

Lecture 1.1: Configuring the World

Hi there, and welcome to this, the very first lecture in our course Configuring The World. I don't know about your experience, but one of the earliest books I remember receiving was a child's atlas. [It had] big, bold print countries populated by exotic beasts, and inhabitants in strange and colorful costumes. Still later, I had a globe where from the comfort of my room, I could let my mind follow my finger as I traced the route to faraway places. But at some stage, the fascination dimmed. For me, it happened at secondary school, where my color blindness proved a bit of a problem (well, actually, a major handicap) when it came to deciphering all of the various hues of greens and browns and reds (Yeah, what reds?).

For most of us, the world eventually became too familiar, and we settled for a one page representation that looked more or less like this one. (My Chinese map of the world, by the way, spins it round so that China is nearer the center.) This is the **Mercator projection**, named after the Belgian cartographer Gerardus Mercator, who in 1569 produced this view of the world. He was faced with the question of how to portray a 3D object in 2D space, because it's a globe, as we move away from the equator to the pole so the surface area decreases as a constant rate. Mercator resolved the problem simply by increasing the distances at the same rate. Then with a set of tables, it would be easy to convert a measurement between two points back to their true distance. This meant basically, with such a measure and the set of tables, sailors could calculate the distance between two points on the map because that's what Mercator wanted, a map of the sea, not a map of the land.

But, as for the land, the further you moved away from the equator, so the areas distorted at the same rate, of the other distances. Most of us can live with that, and anyway, why bother to change it? We probably wouldn't do anything with a different map anyway. A long time ago we've already internalized the map, and the locations and information it projects to basically suit our own purposes. For most of us, our view of the world is by now well established. It's been shaped by our knowledge, our prejudices, our interests, and it differs from the view of the world from other countries and other cultures.

World Mercator Projection Map with Country Outlines



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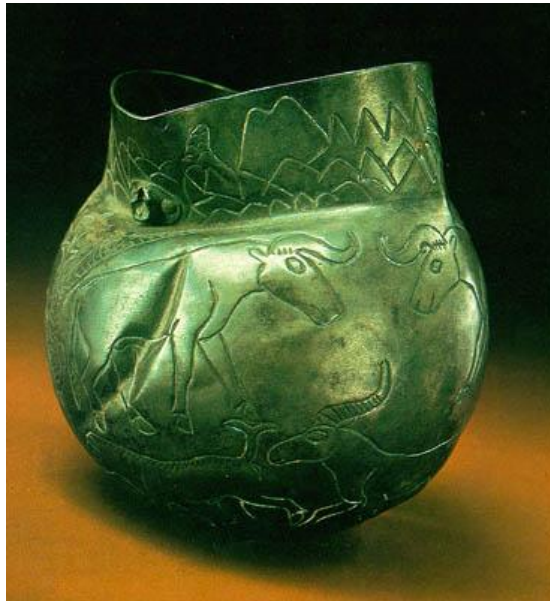
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THE NEW YORKER

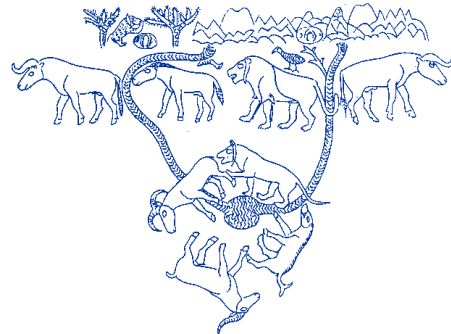
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The map you're looking at (left) was drawn by Saul Steinberg in 1976, and it caricatures the image of the world as seen from New York. It portrays downtown Manhattan in detail. It shows the rest of the USA as a desert, with a few points of interest, and on the distant horizon, you can barely discern Russia, China, and Japan. It's a parody, and the format's been copied for many different countries, and the viewpoint of many different statesmen. It's not new to say that our view of the world starts with ourselves. It's always been this way, and we might as well be honest and stop pretending.



Picture map on a silver vase from a tomb at Maikop, Ukraine, dating to about 3000 B.C.



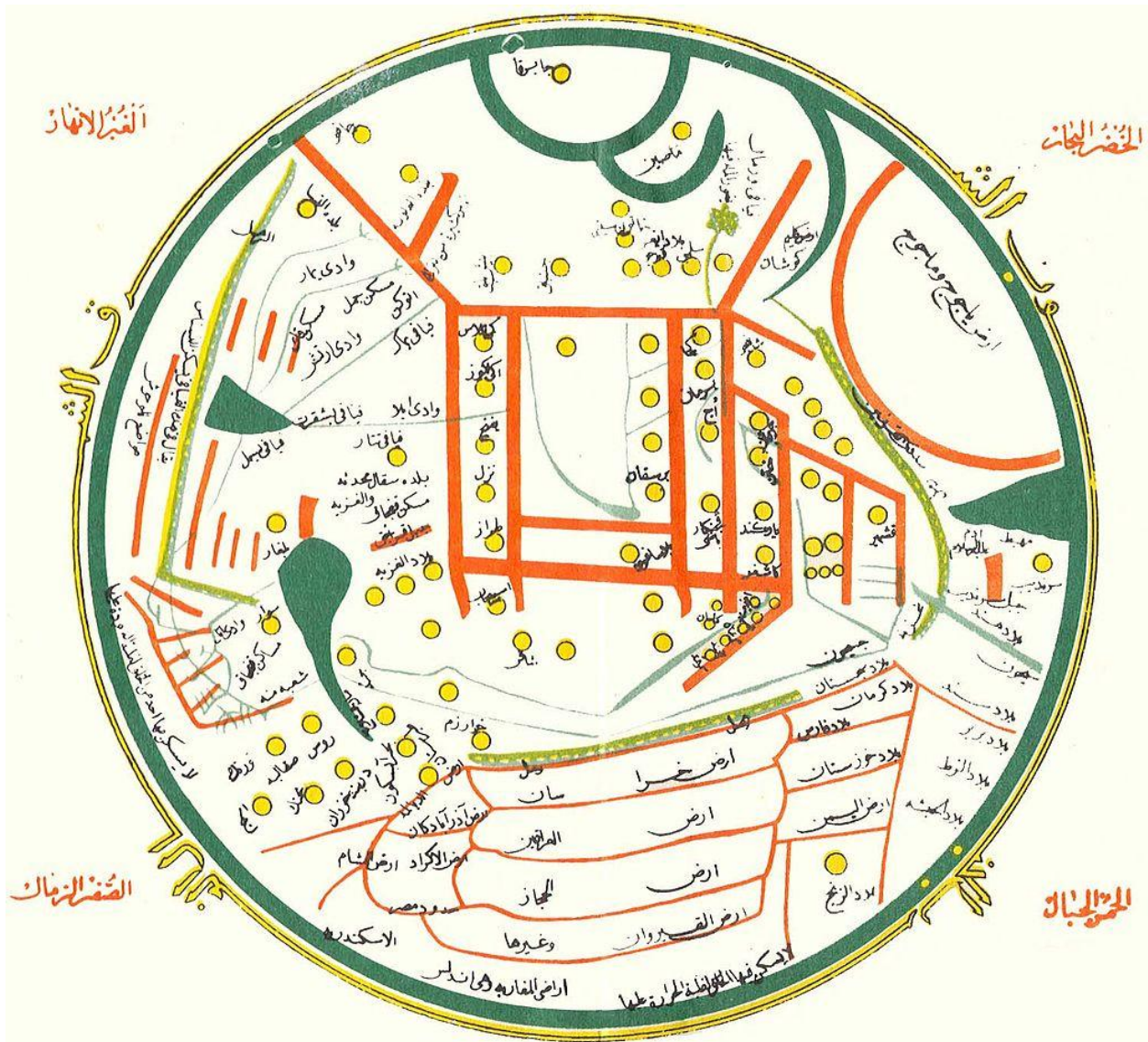
You're now looking at the oldest world map ever discovered. The **Maikop vase** is 4,500 years old. It was discovered in 1897 in the Western Caucasus. It portrays the Kuban River region. It shows two rivers flowing into a lake in the foreground, where wild animals are grazing.

Various cattle roam the middle ranges, and in the distance, a forest, fruit trees, and distant hills and mountains, and beyond that, who knows?

Let's look at one more map, this one just over 950 years old (see next page). It's a Turkish map projection by Mahmud, al-Kashgari, and it's oriented so that the top faces east. The map is interesting for its use of different symbols and colors for mountains, cities, deserts, and the like. Notice, the closer to home the more detailed it is, but it does name most of the countries in North Africa and Asia, including China and Japan at the top, and when one gets to the north, it simply has the inscription, uninhabitable, because of excessive cold. Most of the maps of that time had dark, unknown places which were either left uninhabitable, or were filled with strange, imaginary creatures, actually just like our own worlds. For them, like us, what you see depends on where you stand. But it shouldn't determine where you should be looking.

So in this course, we're going to make a start on configuring the world, and that process must begin with recognizing the limitations in our own view. It's not enough to recognize that our view may be distorted and that there are other views. We must start by assuming that our view also belongs to the category other.

Now, to **configure the world, we need two things: a framework of questions, and data to answer them.** For the framework, we will start with a state controlled view. If you noticed, the modern version of the



Mercator map we saw at the beginning was framed as states, not forests, rivers, and hills. Then we'll start by adding some data, checking what we really know, compared to what we think we know. We're going to begin with size and wealth, and this is what we're going to be doing for the rest of this week. Now, we've put the maps that you've seen in a special visualization together with some others that I hope you're going to enjoy.

