




# WORLD POPULATION

As told by Dr. F. Elwell



# World Population

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- In the six seconds it takes you to read this sentence, 24 people will be added to the earth's population.
  - Within an hour, 11,000 will be added.
  - By day's end...260,000.
  - 1 Million every 4 days

# Exponential Growth




- It took 4 million years for humanity to reach the 2 billion mark.
- Only 30 years to add a third billion.
- And now we're increasing by about 90 million every single year.

# DOUBLING TIME

- From 6000 B.C. to 1650 A.D. the population of the earth doubled about every 2000 years.
- In 1650 A.D. there were about 500 million people in the world.
- Now, only 360 years later the population is 6.7 billion people in the world.

# DOUBLING TIME


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- The world's current growth rate is about 1.14%, representing a doubling time of 61 years. We can expect the world's population of 6.7 billion to become 13.4 billion by 2070 if current growth continues.

# DOUBLING TIME




- The world's growth rate peaked in the 1960s at 2% with a doubling time of 35 years. Some countries are still experiencing this rate of growth or higher


# DOUBLING TIME

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- The growth rate can be used to determine a country or region or even the planet's "doubling time," which tells us how long it will take for a country's current population to double. This length of time is determined by dividing the growth rate into 70. The number 70 comes from the natural log of 2, which is .70.

# DOUBLING TIME

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- How to Estimate Doubling Time: divide 70 by the annual growth rate and you will get a very accurate estimate of the years it will take anything that grows exponentially (population, production) to double in size.
    - $70 / \text{annual rate of growth} = \text{doubling time}$

# DOUBLING TIME


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- At 6.7 billion people, and a growth rate of about 1.7%, the world's population will reach 13.4 billion by about 2050. That is, world population will double in size in about 41 years. This, of course, assumes that the 1.7 percent growth rate will be maintained.

# DOUBLING TIME



- Many Asian and African countries have high growth rates. Afghanistan has a current growth rate of 4.8%, representing a doubling time of 14.5 years!

# DOUBLING TIME

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- If Afghanistan's growth rate remained the same (which is very unlikely as the country's projected growth rate for 2025 is a mere 2.3%), then the population of 30 million would become 60 million in 2020, 120 million in 2035, 280 million in 2049, 560 million in 2064, and 1.12 billion in 2078! This is a ridiculous expectation.

# MILLIONS AND BILLIONS



- Now we are talking about some astronomical numbers. To get some idea of the magnitude of the problem, consider the following slides...

# KNOW YOUR MILLIONS




- Suppose you won a MILLION dollars in the Oklahoma lottery. You don't trust banks so you stuff it in your mattress and spend \$1,000 a day for expenses. How long would it take for you to spend the million?

