POPULATION DISTRIBUTION AND COMPOSITION

Key Terms:

- Ecumene
- Nonecumene
- Arithmetic density
- Physiological density
- Nutritional density
- Sex ratio
- Population pyramid
- Dependency ratio
- Elderly

Population Distribution

In this section we will focus on the "where" of populations. However, the where question is a relatively easier one to answer than the "why" question.

- **Human populations are not uniformly distributed across the globe, or within a county**
- **Understanding this distribution is fundamental to understanding the highly complex relationships between humans and the PHYSICAL environment**
- **The relationship are made even more complex by the mediating impacts of intermediate variables including technology, economy, and social organization**

Global Distribution Patterns

- Approximately 90% of the world population lives on 10% of the land.
- 90% north of the equator 10% south of the equator
- 70% within 700 miles of sea
- 50% within 120 miles of sea
- Altitudinally, 80% below 500 meters

Four areas of large population clusters:

- Southern Asia
- Eastern Asia
- Western Europe
- East-central North America (the smallest)

Map text p. 51

Ecumene and Nonecumene

- **Ecumene: The permanently inhabited part of the world**

- **Nonecumene: The uninhabited, or virtually uninhabited portion of the world**

Climate and physiography play a significant role in the determination of nonecumene areas

- **Permanent icecaps**
- **World's deserts**
- **Some mountain ranges**
- **Forest lands**

* *Nonecumene: smaller today than at any time in the past*

Factors responsible for the pattern of today's world population distribution

Physical Factors

- Climate
- Terrain
- Vegetation and Soils

Human Factors

- History
- Socioeconomic and technical development

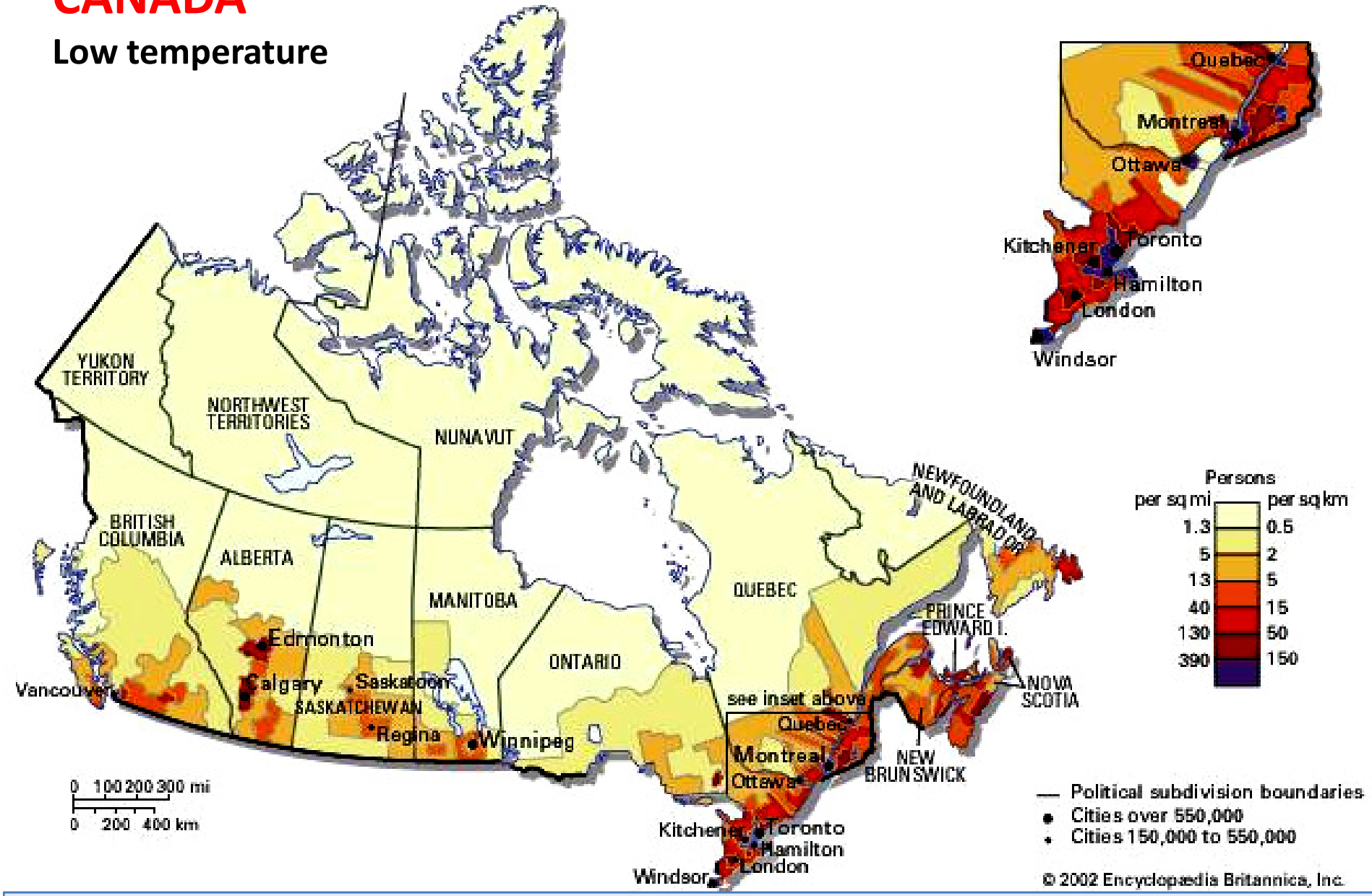
Physical Factors	High Density	Low Density
Relief (shape and height of land)	Low land which is flat e.g. Ganges Valley in India	High land that is mountainous e.g. Himalayas
Resources	Areas rich in resources (e.g. coal, oil, wood, fishing etc.) tend to densely populated e.g. Western Europe	Areas with few resources tend to be sparsely populated e.g. The Sahel
Climate	Areas with temperate climates tend to be densely populated as there is enough rain and heat to grow crops e.g. UK	Areas with extreme climates of hot and cold tend to be sparsely populated e.g. the Sahara Desert

Source:http://www.geography.learnontheinternet.co.uk/topics/popn1.html#distribution

