

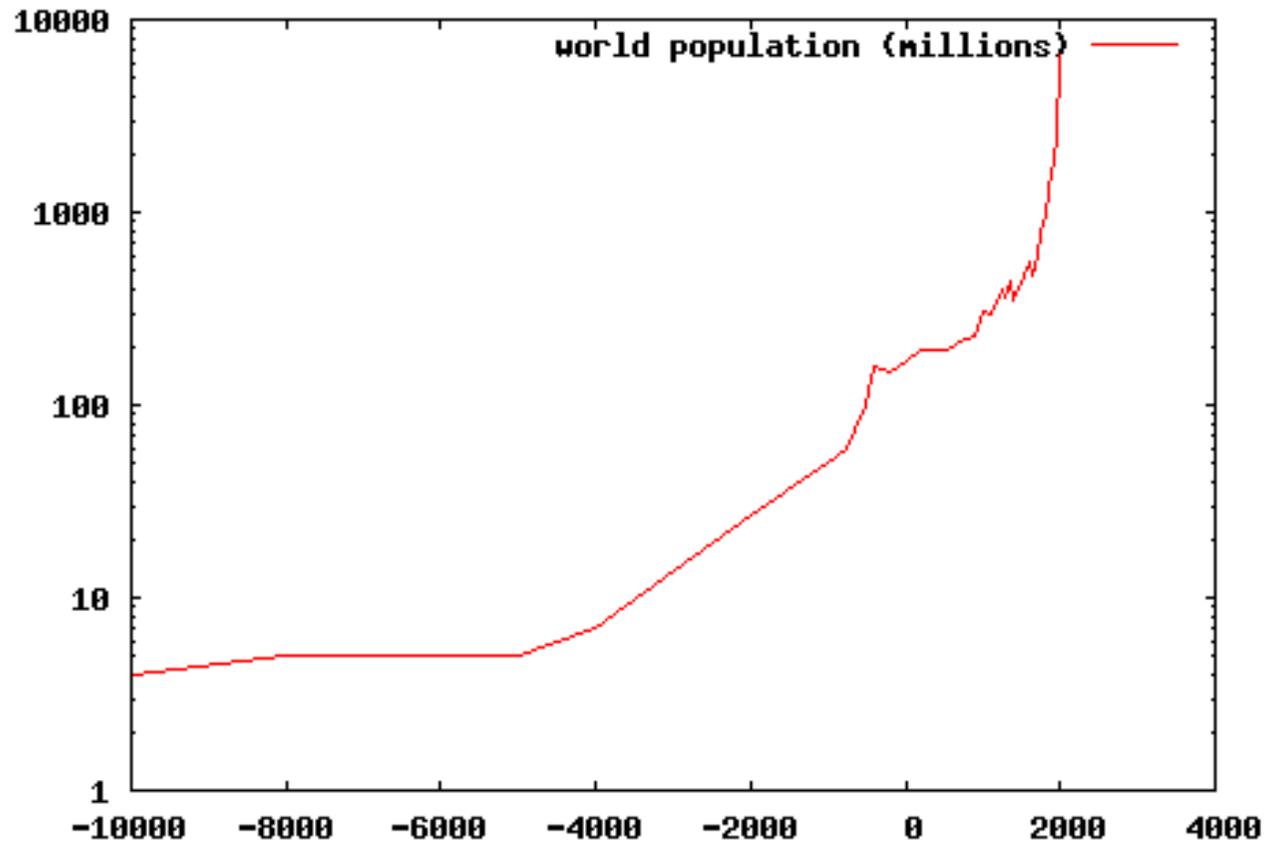
World Population dynamics

6.8 billions and still growing

M. Dittmar, conCERNed workshop February 22.2010

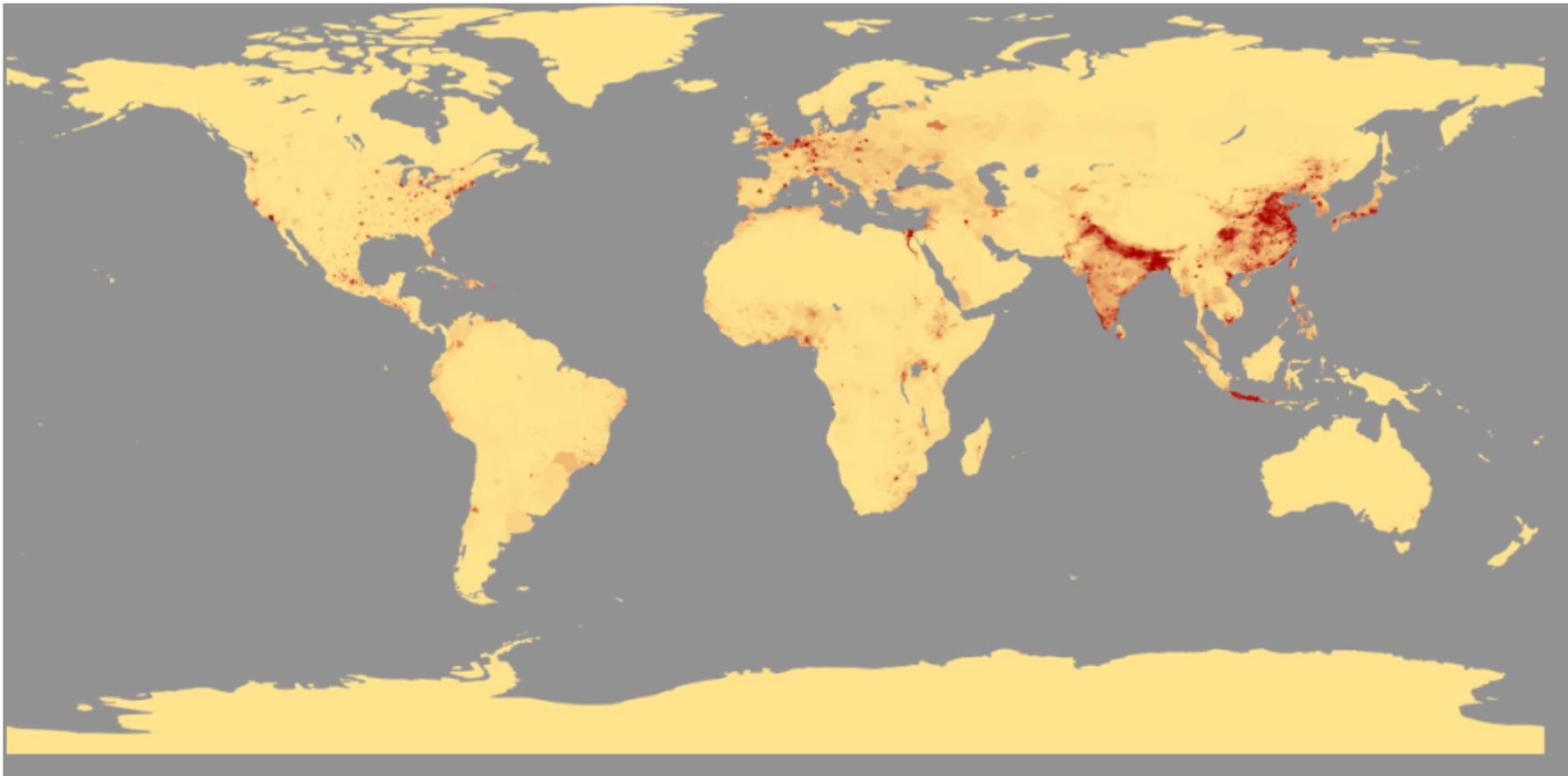
- ***Some facts about the world population***
- ***The problem of the age structure,
the delay problem!
or why it will take 20-25 years before
a “1 one child policy” shows hard results?***
- ***Other constraints:
net growth = “newborn - death rates”***

Some facts about the world population (I)



Some facts about the world population (II)