# KNOW YOUR MILLIONS



- About 3 years

# KNOW YOUR BILLIONS

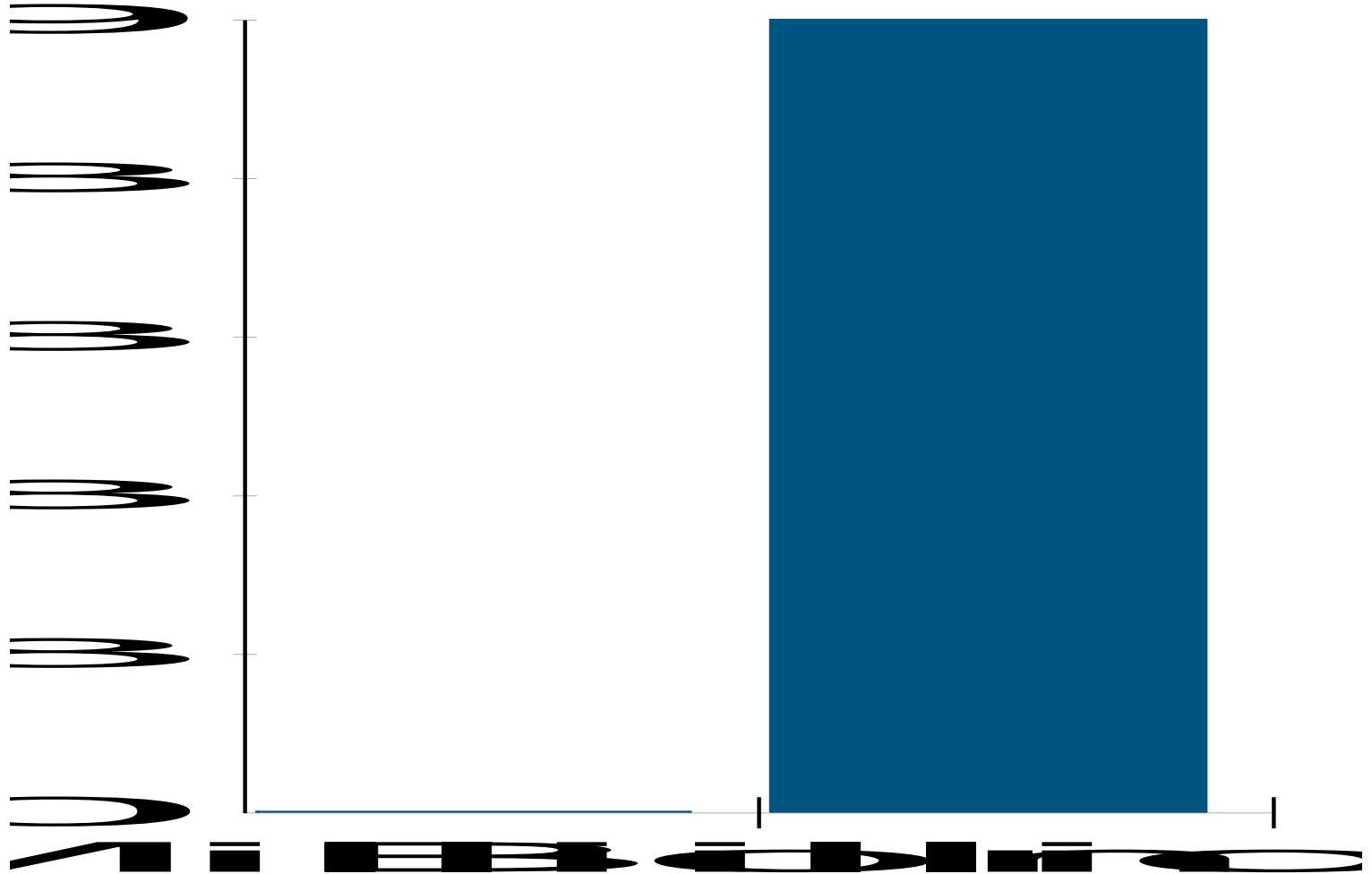
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- Now suppose you won a BILLION dollars in the U.S. lottery. You don't trust banks so you stuff it in your mattress. You take out \$1,000 dollars a day for expenses. How long before you spend the entire billion?

# KNOW YOUR BILLIONS




- About 3,000 years!
- The next slide will graph the comparison between a million and a billion...


# MILLION vs. BILLION




# POPULATION GROWTH

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- You'll find two percentages associated with population growth—natural growth and overall growth. Natural growth represents the births and deaths in a country's population and does not take into account migration. The overall growth rate takes migration into account.


# POPULATION GROWTH

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- Most European countries have low growth rates. In the United Kingdom, the rate is 0.2%, in Germany it's 0.0%, and in France, 0.4%. Germany's zero rate of growth includes a natural increase of -0.2%, without immigration, Germany would be shrinking, like the Czech Republic.


# POPULATION GROWTH

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- The Czech Republic and some other European countries' growth rate is actually negative (on average, women in the Czech Republic give birth to 1.2 children, which is below the number to yield zero population growth, approximately 2.1 children).


# POPULATION GROWTH

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- The Czech Republic's natural growth rate of  $-0.1$  can not be used to determine doubling time because the population is actually shrinking in size.


# POPULATION GROWTH

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- In the U.S., the natural growth rate is 0.6% and overall growth is 0.9%. The growth rate of a country provides demographers with a good contemporary variable for current growth and for comparison between countries or regions. For most purposes, the overall growth rate is the more frequently utilized.

# POPULATION PROJECTIONS

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- Because of economic development and concerted action in the last few decades, growth rates in many countries have slowed. According to projections, the world's population will likely reach only 9.2 billion in 2050, with virtually all new growth occurring in the developing world, according to a U.N. report issued in March of 2007.

# FUTURE PROBLEMS


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- Four facts about the additional 2.5 billion or so people who will be added by 2050:
    - Almost all the increase will be in the under developed countries of the Third World.
    - Age 15 to 35 will be the dominant age category.
    - Most of the growth will be urban.
    - Poverty is both a cause and effect of population growth

# DEVELOPMENT

In 1975 the population of underdeveloped nations in Asia, Africa, and Latin America constituted 73% of the world's population; by 2000 it was 80%.




# YOUTH.

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- Since 1960, the population growth in Third World nations has meant that people age 15 to 35 have become the dominant age category.
  - The massive gap between expectations and reality for these many millions is likely to have international repercussions.


# STIMULATING DESIRES




# YOUTH.

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- Demographers often call this group the “young barbarians.”
  - They are not yet tied into the social structure. They have high expectations of life, little skill, and very little patience.