Physical Factors

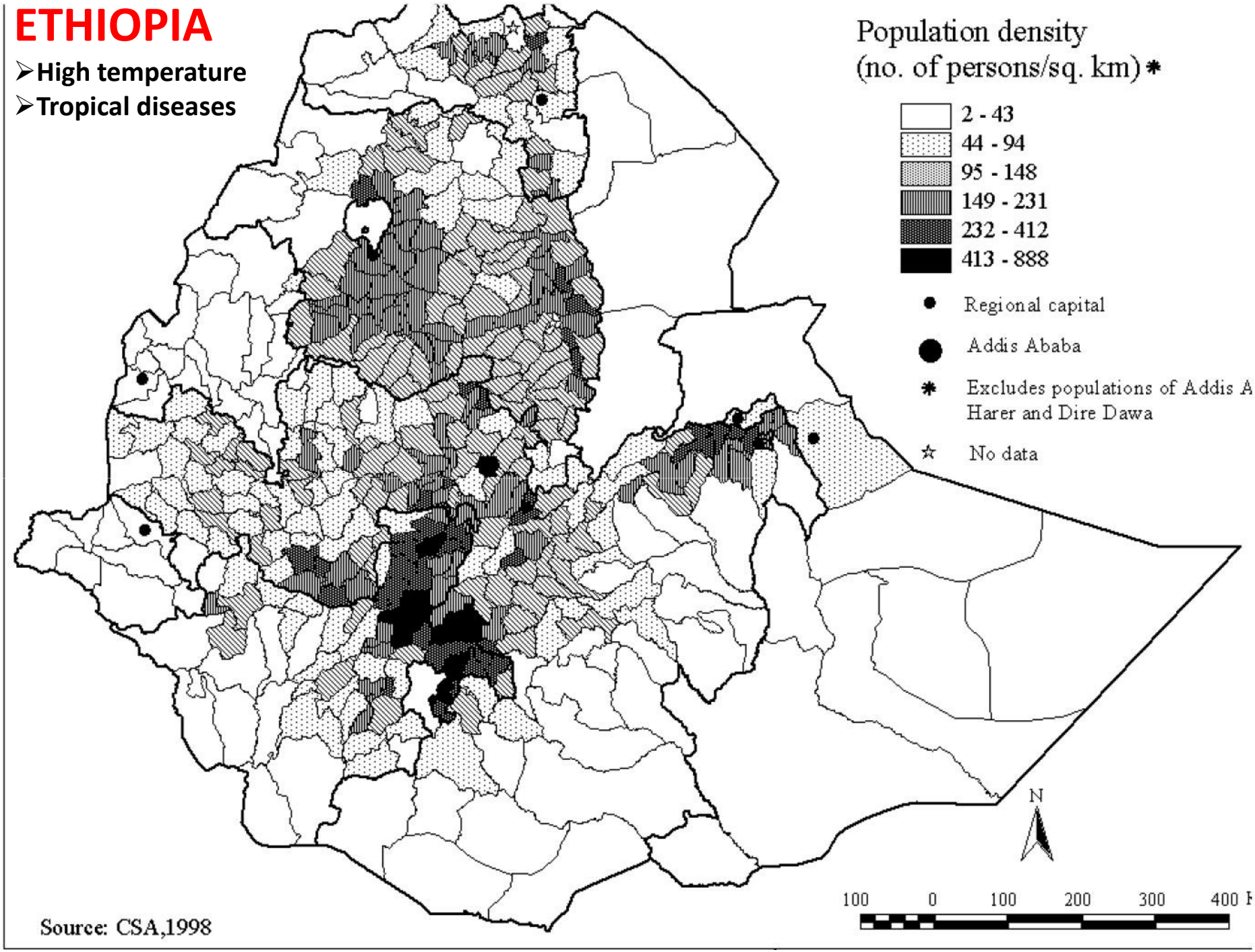
CANADA

Low temperature



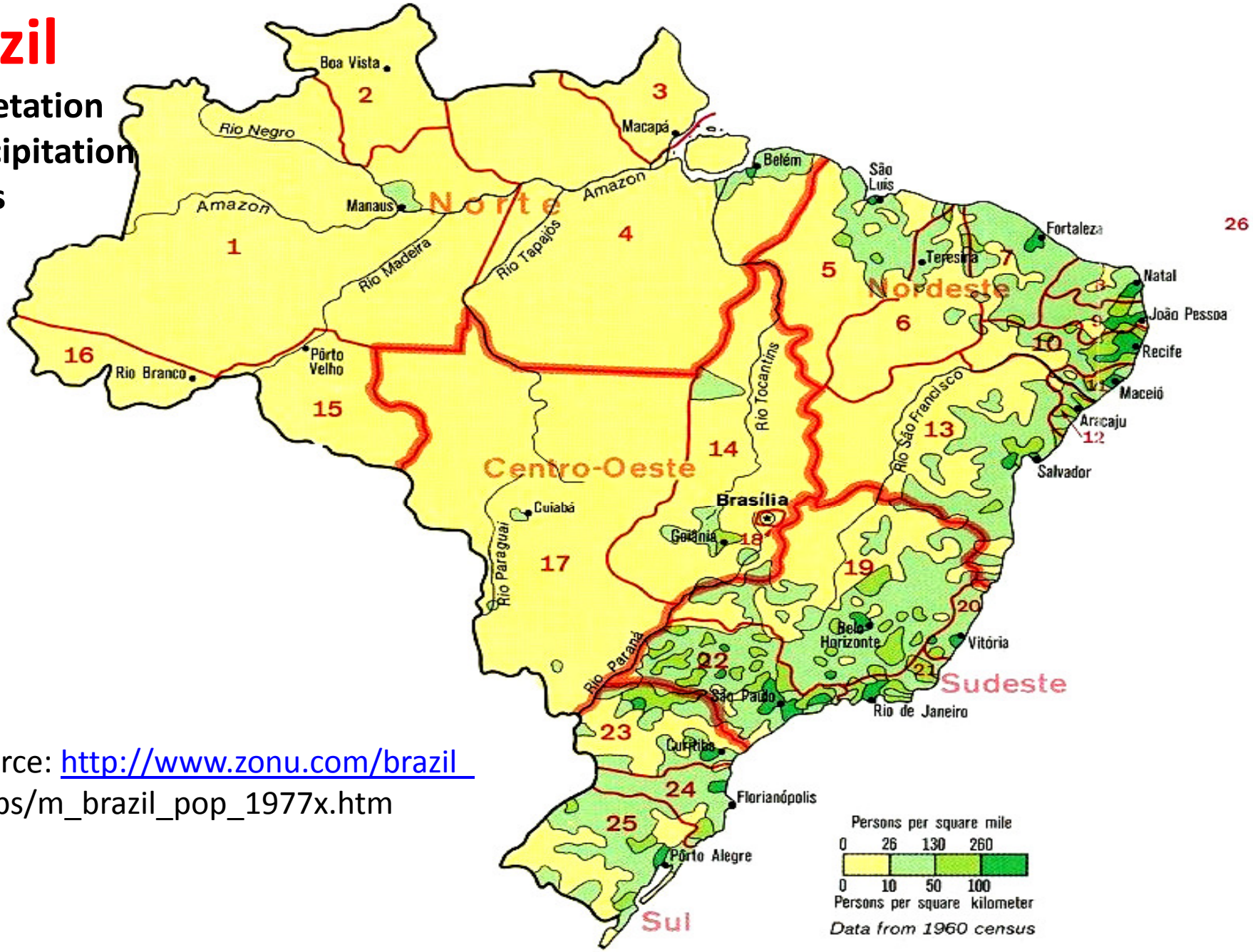
ETHIOPIA

- High temperature
- Tropical diseases

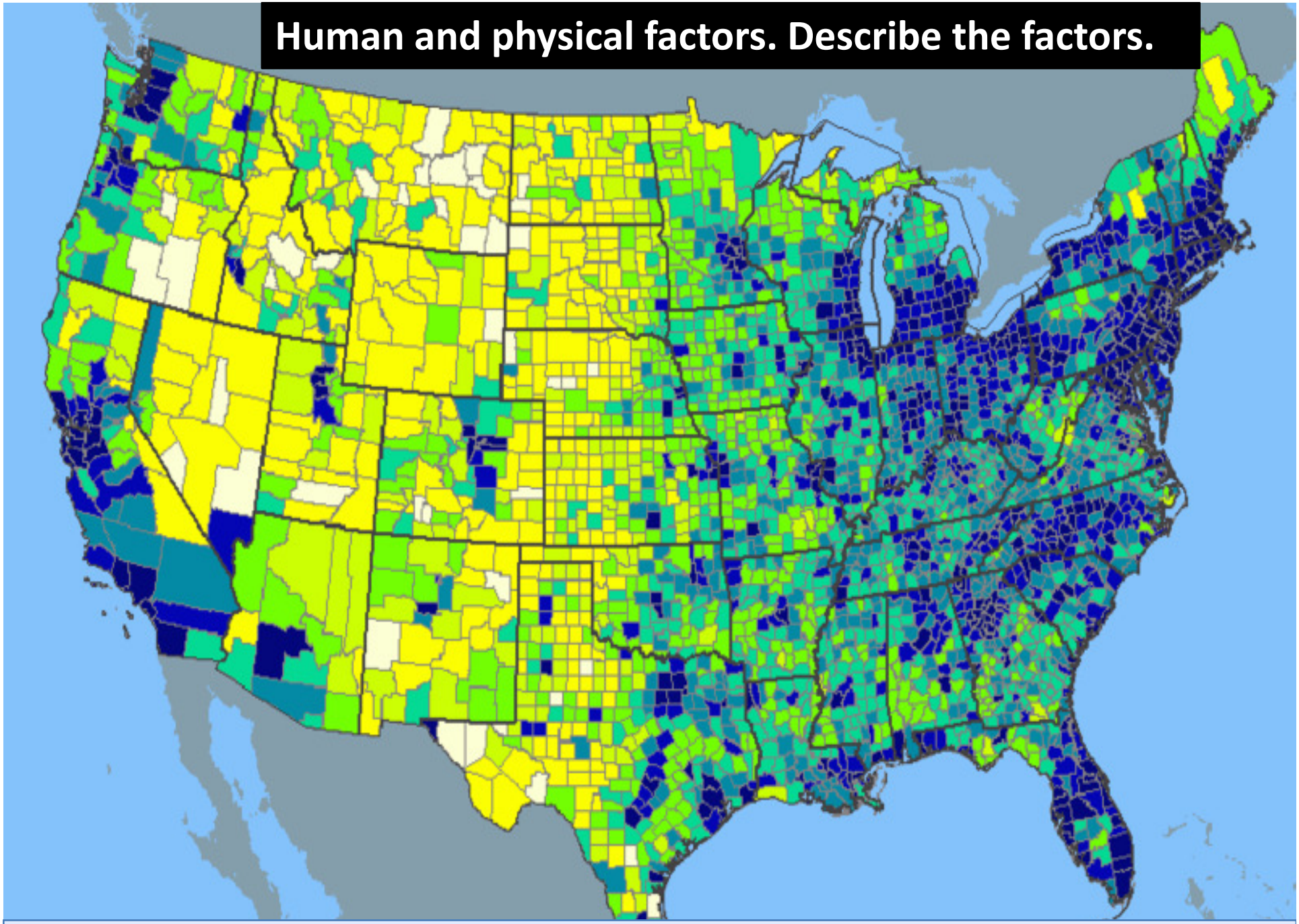


Brazil

- Vegetation
- Precipitation
- Soils



Source: http://www.zonu.com/brazil_maps/m_brazil_pop_1977x.htm



Source: http://commons.wikimedia.org/wiki/Image:USA_2000_population_density.png

Measuring Population Distribution

Density

- **Arithmetic density**
- **Physiological density**

(also known as nutritional density)

- **Other mathematical methods**

Population Density is:

- A measure of the number of people in an area.
- An average number.
- Calculated by dividing the number of people by the size of the area.
- Usually shown as the number of people per square kilometer, or mile.
- Often portrayed using a - choropleth (shading) map - (the darker the color the higher the density), or occasionally, a dot map.

Arithmetic Density = Total Population of an area divided by the total area of the land they inhabit

Physiological density = Total population of area divided by total arable land

Def. Arable land is that portion of the earth's land surface that is suitable for tillage*

** Leaves out natural pastures, forests, scenic regions, mining land….etc*

“Population density values have the least significance when large areas with marked environmental differences are involved.”

