AOHS Global Health

Lesson 2

What Is Health?

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<th>Resource</th>
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<td>Student Resource 2.1</td>
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Student Name: ___________________________________________ Date: ____________

Directions: Read the list below and consider which of these services were a part of D. A. Henderson’s work on smallpox. Put a check mark next to any services that you saw or heard about in the video.

<table>
<thead>
<tr>
<th>American Public Health Association’s List of Essential Services</th>
<th>In the Video?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Monitor health status to identify community health problems.</td>
<td></td>
</tr>
<tr>
<td>2. Diagnose and investigate health problems and health hazards in the community.</td>
<td></td>
</tr>
<tr>
<td>3. Inform, educate, and empower people about health issues.</td>
<td></td>
</tr>
<tr>
<td>4. Mobilize community partnerships to identify and solve health problems.</td>
<td></td>
</tr>
<tr>
<td>5. Develop policies and plans that support individual and community health efforts.</td>
<td></td>
</tr>
<tr>
<td>6. Enforce laws and regulations that protect health and ensure safety.</td>
<td></td>
</tr>
<tr>
<td>7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable.</td>
<td></td>
</tr>
<tr>
<td>8. Assure a competent public health and personal health care workforce.</td>
<td></td>
</tr>
<tr>
<td>9. Evaluate effectiveness, accessibility, and quality of personal and population-based health services.</td>
<td></td>
</tr>
<tr>
<td>10. Research for new insights and innovative solutions to health problems.</td>
<td></td>
</tr>
</tbody>
</table>
Senior Resource 2.2

Key Word Prediction: Health Status Indicators

Student Name: __________________________ Date: __________

Directions: Before viewing the presentation Health Status Indicators: Life Expectancy, read the terms in Section 1 below. In the I Predict column, do your best to guess or predict what you think that term means. As you view the presentation, add a more detailed definition to the I Learned column. An example is provided.

Next, before viewing the presentation Health Status Indicators: Illness and Injury, read the terms in Section 2 and complete the I Predict column. Then complete the I Learned column as you view the presentation.

Section 1

<table>
<thead>
<tr>
<th>Term</th>
<th>I Predict</th>
<th>I Learned</th>
</tr>
</thead>
<tbody>
<tr>
<td>health</td>
<td>Not being sick</td>
<td>A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity</td>
</tr>
<tr>
<td>1 World Health Organization (WHO)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 life expectancy at birth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 mortality rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 under-5 mortality rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 infant mortality rate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Section 2

<table>
<thead>
<tr>
<th>Term</th>
<th>I Predict</th>
<th>I Learned</th>
</tr>
</thead>
<tbody>
<tr>
<td>neonatal mortality rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>maternal mortality rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>morbidity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>disability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>incidence rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>prevalence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>health-adjusted life expectancy (HALE)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Today we are going to learn about important ways that professionals can measure the health of a population.
Health status indicators measure the health of a population

Measurements called **health status indicators** are used to assess the health of populations around the world, from farmers in Uganda to city dwellers in India.

If you were trying to determine the health of a population, what are some of the things you would want to measure?

Health professionals use health status indicators to determine the health of different global populations. Health status indicators help them know if they are achieving the World Health Organization’s (WHO’s) goal of total physical, mental, and social well-being for everyone.

Image retrieved from http://commons.wikimedia.org/wiki/File:India_-_Sights_%26_Culture_-_001_-_crowd_shopping_%28342043908%29.jpg on August 9, 2013, and reproduced here under the terms of the Creative Commons Attribution 2.0 Generic license (http://creativecommons.org/licenses/by/2.0/deed.en). Image courtesy of McKay Savage.