# YOUTH.

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- This is the group most likely to participate in:
    - riots
    - revolution
    - emigration
    - anarchy


# URBAN GROWTH

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- “In 1950 there were 86 cities in the world with populations over one million; today there are 386, and by 2015 there will be at least 550. The present urban population (3 billion) is larger than the total population of the world in 1960.”


# URBAN GROWTH

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- The global countryside, meanwhile, will reach its maximum population (3.3 billion) in 2020 and thereafter will begin to decline. As a result, cities will account for all future world population growth.


# URBAN GROWTH

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- The most remarked upon result will be the burgeoning of new megacities with populations in excess of 8 million and, even more spectacularly, hyper-cities with more than 20 million inhabitants.


# URBAN GROWTH

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- By 2025, Asia alone could have ten or eleven hyper-cities that large, including Jakarta, Dhaka, and Karachi. Shanghai could have as many as 27 million residents in its huge estuarial metro-region.


# URBAN GROWTH

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- People from rural areas are often unprepared for life in the cities:
    - No mechanical skills
    - Often illiterate
    - Often steeped in rural traditions and superstitions


# URBAN GROWTH

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- Cities are often unprepared for rural peoples:
    - Provision of food and services
    - Disposal of waste and sewage
    - Increasingly polluted air and water
    - Housing and sanitation
    - No industries to provide jobs


# URBAN GROWTH

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- High growth rates of cities will magnify and intensify other problems:
    - Religious animosities
    - Resource shortages
    - Pollution
    - Racial unrest

# URBAN GROWTH

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- This may lead to a situation of continuous disruptions, revolution, mass starvation, ethnic and religious upheaval as numerous groups pursue their narrow interests and goals.

# URBAN GROWTH

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- The global forces pushing people from the countryside are mechanization in Java and India; food imports in Mexico, Haiti, and Kenya; civil war and drought throughout Africa; and everywhere the consolidation of small into large holdings. These forces will sustain urbanization even when the pull of the city is drastically weakened by debt and depression.

# POVERTY

- As much as half the population of some countries (India, Bangladesh, Indonesia, Ethiopia, Somalia) live in absolute poverty.



# POVERTY



- Absolute poverty translates into:
  - Inadequate diets
  - High infant mortality
  - Low life expectancy
  - High illiteracy rates

# POVERTY




- Poor families want a number of children
  - because so many children die
  - to help them economically
  - to provide social security

# POVERTY


- Poor parents have large families because they are poor, they are not poor because they have large families.



# POVERTY

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- Poverty in Central America is a cause of political unrest in the region. There are now 118 million people living on the land between the Rio Grande River and the Isthmus of Panama.
  - By the year 2025, there will be 204 million.

# POVERTY


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- From the Arab nations in the north to South Africa, the African continent faces internal and external unrest.
  - Today, the continent's population is 680 million; by the year 2020 it will be 1.65 billion.

# POVERTY



- Egypt, a nation of some 69 million people and a key force for stability in the Middle East faces serious economic problems today.
- There will be 105 million Egyptians by the year 2025.

# DEMOGRAPHIC TRANSITION


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- The great hope of the world is that Third World countries will undergo the demographic transition, and that world population will stabilize at sustainable levels.

# DEMOGRAPHIC TRANSITION




- Economic development brings improvements in nutrition, sanitation, and medicine.
- Each of which lowers a society's death rate.


# DEMOGRAPHIC TRANSITION

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- In addition, economic development also changes the incentive for having children for many people.
  - When a certain level of development is reached by a family, children are no longer economic assets and become “liabilities.”


# DEMOGRAPHIC TRANSITION

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- Assuming that development produces a large middle class, these people begin to voluntarily lower their birth rates and the population growth of the society begins to decline.


# DEMOGRAPHIC TRANSITION

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- So, initially, in the first stage of the transition (in the “pre-industrial” stage) both birth rates and death rates are high, canceling each other out, and population level remains low (in line with what the environment can provide).


# DEMOGRAPHIC TRANSITION

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- In the second stage, the “industrializing” or growth stage, death rates decline and birth rates remain high, population level thus climbs rapidly.