Lecture 1.1.1: Visualization: World Maps

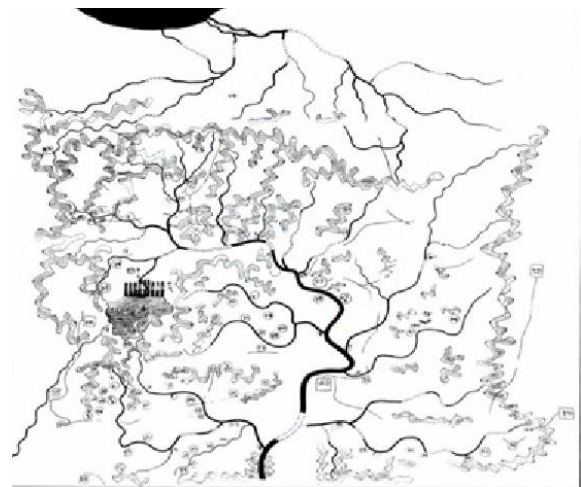
Hi there. Welcome to the very of the visualizations that accompanies this series of lectures. In this one, I want to give you a chance to have a closer look at the maps I used in the lecture, and also to introduce you to some others. While teaching this course, I've become fascinated by world maps that pre-date our modern world view. Modern image started to take shape in the 15th Century as European sailors mapped down the West coast of Africa and then, so called, discovered America. And don't forget that

one of the advantages of a visualization is that you can always pause at an image you want to view in more detail.

Well, let's start with the all too familiar Mercator Projection. (See map in above Lecture.)

The next visualization is the bronze Maikop vase, with a full map representation, which we also looked at in the lecture itself. (See picture and graphic in above Lecture)

I want to show you this silk map (below), which was discovered in Hanan province in China in 1973. It dates from about 160 BC. It's interesting because of its accuracy (it was probably drawn on a grid, although you can't see that,) and also for its intimate use of symbols.

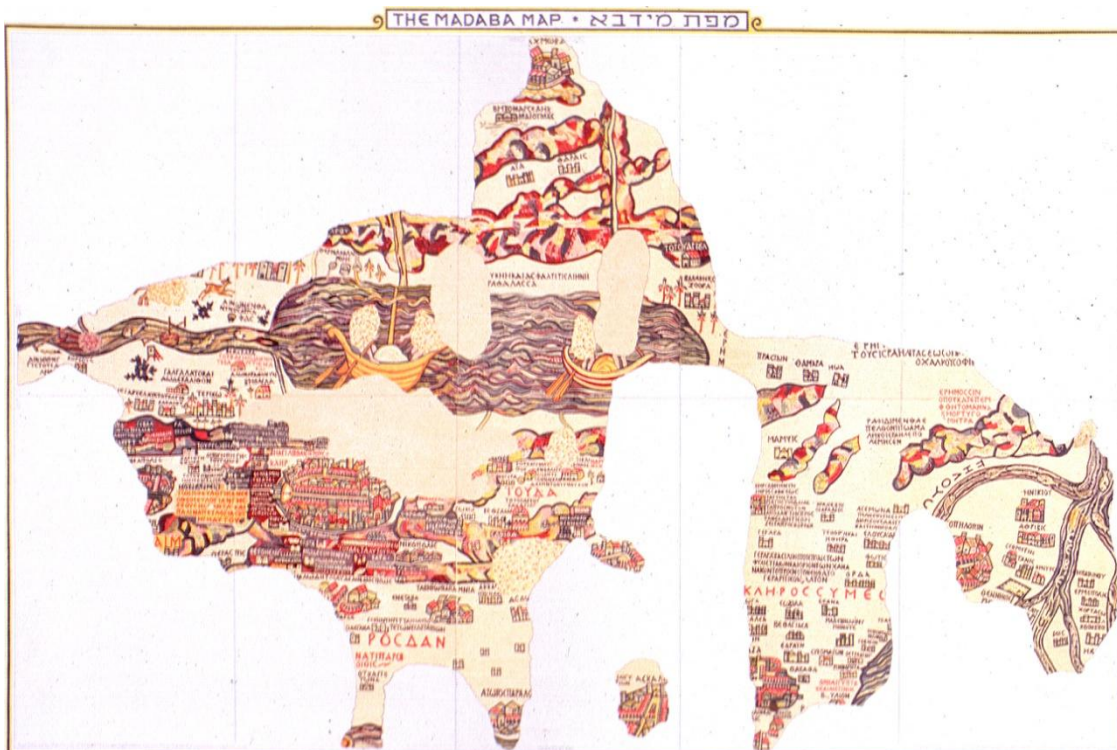


Now this (at right) is a map devised by Ptolemy, a Greek geographer living in Egypt. We don't have any surviving maps, but we do have these grid measurements. And these were used in the 1400's in order to reconstruct his world view. Note the belief at the time that the Indian Ocean was an enclosed sea, a belief that persisted for another 1,000 years or more.

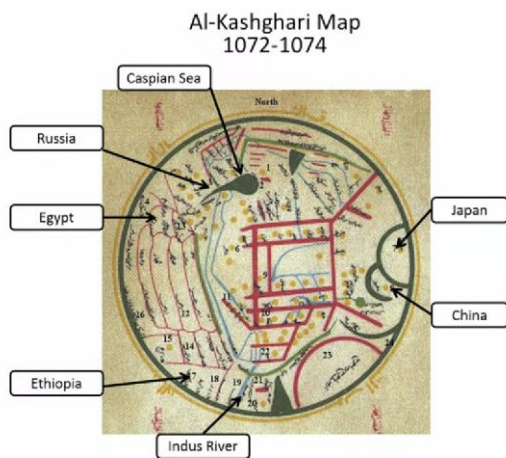




Now this next map (above) is one of my favorites. It's a copy of a Roman map dating from about 3 or 400 AD. It's made up of 12 panels, 40 centimeters high. And there's a total length of almost seven meters. It shows the entire Roman Empire. The panel I've chosen shows the area where I live. And the gash near the bottom is the Mediterranean.

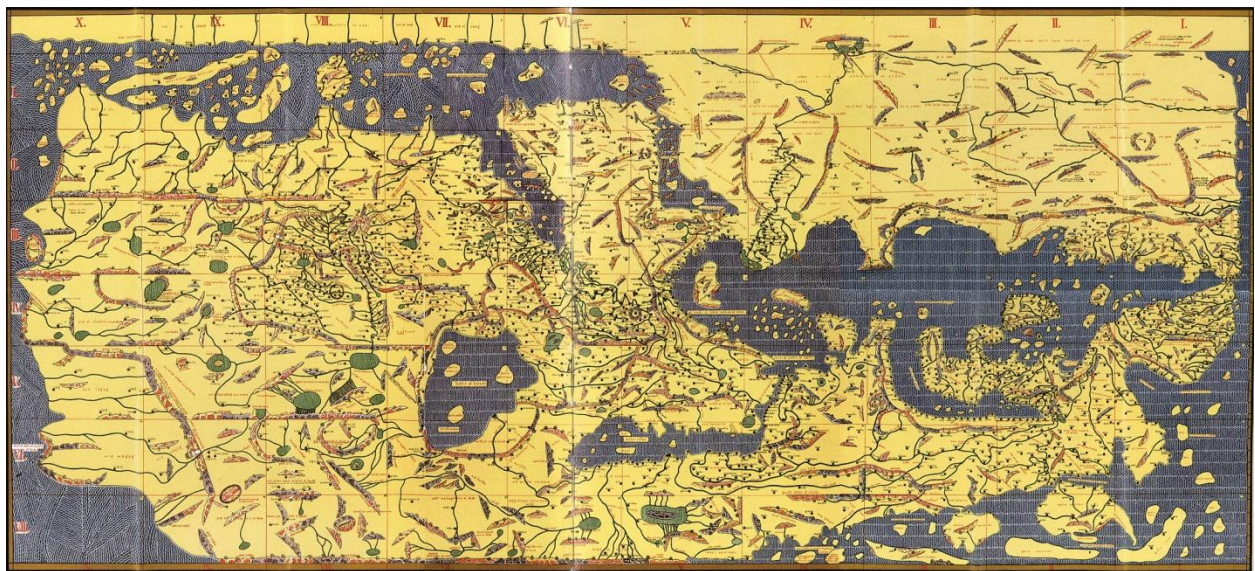


Now dating from almost the same period, is the Madaba mosaic map of the Middle-East (452-470 AD), discovered in 1884 in a church in Jordan (bottom of previous page.) The map was intended for Christian pilgrims. I particularly like its 3D portrayal of Jerusalem, which I've enlarged for you.



Now, then we've come to the Kashghari map that you saw in the lecture (see previous lecture, not reoriented), in which we we've reoriented now to the north and I've indicated some of the main locations for you.

Now we turn to an Arab map, created by Muhammad Al-Idrisi in 1154 (below.) It's orientated so south is at the top, but if I invert it, it'll be more familiar. The Mediterranean, is on a better scale than the version by Ptolemy, and there's much more detail in the Indian Ocean. If you look at the top there, Britain does seem to have suffered.



Now here (next page) is a typical Christian medieval map, this one dating from 1265 AD. It's oriented to the east. At the center is Jerusalem, and the top half is occupied by Asia. Bottom left is Europe and the bottom right is Africa. The map itself is filled with place names, bits of biblical history including Adam and Eve, and The Garden of Eden if you look just inside the world's circle at the top. And the unfamiliar parts, for example in Africa, are filled with mysterious fantasy creatures. It's a medieval world. But, it's



also our configured world. It's filled with some detailed knowledge, some associated pieces of information and with bits of imagination and fantasy to fill out the rest. Well, I hope you've enjoyed this trip to the past. And if you have any examples of your own, put some URLs and a little bit of context on the thread that we'll create in the forum. Let's see what sort of collection we can build up together.

