

## MCDB 150 Global Problems of Population Growth Lecture 12 Notes

We are now at the point in the class where we have come forward in time to what's usually called the POPULATION EXPLOSION.

I want to tell you about my first introduction to this phenomenon.

When I was just a little bit older than you are now, I went walking around Asia.

### HONG KONG

In Hong Kong in those days, many of the people lived on small boats, sampans, in the harbor. I visited these and on each one there seemed to be a little girl about 9, 10, 11 maybe 12 years old who seemed to be doing all the work. They were never introduced to me and they clearly weren't treated as members of the family. I was told that they were servants.

asked around and eventually found out that these were excess girl children who were sold to be servants to other poor families. People were embarrassed about it and I couldn't get much information.

Later I visited the big British Hospital, Queen Elizabeth Hospital, and was taken to several wards full of girls 12 or 13 or younger. They were infected with tuberculosis. We think of TB as a lung disease, but it can also get into the bones - in these girls the TB had infect the bones and the bacteria had eaten its way through the bones and the pus was oozing out through holes in the skin.

PBS 1/10/00: Mrs. Roosevelt (wife of the President) died of Bone Marrow TB

I found out that these were the same little girls that I had seen on the sampans. They were sold as servants when they were little girls and almost all eventually came down with TB. These little girls were sold by poor families to be servants to other poor families - slaves would be a better word. They lived hard and neglected lives and when they started to be sickly - they would be taken to the health authorities who would give them powdered milk and other food supplements. This food would be taken home and fed to the boy children. The girls would get sicker. Next time the health authorities would give them medicines. These would be taken to the market to be sold and the money was used to buy rice for the boy children. Eventually when the pus started oozing through the skin they would be dumped at the big hospital, but they were too far gone and would die in a few weeks.

Well, what I saw, and what I was wrestling with then, soon came to be included under the term - The Population Explosion. That nexus of deep poverty, dense population and rapid population growth that had most of the world's people in its grip.

I have never seen anything in print about this major public health calamity.

I have never seen any statistics on how many girls died of TB in those years.

When I prepare for this course, I want to be sure that everything I say has a factual basis. This is a story that I can't back up. After a while I began to get worried. Am I remembering correctly? Am I exaggerating or embellishing the story? Is it a slur on the Chinese people? Did I just see some exception and mistake the exception for the general rule?

By '01 I had just about decided not to tell the story any more - to delete it from the class.

A few days after I told this story in '01 I gave a make-up midterm to a few students. After the exam, I started chatting with one student. The student was shy and I think if she hadn't had to take the make-up I would never have heard what she told me.

She told me her mother had been one of those girls. Orianna Dutka's '02 mother was one of these girls. In 1958 she was in the same hospital I described, with TB. She was only 5, but she was not abandoned by her parents. Her parents came to visit her in the hospital. As a child she remembers wondering why none of the other parents came to visit their children. And the death rate was horrific. Probably because she had parents to go back to, a British Dr. worked very hard to save her. The TB had gotten into her long bones and she now is missing a hip and some other parts of her leg. But she survived, came to America, is a Prof. of English Literature and her daughter went to Yale.

### GLOBAL POPULATION

Graph of long term growth.

->Fig. 10, 11

Why is the word explosion used?

In exponential growth, the rate of growth (1/2% or 1% or some other %/year) stays constant. In global population growth, the percentage kept increasing. From 0.1% to 1/2 % to 1%, then 2% and eventually 3%/yr. The number of people added each year grows because

- 1) each year the growth rate was on a higher base
- 2) the percent of growth was itself increasing.

Until very recently, world population growth was not exponential, but was hyperexponential

Anyone who argues that we shouldn't be worried about the population explosion because we've coped with growth in the past – has never seen this graph.

This sharp rise is absolutely unprecedented in human history.

We are in utterly unknown territory.

The world's population just keeps on increasing

1950 - 2050, we are now over 6.7 Billion--->12

It will almost certainly get to 9-10 Bill by 2050

To 9-10 Bill in 2050

The # of people added each year also increased but has now slowed a bit off its peak.