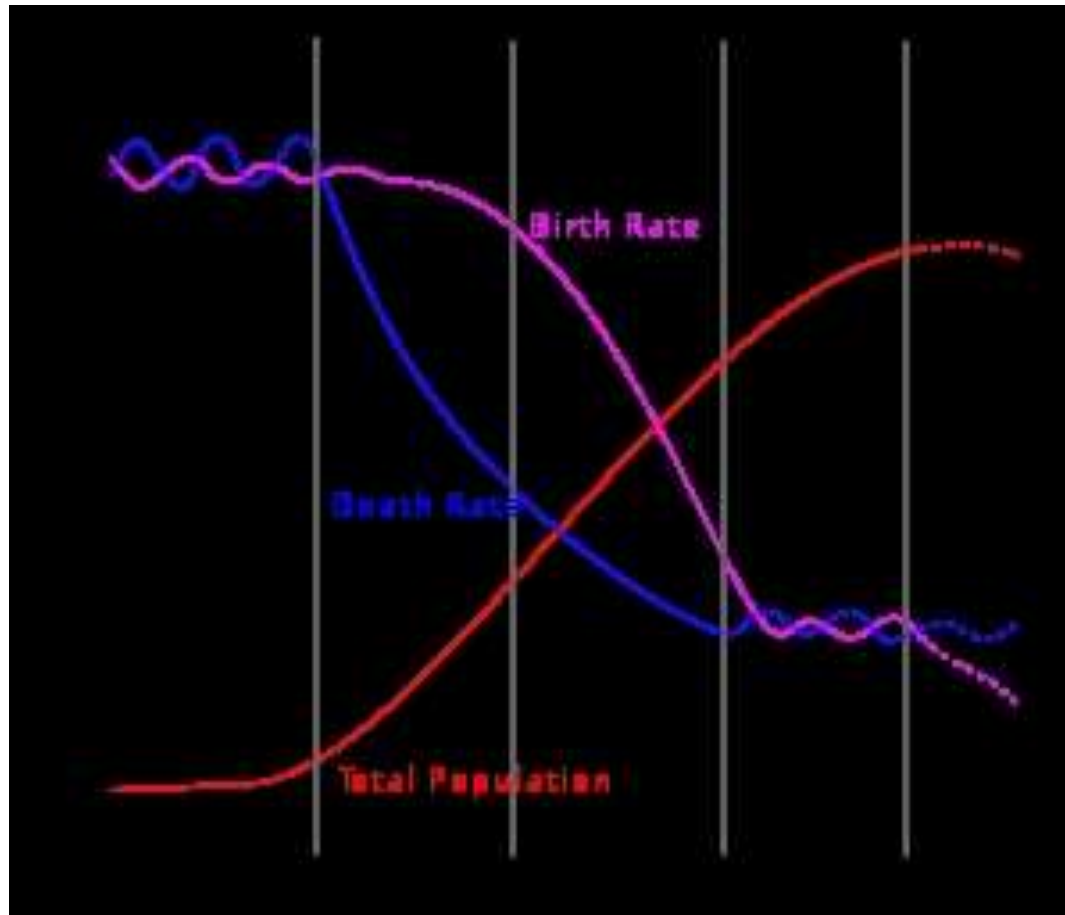
# DEMOGRAPHIC TRANSITION

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- Finally, in the mature industrial stage, both death and birth rates are low, population levels off (at a far higher level than pre-industrial societies).
  - In mature industrial societies (or “hyper-industrial” as I like to call them) population level actually begins a slight decline.


# DEMOGRAPHIC TRANSITION

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- Three stages:
    - Pre-Industrial
    - Industrializing
    - Advanced Industrial


# DEMOGRAPHIC TRANSITION




# DEMOGRAPHIC TRANSITION

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- The great hope of the world is that Third World countries will undergo development and thus enter into the demographic transition.


# DEMOGRAPHIC TRANSITION

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- Many Third World societies have entered the second stage--death rates have declined because of advances in nutrition, sanitation, and medicine.

# DEMOGRAPHIC TRANSITION

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- But many societies seem to be stuck in this second stage.
  - There are two problems with relying on the demographic transition to solve the problem.

# DEMOGRAPHIC TRANSITION


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- Problem with pace of development:
    - Several Third World countries have faster population growth than economic growth.
    - Therefore, each year, their standard of living declines thus giving people little incentive to cut down on their fertility.

# DEMOGRAPHIC TRANSITION


## ■ Debt Problem:

- Many Third World countries borrowed heavily in ill-advised development schemes in the last 30 years.
- Thus they are have trouble paying the interest on their old loans; few will lend them money for economic development.


# PROSPECTS

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- There are many positive trends of late. Because of development and active social programs population growth rates are declining in many countries.
  - However, the population problem can never be “solved,” we can only ameliorate the problem.

# PROSPECTS

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- It has been and will always be a continuing struggle for human societies to control their numbers.
  - And this means that there will always be great inequality in the world. There will always be great poverty, human suffering, famines, war, and political upheaval.

# PROSPECTS

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- We can certainly do better than we are now, but we can not look to solve the population problem.
  - Inequality and population growth are inextricably linked. See [Malthus](#) for why this is so.