Lecture 1.1 and 1.11. Sources:

Sources	Sources
Mercator projection: http://www.freeusandworldmaps.com/html/World_Projections/WorldPrint.html	Mercator projection: http://www.freeusandworldmaps.com/html/World_Projections/WorldPrint.html
New Yorker cover: http://en.wikipedia.org/wiki/File:Steinberg_New_Yorker_Cover.png	The bronze Maikop vase: http://www.hermitagemuseum.org/html/En/03/hm3_2_3a.html Copyright The State Hermitage Museum, St. Petersburg
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Maikop map: http://www.infoukes.com/history/inventions/ Copyright 1994 Andrew Gregorovich	Ptolemy grid measurements: http://www.hellenicaworld.com/Greece/Literature/SamuelButler/en/AtlasOfAncientAndClassicalGeography.html
Kashgari map: http://commons.wikimedia.org/wiki/File:Mahmud_al-Kashgari_map.jpg?uselang=nl	Tabula Peutingeriana: http://entoen.ru/romeinselimes/beeld-en-geluid/tabula-peuteringiana
	Madeba Mosaic Map: http://www.bibleistrue.com/qna/pqna66.htm
	Kashgari map: http://commons.wikimedia.org/wiki/File:Mahmud_al-Kashgari_map.jpg?uselang=nl
	Mohammed Al-Idrisi map: http://commons.wikimedia.org/wiki/File:TabulaRogeriana.jpg?uselang=nl
	Psalter Map: http://commons.wikimedia.org/wiki/File:Psalter_world_map.jpg?uselang=nl

Lecture 1-2: Political Economy and Data

Hi there. In the last video, we saw how we tend to distort our world picture with our own preconceptions. But in this video, we're going to explain why we'll need the basic data we'll be using in the rest of the lectures, and also how they fit into the analysis we'll be undertaking later in the course.

Already we've seen in the previous video, how the Mercator projection distorted geographical area, and therefore, it distorts the size of states superimposed upon it. But why should states matter? **Why should they be the unit of our analysis**? Well, there are several pretty good reasons. Firstly, **states intercede on our behalf with other states** and if necessary, they defend us. **States also provide and enforce the rules** that govern most of our actions inside their borders. **States tax us** and provide us with collected goods. And **states collect and collate data** most often at the national level. For this reason, social scientists who are interested in comparisons also construct much of their data at a national level as well.

One of the first sets of data we need to examine is population. States have been counting their citizens since before the first millennium, partly because they want it as a base of taxes, and partly to recruit manpower for large scale projects like pyramids or for membership of the army. We're also interested in population because it offers us a quick guide to the **size of states**, to their **economic and military potential**. We're also interested because we regularly divide different data by population, to reduce it to a **common unit**. Many measures are expressed in per capita terms, 'per capita' coming from the Latin, meaning per person. Social scientists generally assume that population data is accurate, but we'll see how well founded that belief is in the next video.

One item that's regularly expressed in per capita terms is a country's output or national income. National income is a generic term. What is most commonly measured is a subcategory of national income called **gross domestic product**, which is a **measure for a country's output**, usually over a calendar year. Throughout history, states have generally had a pretty good idea whether the economy was doing well or badly, but they rarely tried to capture it in one single number like GDP. States only began, and that is only one or two states, to collect national income data in the 20th century. **And the practice only became common after the WWII.** Calculating national income is far more complex than just counting people, and the **room for error is much, much larger.**

We're interested in **national income** for several reasons. Once we've converted it to a common currency like the dollar, it provides an indicator of how large a country is in **relation to the rest of the world economy.** If we divide it by the labor force, we get a good idea of a country's **productivity** or competitiveness. If we divide it by population, we get an idea of the **level of wealth** at the disposal of its citizens. And on this last basis, we used to make statements about **how rich or how poor** a country was. We used to, but not anymore.

Anyone who's traveled abroad will have had the experience that the country visited seems expensive, or alternatively, it's cheap. The country has different **purchasing power** depending on the country where it's spent. For example, a Euro will buy you much less in Switzerland than in Thailand for example. So converting national income into current dollars is going to give a misleading picture. In the **1970s**, economists started experimenting by calculating new **purchasing power parities** to obtain a better basis for **national income comparisons.** But note very carefully now that any **errors in the original calculation still remain.** They're now joined by new difficulties, but by now, directed by the World Bank, the sophistication of current comparisons has improved immensely. But even so, there still remain some problems when we want to measure economic growth or to make other comparisons involving changes over time.

Now the use of purchasing power parities has provided us a clearer measure for comparing levels of consumption between countries. But the capital income however measured is still an average. It doesn't tell us much about the **degree (definition) of poverty.** The **World Bank tried to monetize poverty** by expressing it as the number of people living below a certain figure, for example, a dollar a day expressed of course as **purchasing power parity dollars** of a certain year. At the same time within the United Nations development program, efforts were made to broaden the definition of poverty so that it included more than the simple level of income. As a result, they constructed a **human development index** which took account of factors such access to education and health as well as describing living standards.

So let's **sum up then:** **population, economic size, per capita income, economic growth and poverty.** These are all variables politically economist employ when they try to configure the world, and over the next four videos, we'll examine each of these in turn and try to assess the accuracy of the data, and to configure the world through each of these different lenses.

Lecture 1-3: Population

Hi there. In the last video, we saw why the state was so central to the analysis that we're doing in this course. We also saw why we needed to collect a basic set of data. Well in this video, we're going to configure the world in terms of **population**. We're going to examine its **growth and its distribution** over the 20th century. And we're also going to assess the **accuracy** in measuring it.

On the **11th of October, 2011, the world's seven billionth** citizen, Danica May Camacho, was born in the Philippines. By the end of the day, though, she'd been joined by at least four other claimants, one in India, one in Canada, and two in Russia, but at opposite ends of the country. Later, the UN Secretary General Ban Ki-Moon conceded that the choice had been symbolic, that the date chosen had been arbitrary, and that he didn't know who the seven billionth citizen was and or where and when he or she had been born. And as if to prove the capricious nature of democratic forecasting, Danica May had been in such a hurry to be the seventh billion citizen, that she was actually born at two minutes before midnight on October the tenth.

Seven billion inhabitants! Back in **1900, it was estimated that the world population stood at 1.6 billion. In 1960, it was still only three billion**. But not only had the world's population exploded over the 20th century, it had been accompanied by a marked shift in its distribution. The largest relative gains were in Africa and Asia, and the greatest relative decline was in Europe. The causes of that growth in **Africa and Asia had been a large fall in the death rates**, and this was because of the impact of modern medicine, and the control of killer epidemics, the major beneficiary being the young, who then survived and had children of their own. Now these same factors also impacted on **Europe, but here they were also accompanied by a fall in the birth rate**, as women delayed the start of child bearing and reduced family size. The effect in many European countries, and in Japan as well, was to reduce the birth rates below replacement levels.

All of this presents **two kinds of challenges**. Countries with a **high birth rate have to find productive employment for new entrants** to the labor markets, while countries with a **lower birth rate will have to cope with an aging population**, and the increased costs of health expenditure that this entails. And they have to do both of these with a much smaller potential productive base.

Population is seen as one of the simplest numbers. People are people, and **they can be counted**. And for this reason, they're supposed to be more accurate than the other data that we have. But this second assumption depends largely on the **efficiency of the statistical agencies** responsible for assembling the data. In the poorer countries especially, they have fewer resources that they can divert to these kind of activities, and generally, the less trustworthy the results. Often births and deaths remain unrecorded, especially in remote or rural areas. And **a census is costly**, and is often politically fraught as an undertaking. It's not just a question, then, of the funds devoted to counting population that matters. The **political context can also play a role**. For example, when politics is tribal, there may be incentives to inflate the census returns, if the country's demographics determine the distribution of parliamentary seats, or form the basis for government expenditure. For example, in **Kenya**, there'd been massive upheavals in 2009 that led to 1,000 deaths and more than half a million people displaced. The count in

the northeast was nullified because it was felt the figures had been inflated. In **Nigeria**, the UN has completely ignored the census data altogether, and produces regularly its own estimates on the basis of extrapolation. For almost all countries, the most recent data everywhere is probably pretty close to reality.

But this **isn't necessarily true at a local level**, and this is important. I always tell my students, be very careful when the disaggregated data does not add up to the aggregated data. For example, in **Shanghai**, only one year before the official census in 2010, the authorities estimated the city's population to be 19.2 million. It turned out to be 23 million. Many more **migrants** from the countryside had stayed on than had been estimated. But the effect of this error was that the authorities had somehow misplaced the equivalent of the entire workforce of Bulgaria.

You probably haven't heard of **Newham in London**. It's in the shadow of the Olympic Stadium. In 2009, the authorities had estimated the population to be 246,000. The census results, 2012, revealed a population of 308,000, an error of 25%, which had a direct impact on levels of funding. And the reason was that **migrants** into the area were staying longer than they had a decade earlier.

The police, by the way, estimated if you added the illegal migrants, you'd have a figure closer to 320,000. **Illegal or irregular migration** is another source of democratic uncertainty, also on a national scale. Since these people have evaded being identified, there's no real way to count them. Most estimates of illegal migration are derived from the numbers caught. But that might actually reveal the success or failure of enforcement, rather than the numbers actually successfully entering the country. After all, they're not caught. The estimate for illegal migration in the European Union ranges from 1.9 to 3.8 million. And for the United States, the estimate is 11.5 million.