Ann Increment SLIDE 13

Now, if someone wants to be more optimistic, they can present this data as a %age.

BUT IT IS ONLY DECLINING BECAUSE THE BASE IS GETTING LARGER

THE INCREASE IN NUMBERS HAS BARELY BUDGED. The key number to remember is

80 MILLIONSLIDE 15

THE EXPLOSION IS GOING TO CONTINUE BECAUSE:

In 3d world 1/3 of population is <15 years old.

PRB World Pop Data Sheet

They will soon enter their reproductive years.

The largest group ever is about to enter adulthood.

1.5 Billion people are between 10 and 24 yrs old.

86% of them live in less developed countries.) (Pop Today: 9/00:

Another Billion and a half are right behind them.

That's 3 billion young people entering their reproductive years in this generation.

That's equal to the entire world population in 1960

UNDER OPTIMISTIC ASSUMPTIONS IT IS ALMOST INEVITABLE THAT POPULATION WILL RISE 50% ABOVE ITS CURRENT LEVEL BY ~2050 AND CONTINUE GROWING AFTER THAT.

Repeat of slide 12 = 16

UN report 5/91 reported on PBS, OH US Census Bureau Proj to 2050

Repeat: Anyone who says that, look, we've coped w/ population growth in the past, there's no need to worry about the future

Repeat of 11 = SLIDE 17

- IS GUILTY OF GROSS MISUNDERSTANDING OF THE PROBLEM.

We have NO WAY to predict the results of this type of population growth

in terms of the strain on human institutions

and the stress on the earth's environment.

I am NOT predicting disaster or anything else.

I left my crystal ball at home.

The point is:

When the population grows like this - we're just gambling wildly with the future.

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The population problem is really two rather different problems.

The first is over-consumption by large numbers of rich people.

The second is under-consumption by vastly larger numbers of poor people.

Over-consumption leads to global warming, depletion of the world's resources, pollution, destruction of habitat, etc. etc., etc.

I call these things environmental misery.

Under consumption is poverty and all the attendant evils that poor people suffer.

I call these things human misery.

For any individual, usually one or the other of these problems grabs us by the heart strings.

We either worry about population because it's bad for trees,

or we worry about population because its bad for people.

It's amazing how rarely an individual worries about both.

This course is set up to worry about both.

So many people are now green, and there is so much information about the environment available, that environmental misery gets a smaller portion of the course.

Nevertheless, we will consider environmental misery later in the term.

## US POPULATION

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US Pop crossed 300 million in the year 2006. 2/21/06 <http://www.census.gov/main/www/popclock.html>

US POP GROWTH TO 2006 NYT SLIDE 18

US pop grows by ~3 Million/yr or ~1% / yr.

RW calc from '08 World Pop Data Sheet

2/3 natural increase, 1/3 immigration Pop Bull 6/99; RW calc from '08 World Pop Data Sheet

Of immigration, 2/3 legal, 1/3 illegal.

The importance of our population growth is that the average American,

or equally someone in another rich country,

CONSUMES ABOUT 20-40X WHAT SOMEONE IN A POOR COUNTRY CONSUMES.

So THE us population growth of ~3 million/yr translates to an increase in consumption approx equal to that of 60 million or so poor people.

That is a humongous factor when considered globally.

SO WE ARE A TREMENDOUS DRAIN ON THE EARTH'S RESOURCES

& Even worse as PRODUCERS OF WASTE AND POLLUTION

IT'S NOT GETTING BETTER:

US POP GROWTH TO 2006 NYT 4

US Census Bureau used to say that

US population will stabilize @ ~300 Meg by ~2050.

BUT: We passed 300 Million 44 years before their projection.

Now they say that our pop will double in the next century with no sign of stabilization. Yale Daily News 1/13/00 from AP

---->US Pop Growth 5

The projection for 2100 is now ~600 million.

<http://www.census.gov/population/projections/nation/npaltsrs.txt>

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The POLITICIZED ARGUMENT over whether the population problem is

primarily rich people consuming too much or

poor people reproducing too much has little value.