“…nutritional density provides a better indicator than does arithmetic density, of the degree of crowding in a region compared with its physical potential for producing food and agricultural raw materials”

Region	Density 1960	Density 2007	% Change
World total	22.1	49	121.7
More developed	16	27	68.8
Less developed	27	65	140.7
Europe	86	132	53.5
U.S and Canada	9.2	15	63.0
Oceania	1.9	4	110.5
South Asia	54.9	154	180.5
East Asia	67	132	97.0
Africa	9	31	244.4
Latin America	10.5	28	166.7

Source: Text p. 52 Note: Europe. Text says 32

Countries	Population (million)	Density 2008 (per sq.km
Mongolia	2.7	2
Australia	21.3	3
Namibia	2.1	3
Canada	33.3	3
Iceland	0.3	3
Russia	141.9	8
USA	304.5	32
Mexico	107.7	55
China	1325	139
Nigeria	148.1	160
El Salvador	7.2	343
India	1.149	350
Netherlands	16.4	396
Bangladesh	147.3	1023
World	6705	49

Island nations, or city-states 2008

Density (sq. km)

Bahrain	1124
Maldives	1040
Singapore	7013
Hong Kong	6360
Macau	21192
Monaco	34000
Malta	1304

The sex structure of a population

"…statistics on sex are usually easy to get and accurate….There is no ambiguity about the meaning of female and male…."

The sex ratio is defined as the number of males per 100 females

$$\text{Sex ratio} = \frac{\text{Number of males}}{\text{Number of females}} \times 100$$

Sex ration can be altered slightly or profoundly by:

- **Differential migration**
- **Excess mortality (e.g. war)**

Is a good measure to use in population planning geared toward serving one gender as opposed to the other (e.g. breast or prostate cancer awareness campaigns, and screening activities)

Sex Ratio:

- 100: Even balance
- <100: Feminine
- >100: Masculine

- Sex ratio at birth 105

USA: Sex ratios 1840-2000 (graph and maps text p. 56-59)

International: High and low sex ratios (text p. 60)

Summary Examples

Low sex ratios

Low sex ratios in Europe due to male emigration

High sex ratios

China, sex ratio 117 (up to 135 in places)

***** Excess males a threat to domestic stability and international security !!! (?)**

Summary Examples

Summary Examples: Countries

Countries	High sex ratios
UAE	186
Quatar	173
Kuwait	151
Pakistan	135
Oman	135
Bahrain	135
Saudi Arabia	116
Jordan	108
Brunei	108
	Low sex ratios
Estonia	85
Latvia	85
Lithuania	87
Ukraine	87
Lesotho	87
Russia	88
Text p. 60	

Why ?

Answer for high sex ratio countries below

#1 Holy See (Vatican City): 100
#2 Andorra: 77.25
#3 Qatar: 75.9
#4 United Arab Emirates: 71.4
#5 Monaco: 70.11
#6 Kuwait: 62.11
#7 Macau: 51.09
#8 Singapore: 42.6
#9 Bahrain: 42.22
#10 Jordan: 39.01
#11 Nauru: 38.45
#12 Israel: 37.87
#13 Luxembourg: 37.42
#14 Liechtenstein: 35.31
#15 Brunei: 33.16
#16 San Marino: 32.01
#17 Saudi Arabia: 25.25
#18 Oman: 24.46

Source:
http://www.nationmaster.com/graph/imm_imm_pop_imm_as_per_of_sta_pop-immigrant-population-immigrants-percentage-state

What is the answer for low sex ratio countries?

Gender studies vs. sex studies (studies of sex ratios)

"Gender studies …are concerned with socially created differences between the sexes (in contrast to biological distinction)

Age Structure

"What one is, thinks, does, and needs, is closely related to the number of years since one was born."

Factors affecting age structure:

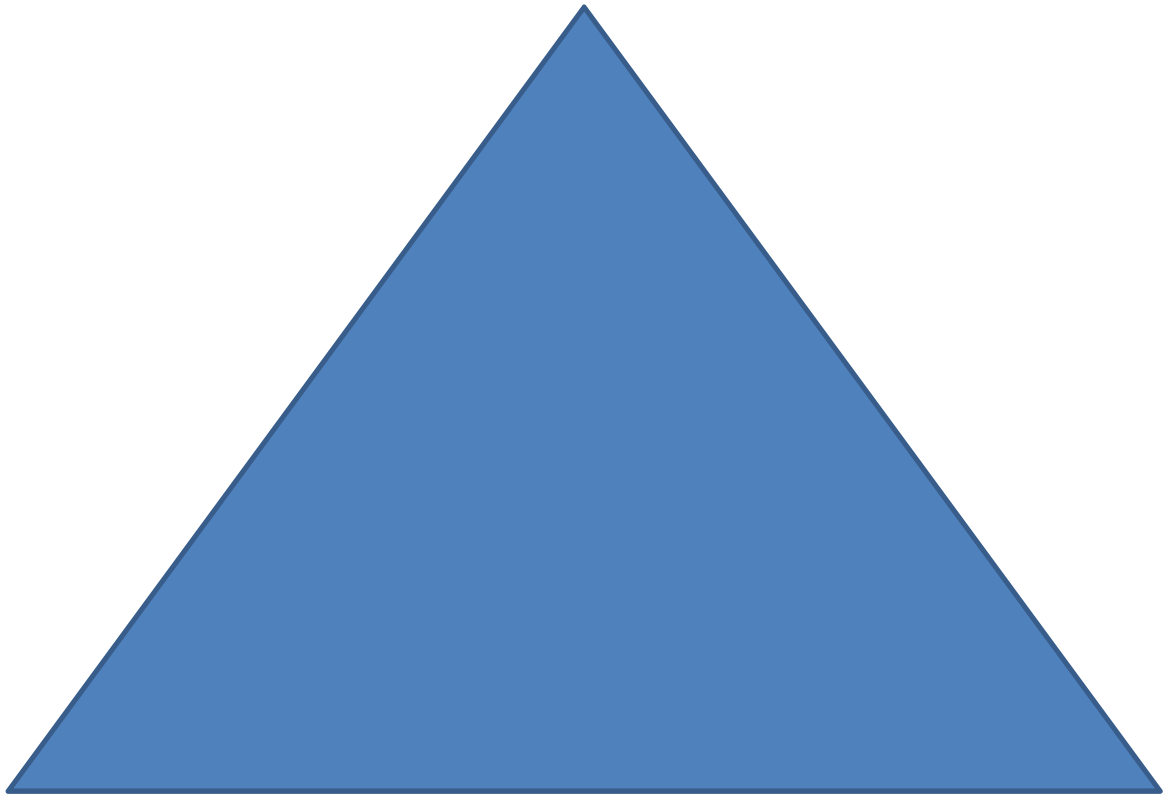
- **Birth rate is the most important factor**
- **Migration can have a considerable impact at a sub-national level**
- **Catastrophes such as famine, pestilence, or war may also influence the age structure of a region**

Was has a two-fold effect…..

