

Using Curated Datasets

Global Health Observatory

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www.who.int/data/gho

Global Health Observatory

The Global Health Observatory (GHO) is a branch of the World Health Organisation that aims to share data about different health issues facing the world, how they are being managed and how effective that management might have been. They produce reports on global health which rely heavily on up-to-date data in order to react quickly to health crises.



How do I access the data?

The above link is for the homepage of the Global Health Observatory. From here, there are two main ways researchers can access the data.

On the homepage are some quick links which one can access if one scrolls to the bottom of the page. These links mainly offer data on issues and specific diseases. At the top of the page is the

Examples of Indicators available

15-years old any alcoholic beverage consumed in past 12 months, (%)

Children aged under 5 overweight (%)

Coverage of skilled birth attendance

Diphtheria - number of reported cases

Full immunization coverage among 1-year-olds (%)

Government benefits for people with drug use disorders

Hospital beds (per 10 000 population)

Households using a piped onto premises drinking-water source (%)

Mean Body Mass Index (kg/m²)

Mental health outpatient facilities (per 100,000)

New HIV infections among adults 15-24 years old (per 1000 uninfected population)

Indicators tab. This provides a vast array of datasets (examples of which are given on the left) listed alphabetically for ease of search. When an indicator is selected, most will open with a cartographic **Visualisation** of how that indicator is felt across the world, often through a choropleth map. In the **Data** tab there is the option to view the associated data in a table from where it can be filtered by **Year**, **Country** and **Sex** for example, as well as downloaded as a picture or PDF file. While there is not the option to download the data in spreadsheet format, one can copy and paste the table into such a programme freely.

The **Metadata** menu takes you to a further page which gives a comprehensive breakdown of the nature of the data. For example, there is information on the rationale on which the data has been collected, how the data is defined, and the type of data displayed. There is also a **Related Indicators** menu which provides links to indicators related to that selected and hosted by the GHO site.

In the **Countries** tab a similar menu is offered with all countries listed alphabetically. When one is selected a simple country profile is displayed, with a series of graphics produced as standard.



How can I use this in my teaching?

Though not many specifications directly discuss detailed issues connected with health and disease, ideas surrounding health are an integral part of any study of development, inequality and injustice. As an indicator of progression in the Sustainable Development Goals, health, and particularly the health of vulnerable people, forms a key part of any study of the subject.

The study of disease and particularly the spread of malaria, tuberculosis and HIV/AIDS is a common part of the curriculum at Key Stage 3. Students can have less knowledge though about common health issues that effect both them and citizens the world over. Comparing the spread of non-communicable and communicable diseases can make an interesting focus for students wishing to do comparative spatial studies.

Within a country, health becomes an indicator of a huge range of socio-economic variables. Access to high quality healthcare varies within every country and students studying urban settlements and rural to urban migration will find health issues at the core of many of the decisions made by individuals and policymakers alike.

Wider demographic studies are difficult to pursue without an understanding of how health and disease can affect population dynamics. Life expectancy, birth rate and mortality rate are all correlated to the ability of a country's citizens to access quality healthcare and students wishing to study these statistics in more detail are well advised to understand more precisely how health can vary globally first.



Curriculum Links

This curated dataset links to a number of parts of the National Curriculum and is relevant to GCSE and A Level Specifications.

Key Stage Three: An understanding, through the use of detailed place-based exemplars at a variety of scales, the key processes in human geography relating to population and urbanisation.

GCSE: An understanding of the causes and consequences of uneven development at global level as the background for considering the changing context of population.

A study of a country that includes the examination of the wider political, social and environmental context within which the country is placed.

A Level: A study of patterns of human development and life expectancy.

An understanding of the impacts of global governance including human rights and the geopolitics of intervention.

An understanding of how attempts at global governance can work to promote growth and stability.

The following specifications make particular reference to health and disease in different contexts:

GCSE:			A Level:		
AQA	Edexcel A	Edexcel B	AQA	Edexcel	Eduqas
Eduqas A	OCR A		OCR		



An example data walk-through

A student wishes to study how the average Body Mass Index (BMI) score has changed over time for different countries. They have a theory that this measure will have increased fastest in countries that have seen the most rapid economic development over the same time period, while those countries who have seen a deceleration or recession in their economic growth are more likely to have kept the same or have a lower average BMI.