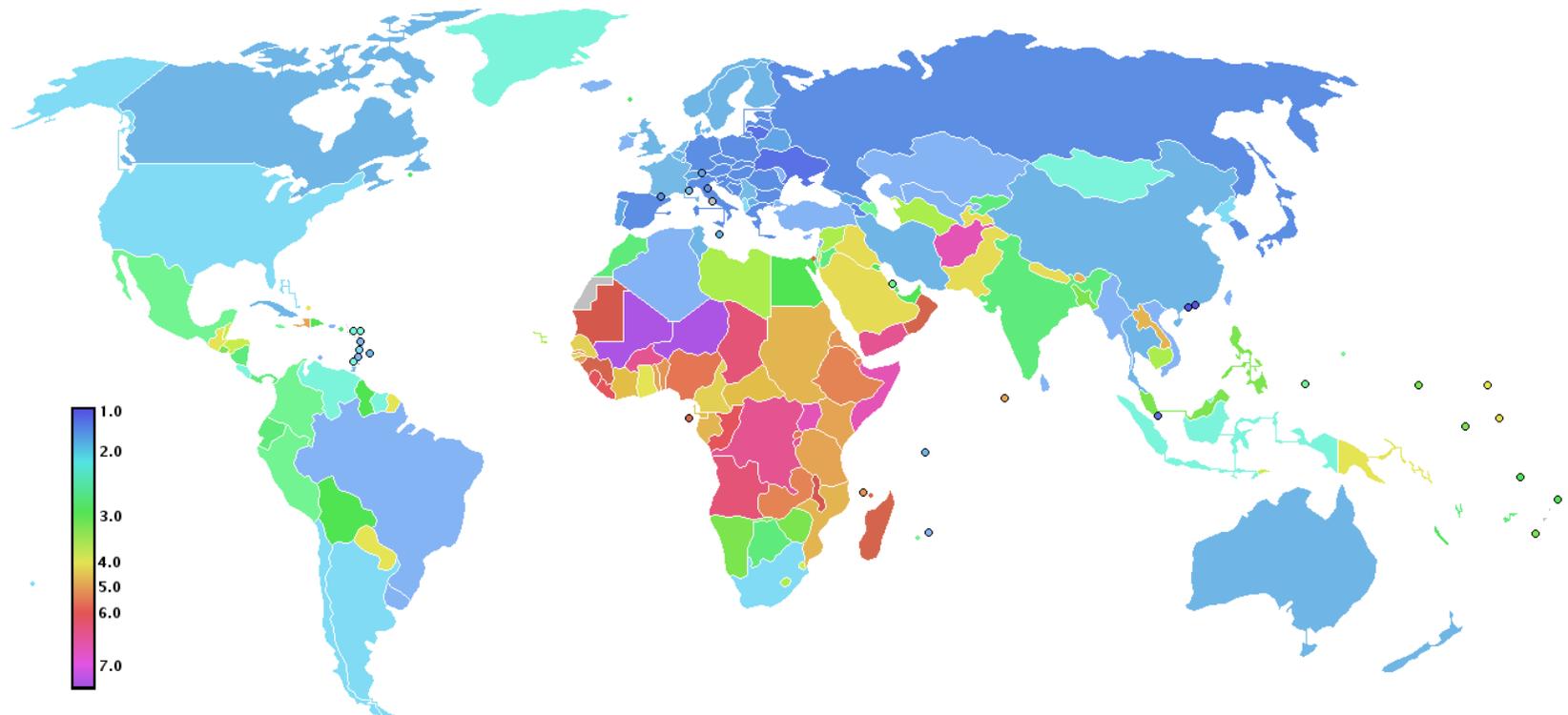
- World population density (some hot spots)



Some facts about the world population (III)

- Fertility rates (children per woman)

Attention the age structure of the population matters!



Some facts about the world population (IV)

How did we reach the 6.8 billion people?