The 3 million added Americans each year (a good fraction of them immigrants from poor countries) consume an increment roughly equal to that of the 80 or so million added people in developing countries.

The argument also has the Western perspective that we are rich and will remain so while poor countries will remain poor. Not so.

Many countries are developing fast and catching up to our levels of consumption.

This is truly a global problem, not one of haves vs have-nots.

The other side of the coin is Poverty:

>95% of this growth WILL OCCUR IN THE POOREST COUNTRIES State of World Pop '99

where people already suffer from brutal poverty, starvation and civil strife.

Virtually all of the growth will be in the cities of these poor countries.

To cope with urban growth, the poor countries will have to build the equivalent of a city of more than 1 million people EACH WEEK FOR THE NEXT 45 YEARS. J Cohen Sci Am 9/05 p51

Most people in the US have no idea what poverty means when discussed on a global scale.

#### DESCRIPTION OF BOMBAY

NYT 9/27/07, p1 GM compensates workers with a combination of wages, health benefits, and pensions. Total hourly rate for GM Union Workers is \$80/hr.

Toyota's labor costs in the US are less than \$50/hr.

Most of your families earn a lot more than union workers at an auto plant.

At the other end, In US poverty level for a family of mother, father and 3 children is defined as earning less than \$24,382/year. That's \$13.35/day/person (2006).

\$20,614 for a family of 4 in 2006.

<http://www.census.gov/hhes/www/poverty/threshld/thresh06.html> just change 06 for later years.

Wal-Mart: 750,000 women work as "sales associates."

On average they earn \$6.10/hr or \$12,688/yr if they can get full time work.

The next step UP for a Wal-Mart worker is the poverty level

In 2000 W-M's had annual sales of more than \$137 Billion. It's assets totaled more than the GDP of 155 of the 192 countries in the world,. (be careful: mixes GDP, assets, sales)

<http://www.now.org/issues/wfw/wm-facts.html#foot2> references Rosen, Ellen I., *The Women Who Work for Wal-Mart*

When one considers wages in the developing countries – one has to divide Wal-Mart wages by at least a factor of 4.

Wal-Mart makes pants in El Salvador. The pants sell for \$16.95 in its US stores.

How much do you think the women who make the pants earn? 15 cents a pair.

NOW, Greater New Haven Chapter Newsletter 8/02; Guatemala \$10/day in apparel industry.  
\$2,500/yr

The UN's International Labor Organization reports that ½ of world's workers, or 1.4 billion people, the highest # ever recorded, earn less than \$2/day. NYT 12/8/04

SLIDE 21

Look at the Blue line. In 1980 more than 50% of the world's people lived on \$1.25 or less a day.

Another 20% or so lived between \$1.25 and \$2 (Green line, 1980).

So, all together, 70% of the world's people lived on \$2 a day or less.

1.4 billion people in the world live in less than \$1.25 a day.

2.6 billion people consume less than \$2 a day in 2005 prices.

World Bank from 2005 data.

You can see that things have gotten better over time.

By 2005, !ONLY! 50% of the world's people live in \$2/day or less (Green line 2005).

I shudder to think what the numbers look like now, after the recent rise in

food and fuel process and the collapse of the world economy.

<http://siteresources.worldbank.org/DEC/Resources/Poverty-Brief-in-English.pdf>

Almost all of this progress was in China,

In 1980, China was POORER than the rest of the developing world.

By 2005, it was richer.

You can see that the dashed lines (w/o China) are much flatter.

Little progress has been made.

Later in the term we'll discuss the relationship between China's progress and its population policies.

But now, the news is full of all the factory closing in China and people returning to their villages. NYT had a story on Sunday (2/22/09) There are 130 million migrant laborers. Last year (2008) 2,400 factories in and around Guangzhou (Canton) closed. , In just the past few months 20 million have lost their jobs.

These people have to go back to their villages and try to survive on their land.