First, the student goes to the **Indicators** menu and in the search facility types in BMI to see the range of indicators available to them. From the generated list they select the indicator **Mean BMI (kgs/m²)**. They then select the **Data** tab and choose to filter by **Sex** (both sexes) to ensure the whole population is considered and by **Age Group** (18+ years) to test the theory against adults only. The student decided to study the change in BMI over the most recent time period available. The Global Health Observatory's most up to date data for all countries is that from 2015, so the student decided to study the change in BMI for the decade preceding this: from 2005 to 2015. Therefore, in the **Year** filter, they selected these two dates in order to make the display of data more manageable. The student has decided to study six different countries; two countries considered to have had rapid economic growth since 2005 (**China** and **Qatar**), two countries who have witnessed stagnated

economic growth (**Portugal** and **Japan**) and two countries that have gone into economic decline in that time period (**Yemen** and **Venezuela**). This data is garnered from external sources based on the rate of economic growth (GDP growth in annual %) between 2005 and 2015. When countries were placed in growth rate order, two were chosen from the top, middle and bottom of the list.

For each of these countries in turn, the student downloads the BMI

	2005	2015	Change in BMI
China	22.8	23.9	+1.1
Qatar	28.2	29.1	+0.9
Portugal	26.2	26.3	+0.1
Japan	22.7	22.9	+0.2
Yemen	22.4	23.3	+0.9
Venezuela	26.3	26.6	+0.3
WORLD	23.6	24.4	+0.8

data for **2005** and then repeats the exercise for those same countries for **2015**.

The student realises that this data does not offer a comparative figure for the global change in BMI and therefore there is no benchmark against which these figures can be judged. The student returns to the Global Health Observatory's site and to the **Filters** menu. Under **Location Type** they select **UN Region** which allows them to subsequently select **World** under the separate **UN Region** menu. Applying this filter gives the World picture of how BMI has changed in the same ten year period. The results are shown in the table above.

From the data, the student can see that it is certainly the case that the two countries that are classed as having experienced strong economic growth between 2005 and 2015 have seen an above world average increase in their citizens' BMI score. However, the same is not true at the other end of the scale of economic growth. While the countries that have seen a stagnant economy over the decade have seen little change in their mean BMI scores, those that have seen a decline in their economy have increased both above and below the world average in that time period.

The student also sees that their sample size is too small to really gain an understanding of any link between BMI change and economic growth and that all countries should be considered if a truly meaningful conclusion is to be drawn.



Suggested delivery activities

Future predictions

Students can download different data sets showing how certain health indicators have changed over time. These can be linked to World Health Organisation targets or the Sustainable Development Goals. Students can graph these results and then undertake a mathematical extrapolation of the data - showing how it is likely to change in the future if it continues at the same rate as the present.

Students can then think about the upper and lower limits of extrapolation and how likely it is that their prediction will actually happen. They can come up with reasons for lower or higher values in the future and make informed extrapolation lines for the upper and lower predictions too.



Battle of the Sexes

Students can pick out a health indicator of their choice and decide what the overall statistic tells them about the nature of health in a range of different countries at both ends of the development spectrum. They should then look at how the data changes when one looks at the indicator for men and women separately. This can raise a further discussion about how health indicator values for both men and women together may mask the seriousness of the situation for fifty percent of the population.

Students can analyse the extent to which there are particular types of health issues that seem to favour one sex over another and design a framework or health policy to address any sex and gender imbalance they find.



Top Trumps

Students can use the data from the Global Health Observatory to design 'Top Trumps' cards based on health statistics. They can choose eight different indicators which would cover a range of health and disease issues and make up cards for twenty different countries. Students should justify why they have chosen the eight indicators they have and why other indicators may have been rejected for the game. Students can then play the game against each other. This will get them to think and discuss the different aspects that make up health as well as learn about the health issues facing certain countries. They can conclude the game by trying to place the countries in order from good to poor health, again justifying their choices to their peers.