Image retrieved from http://commons.wikimedia.org/wiki/File:Chimoio_market_-_banana_sellers.jpg on August 9, 2013, and reproduced here under the terms of the Creative Commons Attribution 2.0 Generic license (http://creativecommons.org/licenses/by/2.0/deed.en). Image courtesy of Ton Rulkins.
The WHO is the directing and coordinating authority for health within the United Nations system. To perform all of its tasks, the WHO needs to be able to measure health in each region of the world. The WHO divides the world into six regions: Africa, the Americas, the Eastern Mediterranean, Europe, Southeast Asia, and the Western Pacific. The WHO has a regional office in each of these areas. These regional map designations are for administrative purposes by the WHO and do not represent political areas or borders.

Health is measured by region because different parts of the world face different problems. For example, polio is a disease that used to affect a lot of people in the United States in the mid-20th century. Even one of our presidents, Franklin Roosevelt, suffered from polio. In the ’50s with the availability of mass-produced polio vaccines, people started to vaccinate their children. The United States has been polio-free since 1979. But there are three countries, Afghanistan, Nigeria, and Pakistan, where polio is still a major problem.

Data from http://www.who.int/about/regions/en.
The WHO provides leadership on all global health issues

In 1945, diplomats met and formed the United Nations. They discussed the importance of setting up a global health organization. In 1948, the World Health Organization was established. It has provided leadership on all global health issues ever since.


• The idea of setting up a global health organization originated with the United Nations.

• The WHO is now involved in all aspects of global health.

• Professionals who work for the WHO measure and monitor the status of health around the world.

The WHO was a leader in the smallpox eradication program. This image shows a woman being vaccinated in Niger in 1969.
Health status indicators can answer important questions

Health status indicators might take into consideration what type of work people do, whether they smoke, and what their diet is like.

- What health conditions are people suffering from?
- Which of these conditions cause people to be sick or disabled or to die?
- How fast is a disease spreading?
- Is a society’s health status improving?

What other questions might professionals ask to determine the health status of a population based on complete physical, mental, and social well-being?

Health status indicators provide important information about the health of a population. Indicators give information about what conditions a population suffers from and which of the conditions causes people to be sick or disabled, or to die. Indicators also tell us if a society's health status is improving. Improvements may be due in part to better health systems, such as the availability of medicine or the accessibility of health centers or hospitals.

Image retrieved from https://commons.wikimedia.org/wiki/File:2007-09-05_Hong_Sang-soo_sur_Nuit_et_Jour.JPG on August 9, 2013, and reproduced here under the terms of the Creative Commons Attribution 3.0 Generic license (http://creativecommons.org/licenses/by/3.0/deed.en). Image courtesy of Étienne André.
One way to measure health: look at how long people live

The WHO tracks the following information:

- How long people live (life expectancy)
- How many children die before they are 1
- How many people die before they are 60
- How many children die in the first 28 days of life
- How many children die before they are 5
- How many mothers die in pregnancy and childbirth

In the next few slides, you will learn why each of these measurements is important.
Life expectancy at birth gives an average prediction for how long someone will live

Life expectancy is influenced by when you were born. In most countries, people born 100 years ago had a much shorter life expectancy than people born today. You will probably live longer than your grandparents did.

Life expectancy is also influenced by where you were born. The map above shows the average life expectancy for babies born in 2011. As you can see, the average life expectancy for a baby born that year in the United States was 70–79 years. But there were several countries in Africa where a baby born in 2012 was expected to live fewer than 50 years!

Life expectancy is a very important measure of global health. As we continue to make medical breakthroughs, overall life expectancy increases. That is a positive trend, but it is not a universal trend. By looking at data on life expectancy, health professionals can identify quickly which regions of the world are facing the most difficult health challenges.

This map is included under fair-use guidelines of Title 17, US Code. Copyright © World Health Organization. Map available online at http://gamapserver.who.int/mapLibrary/Files/Maps/Global_LifeExpectancy_bothsexuals_2012.png.
Life expectancy is influenced by when and where you are born

Of these three babies, the one born most recently has the lowest life expectancy. The life expectancy of a baby born in South Africa in 2013 is one of the lowest ages in the world, with an average age of 59. The baby born in Japan in 2011 has the longest life expectancy at birth: over 80 years. The life expectancy of a person born in the US in 1930 was only 60.


