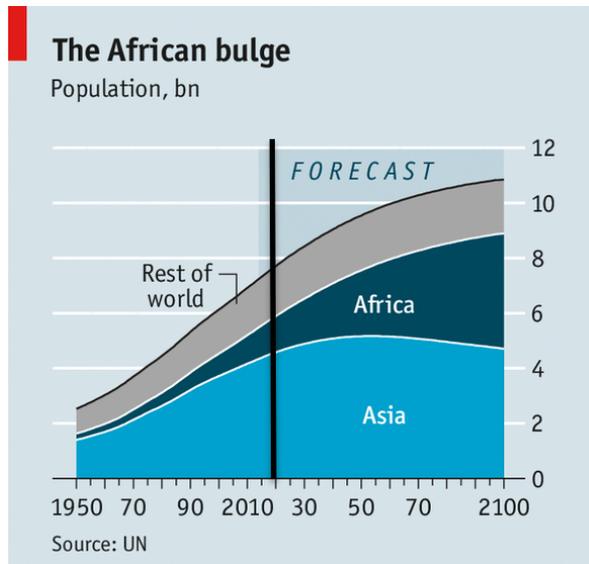
**Prof. Paul Romer (1975-...) the  
“Prophet of Post Scarcity”**

**Malthus: Misery, vice and poverty!**

- Malthus’ point of view did not take into account that there were other “positive”, less draconian checks such as contraception, education, the industrial revolution, accumulation of wealth and etc. as well as the enterprise of ideas.
- Paul Romer (World Bank chief economist): New ideas and **resources** will continue to be the engine of growth for the world. But can resources keep up with growing population especially middle class?

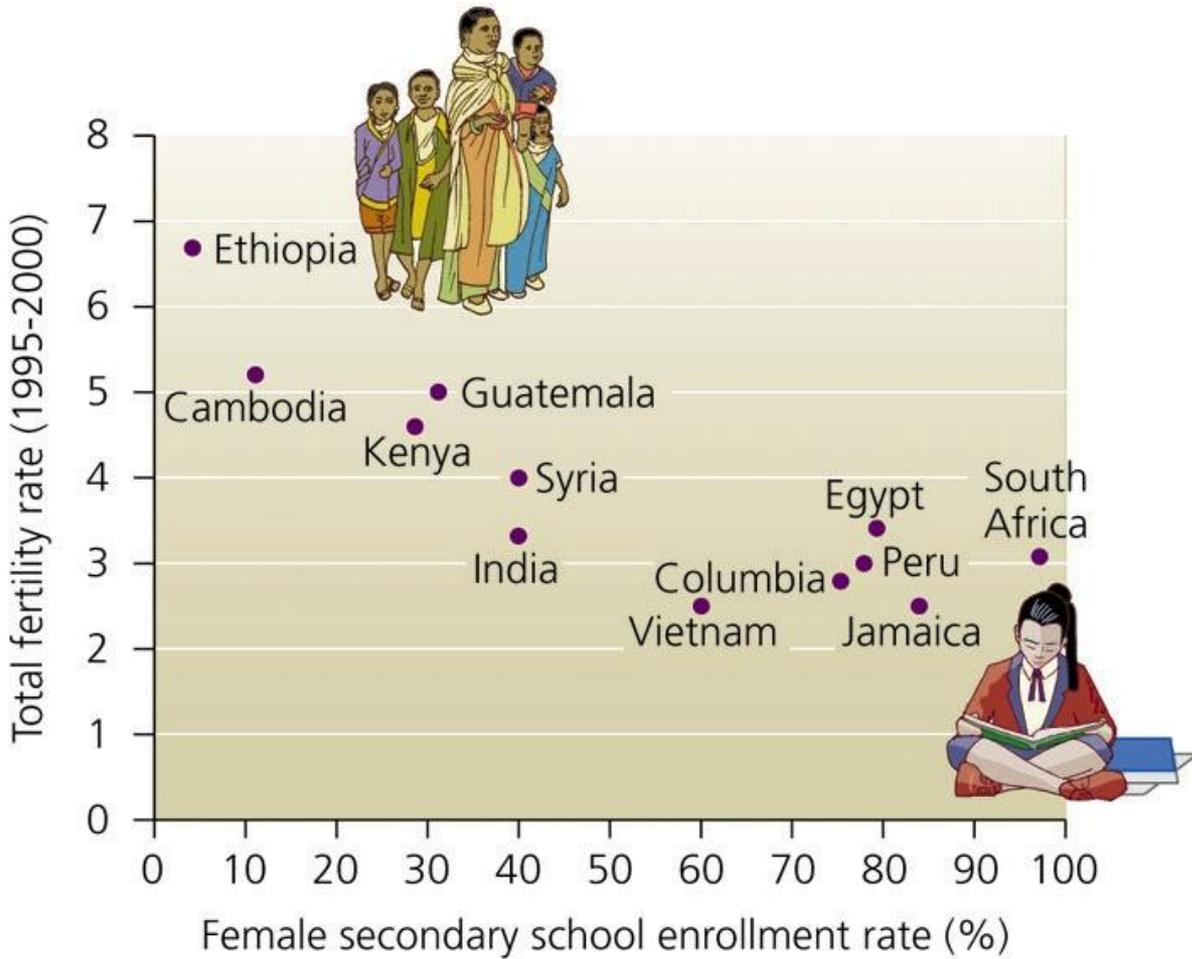
# Global population growth rates have fallen!