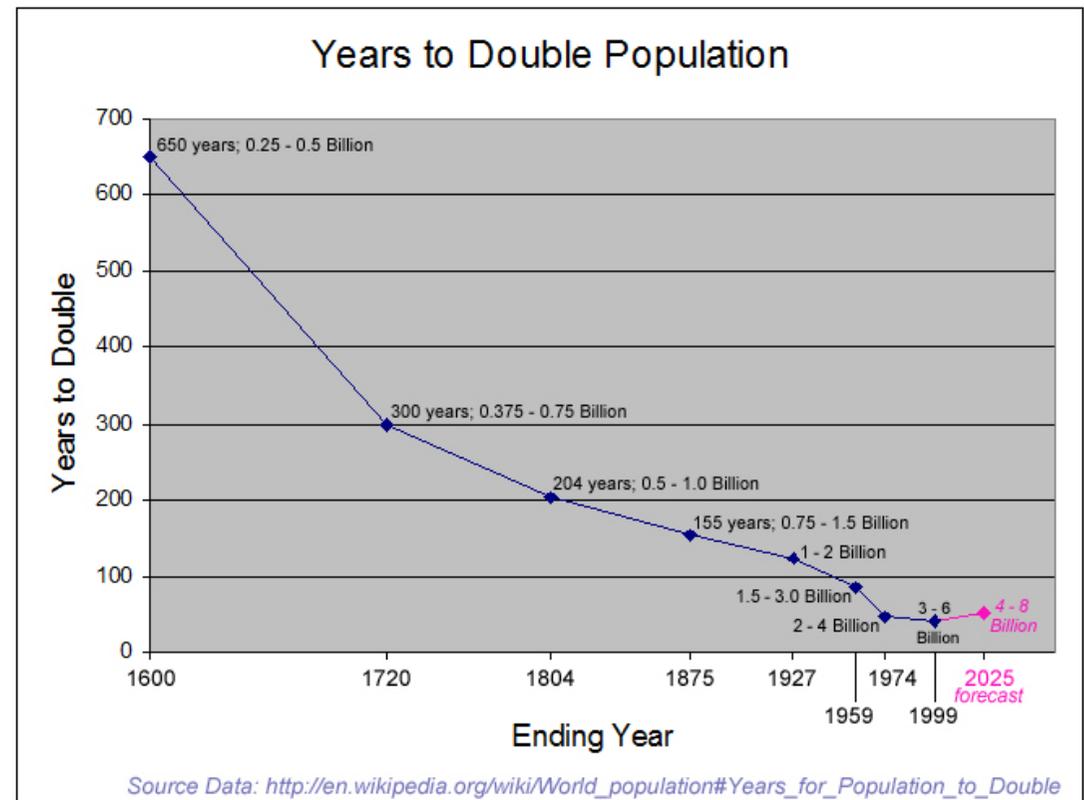
http://en.wikipedia.org/wiki/World_population

Starting at 500 million

Population (in billions)	0.5	1	2	4	8
Year	1500	1804	1927	1974	2025
Years elapsed	304	123	47	51	

Starting at 375 million

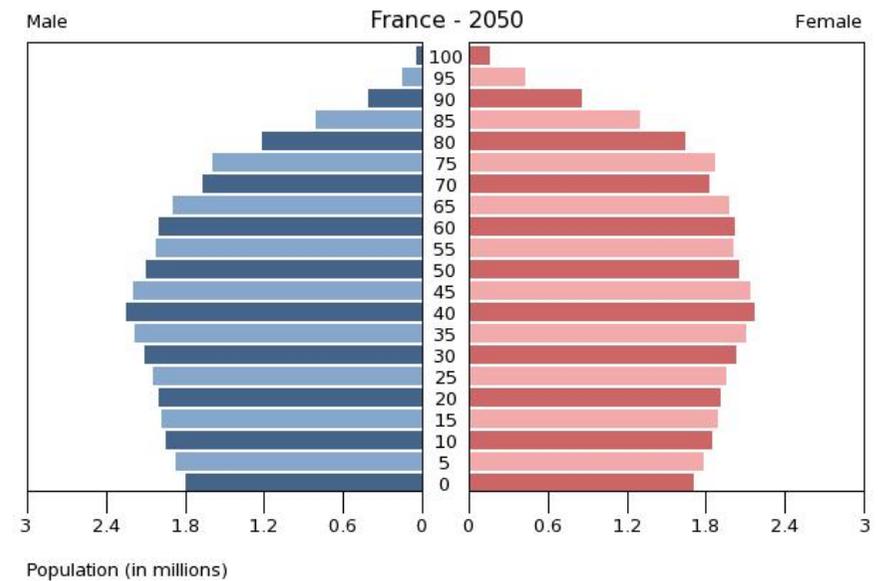
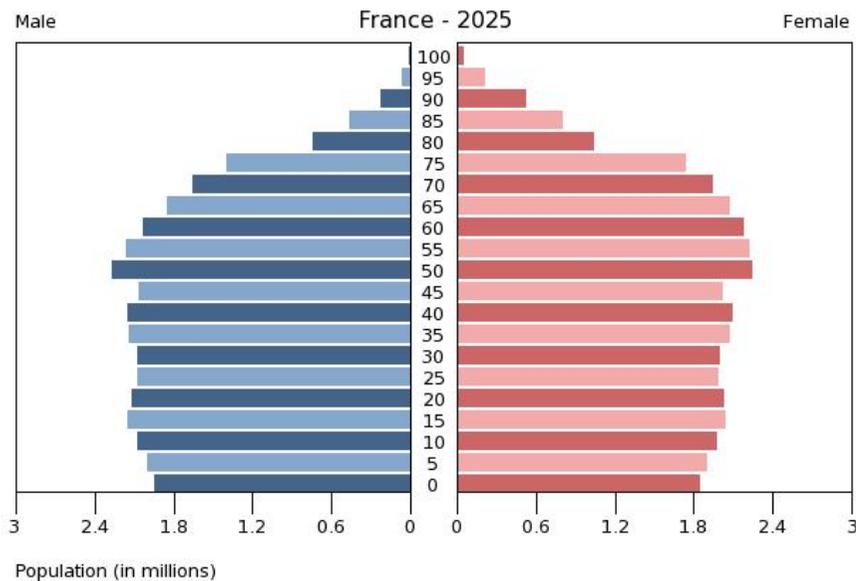
Population (in billions)	0.375	0.75	1.5	3	6
Year	1181	1715	1881	1960	1999
Years elapsed	534	166	79	39	