Image retrieved from https://commons.wikimedia.org/wiki/File:Young_mother_%28Klashorst%29.jpg on August 9, 2013, and reproduced here under the terms of the Creative Commons Attribution 2.0 Generic license (http://creativecommons.org/licenses/by/2.0/deed.en). Image courtesy of Peter Klashorst.

Image retrieved from https://commons.wikimedia.org/wiki/File:Best_boy_1857.jpg on August 9, 2013, and reproduced here under the terms of the Creative Commons Attribution 3.0 Generic license (http://creativecommons.org/licenses/by/3.0/deed.en). Image courtesy of Boxears.

Mortality rate measures how many people die before old age

<table>
<thead>
<tr>
<th>2013 Mortality Rate for Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
</tr>
<tr>
<td>77/1000</td>
</tr>
</tbody>
</table>

- The adult mortality rate measures the number of deaths per year per 1,000 people between the ages of 15 and 60.
- It’s an important indicator because it shows where efforts can be taken to avoid early deaths.

If you were a 15-year-old girl living in the United States in 2013, the probability that you would die before reaching 60 was 77 out of a thousand (or 7.7 out of 100). If you were a 15-year-old girl living in Afghanistan in 2013, the probability that you would die before reaching 60 was much higher: 232 out of a thousand (or 23.2 out of 100).

Mortality rates, or death rates, vary by country because of availability of medical care and quality of life, such as sanitation and access to food and water. Mortality rates also consider non disease-related deaths, including people who are killed in a war or in a natural disaster.

In less developed parts of the world, many people die earlier than expected. Specific types of mortality rates are measured for life expectancy evaluation in a country, as you’ll see on the next few slides. Measuring the mortality rate at different ages can help professionals recognize what kinds of intervention could save more lives.

Data from [http://wdi.worldbank.org/table/2.21](http://wdi.worldbank.org/table/2.21).
The under-5 mortality rate measures the probability that a child will die before reaching the age of 5.

In the United States, the under-5 mortality rate for 2013 was less than 7 deaths per 1,000 live births. That means that for every 1,000 children in the United States, 7 will die before they reach the age of 5. The under-5 mortality rate is considered to be a leading indicator of the level of child health and overall development in a country. In other words, more-developed countries or wealthier countries have fewer deaths of children under 5.

This map is included under fair-use guidelines of Title 17, US Code. Copyright © World Health Organization. Map available online at http://gamapserver.who.int/mapLibrary/Files/Maps/global_underfivemortality_2013.png.
The infant mortality rate measures how many babies die in their first year of life

The infant mortality rate can provide insight into the quality of infant care available in a specific country or region. It may reflect a need for more parent education, since some causes of death are preventable. And some methods of care, like breastfeeding, can improve childhood immunity to disease. Countries that have high infant mortality or under-5 mortality rates also have lower life expectancy.

This map is included under fair-use guidelines of Title 17, US Code. Copyrights belong to respective owners. Map available online at http://commons.wikimedia.org/wiki/File%3AInfant_Mortality_Rate_World_map.png.
Low-income countries are making progress in reducing infant mortality rates

Over the last decades, the infant mortality rate in the poorest urban areas of Asia has seen a dramatic drop:

Children in the city of Gorakhpur, India, in 2000

<table>
<thead>
<tr>
<th>Year</th>
<th>Infant Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990s</td>
<td>8/1000 live births</td>
</tr>
<tr>
<td>2007</td>
<td>51/1000 live births</td>
</tr>
</tbody>
</table>

*What do you think might have contributed to a decrease in infant mortality rates?*

Infant mortality rates have been decreasing in urban areas of Africa and Asia. For example, the urban poorest 20% in Africa witnessed a decrease in infant mortality rate from 99 per 1,000 live births in the 1990s to 70 per 1,000 live births in 2000–2007, on average. The poorest 20% in urban areas of Asia have also experienced a fall in infant mortality rates. The rates dropped from 81 to 51 per 1,000 live births between the 1990s and 2000–2007, on average.