Student's T test

The Student's T Test is a statistical measure of the degree of commonality there is when one compares the spread of data seen in two separate samples. It can be used to compare different locations or the same location in different time frames. For example, a student might research the extent to which life expectancy data for all countries, or for a region of countries, in one year has the same or different degree of dispersion around the mean than that of the same set of countries in a different year. If the data was more spread out in one, it might suggest that health care policy changes or the infection rate of a certain disease are having an impact on the general life expectancy witnessed. A guide to using the Student's T test can be found on the next page.

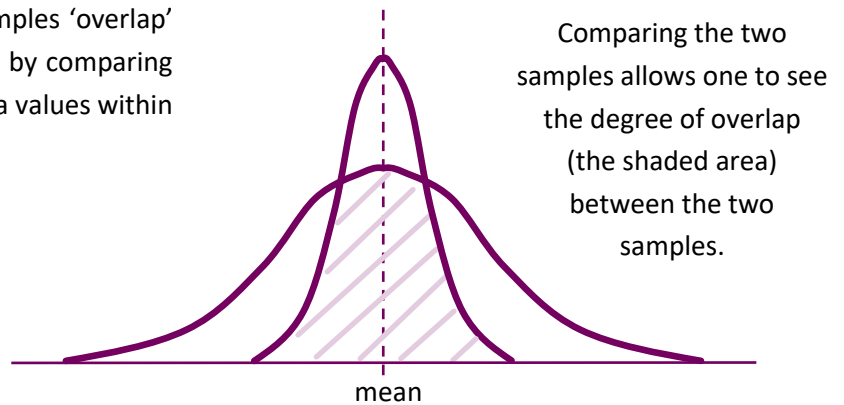




A Guide to Calculating a Student's T Test using Global Health Observatory Data

The Student's T Test is a statistical method used to find out the extent to which two samples 'overlap' in the spread of their data. This is calculated by comparing their standard deviations (how much the data values within a sample differ from the mean value).

Using the data from the Global Health Observatory site, a student might use the Student's T test to see the degree of commonality between life expectancy data (measured at birth in years) from before the Millennium Development Goals and after them.



	1999 (x_1)	2016 (x_2)
Argentina	73.4	76.2
Belize	68.7	74.2
Bolivia	61.8	70.6
Brazil	69.8	75.2
Chile	76.1	79.8
Colombia	72.6	76.7
Costa Rica	77.3	79.7
Ecuador	72.4	76.4
El Salvador	68.6	72.6
Guatemala	67.4	73.5
Guyana	65.0	69.5
Honduras	70.4	74.7
Nicaragua	69.1	73.9
Panama	74.9	78.0
Paraguay	70.3	73.8
Peru	70.7	76.0
Suriname	67.8	71.4
Uruguay	74.5	77.5
Venezuela	71.9	72.4
\bar{x}	70.7	74.9
σ	3.72	2.79
n	19	19

Worked example:

The relevant life expectancy data was downloaded from the GHO site, using the years 1999 (pre MDGs) and 2016 (post MDGs) as samples. The student wished to focus on a particular region of the world (Central and Southern America) so only downloaded data for those countries.

The student then calculated the mean life expectancy (\bar{x}), the standard deviation (σ) and the number of values (n) for each year. A data table was created (left).

Using the Student's T test equation, (below), the student then calculated the value of T:

$$t = \frac{|\bar{x}_1 - \bar{x}_2|}{\sqrt{\frac{(\sigma_1)^2}{n_1} + \frac{(\sigma_2)^2}{n_2}}} \quad t = \frac{|70.7 - 74.9|}{\sqrt{\frac{(3.72)^2}{19} + \frac{(2.79)^2}{19}}}$$

$$t = 3.94$$

This is known as the calculated value. To find out if this represents a significant difference between the two years of data, one needs to use a significance table and compare the calculated value with the critical value. The degrees of freedom are calculated by adding the two n values together and subtracting 2. In this case the degrees of freedom is 36 which gives the student a critical value of 1.697.

As the calculated value is greater than the critical value, the student can say that there is a significant difference in the distribution of values of life expectancy seen between the two years in question.