- The annual growth rate of the world population has declined since the 1960s.
- Yet, we are still talking about the doubling of VERY large numbers.



- Does planetary holding capacity eventually become an issue (as per Malthus??)

# Why has there been such a reduction in birth rate?

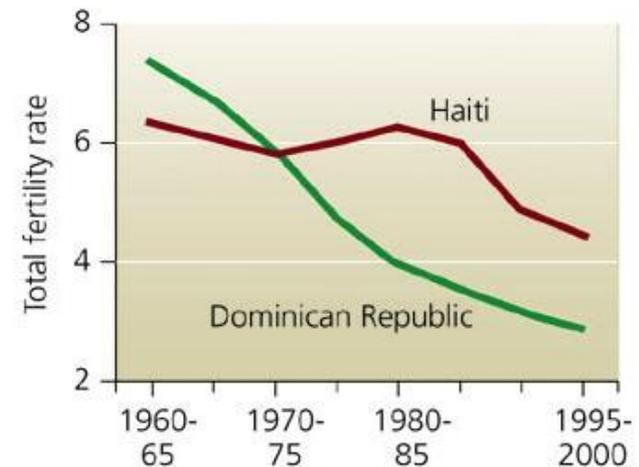
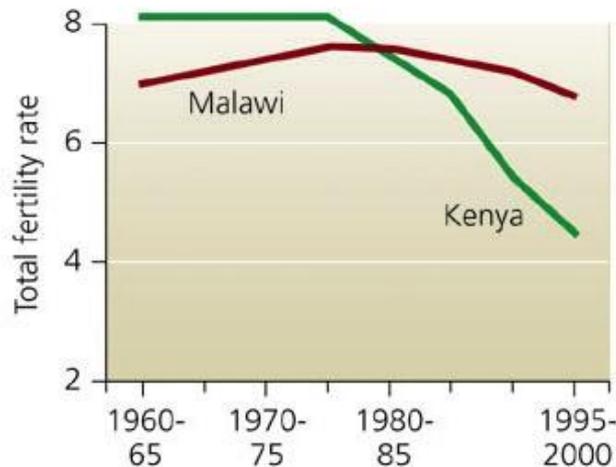
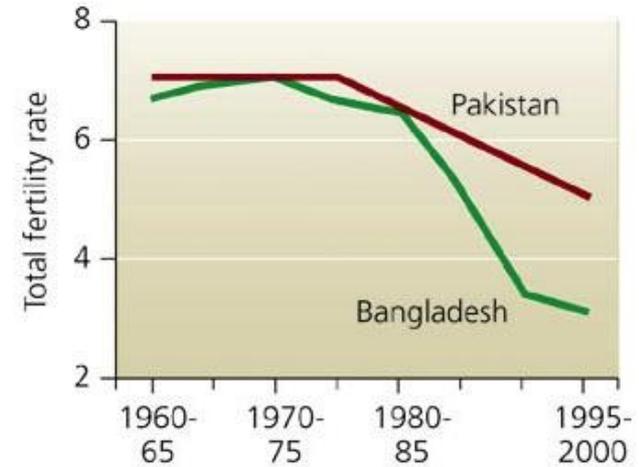
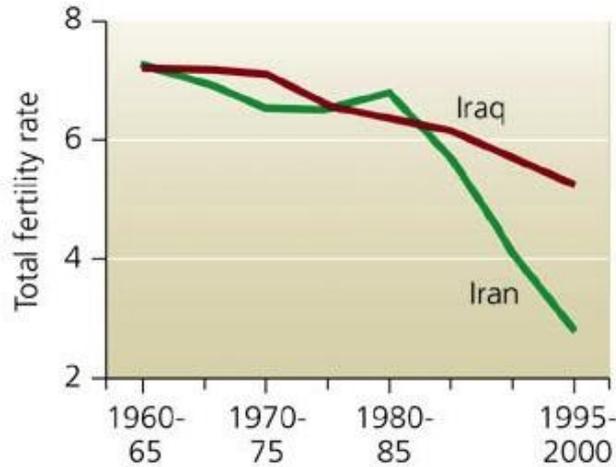