Try figuring out a statistic on your own

You are going to figure out what the infant mortality rate was in the United States in 2013.

First, write down this information:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of live births</td>
<td>3,932,181</td>
</tr>
<tr>
<td>Number of children who died</td>
<td>23,440</td>
</tr>
<tr>
<td>before the age of 1</td>
<td></td>
</tr>
</tbody>
</table>

You want to find out how many children out of 1,000 die before the age of 1. What equation do you think you’re going to use to calculate the infant mortality rate?

This exercise will help you see how health professionals use data to come up with statistics. Remember, the infant mortality rate measures how many children die before the age of 1.

23,440 deaths is to 3,932,181 live births as $X$ deaths is to 1,000 live births. You want to solve for $X$, which is the infant mortality rate.

Here’s the equation you want to use:

\[
\frac{23,440 \text{ deaths}}{3,932,181 \text{ live births}} = \frac{X \text{ deaths}}{1,000 \text{ live births}}
\]

Answer: The 2013 infant mortality rate in the United States was 6. That means 6 out of 1,000 children born that year died before they turned 1.

First, multiply the number of deaths by 1,000. You should get 23,440,000. Then divide 23,440,000 by the number of live births (i.e., by 3,932,181) to solve for $X$. The answer is 6 (rounded up from 5.96).
Many infants deaths that occur in the first 28 days of life are often connected to problems that occurred during the mother’s pregnancy. Maternal and neonatal tetanus is one example.

After a baby is born, the umbilical cord that connects the baby to its mother is cut. If the cut is done with an unclean knife, the baby could get tetanus. In 1988, 787,000 babies died from neonatal tetanus. These deaths were preventable. By immunizing women, it’s possible to dramatically reduce the risk of contracting neonatal tetanus. So, the WHO implemented a program to immunize pregnant women and women of child-bearing age. The program was a huge success. By 2008 there had been a 92% reduction in deaths from neonatal tetanus.

Pregnancy can be very dangerous for women who have limited access to health care. Many conditions and complications can arise during pregnancy, which can prove life threatening if not treated promptly. In some cases, the process of giving birth to a child can create life-threatening complications if the baby is not coming out easily or the mother begins to bleed too much. In some countries, women who choose to abort a pregnancy may die because the procedure is performed incorrectly or in unsterile and unsanitary circumstances.

In developed and wealthier countries, the maternal mortality rate is much lower. This is because it is far more common to have trained medical professionals available during a birth and, in many cases, because births happen at a medical facility.

Health status indicators are measurements that help us assess health populations

- Life expectancy at birth measures how long people will likely live based on where and when they are born.
- Mortality rate measures how many people die before old age.
- Under-5 mortality rate, infant mortality rate, and neonatal mortality rate measure how many children die.
- Maternal mortality rate measures how many women die during or shortly after pregnancy.

By using these health status indicators, health professionals can better understand the overall status of health around the world. This allows them to make informed decisions about what to do to improve the health and health care of people in all countries.
Student Resource 2.4

Summary: Reading and Translating Graphs

Directions: Look at the example graph Infant Mortality Rates in North America, 2013. Then read the example summary of the graph. Follow your teacher’s instructions to fill in the table explaining how the example summary accomplishes the points given in the checklist.