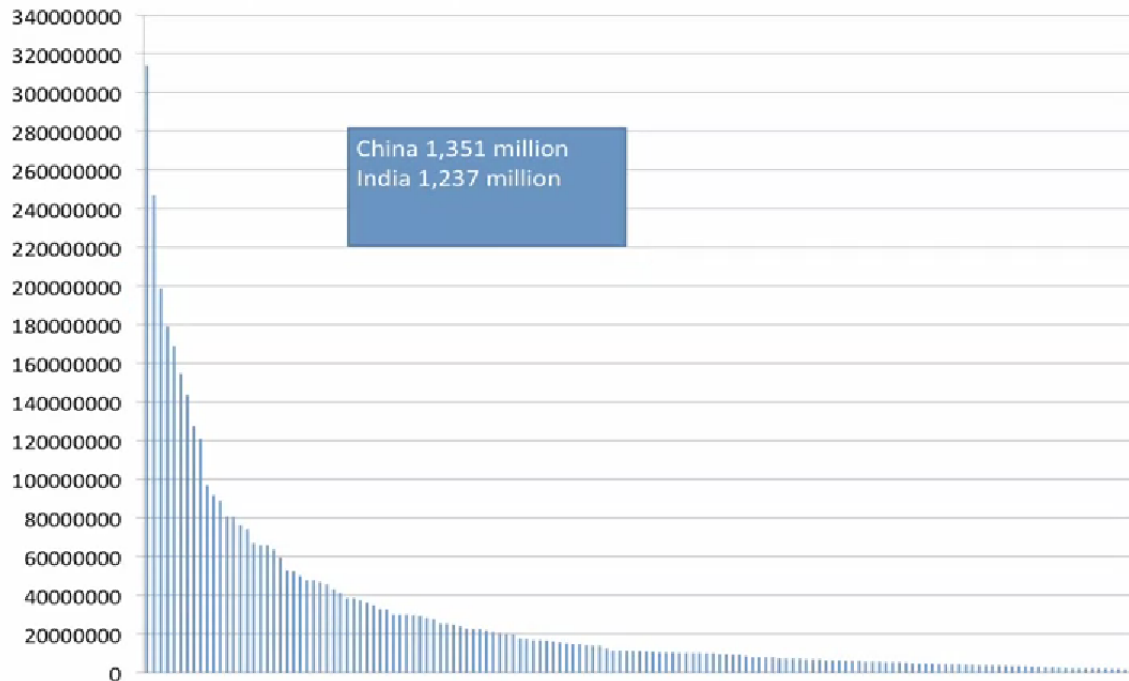
So let's pull all of these ideas together. We've seen that the **world's population has more than quadrupled since 1900**. We've seen that this was accompanied by a **shift in its distribution towards Africa and Asia**. We've also looked at **why** this growth occurred, and pointed to the problems that that has entailed. And we described some of the **factors, institutional and political, that have influenced the accuracy of the statistics**. In the next video, we'll start to examine the world's output, as measured by its GDP, its gross domestic product. Now, in order to help you configure the world population, we've prepared a visualization, a map of the world's demographics. We invite you to have a look at it now.

Lecture 1.3.1: Visualization: World Map of Population

Hi there. In this visualization we're going to focus on the world's population in 2013. In this bar diagram (top, next page,) I've ranked by population size all the countries in the world with a population above 1.5 million. This is the cutoff point that we're going to use throughout these configurations. I've listed China and India separately, so as not to distort the scale too much. On this scale, the halfway point is around 11 million. And we've divided the map into ten equal parts known as deciles. With 152 countries, the first 10% and 20% will have 16 countries, and then all the rest will have 15.

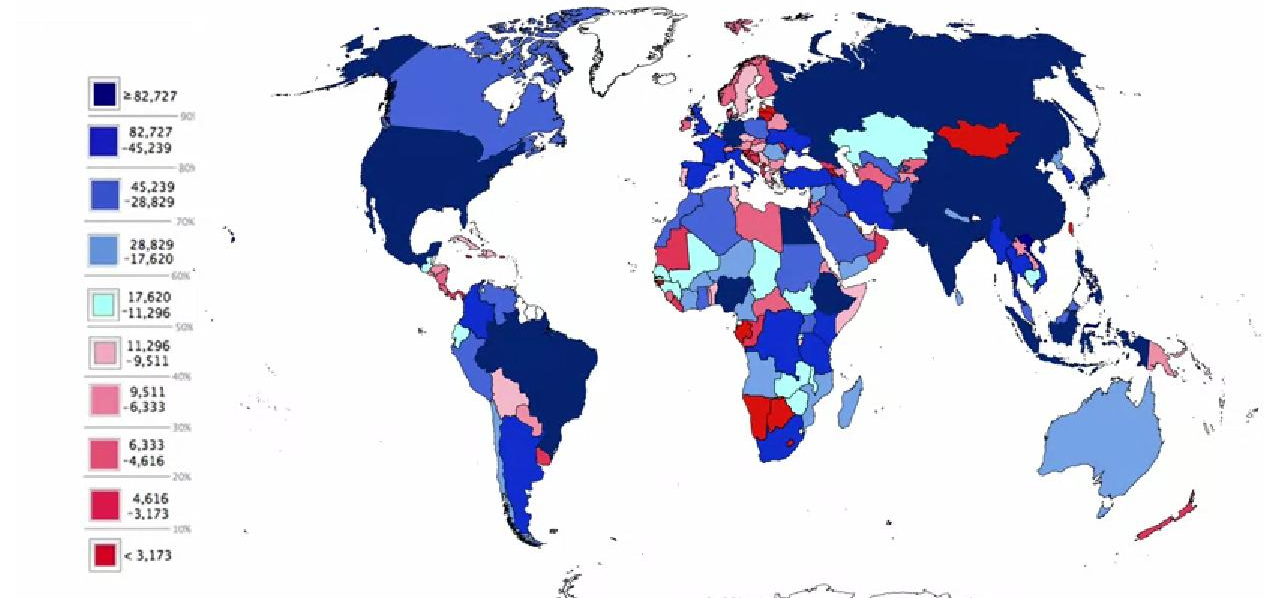
Well, here they are. We've already seen China and India with over a billion each. USA, Indonesia and Brazil come next. And then we go below 200 million with Pakistan, Nigeria, Bangladesh, Russia and

Range of Observations for World Population 2012



Japan. With the Philippines, we drop below 100 million. Ethiopia, Vietnam, Germany make up the 15. And Egypt comes in at number 16. From here onwards, we'll slowly develop the map. In each case, I'll mention the countries at the opposite end of the range, but without naming the rest. You can always slow down or pause the visualization if you wish. (Final map with all deciles is pictured here.)

Population Map



So the next decile spans the range between Iran and Argentina. The third decile spans the range from Algeria with 39.2 million and Ghana, with 26 million. After that, we reach the range between

Mozambique and the Netherlands, and we complete the top half of the range with the span between Kazakhstan, with 16.4 million, and Greece with just over 11 million. So, now we've reached the middle of the range, called the median in statistics. And the remaining countries are compressed between 11 million and 1.5 million. So we're just going to run through the rest of the maps through the deciles without further commentary.

So that was the world map of population in 2013. I hope you enjoyed it. The data used to create it is available to you in the CTW database accompanying this course.

Lecture 1.4: Output (GDP Current Values)

Hi there. In the last video, we spent some time looking at the growth and distribution of the world's population in the 20th century. We explained the dynamics of change. And we looked at the difficulties in compiling the data. Well in this video, we're going to configure the world in terms of **output, GDP** or Gross Domestic Product. We'll look at its **distribution**, and we'll assess the **accuracy** in measuring it.

On the 6th of April, 2014, the head of the Nigerian statistical bureau announced that his country's output was 89% higher than had previously been believed. He was proud to announce that the country had passed South Africa, as the largest economy on the continent. Of course, on the ground, nothing at all had changed. But what about the results of all the earlier calculations that employed the earlier data?

We'll return to this question later in the video. **Statisticians, don't actually measure output. They measure transactions.** If no money changes hands, it's not recorded, and if transactions are not recorded, they don't get measured either. To complicate matters, not all transactions are included. Illegal transactions, for example, are deliberately excluded. And, to provide a final touch, **they're not interested at all in transactions per se, but in the value added between each transaction.**

Needless to say, constructing national accounts is a hugely complex operation, involving the collection of data from a vast array of sources and compiling them into a coherent set of numbers. We've shown this in more detail in the visualization that accompanies this video. So, just imagine then, all over the world statistical agencies are engaged in the collation and compilation of national accounts. In order to make comparison easier, the **results are usually expressed in a common currency**, most often the dollar, **expressed in current values**. We use this form of calculation when we're assessing the impact of countries on the world economy, less so when we're looking at their relative incomes or their relative spending powers.

The first thing to note is that the distribution of the **world's GDP stands in stark contrast the distribution with population**. Despite the explosive economic growth of China and some of the other developing countries, the world economy remains dominated in size by Europe, North America and Japan. In per capita terms, the richest countries in the world are also concentrated in these regions. We'll see in a moment that there are possibilities of wide margins of error, especially among the poorer countries. But even if we adjust for these, it wouldn't significantly change the overall picture.

We've observed that calculating GDP statistics is a complex exercise. It requires a sophisticated infrastructure of data reporting and registration, and that costs money. So it'll be no surprise to learn that the **greatest difficulty in obtaining accurate data is among the world's poorer countries.**

[Assesment / Sources of Error] One obvious problem lies simply in the task of **data collection**, with an underpaid staff and under equipped offices. With UN agencies demanding answers and statistical bureaus just simply unable to supply them, it didn't wonder that one researcher who described the results as simply random numbers.

A second source of error lies in the **informal sector**. For example in the 1990s, officials in Tanzania estimated the size of the informal sector as anything between 30% and 200% of GDP. In the end they decided to hike their GDP estimate by 62% to take this into account.

A third source of error is simply **fraudulent reporting**, not by businesses, but by government themselves. In the wake of the Euro crisis for example, the Greek government has been accused of misrepresenting it's GDP figures in order to hide the size of its debt.

A final source of problems are **legitimate re-estimations**. And this is where the Nigerian case is interesting. The country hadn't adjusted the baseline for its calculations for over 20 years. It also based its GDP on very small sample of businesses. Remedying both these deficiencies resulted in that 89% boost to its GDP figures. But it's not the first African country to have done this. So far, 12 countries have reported the results of rebasing exercises. And many more are still to come. All these efforts at improving statistical accuracy must surely be welcomed.