But, in the village that The Times covered, the average farm size was 1/10 of an acre. Most of Bethany (just NW of New Haven) where I used to live is zoned for 3 acres – that's just for a single family house. The amount of land that 30 Chinese peasant families are expecting to live off.

Each country sets its own official definition of poverty.

The official poverty line in the poorest 10-20 countries is \$1.25.

<http://siteresources.worldbank.org/DEC/Resources/Poverty-Brief-in-English.pdf>

The national poverty lines used in both China and India are closer to \$1.00 a day at 2005 prices.

<http://siteresources.worldbank.org/DEC/Resources/Poverty-Brief-in-English.pdf>

In discussing poverty in middle income countries and regions such as Latin America and Eastern Europe higher lines are called for. \$2 a day is more appropriate for these regions.

This is the median poverty line for all developing countries.

<http://siteresources.worldbank.org/DEC/Resources/Poverty-Brief-in-English.pdf>

The % of people on earth in poverty is going down.

But there are so many more people on earth, that the absolute number of poor people may be going up.

The World Bank defines poverty as less than \$1/day. As an example, it calculates that the % in poverty fell from 28.3% in 1987 to 24.0% in 1999.

But it also calculates that the # of people living in poverty increased by more than 100 million from 1987 to 1998. NYRevBooks 5/31/01

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1/3 of people in Latin America have incomes of less than \$2/day. NYT 3/25/98 pA7

2/3 of people in Pakistan live in \$2/day or less. Assoc Press carried in NH Register 11/16/08.

Kenya: >58% of the population earns less than \$1/day. Technoserve World Fall Winter 2004

Brazil (pop 168 Meg): 25% of the people live on <\$1/day. NYT 2/5/98 pA10 col.1.

China: 1/3 of people live on less than \$1 a day.

That's 400 million people living on less than \$1 a day.

Pop Bull: China's Demog Problems

Sub-Saharan Africa: 44% of people live on less than \$1/day.

NYT 8/24/06 pA1

Equally bad now are some of the post-soviet countries:

In Romania, 40% of people live on less than \$1 a day (NYT 2/11/01 p8).

Indonesia: in a gov't job creation program laborers get 75¢ for 5 hrs work a day - "considerably more than they would earn working in the fields or as laborers in nearby towns. NYT 2/26/98

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Child labor:

Official Indian figures say that there are 12 million child workers in India – opponents of child labor estimate the actual figure could be closer to 60 million.

NYT 11/16/07

In Zambia a 9 yr old boy, Alone Banda, beats rock fragments into powder. He doesn't have a hammer. He found a large steel bolt which he grips in his bare hand and pounds the rock with it. In a good week he can fill ½ a bag which he can sell for ~\$1.50. The stone powder is used to make concrete.

In Kenya in 2001, 30% of coffee pickers were children.

NYT 8/24/06 pA1

See Video at: [http://www.nytimes.com/packages/html/world/20060814\\_ZAMBIA\\_FEATURE/blocker.html](http://www.nytimes.com/packages/html/world/20060814_ZAMBIA_FEATURE/blocker.html)

Children, some as young as 5 or 6, work as prostitutes, miners, construction workers, pesticide sprayers, haulers, street vendors and full time servants.

They are not always paid for their labor.

NYT 8/24/06 pA1

Sub-Saharan Africa yr 2000: ~48 million children 14 and younger worked. 4 yrs later: 2004, the # increased by 1.3 million to over 49 million.

NYT 8/24/06 pA1

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NYT 4/11/07

ROMANIA is a poor country. Wages average about \$83 a week. It was allowed in to the E.U. and 2 million people moved to Western Europe (mostly Italy and Spain) for the better pay. How to replace the labor? Import workers from China. One clothing factory imported 800 Chinese workers (mostly or all women). They earn about the same as Romanian workers would have. They make sportswear for luxury brands like Prada among others. They live in 5 bed dormitory rooms. Xu Xian Hong from Fujian province described life as better than in China. "It is quiet here and the air is much cleaner. The work is the same, but pay is more." She misses her husband and 3 yr old daughter back home.