Example Summary

The graph Infant Mortality Rates in North America compares the estimated infant mortality rates from 2013 for all three North American countries: Canada, the United States, and Mexico. The infant mortality rate is the estimated number of infants that died per 1,000 live births. Canada has the lowest infant mortality rate in North America. At more than 15, Mexico’s infant mortality rate is significantly higher than that of both Canada and the United States. This graph raises questions about why Mexico’s infant mortality rate is so much higher than Canada’s and the United States’, and what efforts could be taken to lower the rate.
Summary Example Checklist

<table>
<thead>
<tr>
<th>Checklist</th>
<th>How the example summary accomplishes this point</th>
</tr>
</thead>
<tbody>
<tr>
<td>The summary mentions the title of the graph.</td>
<td></td>
</tr>
<tr>
<td>The summary explains the purpose of the graph.</td>
<td></td>
</tr>
<tr>
<td>The summary explains the health status indicator expressed in the graph.</td>
<td>Infant mortality rate is the health status indicator expressed in the graph. The second sentence of the summary explains that the infant mortality rate is the estimated number of infants that died per 1,000 live births.</td>
</tr>
<tr>
<td>The summary puts into words important statistics shown in the graph.</td>
<td></td>
</tr>
<tr>
<td>The summary points out why the graph is important.</td>
<td></td>
</tr>
</tbody>
</table>

Create Your Summary

Now that you’ve reviewed the example summary, write one yourself. First, analyze the graph Life Expectancy at Birth, 2013 at the top of the next page. Then write a short paragraph that summarizes the information given in the graph. Make sure that your paragraph includes all the points on the checklist shown at the end of this resource.
My Summary

Make Sure Your Summary Covers These Items

___ The summary mentions the title of the graph.
___ The summary explains the purpose of the graph.
___ The summary explains the health status indicator expressed in the graph.
___ The summary puts into words important statistics shown in the graph.
___ The summary points out why the graph is important.
Today we are going to learn about important ways we can measure the health of a population by looking at illness and injury.
Looking at how long people live is just one way to measure health

<table>
<thead>
<tr>
<th>Country</th>
<th>Egypt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life expectancy at birth (2013)</td>
<td>73 years</td>
</tr>
<tr>
<td>Infant mortality rate (2013)</td>
<td>23 deaths per 1,000 live births</td>
</tr>
<tr>
<td>Maternal mortality rate (2011)</td>
<td>66 deaths per 100,000 live births</td>
</tr>
</tbody>
</table>

What other information would you want to know about Egypt to determine the health of the population?

How long people live and how many children die are important health status indicators, but they only give part of the picture. Health status also has to do with quality of life. People who are ill or injured don’t enjoy the same quality of life as people who are healthy.

Information about illness and injury is also used to measure a health status

- What illnesses do people have?
- How quickly does an illness spread through a population?
- What percentage of the people in a population have the illness?
- How much does illness affect people’s ability to enjoy life?

In the next few slides, you will learn how illness is measured and how measurements of illness are used.
Morbidity is another word for illness and injury

- Illnesses, such as cancer, HIV, or malaria, are common examples of morbidity.
- Morbidity also refers to injuries, such as a loss of limb due to war.

Car accidents are a common cause of morbidity around the world.

Think about a particular condition, such as HIV. What might professionals want to be able to measure about that condition?

Morbidity refers to anything that interferes with a person’s good health. Morbidity means sickness, or a change from psychological and physical well-being. It is different from mortality, which refers to death.
Disability is a physical or mental condition that limits a person’s movements, senses, or activities

- Over a billion people, about 15% of the world’s population, have some form of disability.
- Rates of disability are increasing due to the population aging and increases in chronic health conditions, among other causes.

A disability could be the result of a disease, such as muscular dystrophy; an injury, such as a soldier losing a leg in battle; or something a person was born with, such as vision impairment. Disability can also refer to an intellectual disability or a mental disorder.

People with disabilities need health care services as much or more than the average person does, but they often get fewer health services because of their disability. Disabled people may have a harder time getting around, so getting themselves to the doctor can be more difficult. In other cases, people with certain intellectual disabilities or mental illnesses may not be able to understand the need for medical treatment. And in some places, disabled people are rejected by their families or seen as a burden on the community, so they may not have the support they need.