Implications. My point is this. Let's accept that with some exceptions, the richer countries tend to produce better statistics. But many of the **statistical exercises undertaken by social scientists are aimed at the poorer countries.** And it's here where the **errors are high**, where any improvements are haphazard and disjointed. So **what is the value of any ranked series** of data at any point in time? What is the **validity of any effort to look at changes over time**, as we do when we talk about economic growth? And what therefore, is the **validity of any statement made** on this basis, regardless of how neat and tidy the statistical outcome might appear to be? As we'll see in this course, social scientists spend a lot of time and ingenuity in constructing data, for different social science variables. But **they tend to ignore the possibility that a basic data set like GDP, might get so totally unsuited for statistical analysis.**

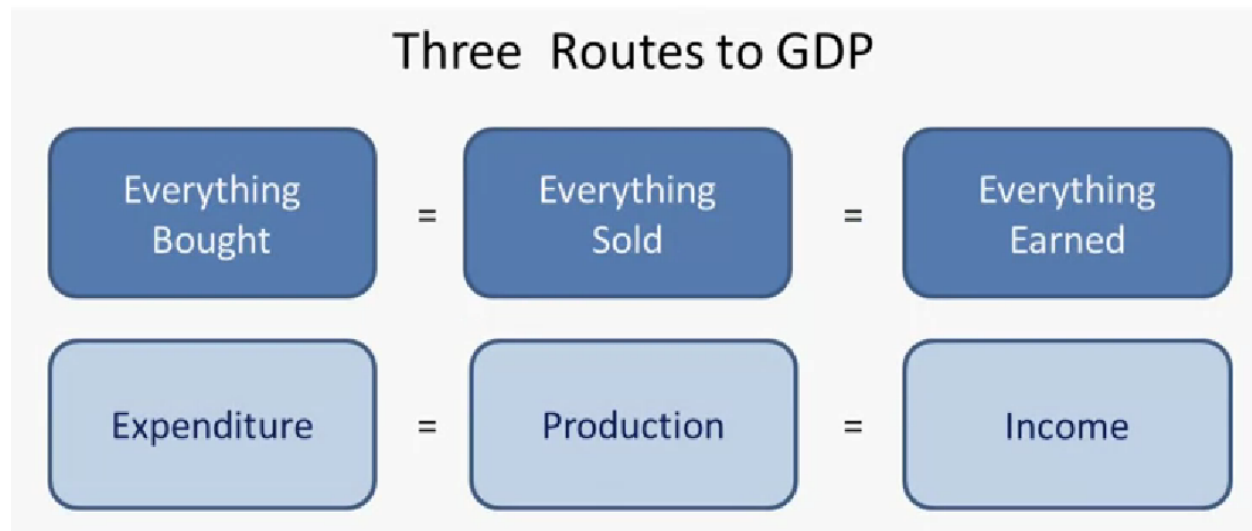
Okay, let's tie all of this together. We've looked at how world output is measured, and we've pointed to



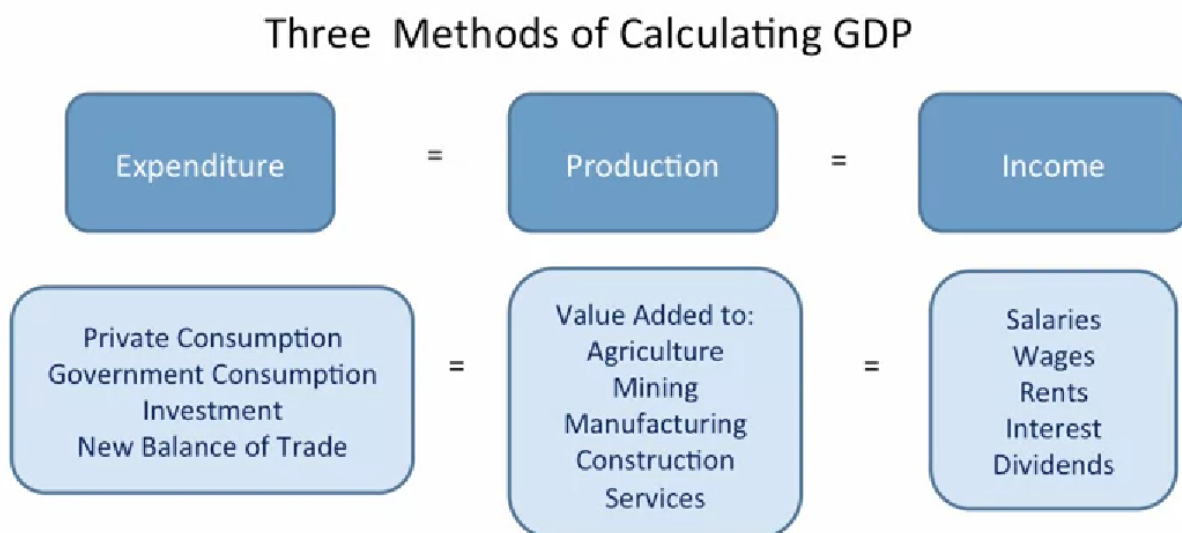
the broad outlines of its distribution. We spend a considerable time, looking at the difficulties in estimation, especially among the poorer countries. And we've underlined how this affects the use of GDP indicators, in any statistical exercises. Well, we've tried to configure for you the size of the various economies. We invite you now to look at our visualization of the world map of GDP. In the next video, we'll look at how the world output is estimated so it's better to reflect, well, real world output.

Lecture 1.4.1: Visualization: World Map of GDP Current US Dollars

Hi there. In this visualization, we'll turn our attention to the world's GDP in current dollars. Since current dollars, real dollars, give an indication of the command over the world's resources, this is the favored measure for showing the relative size of the world's economies. But before we look at the data, let's take a closer look at how the numbers are calculated.

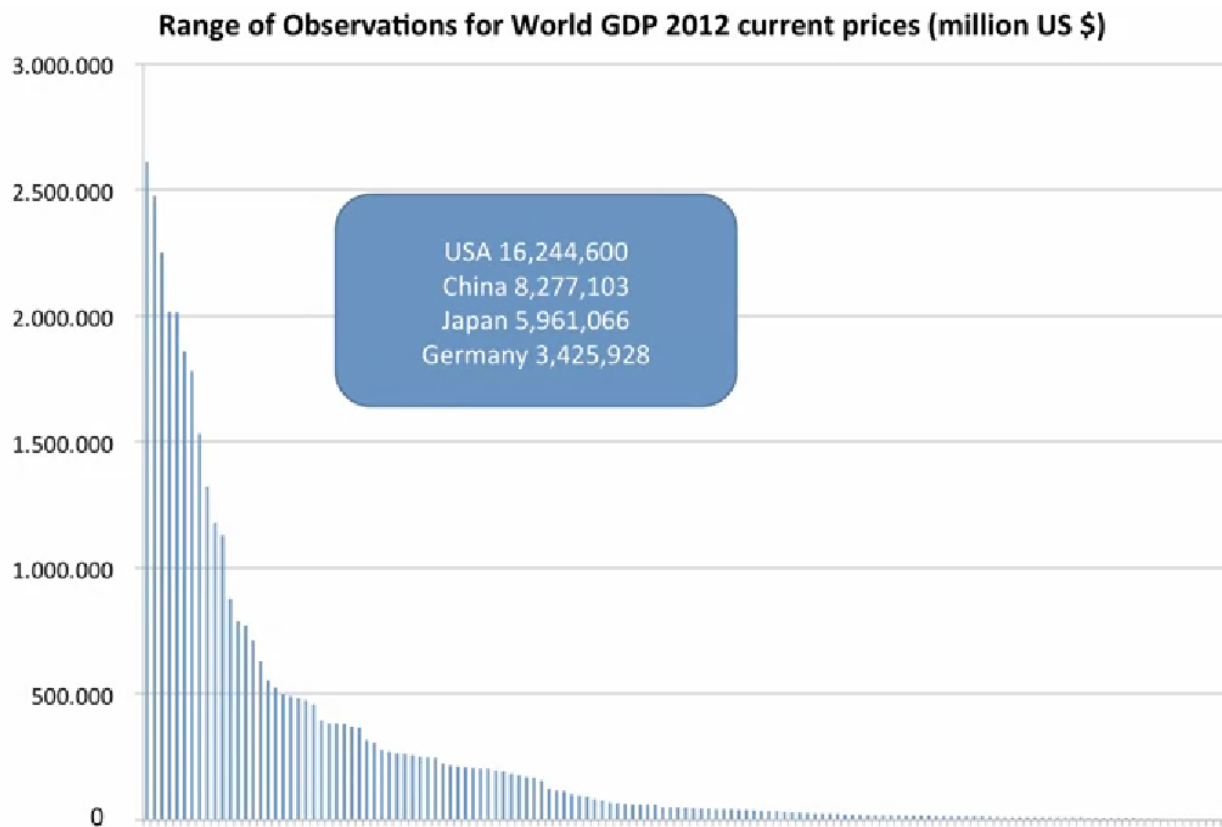


Basically, there are three different routes to the same number. Since everything earned in a society is equal to everything consumed or saved, and since everything consumed in a society must be equal to everything produced, it stands to reason that income equals expenditure equals production.