A population pyramid

- Is a diagrammatic representation of the age structure of a population
- Is two bar graphs placed back to back
- Its shape varies according to the country, community, or time period under consideration
- Represents the demographic history of the population over the last two or three generations
- The pyramid is also affected by death rates though to a lesser extent
- Selective migration can change the shape of the pyramid.

Shapes of population triangles



Regular triangle

High birth rate and death rate

Concave sides

High birth rate, falling childhood death rate (most developing countries)

Beehive

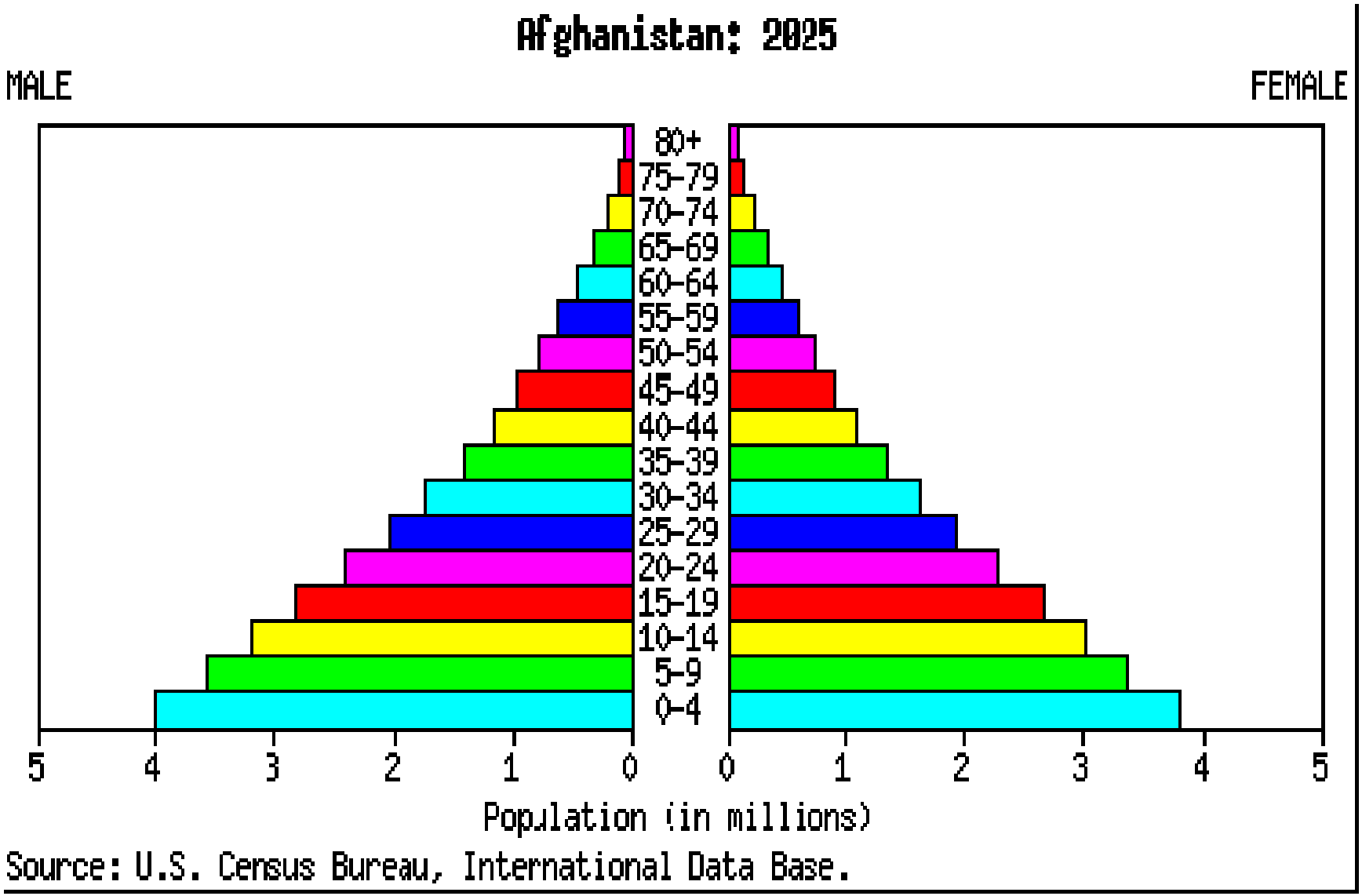
Stable population with low birth rate, law death rate, high median age (most European countries)