Professionals use incidence and prevalence to measure the occurrence of disease in a population

- **Incidence** = newly diagnosed cases of a disease in a particular population over a specific time period.

- **Prevalence** = the number of people in a specific population who contracted a disease and are still living with it.

As you saw in the video on smallpox, it is important to be able to track a disease. For a disease like smallpox, which is contagious, health professionals need to be able to track how fast it is spreading and where it is spreading. That is how they are able to stop the disease. It’s important to track the spread of all diseases, even noncommunicable (noncontagious) diseases like cancer or heart disease. With this information, organizations like the WHO know where to send professionals, materials, and medicine.

Incidence and prevalence are two health status indicators professionals use to track a disease. The bathtub shown is a good illustration of incidence and prevalence: The water coming in from the faucet is incidence. The water in the tub is prevalence. And water going out the drain is due to cure and/or death.

The next few slides are going to give you more information about what incidence and prevalence rates are and how to calculate them.
Health professionals use incidence rate to track the spread of disease in a specific population

### Bay Town Flu Season, 2013

<table>
<thead>
<tr>
<th>Total population in Bay Town:</th>
<th>1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>People who got the flu in Bay Town in 2013:</td>
<td>100</td>
</tr>
<tr>
<td>Incidence rate:</td>
<td>100/1,000 or 100 out of 1,000</td>
</tr>
</tbody>
</table>

- The **incidence rate** is shown by creating a fraction.
- The **numerator** (the top part of the fraction) is the number of newly developed cases of a health condition over a specific period of time, such as one year.
- The **denominator** (the bottom part of the fraction) is the total population.

Incidence measures the number of people in a specific population (such as people living in a particular city) who contract a disease over a certain period of time, such as one year. Incidence is usually used to track infectious diseases, acute diseases (diseases that occur suddenly), and outbreaks.

Imagine a small town called Bay Town with a population of 1,000 people. During a specific period of time, the 2013 flu season, 100 people got the flu. The incidence rate is determined by creating a fraction. Put the number of cases of the flu, 100, over the total population, 1,000. The incidence rate is 100 out of 1,000.
Let’s figure out the incidence of mononucleosis at Grant High School

- Grant High School has a population of 1,200 students.
- During the 2012–2013 school year, 10 students got the virus mononucleosis.
- Therefore, 10 out of 1,200, or 1 in 120 students, got mononucleosis during that school year. That’s the incidence rate.

Out of 1,200 students at Grant High School, there were four cases of measles during the 2012–2013 school year. What was the incidence rate for measles?

Remember, incidence measures the number of new cases of a disease in a specific population over a specific period of time. Take the example of Grant High School. During the 2012–2013 school year, 10 students got mononucleosis. There might have been other students who had mononucleosis in a previous school year, but that is not what the incidence rate is measuring. This study focuses on new cases.
Unlike incidence, prevalence focuses on the total number of existing cases of a disease. Prevalence includes both new cases and those who contracted a disease in the past and are still living with it. It is frequently used to measure the amount of chronic disease in a population.

Knowing prevalence is important for professionals who work with people who have terminal diseases. Prevalence allows health professionals to evaluate whether treatments are helping people live longer. In the 1980s, most people diagnosed with HIV didn't live for very long. Today, people with HIV can live for years, even decades, with the right medications. By studying the prevalence of HIV, doctors can see that the medications are helping patients, even if there is no cure for the disease at this time.

Let's take the Bay Town example again. The population of Bay Town is 1,000 people. In 2013, 50 people in Bay Town had been diagnosed with depression. This number includes new cases (people who received the diagnosis in 2013) and people who were diagnosed before 2013 and were still living with the condition. The prevalence rate is determined by creating a fraction. The prevalence of depression in Bay Town is 50 out of 1,000.
Let’s figure out the prevalence of obesity at Grant High School

- Grant High School has a population of 1,200 students.
- In 2013, 200 students at Grant High School were considered obese. This number includes students who had been obese before 2013 and were still obese, and students who were diagnosed for obesity that year.
- Therefore, 200 out of 1,200 students are obese. That’s the prevalence rate.