Female literacy and school enrollment are correlated with total fertility rate:

**More-educated women have fewer children.**

# Some interesting comparisons

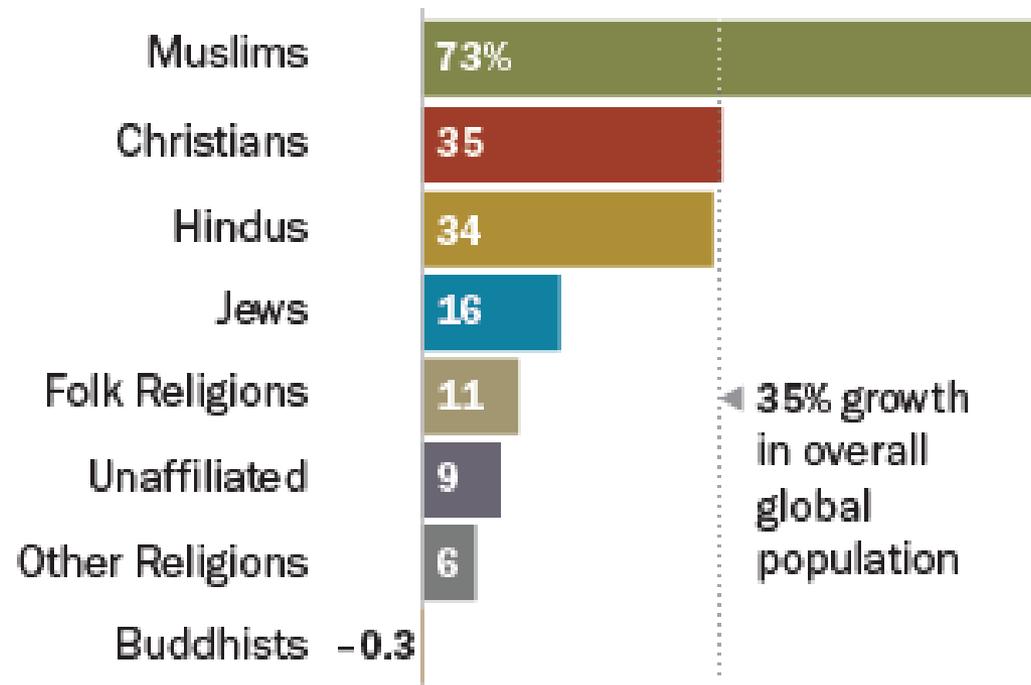
- Nations that invested in family planning (green) reduced Total Fertility Rates more than similar nations that did not (red).
- Note that these are the highest growth regions on the planet.
- It works!