The problem of the age structure, the delay problem! (I)

- Example France: 2009 est. 1.9 children/woman
2000=61 mill. 2025=68.5 mill. 2050= 69.8 mill

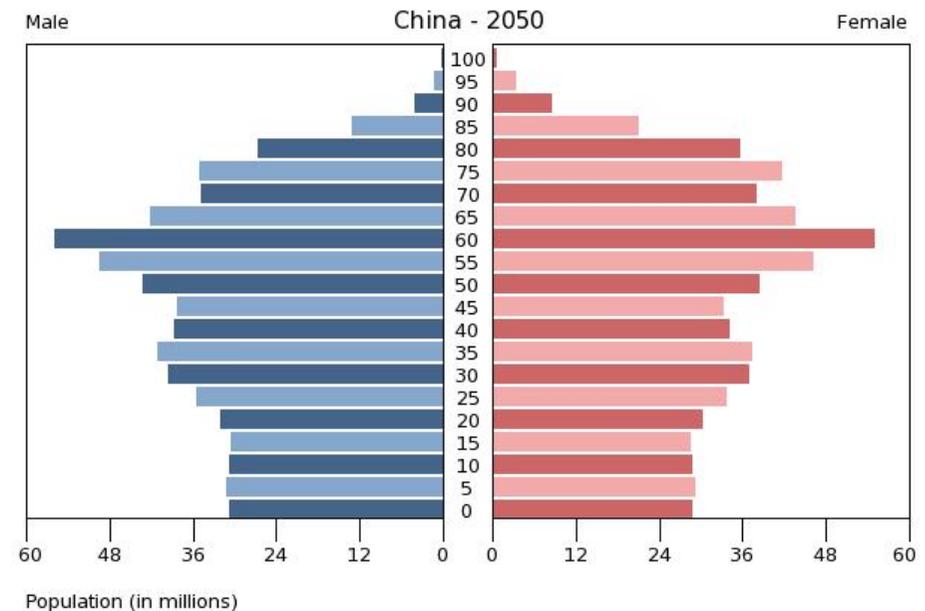
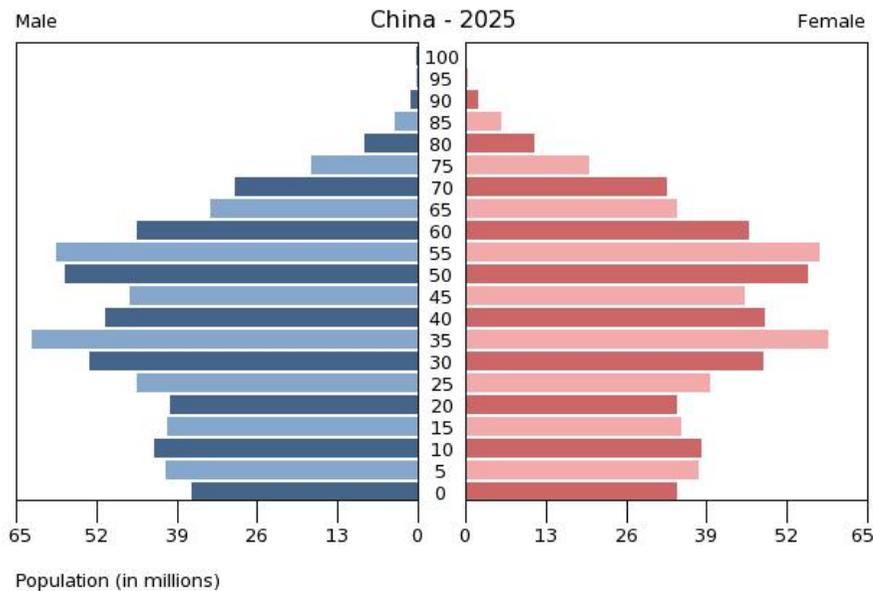
source: <http://www.census.gov/ipc/www/idb/country.php>