If there are 80 students with asthma at Grant High School, what is the prevalence rate?

Remember, prevalence measures the number of existing cases in a specific population at a moment in time. Take the example of Grant High School. In 2013, 200 students were considered obese. These students include people who were obese before 2013 and people who became obese that year. Prevalence shows the proportion of the population of Grant High that is obese: 200 out of 1,200.
Let’s look at the incidence and prevalence of arthritis in Bay Town

<table>
<thead>
<tr>
<th>Incidence of arthritis in Bay Town, 2013</th>
<th>Prevalence of arthritis in Bay Town, 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 out of 1,000</td>
<td>200 out of 1,000</td>
</tr>
</tbody>
</table>

How many new cases of arthritis were diagnosed in Bay Town in 2013? How many people in Bay Town in 2013 had arthritis but had been diagnosed prior to that year?

Arthritis, a form of a joint disorder, is a leading cause of disability in the United States. In 2013, there were 25 new cases in Bay Town. Remember, the incidence shows the number of new cases in a population during a specific period of time. The prevalence shows the total number of cases. So, in 2013 there were in total 200 cases of arthritis. Of those cases, 25 were new, and 175 had been diagnosed prior to 2013.
Health-adjusted life expectancy (HALE) is a measure of how many years you can expect to live in good health.

HALE evaluates the quality of life. In other words, while life expectancy measures the total number of years you might live, HALE measures the number of years that you are likely to feel well enough to enjoy your life.

<table>
<thead>
<tr>
<th>Country</th>
<th>2013 Life Expectancy</th>
<th>2013 HALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>61</td>
<td>50</td>
</tr>
<tr>
<td>Cameroon</td>
<td>57</td>
<td>49</td>
</tr>
<tr>
<td>United States</td>
<td>79</td>
<td>69</td>
</tr>
</tbody>
</table>

To calculate health-adjusted life expectancy, a person’s years of ill health are weighted according to the severity of the illness or condition and then subtracted from the overall life expectancy. HALE is a controversial measurement because not everybody responds to illness in the same way. Still, it’s one of the best ways to account for quality of life as well as life expectancy. As you can see from the statistics above, in both developed and developing nations there is a gap between the years someone is expected to live and the years they are expected to be in good health.

Data from [http://apps.who.int/gho/data/node.main.688](http://apps.who.int/gho/data/node.main.688).
Health status indicators help professionals understand the status of health around the world

- Tracking the incidence of a disease in a population shows us if the number of new cases of diseases like polio is decreasing.

- Tracking the prevalence of a disease shows if people are living longer with chronic illnesses such as HIV.

- HALE measures the number of years a person can expect to live in reasonably good health.

Health status indicators that measure illness and injury, as well as indicators that measure life expectancy, give health professionals information needed to improve the health of global populations.
Assignment Sheet: Health Status Measurement Tables and Graphs

Student Name: ______________________________ Date: __________________

Directions: Using Excel or the spreadsheet program your teacher provides, create the graphs described in this resource and write a summary describing each graph. Before you begin, read through all of the instructions and the assessment criteria to make sure you understand how your work will be assessed.