But the data should also be calculated in each of three different ways as well. And in each case, using different sets of data, they should all come to the same result. Now even in richer countries, this often

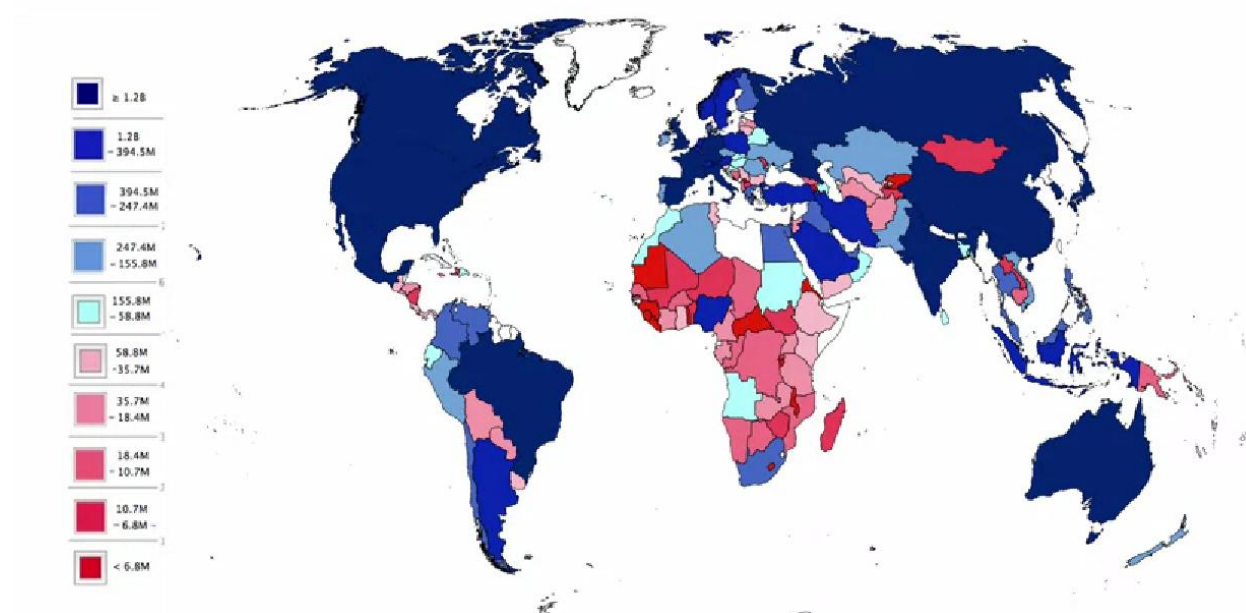
requires an error term to balance the measures. But simply to look at the information needed makes it easier to see why in countries with a less developed administrative infrastructure, it is difficult to produce reliable statistics.



When we look at the range of country incomes, the gradient is much steeper than it was for population. In this diagram, you'll notice we've removed the top four economies so as not to compress the range too greatly. In the diagram, I've ranked by GDP size all the countries in the world with a population above 1.5 million. The data for 2012 has a few countries missing, and you can see them here. Since there are 143 countries, we've divided the map into ten equal parts with 14 in each except for the first three which have 15.

So, let's get started. The first decile is headed by the United States, followed at some distance by China and Japan. Germany, France, and the UK come next, followed by Brazil and Russia. Italy, India, and Canada are next and by the time we reach Australia, we're talking in terms of the economy that's less than 10% the size of the United States. Spain, Mexico, Korea make up the rest. Indonesia that leads the next SR, is a little more than 5% the size of the United States. And the range now extends to the United Arab Emirates, whose GDP level is less than 2.5% of the USA. Nigeria, by the way, has its unrevised statistics in this group. But you can see, there are still many middle-sized European economies. The third decile stretches down to Iraq with a GDP of only 1.3% of that of America. And by now a pattern is emerging of a mixture of small, richer states with bigger, poor ones. So, we'll run through the rest of the data without much comment. Don't forget, you can always slow it down to make the viewing easier.

World Map of GDP



So, that was the world map of GDP. I hope that you enjoyed it. The data used to create it is available to you in the CTW database accompanying the course.

Lecture 1.5: Output: GDP PPP

Hello again. In the last video, we spent some time exploring the basis for calculating a country's GDP. We sketched the distribution of world GDP in current dollars. And we explored the difficulties in compiling the data. We stressed how errors contained in this exercise might make the data unsuitable for sophisticated statistical analysis.

In this video, we're going to configure the world in terms of output, or **GDP again, but when adjusted for differences in purchasing power**. In the last video we stopped our discussion of the calculation of GDP in current values, and then converting them into a common currency. But in order to make comparisons over time, it's necessary to **separate out the changes produced by fluctuations in prices**. Statistical officers do this by constructing a **special price index called a GDP deflator**. This is made up of a selection of goods weighted so that their relative values affect their relative importance in the economy. **The result is called Real GDP**. In International comparisons it's usually anchored to a currency the dollar, at the exchange rate prevailing in a particular year.

For many social scientists, this didn't go far enough. They observed that **there were also structural difference in prices between countries**. They pointed out, quite correctly, that in poorer countries, money seemed to go further. And they made the valid point that since most goods produced in a country were consumed in a country, this difference in purchasing power was important. What they wanted was a set of data measured in a common currency that had been adjusted to take account of the **Purchasing Power Parity**. In other words they're there to eliminate these structural price

differences. So you'll recognize these because they'll all be expressed as something like 2012 US Dollars PPP.

Key Remarks: Now before we see how this happens, I want to say three things. Firstly, **PPP Dollars do not exist**. The economy functions in real current currencies. An Indian spending Rupees in his own country might get a consumption boost by PPP figures, but everything else will seem more expensive all the same. Secondly, the PPP calculations do not start from scratch. **Any flaws or errors in the original estimates will be carried over** into their conversion into PPP values. And third, the official calculations of GDP did not start on any scale until the 1950's. **In these early days, much of the information available was patchy and of dubious quality**. And in many poorer countries it still is today. All the GDP statistics from before the 1950s is the result of reconstructions, often with data that was never really intended for that purpose.

The GDP figures were originally used for purposes of wartime planning and post-war reconstruction. And they retain their usefulness as governments try to adjust their policies to smooth out the path of economic development. In **1968, the World Bank** and the University of Pennsylvania, which has since continued on its own, started an **International Comparisons Project**. Comparison started with only ten countries. But the range and depth of coverage has since improved substantially. Now, many comparisons over time uses PPP adjusted data, especially for per capita comparisons and for economic growth. PPP adjusted data is also used in discussions on poverty, because it reflects the purchasing power inside a country.

Difficulties in Assessment: It's important to note the difficulties that such an exercise entails and the faults in the earlier efforts. The first difficulty is that to establish comparable prices, **you need comparable products**. The **patterns of consumption tend to vary** among countries. Let's take a Big Mac. A big Mac in China is 43% cheaper than in the United States but a Star Bucks coffee by contrast is only 4% cheaper. The lesson of course is Star Bucks is more at market in China than is McDonalds. But a bigger question is do the Chinese consume much of either of them?

A second problem is not just selecting the comparable products, but also **choosing representative locations**. There's little point in focusing on the towns, where presumably most of the comparable products are likely to be found, when most people still live in the countryside.

Now I've started with these two criticisms because they were at the source of a huge row in the United Nations. In 2007, the World Bank cut back the estimates for the size of the **Chinese and Indian economies** by almost 40%. This was because of faults in the construction of the earlier 1995 price comparison. 1995 was better than the previous effort, undertaken in 1985. Now I mentioned this because **long run growth statistics stretching back before 1970 and even back into earlier centuries are expressed in PPP values of 1990**. This is because it was the year chosen by OECD economist Agnes Madison, who did much of the pioneering work in this field. But there was **no comparison made in 1990**. The values from 1990 are extrapolations from 1985. And **in 1985, only 62 countries were actually surveyed**. The price differences discovered there assume to prevail over the neighboring countries as

well. And the reason why there was no survey in 1990 was because it was decided to take a break so they could overhaul the whole system.

Well, in April 2014, the latest results of the PPP calculations have been published. And these were based on surveys conducted in 2011. Even with much improved data, the World Bank concedes that the estimates still contain a margin of error. Its own recommendation is that differences less than 5% should be discounted. But the error margins could be as much as 15% in countries of dissimilar size and dissimilar economic structures. Will anyone take any notice? Well they haven't before.

Summary:

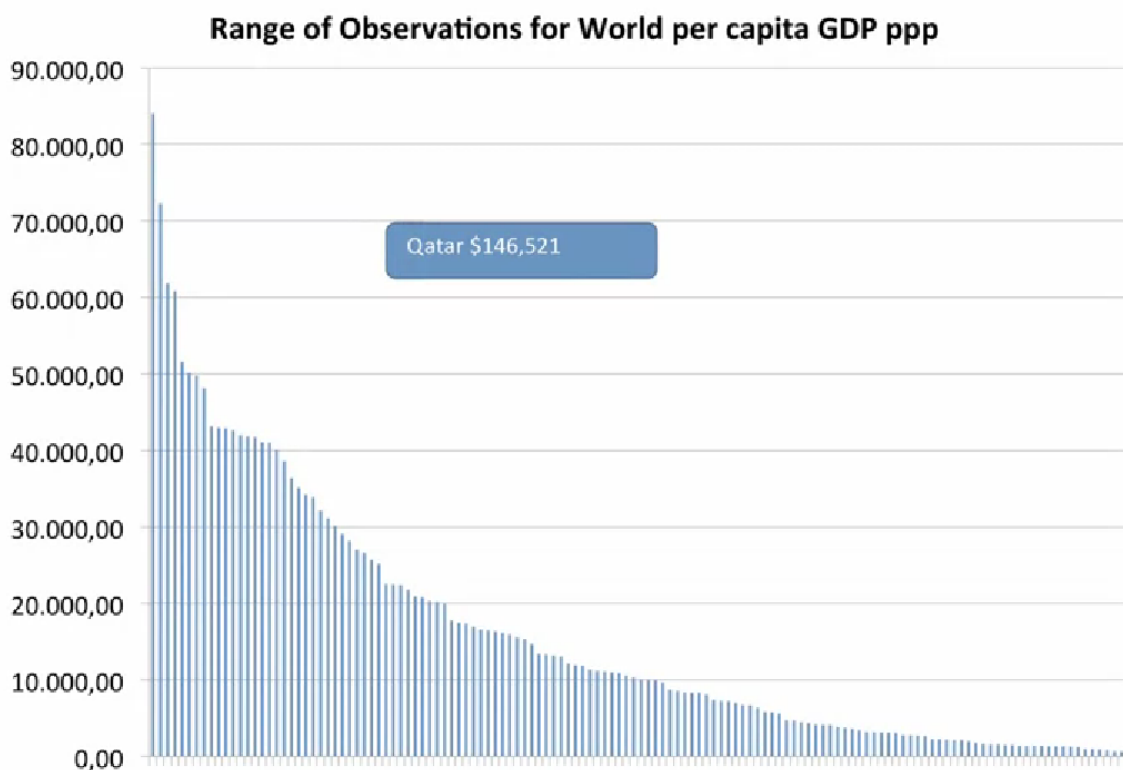
- GDP PPP added complications
- Doubtful results

Okay, let's sum up then. In addition to the difficulties inherent in the original GDP estimates, we now have to add the complications in international price comparisons. But there are still problems and uncertainties in the results. In the next video, we're going to look at how these

new PPP estimates will fit into the debates on poverty. In the meantime, we've taken the brand new published PPP data, and used it to configure the world along the lines of per capita incomes. So why not look at our visualization of the world map of GDP. PPP.