The problem of the age structure, the delay problem! (II)

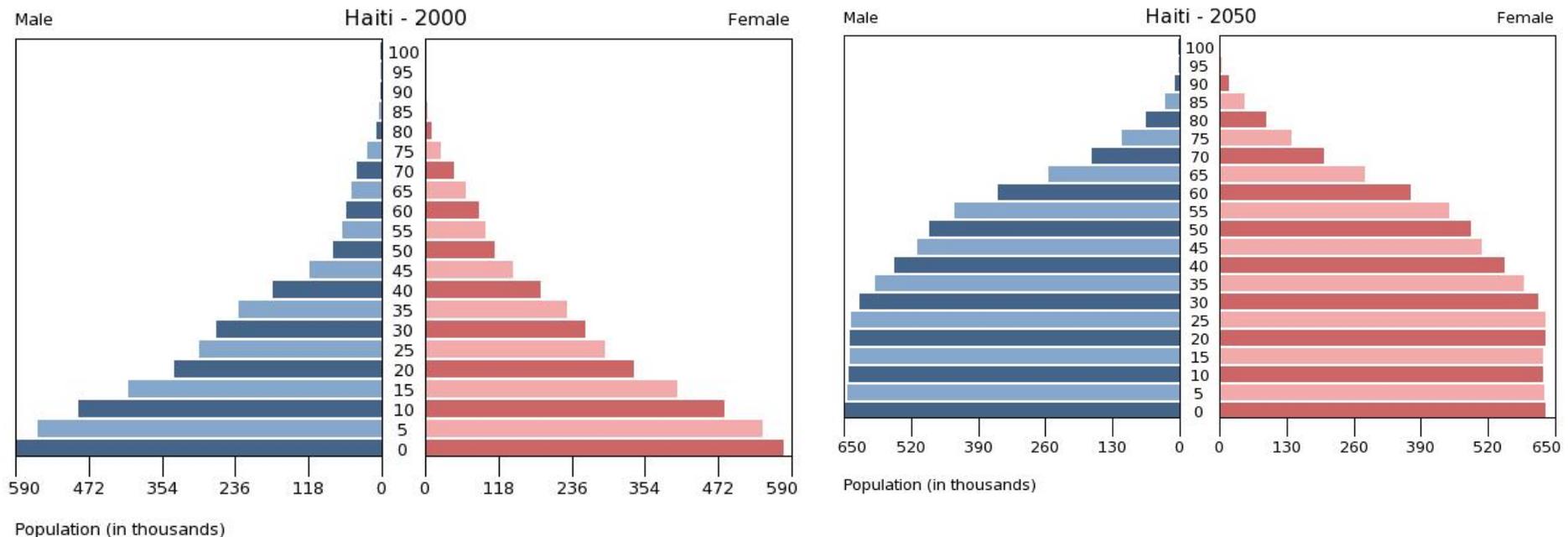
- Example China: 2009 est. 1.6 children/woman
2000=1260 mill. 2025=1400 mill. 2050= 1300 mill