Wages in MEXICO in the assembly plants near the US border are too high there. So 1/3 of the jobs have already gone to China.

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You've heard about the Economic Miracle in Asia. The miracle is when peasant who lives on \$1/day gets a job in the "modern sector" (actually a sweatshop factory) paying enough so that he and his family can live on \$2/day.

SO ABJECT POVERTY IS LESS THAN \$1/DAY

AND THE MIRACLE STARTS AT \$2/DAY.

This nexus of poverty and overpopulation is found everywhere on earth.

Places at the end of the earth, that you never heard of are exploding

The ends of the earth are in the desert, in the deep jungle and on top of the highest mountains.

IN THE DESERT:

Nouakshott, Mauritania, where Sahara desert rolls into Atlantic Ocean.

Squatter settlement 25

Fisherman's Boats ---26

Sudan: Hag Yousif, a large urban area just north of Khartoum:

(FPIA News 11/97)

"The people .. create makeshift houses out of mud, and every scrap of anything that might be used. The communities, sprawled across the desert, are made up of row after row of these mud houses, some of which collapse during the rains. Water is brought in by donkey, there is no electricity, and food is scarce. The government calls these "unplanned" communities.

The government provides no services.

IN THE JUNGLE:

Serra Pelada, Para, North Brazil Sebastiao Salgado "An Uncertain Grace"

2 slides ---28-29>

1986: 50,000 miners hauling sacks of clay up hand lashed ladders.

An army of laborers contained by a few carbine-toting policemen.

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#### ON THE MOUNTAIN TOPS:

NYT 5/27/03 50<sup>th</sup> yr celebration of 1<sup>st</sup> ascent (1953) – Sir Edmind Hillary (a bee keeper) and Tenzing Norkay (a Nepalese Sherpa). A single footstep can require 8 breaths. “500 climbers are jostling to reach the summit by Thursday. To help the climbers there are thousands of yards of fixed ropes. More than 1,200 people have made it to the top. When the article was written, there were 760 people and 90 tents on the S. side of Everest. In 2002 there were 65 expeditions in the 61 days when the weather permits climbing . Everest is littered w/ ~1,000 bottles of oxygen and discarded trash is everywhere. There are now expeditions just to pick up decades old trash. There are 120 dead bodies on the mountain. You have to climb over dead bodies to get to the top.

Let us try to imagine a scenario in which world fertility comes down to replacement level and world population eventually stabilizes.

#### FERTILITY DOESN'T COME DOWN W/O SOME IMPROVEMENT IN STANDARD OF LIVING.

As you've seen a lot of the earth's people live on less than \$1/day -

Let's take a wildly optimistic assumption, that at \$2 a day, they will reduce their fertility. That's a doubling of their standard of living; a true miracle.

We know that when the global economy improves, rich people improve faster than poor people. So, to double the income of the poorest half of humanity will require that the average income for everyone, will have to more than double.

So, the average standard of living on earth has to AT LEAST double as a precondition for a soft landing of the population problem.

Now we've also seen that world population will increase by ~50%.

So that's 1 ½ X as many people - and at least 2X the average income

Thus the global economy will have to at least triple before the population stabilizes.

Most people think that the earth is at a tipping point for its environment already.

#### CAN THE EARTH COPE WITH AT LEAST A TRIPLING OF THE WORLD'S ECONOMY?

THAT MEANS TAKING OUT 3X THE RESOURCES FROM THE EARTH THAT WE ARE TAKING NOW, PUTTING OUT 3X AS MUCH CO<sub>2</sub>, PRODUCING 3X AS MUCH POLLUTION, FINDING LIVING SPACE IN THE HABITAT FOR 50% MORE PEOPLE,.

ADVANCES IN TECHNOLOGY WILL REDUCE THOSE DRAINS.

BUT BY HOW MUCH?

CAN THE EARTH SUSTAIN A TRIPLING OR QUADRUPLING OF THE STRAIN ON IT?WE DON'T HAVE THE FO

IT'S JUST A HUGE GAMBLE WITH THE FUTURE OF THE PLANET.