## Islam Growing Fastest

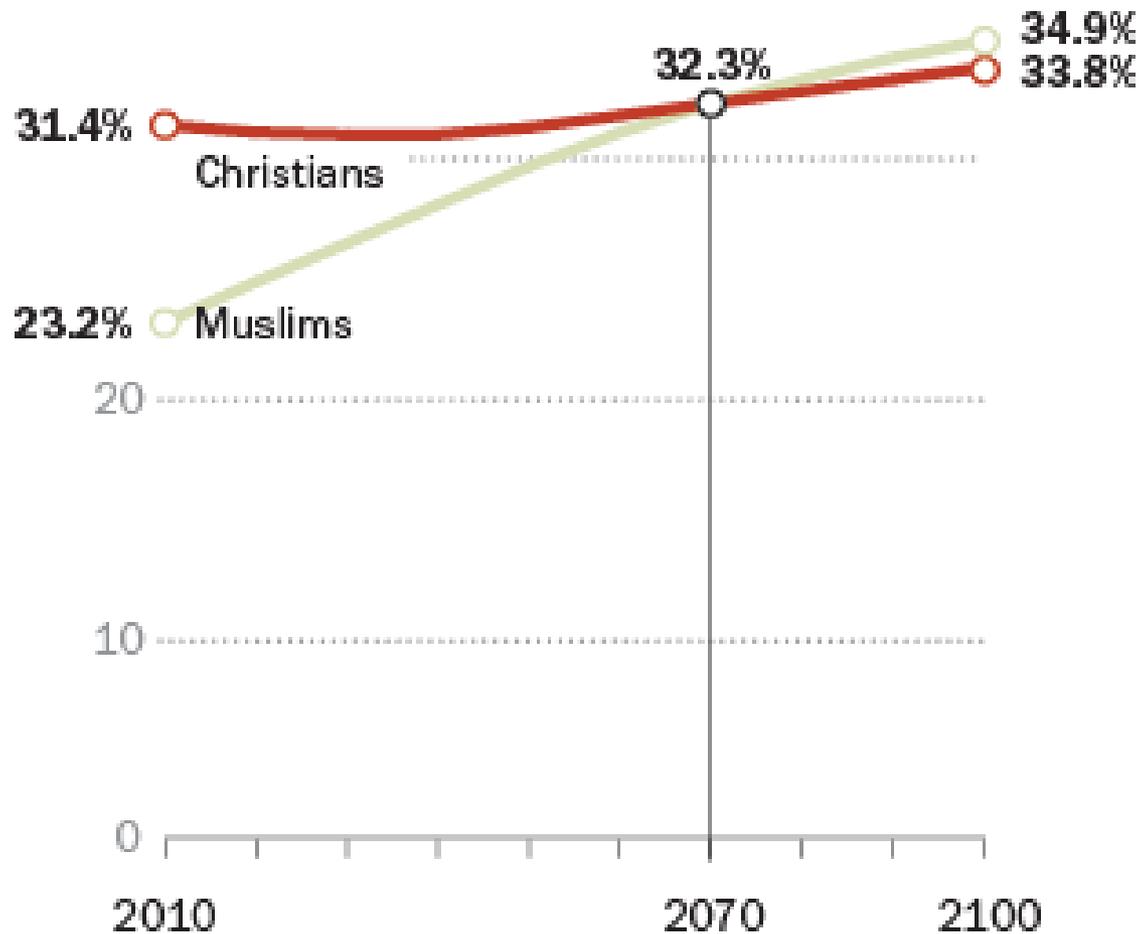
*Muslims are the only major religious group projected to increase faster than the world's population as a whole.*

### Estimated change in population size, 2010-2050



Source: The Future of World Religions: Population Growth Projections, 2010-2050

# Global Changes in Religious Affiliations:



Source: The Future of World Religions: Population Growth Projections, 2010-2050

PEW RESEARCH CENTER

## How can we continue the downward trend in growth rate?

Policy on population has to be an international policy (UN) where, with the exception of the World Health Organization, it is rarely mentioned.

US has played an important, critical and leading role in the last 50 years in the developing world. This needs to continue especially:

- Alleviation of poverty
- Promote female education and emancipation
- Increase access to birth control and family planning
- Natural disaster preparedness (not just reaction) through “strategic adaptation” whether environmental change is natural or forced.
- Aid needs to be politically blind

## Some final thoughts:

- By the end of the 21<sup>st</sup> century, the global demographics and those of western societies will change markedly, exacerbating major global challenges
- Population growth rates in developing countries can be slowed by economic development and family planning
- Unfortunately, it is a taboo topic  
discussion of other people's population may quickly be implied racially, ethnically and religiously.



POGO: Walt Kelly 1971