source: <http://www.census.gov/ipc/www/idb/country.php>



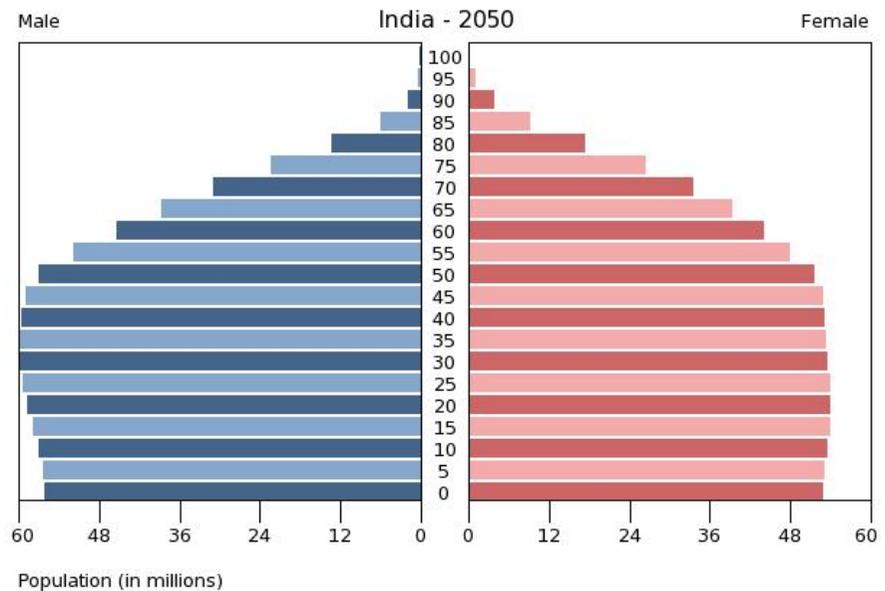
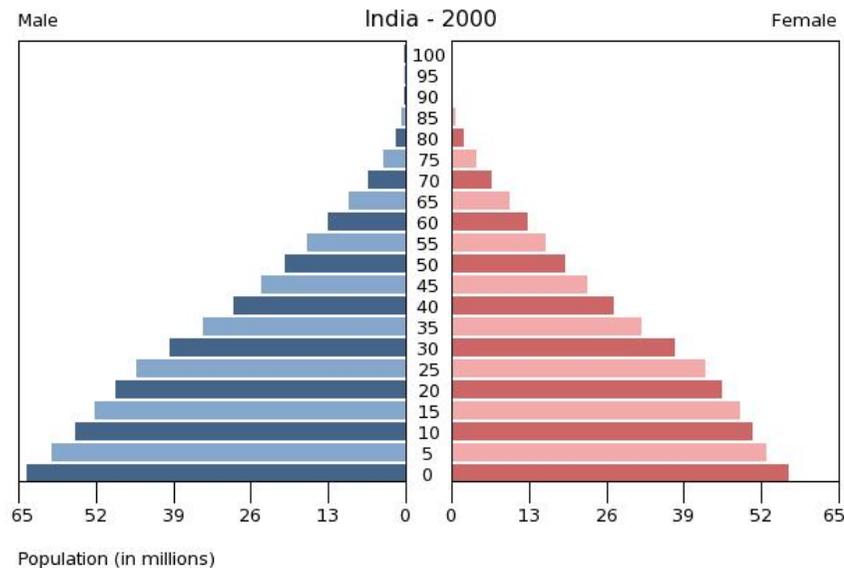
The problem of the age structure, the delay problem! (III)

- Example Haiti: 2000/2025/2050= 4.5/2.7/2.1 children/woman
population 2000= 7.6 mill. 2025=11.9 mill. 2050= 16.1 million
source: <http://www.census.gov/ipc/www/idb/country.php>



The problem of the age structure, the delay problem! (IV)

- Example India: 2000/2025/2050= 3.1/2.3/2.1 children/woman
population 2000= 1006 mill. 2025=1396 mill. 2050= 1656 million
source: <http://www.census.gov/ipc/www/idb/country.php>



net growth = `newborn - death rates` (I)

- How large is a sustainable population/region?

**Can the population of Haiti really reach
16 million people by 2050?**

Can India sustain 1.6 billion people by 2050

**Can the planet earth sustain 10 billion people
in 40 years from now?**

What happens if not? .. See next slide

net growth = `newborn - death rates` (II)

What is a sustainable population/square km?

What happened/ will happen if the sustainable population was exceeded?

(http://en.wikipedia.org/wiki/World_population)

- In 1798 [Thomas Malthus](#) incorrectly predicted that population growth would out-run food supply by the mid 19th century.
- In 1968, [Paul R. Ehrlich](#) reprised this argument in [The Population Bomb](#), predicting [famine](#) in the 1970s and 1980s.
- The dire predictions of Ehrlich and other [neo-Malthusians](#) were vigorously challenged by a number of [economists](#), notably [Julian Lincoln Simon](#).

net growth = `newborn - death rates` (III)

What is a sustainable population/square km?

What happened/ will happen if the sustainable population was exceeded? (http://en.wikipedia.org/wiki/World_population)

- From 1950 to 1984, as the Green Revolution transformed agriculture around the world, grain production increased by over 250%.
- The world population has grown by about four billion since the beginning of the Green Revolution and most believe that, without the Revolution, there would be greater famine and malnutrition than the UN presently documents (approximately 850 million people suffering from chronic malnutrition in 2005).
- The energy for the Green Revolution was provided by fossil fuels in the form of fertilizers (natural gas), pesticides (oil), and hydrocarbon-fueled irrigation.