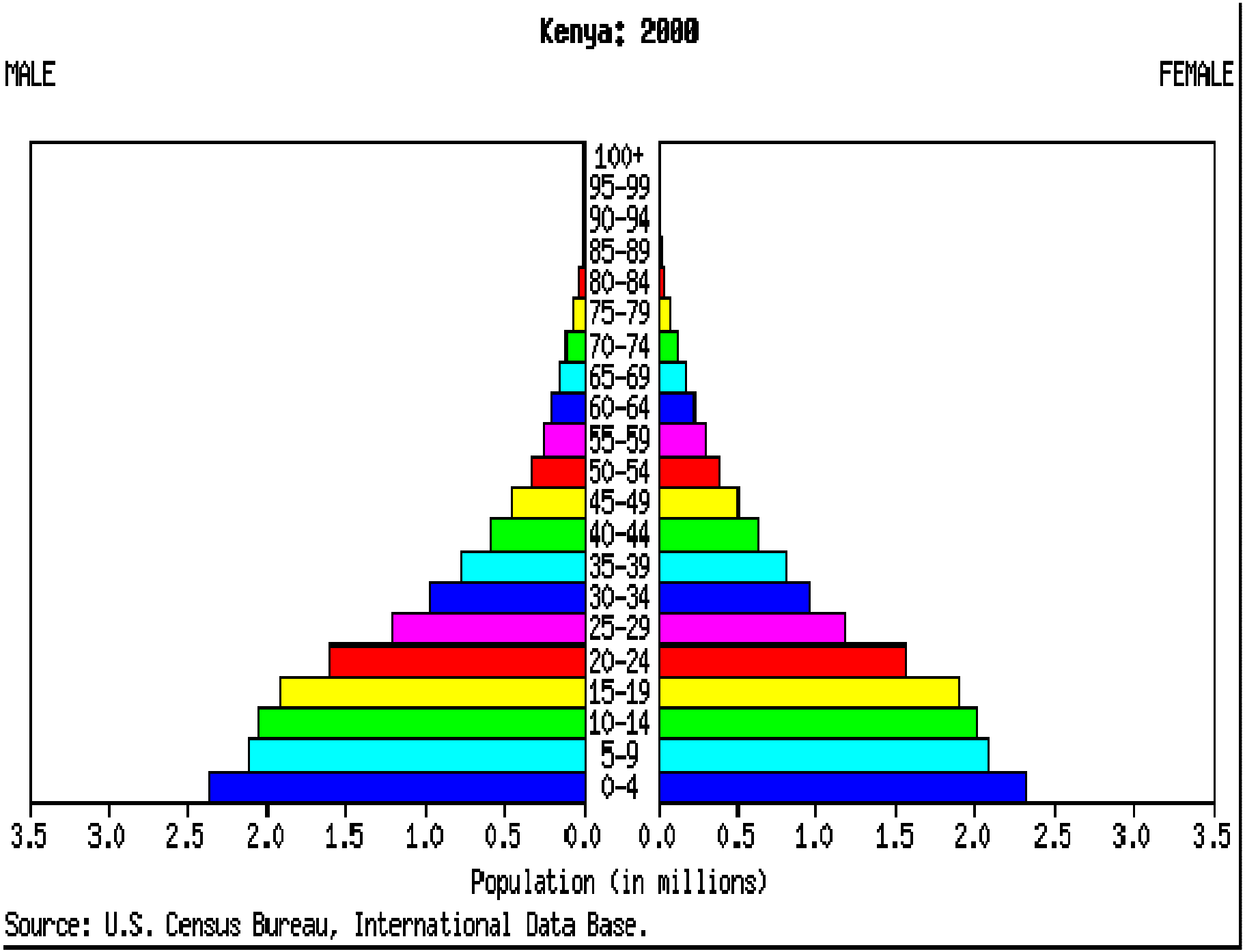
Tapered base

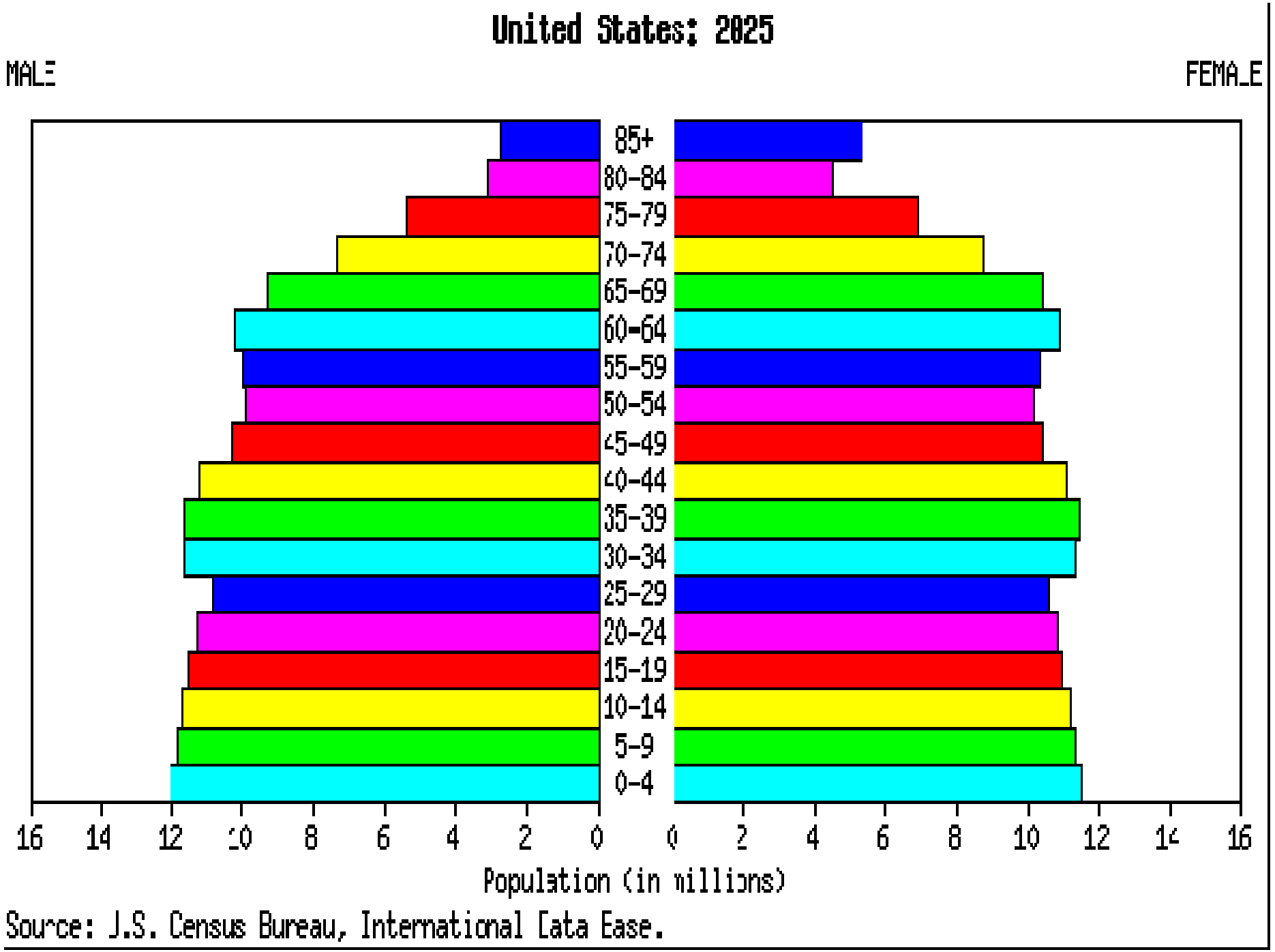
Rapid decrease in fertility

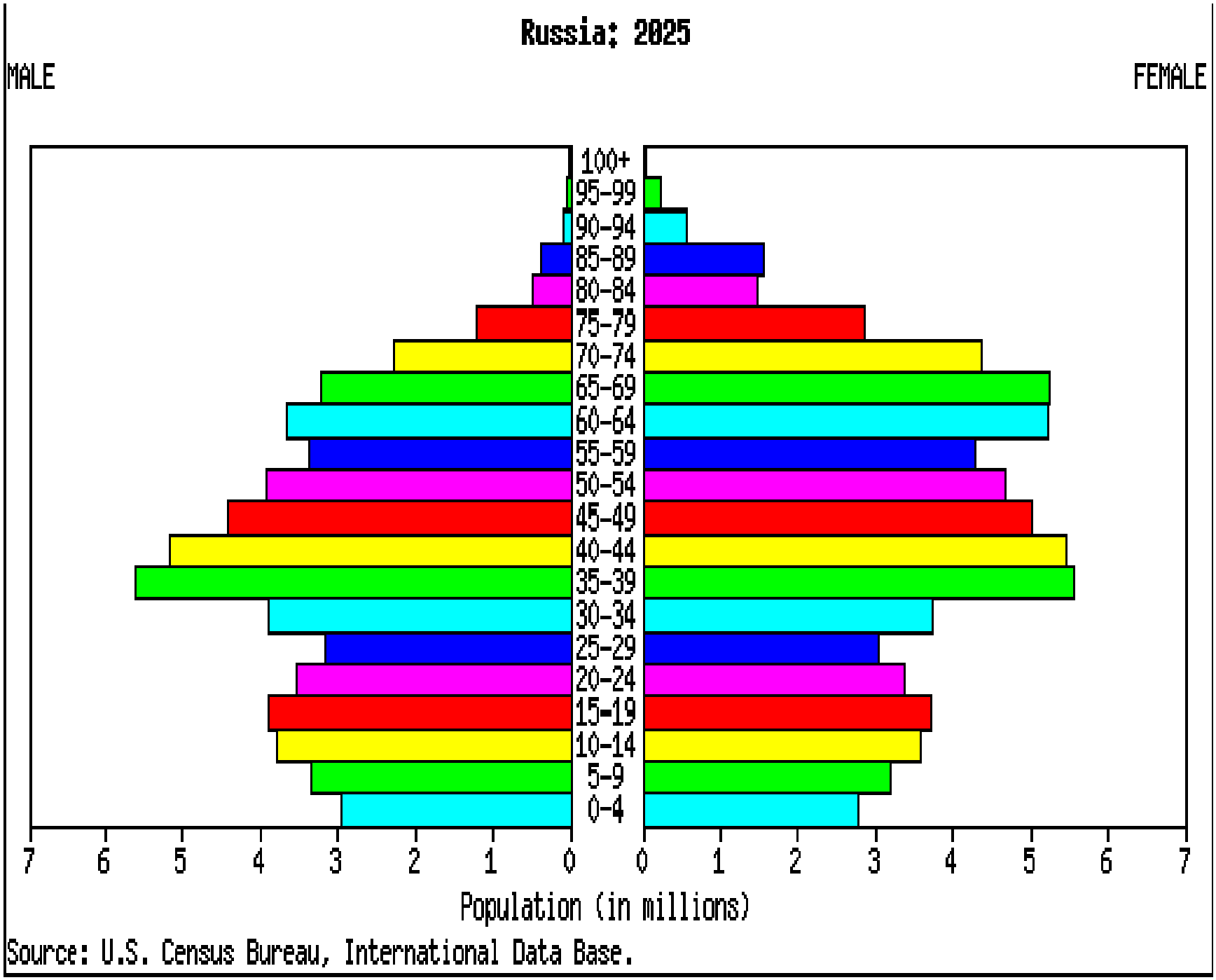
Text: Page 64/65

Population pyramids for all countries of the world at:
http://www.census.gov/ipc/www/idb/pyramids.html


Afghanistan: 2025
MALE
FEMALE
80+
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5-9
0-4
5
4
3
2
1
0
0
1
2
3
4
5
Population (in millions)
Source: U.S. Census Bureau, International Data Base.


Kenya: 2000
MALE
FEMALE
100+
95-99
90-94
85-89
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5-9
0-4
3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5
Population (in millions)
Source: U.S. Census Bureau, International Data Base.


United States: 2025
MALE
FEMALE
85+
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5-9
0-4
16
14
12
10
8
6
4
2
0
0
2
4
6
8
10
12
14
16
Population (in millions)
Source: U.S. Census Bureau, International Data Base.


Russia: 2025
MALE
FEMALE
100+
95-99
90-94
85-89
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5-9
0-4
7 6 5 4 3 2 1 0
0 1 2 3 4 5 6 7
Population (in millions)
Source: U.S. Census Bureau, International Data Base.

Dependency ratio

"The dependency ratio is a simple statistic that measures the role of age composition on the productive activity of a population by comparing the proportion of the population in the non productive ages with those in the working ages."

Pop. in nonproductive age groups

Working age population

$$\text{Dependency Ratio} = \frac{\text{Population } <20 + \text{Population } 65^{+}}{\text{Population 20-64 years old}}$$

"The purpose of dependency ratio is to measure the number of dependents that each 100 people in the productive years must support."

High dependency ratio can result from:

- **a) A high proportion of the elderly in the population, or**
- **b) A high proportion of children in the population**

*** There is no country in the world where these two are happening together. The cause is either a (all developing countries) or b (developed countries, or countries with rapid decrease in birth rates, e.g. former "Eastern Block" countries)**

Weaknesses of the measure:

- **Not everyone in the working ages (20-65) actually works**
- **For the aged, dependency could start before age 65**

(e.g. USA social security could be drawn benefits at age 62, Germany France, Canada 60, Italy 55.)