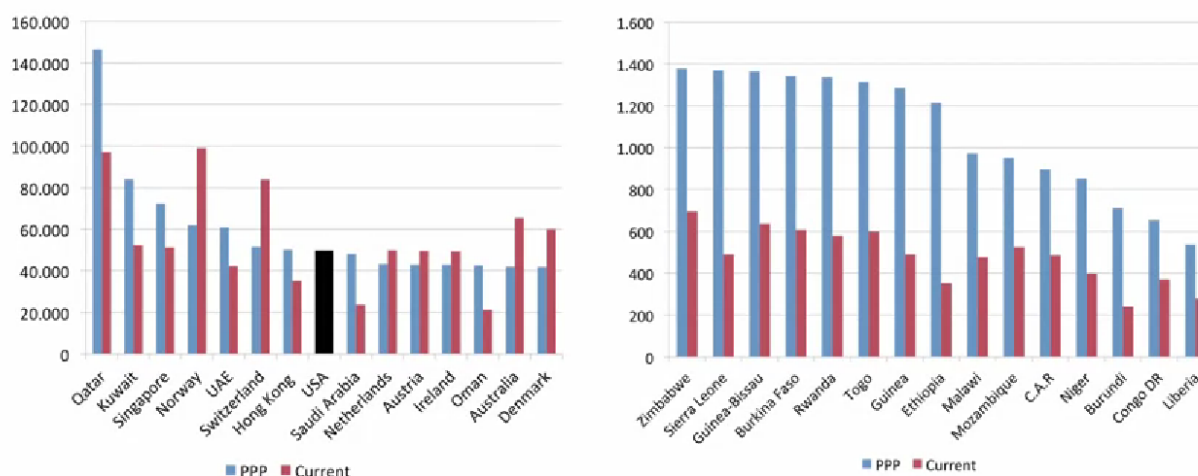
Lecture 1.5.1: Visualization: World Map of GDP PPP

Hi there. In this visualization, we're going to turn our attention to the world's GDP, and measured in dollars adjusted for purchasing power parity, or PPP.



Every five years the World Bank recalculates the benchmark. It did so in April 2014. The data is benchmarked for 2011, and insofar as our accurate, this is probably the best moment to make a comparison.

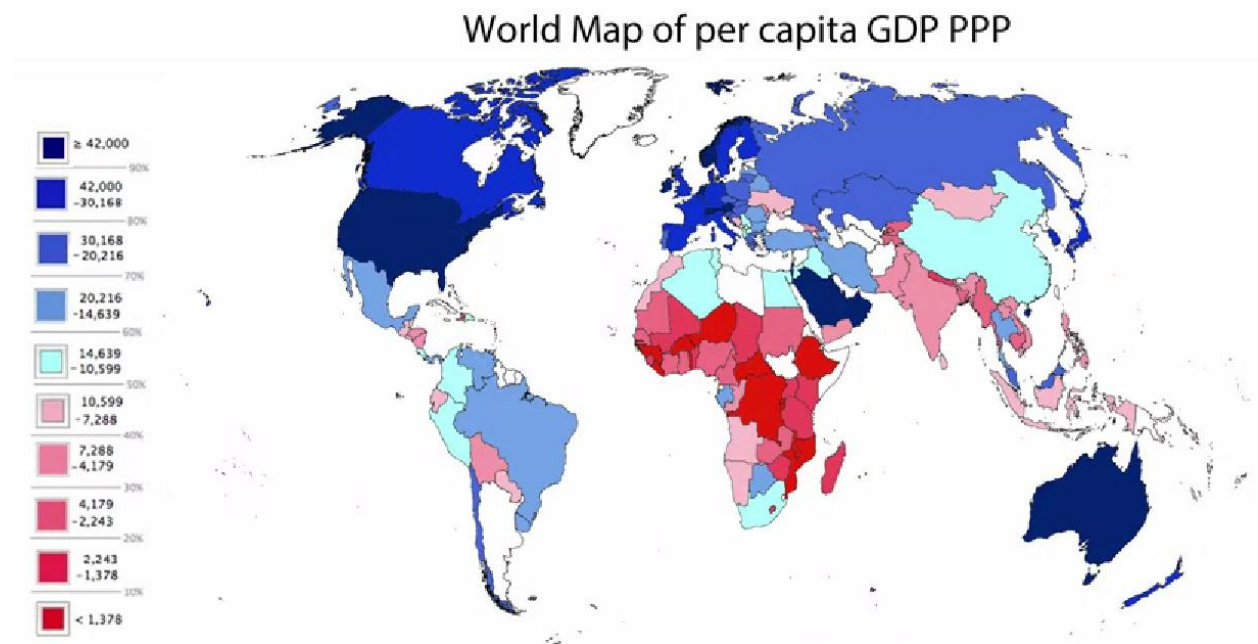
Difference in per capita GDP in current dollars and ppp dollars



Now we've already seen the data's adjusted to take into account structural differences in prices between countries, and therefore they provide the best measure for real differences in per capita GDP. Although in the recently released newspaper headlines, screaming about China catching up with America, and China and India overtaking America, this actually says nothing about the ability to buy resources on world markets. But it does say a lot about how far the dollar goes, when goods are bought inside a country. So we're going to stick with what the data is meant for, comparisons in domestic purchasing power.

With 137 larger countries for which the World Bank has comparable data, each decile is 13, except for the first seven, which are 14 each. The top decile comprises a mixture, all rich states and rich developed economies, often medium sized economies. So, let's work down the list, we start with Qatar, Kuwait, Singapore, Norway, United Arab Emirates, Switzerland, Hong Kong, and only then the United States. With a per capita income of just under 50,000 of both PPP and current dollars, the United States was actually the reference point for all of the calculations. Then there follows Saudi Arabia, the Netherlands, Austria, Ireland, Oman, and Australia with \$42,000. The next decile covers a range down to around \$30,000, It includes most of the rest of Western and Northern Europe, as well as Canada and Japan. The third Decile, takes us down to around \$20,000 and it includes most of the rest of Europe, Malaysia, Kazakhstan, and Chile. The next two deciles take the range down to around 10,000, mostly countries from Central and South America, the Middle East, and North Africa and only just getting in slightly about

the modal income we have China. So let's scroll through and pause at the bottom 30%, at this point the per capita income is around 3,600 dollars. There are still some Asian countries in the mix, the largest being Bangladesh, but as we move downwards the fields increasingly dominated by sub Saharan Africa in countries, and even in mentioning the margin of error of around 50 percent, we're unlikely to propel them out of this bottom region.



Well, that concludes our look at the world's per capita GDP, once it's been adjusted for differences in purchasing power. The detailed data, as well as the per capita data without the adjustment, in other words, in current dollars, are in the database accompanying this course.

Lecture 1.6: Poverty

Hi there. In the last video, we saw how GDP was adjusted to take account the differences in domestic price levels. We explored the difficulties in compiling the data and we saw how it could add an extra dimension of error to the national income estimates. Now in this video, we'll see how international bodies **use this data to measure poverty** and how some of them attempted to **construct new measures** entirely.

Having invested so much in constructing the PPP GDP data, the World Bank was the first to use it to define poverty. **In 1990, the World Bank defined poverty as the number of people consuming less than \$1 a day at 1985 PPP dollars.** Note first that the **target isn't per capita GDP**, because this would have had the effect of ignoring the income divide within a country. And secondly, the **target is consumption**, not output. Using this criterion, the World Bank estimated that 42% of the population of developing countries lived in poverty. And **in 2005, it raised the poverty line to \$1.25, now measured at 2005 PPP dollars.** And on this new basis, it estimated that a quarter of the population in developing countries was now living in poverty.

When the UN formulated the **Millennium Development Goals**, it incorporated the \$1.25 target as one of its indicators. It **aimed at halving extreme poverty** compared to 1990 by 2015. Now it should be noted before you go any further that the World Bank uses many more indicators than this, and both work in alleviating global poverty. The \$1.25 figure is a headline figure intended to grasp the attention of the world's public. But it's always been more than that. From the 1960s, from the development decade, it's been dominated by the GDP data and investment ratios. GDP numbers, modified or not, were mechanically used to measure progress on almost every front. And some authors argue that human advance shouldn't just be a question of GDP movements. **Human development should include other dimensions like access to education and health.** In line with this thinking, the **UN Development Program** constructed a **human development index which it also launched in 1990.**

The human development index is made up of three components weighted equally, the basis for its calculations being changed frequently, the last time in 2011. **Health** was represented by life expectancy at birth. **Knowledge** was represented by the average years of schooling and by the expected years of schooling to give some credit to countries introducing educational reform. And **living standards** were represented by per capita gross national income, adjusted from PPP. The gross national income is a variant of GDP and its use was introduced in 2011. The effect is to widen the differential between rich and poorer countries, but it's much more difficult to calculate.

Now the UNDP has calculated HDI back to 1980. Between then and now, all countries in the world except the Democratic Republic of the Congo have improved their position largely because of increased life expectancy. Looking at the global pattern, richer countries tend to dominate the top end of the spectrum. But many oil rich Arab states dropped down the order. The bottom end of the spectrum is occupied by the countries from sub Saharan Africa, with one exception, and that exception is Afghanistan.