The peaking of world oil production (Peak oil) may test Malthus and Ehrlich critics.

net growth = `newborn - death rates` (IV)

What is a sustainable population/square km?

What happened/ will happen if the sustainable population was exceeded? (http://en.wikipedia.org/wiki/World_population)

- As of May 2008, the price of grain has been pushed up by increased farming for use in biofuels. Food riots have recently occurred in some countries across the world
- Global population growth, climate change, loss of agricultural land to residential and industrial development, and growing consumer demand in China and India.
- **Growing populations, falling energy sources and food shortages will create the "perfect storm" by 2030, the UK government chief scientist has warned. He said food reserves are at a fifty-year low but the world will require 50% more energy, food and water by 2030.**

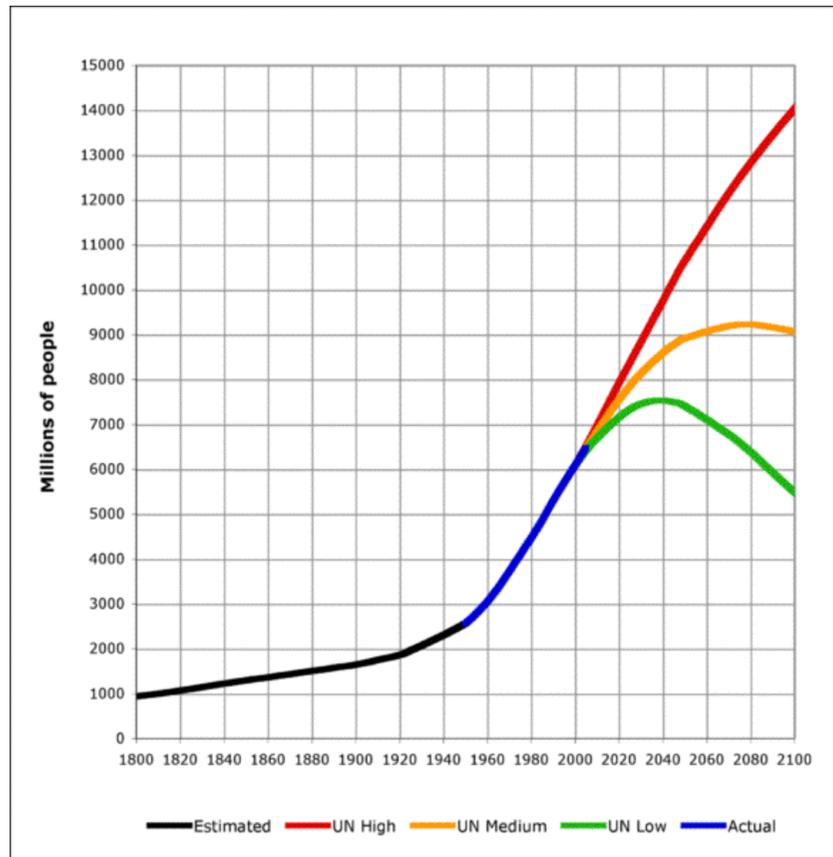
net growth = `newborn - death rates` (V)

What is a sustainable population/square km?

What happened/ will happen if the sustainable population was exceeded? (http://en.wikipedia.org/wiki/World_population)

- The world will have to produce 70% more food by 2050 to feed a projected extra 2.3 billion ([short scale](#)) people and as incomes rise, the United Nations' [Food and Agriculture Organisation](#) (FAO) said.
- The observed figures for 2007 show an actual increase in absolute numbers of undernourished people in the world, 923 million in 2007 versus 832 million in 1995.
- **The more recent FAO estimates point out to an even more dramatic increase, to 1.02 billion in 2009.**

Guessing the future from the past?



- Quote from

<http://home.vicnet.net.au/~ozideas/poprus.htm>

"In 1900, a visitor from another sphere might reasonably have decided that man, as one met him in Europe or America, was a kindly, merciful and generous creature. In 1940 he might have decided, with an equal show of justice, that this creature was diabolically malignant. And yet it was the same creature, under different conditions of stress."

**H G Wells, in
The Shape of Things to Come, 1933**