World Patterns of Age Structures

- The world's youngest populations are found in the Less Developed Countries (LDC) of Africa, Asia and Latin America
- Europe ranks as the most elderly continent with 16 % of its population above 65+ (Italy is the country with the oldest population – 20% above age 65)
- "Aging populations in European countries are forcing many governments to reconsider the generosity of medical and other benefits for the elderly"
- The youth issues in LDC: Unemployment, crime, lack of social services, political instability

Percentage under age 15, and above age 65, 2008

Countries	Pop < 15	Pop 65+
Niger	49	3
Uganda	49	3
Palestinian Territory	46	3
Afganistan	45	2
Italy	14	20
Bulgaria	13	17
Latvia	14	17
Estonia	15	17
USA	20	13
World	28	7

USA age structure

(AmeriStat, August 2002) Over the past two decades, the median age of primary and secondary school teachers increased from 36 to 43. In 2000, teachers ages 40 and over accounted for 60 percent of the teacher population, compared with 40 percent in 1980. With a large number of teachers approaching retirement age, it is projected that 2 million new teachers will need to be hired in the next decade. However, the number of new teachers needed varies by region. The Midwest faces the greatest potential shortages, with an increase in median age from 34 in 1980 to 45 in 2000. In contrast, the median age of teachers in the West increased by only five years during this period, from 37 to 42.

The demand for new teachers has also been fueled by increases in the number of primary and secondary school students. In recent years, enrollment in primary and secondary schools has reached 48 million, the highest since the early 1970s during the peak enrollment of the baby boomers.

What effect will these demographic trends have on schools? Higher student-teacher ratios (more students per teacher) and strains on school resources could result unless policymakers take steps to attract more people to the profession.

Source:http://www.prb.org/Articles/2002/TheChangingAgeStructureofUSTeachers.aspx

USA age structure

Baby boomers

- Born Between 1946 – 64
- Numbered 80 million in 1990
- The oldest of them will start retiring next year
- This will significantly impact American economy and social service
- They might start selling their second homes and impact housing prices for the next two decades or longer

USA age structure

Generation X (1961 – 81)

"In the U.S. Gen X was originally referred as the 'baby bust' generation because of the small number of births following the baby boom"

"….significant overtones of cynicism against things held dear to the previous generations, mainly the Baby Boomers"

"….grew up during the later years, end of, and the decade following the Cold War. This time included the Ronald Reagan era"

An economic study on 30 – 39 year old in 2004 made national headline news on May 25, 2007, and "…emphasizes that in real dollars, that cohort made less (by 12%) than their fathers at the same age in 1974"

Source: http://en.wikipedia.org/wiki/Generation_X

USA age structure

Generation Y (1982 – 94)

"Generation Y, sometimes referred to as 'Millennials,' 'Echo Boomers', or jokingly as 'Generation Why?', refers to the cohort of individuals born, roughly, between 1982 and 1994"

"The rise of instant communication technologies made possible through use of the internet, such as email, texting, and IM, and new media used through websites like YouTube and social networking sites, may explain Generation Y's reputation for being peer-oriented and for seeking instant gratification. This trend of communication is continuing into Generation Z."

Source: http://en.wikipedia.org/wiki/Generation_Y

USA Age distribution, Year 2000

Total Population	138,053,563	49.06%	143,368,343	50.94%
0-4	9,810,733	3.49%	9,365,065	3.33%
5--9	10,523,277	3.74%	10,026,228	3.56%
10--14	10,520,197	3.74%	10,007,875	3.56%
15-19	10,391,004	3.69%	9,828,886	3.49%
20-24	9,687,814	3.44%	9,276,187	3.30%
25-29	9,798,760	3.48%	9,582,576	3.41%
30-34	10,321,769	3.67%	10,188,619	3.62%
35-39	11,318,696	4.02%	11,387,968	4.05%
40-44	11,129,102	3.95%	11,312,761	4.02%
45-49	9,889,506	3.51%	10,202,898	3.63%
50-54	8,607,724	3.06%	8,977,824	3.19%
55-59	6,508,729	2.31%	6,960,508	2.47%
60-64	5,136,627	1.83%	5,668,820	2.01%
65-69	4,400,362	1.56%	5,133,183	1.82%
70-74	3,902,912	1.39%	4,954,529	1.76%
75-79	3,044,456	1.08%	4,371,357	1.55%
80-84	1,834,897	0.65%	3,110,470	1.11%
85+	1,226,998	0.44%	3,012,589	1.07%

Source: http://www.censusscope.org/us/chart_age.html

The Elderly in the United States

- Being elderly or old defined by the Federal social security program "… as having reached 65 years of age"
- The population of the elderly has risen consistently since 1900

Just over 3 million in 1900

9 million in 1940

35 million in 2000

- 1900 – 2000 total population increased 370%
- The population of the elderly increased 1100%

Causes: see text page 71

More facts about the elderly in the US:

- **The "oldest old", people 85 and older, are the fastest growing portion of the elderly population.**
- **Health spending on the elderly is "…four times higher than the expenditure on children"**
- **Increases in the percentages of the elderly have not been uniform spatially (see text p. 75).**
- **The increases are due in part to out-migration of the young.**

Population Composition
Race and Ethnicity in the US

Even though modern science has discredited race as a meaningful biological concept, the term "race" has persisted as an important social category.

"…race and ethnicity are still considered important aspects of population composition, especially in societies that are large, diverse, and undergoing different demographic changes"

The best example is the United States.

African Americans

- 38.3 million in 2002 (13.3%)
- Their share of the population total declined from 19.3 in 1790 to 9.7 percent in 1930.
- Were recently surpassed by Hispanics as the nations largest minority.
- 55% live in the South (see map - text page 78)
- 57% in central cities of metropolitan areas
- Proportionally, Mississippi has the highest percentage of African Americans
- The share of the black population that is foreign-born has grown form only 1.3% in 1970 to 7.8% in 2000.

“Being of African origin in the United States is associated with higher probabilities of death, lower levels of educational status, lower incomes, and higher levels of marital disruption than for the white population”

Hispanics

- 39.9 million in 2003 (13.7% of total)
- A very diverse group in terms of national origins
- More than 26 million are of Mexican background
- Nearly 3.6 million were Puerto Ricans
- 1.6 Million Cubans
- Every Spanish-speaking country represented (including Spain)
- A higher fertility than for non-Hispanics
- Distance from Mexican border is the major explanation for the pattern of distribution
- California and Texas contain more than half of Hispanics (see map - text p. 79/80)

Asians and Pacific Islanders

- 14.5 Asians and Pacific Islanders in 2003 (5% of total)
- Very diverse – Chinese, Filipinos, Japanese, Indians, …
- California is the port of entry for most Asian immigrants
- As a group they have the highest median income in the US
- High educational attainment, low unemployment
- Significant socio-economic differences between groups