Assessing the HDI: Now the human development index is an extremely inferential index. It's often quoted in the press and in academic publications. And it's often used by social scientists in statistical exercises. It's been savagely criticized, sometimes fairly, and sometimes not. It's what we call a **composite index** where different aspects are fused together to give one result and indices like this are always **open to criticism on three grounds: weighting, standardization, and selection.**

On the question of **weighting**, the HDI comprises three elements, each accounting for one third. But is this fair? Is **GDP overrepresented**, because wealth also determines access to both health and education? Is **education over-represented**, because it's been driving the index forward and it takes no account of quality. Once you have the ratings, there's always **a substitution game** you can play. What is the tradeoff between an extra year of life and a small tweak on the GDP data? Nobody by the way, questions the GDP or GNI data itself.

Standardization is always a problem when you take variables with different dimensions. The years of life what ought to 90? The years of learning what, 4 to 10, or to 12 and do we include post secondary education? And per capital GDP? Where do we start, several hundred dollars? Where do we end? All of these need to be standardized to fall inside the same range. Do you insert upper limits? Do you

compress the gradient, a log scale instead of a simple number scale? And the answers to these questions all feed back into these substitution games. Now the UNDP has been particularly sensitive to criticisms of this kind and it's regularly altered the treatment of the variables employed. As we've seen, the last of these changes was in 2011.

Criticisms on weightings and standardization are possible in all composite indices. And the UNDP has defended itself by pointing out that the HDI is simple and transparent. But it's always ducked the question whether it adequately reflects human development.

The most persistent criticism has been on the **selection** of the dimensions to be included in the index. What, for example, about **human rights and democracy**, where is it? Well to be fair, when the UNDP tried to do this in 1992, it ran into such a storm of protest in the UN that it almost lost its funding. Okay, well, what about **inequality within nations**? Well, again to be fair, at the beginning, the data simply wasn't available. It is now, and the UNDP has constructed an index showing the extent to which HDI scores are affected by inequality. It's not a bad effort, but it still contains many of the drawbacks implicit in the original. What about **gender**? What about **real desperate dollar a day poverty**? Well in 2011, the UNDP also published two new indices covering each of these dimensions. I don't want to be unkind, but to be honest, I would wait for the inevitable and absolutely necessary revisions before even trying to use these.

Summary:

- GDP ppp thresholds
- HDI construction
- Criticism

Well, let's sum up now. We've seen how PPP calculations have been used in the description of poverty, either by themselves or in composite indexes. We've also seen how the human development index was constructed, and we've criticized it, pretty seriously. Now taken together, the videos this week have configured the world along different dimensions- population, output, income, and poverty that are commonly used in our own configuration of the world into big, small, rich, and poor, and a jolly good job too. But they're also employed by political economy analysts, all too often uncritically. This basic data is all too often slotted into sophisticated statistical models without pausing to ask whether it's suitable at all, and this surely nullifies the point of the whole exercise.

Next week, we look behind the concept of globalization. Where did it come from? What does it involve? And should we worry? Meanwhile, we built a visualization of the world map of poverty and we'd like you to look at it next.

Lecture 1.6.1: Visualization: World Map of Human Development Index

Hello again. In this visualization we're going to look at the results for 2012 for the Human Development Index compiled by the UN Development Program. If you recall, and as you can see here, the index was a composite one embracing three dimensions. In the lecture itself, we express several reservations about its construction, so don't forget that. The index covers a range from 1 to 0. The median, or halfway point, is at 0.7. The range in the top half of the index is more compressed than at the bottom half. There

Components of Human Development Index

Long and Healthy
Life

Life Expectancy at
Birth

Knowledge

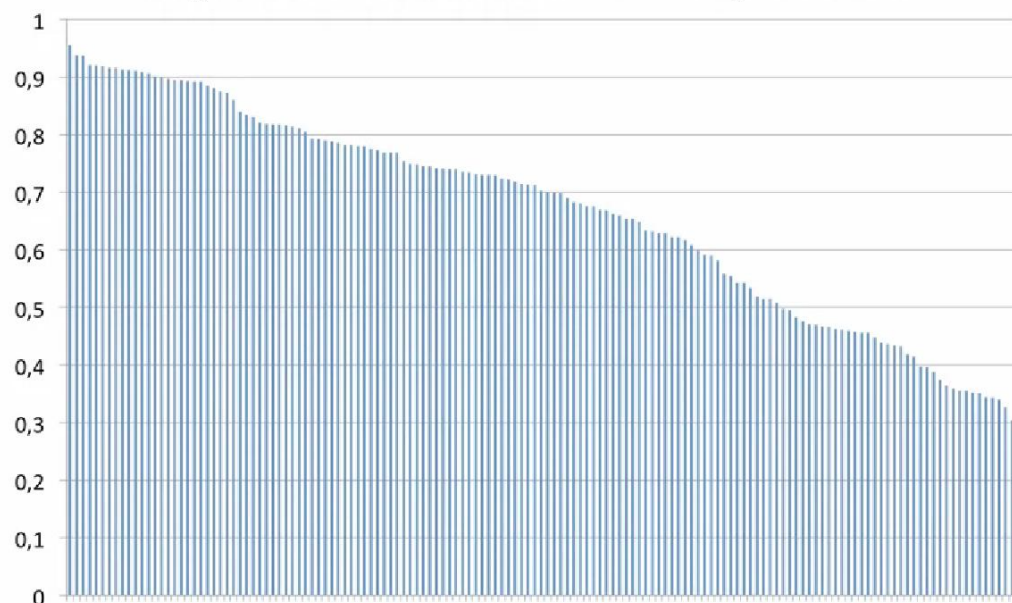
Mean Years of
Schooling

Expected Years of
Schooling

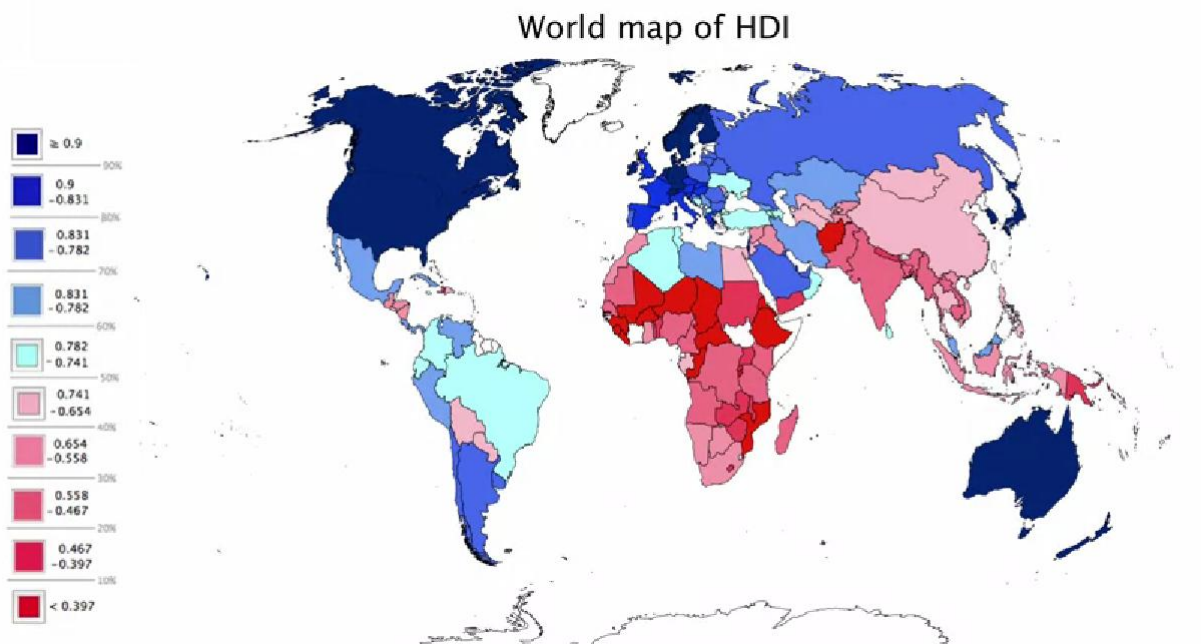
Decent Standard of
Living

Per capita GNI *PPP*

Range of Observations for the Human Development Index



are a few countries missing, as you can see here. With 146 larger countries, each decile is 14, except for the first six, which are 15.



So which countries are at the top of the index? Well nine of the countries in the top decile were also in the top 15 of the list for purchasing power parity GDP. These include six medium size European countries, Norway, the Netherlands, Ireland, Sweden, Switzerland, and Denmark, as well as Australia and the United States coming second and third respectively, and Hong Kong. These are joined by Germany, New Zealand, and fifth and sixth place respectively, Japan, Korea, and Israel. The richer countries dropping out of the index are Qatar, Kuwait, Saudi Arabia, Oman, and Singapore. The next decile comprises most of the rest of the richer European countries. It's now that you see Singapore and Qatar come into the decile. The third decile picks up a few remaining European states, and we start seeing some of South American countries appearing, as well as Belarus, Russia, and Saudi Arabia. Now let's scroll through the middle range. Don't forget, though, you can always slow it down and pause it at any point of interest. Entering the last three deciles, with a score of 0.519, we have Kenya followed by Bangladesh and Pakistan, Myanmar, Nepal and Papua New Guinea, also feature in this segment. But the rest is Sub-Saharan Africa. Only Haiti breaks the Sub-Saharan African presence in the bottom 20%. And don't forget, this is also a range in which one's faith in the detailed rankings shouldn't be too solid.

Well that concludes the visualizations accompanying this first week of lectures. I hope you've enjoyed them. And I also hope you'll take a more detailed look at the database, especially if you're focusing on a particular region, whether you're going to do the advanced track or not.

Week 1 Required Readings and Database Link:

Richard Griffiths, 'Readings Week One – Part 1: Population and GDP Current Values' [Click here to read](#)

Richard Griffiths, 'Readings Week One – Part 2: GDP ppp and Poverty' [Click here to read](#)

Configuring the World Database Week 1: Size, Wealth and Poverty. [Click here to read](#)

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