Column Graphs: Comparison of Life Expectancy in Different Regions of the World

Follow the steps listed below to create three column graphs showing the following:

- Comparison of life expectancy in the six different regions of the world
- Comparison of infant mortality rates in the six different regions of the world
- Comparison of under-5 mortality rates in the six different regions of the world

All of the data you need for these graphs is provided in the following table:

<table>
<thead>
<tr>
<th>Health Measurement Data from 2005–2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Africa</strong></td>
</tr>
<tr>
<td>Life expectancy at birth: 55.16 years</td>
</tr>
<tr>
<td>Infant mortality rate: 79 (out of 1,000)</td>
</tr>
<tr>
<td>Under-5 mortality rate: 125 (out of 1,000)</td>
</tr>
<tr>
<td><strong>Latin America and the Caribbean</strong></td>
</tr>
<tr>
<td>Life expectancy at birth: 73.41 years</td>
</tr>
<tr>
<td>Infant mortality rate: 22 (out of 1,000)</td>
</tr>
<tr>
<td>Under-5 mortality rate: 28 (out of 1,000)</td>
</tr>
</tbody>
</table>

Depending on your version of Excel, the procedure may vary slightly. If you run into difficulties, try using the Excel online help, get help from a classmate, or get help from your teacher.

1. Open a new file in Excel and save it.

2. On the first worksheet, create the life expectancy graph. What data will you need on the x-axis of your chart? Put a label for the data in the top row of a column, and then put the data in the rows below the label. Remember, the x-axis is the horizontal axis, and the y-axis is the vertical axis. An example of the x- and y-axes is shown in the image.
3. What data will you need on the y-axis of your chart? Put a label for the data in the top row of a column, and then put the data in the rows below the label.

4. Select the data in both columns to tell Excel you want to display this data in a chart.

5. Click Insert, and select the type of chart you want to create in the Charts section of the ribbon. (For this exercise, select Column, since you want to create a column chart.)

6. Look at the chart that is created. Does it make sense? Does it present the information well? If not, try to figure out what went wrong, and create a new chart if necessary.

7. Click within the chart area to edit it. Use Chart Tools > Layout to add a title for your graph, add data labels, and label each axis.

8. Underneath (or next to) the graph, write a one- or two-sentence explanation of why the information in the graph is important.

9. Create new worksheets and repeat this process to create the infant mortality and under-5 mortality column graphs.

### Line Graph: Progression of Heath Indicators Over Time

In the column graphs you created for this activity, you compared life expectancy by looking at statistics for different regions at the same point in time. Now you are going to create a line graph that shows how one health indicator, such as infant mortality or under-5 mortality, has increased or decreased over the past 50 years or so in a specific country.

Follow these steps to create your line graph:

1. Choose either the infant mortality rate or the under-5 mortality rate to research in more detail. You also need to choose a country to focus on for this part of the activity.

   Circle the indicator you will graph:
   
   infant mortality    under-5 mortality

   The country you will graph is:


3. Click on the Mortality indicators tab. Select the report that covers your chosen health indicator (infant mortality and under-5 mortality are the first two lines of the table). The report will open in an Excel file, and you will see a lot of data. Scan the report to find the country you chose to focus on.

4. In the Excel file, you will see data from the last 65 years (1950 to 2015). Use all of the data you find for your country. Copy that data for your country into an Excel worksheet and use it to create a line graph, following the same steps you used to create your column graphs.

5. When you have finished the graph, write a summary of the information in your graph. Refer to Student Resource 2.4 for a checklist of what to include in your summary. Write your summary directly in your Excel file and place the text below your graph.
Make sure your assignment meets or exceeds the following assessment criteria:

- A column graph accurately and clearly compares life expectancy in six regions of the world. It is easy to compare and contrast life expectancy in the different regions.
- A column graph accurately and clearly compares infant mortality in six regions of the world. It is easy to compare and contrast infant mortality rates in the different regions.
- A column graph accurately and clearly compares under-5 mortality in six regions of the world. It is easy to compare and contrast the under-5 mortality rate in the different regions.
- For each column graph, a one- or two-sentence explanation demonstrates an understanding of the importance of health status indicators.
- In the line graph that tracks the progression of infant mortality or under-5 mortality, it is easy to identify the country, the mortality rate for each year, and whether the mortality rate is going up or down.
- A one-paragraph summary of the line graph concisely and accurately explains what information the graph conveys and why that information is important.
- The assignment is neat and uses proper spelling and grammar.