

Global Health - HSP 2210

Slide Presentation Handout

Slide 1



Photo:

Community assessment chart in Kakelo, Kenya. This lecture will describe terms and measures typically used in public and global health. These measures are important to assess the state of health in a country or region, and is also critical for measuring trends and impact of interventions. The photo here is a chart that a community in western Kenya was using to plan and coordinate a community health intervention. While it might not use the same terms used in academic settings, it serves the same purpose. We need to remember that when we go into communities to assist, it is important to not bypass what they are already doing. What they are already doing may be quite effective.

Slide 2

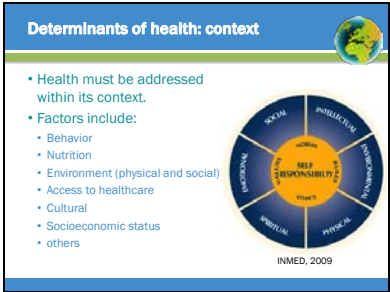


By measuring health we can:

- Estimate the relative importance of diseases. This allows us to decide what to prioritize.
- Monitoring trends is important so that we can see what is working and what is not working, as well as what we need to watch to identify outbreaks.
- Measuring allows us to make etiological connections. Unless you carefully measure potential risk factors and disease, you cannot make connections.

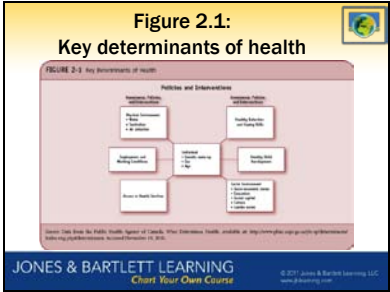
This picture comes from my own research in Kenya, during which we measured the impact of caring for orphans on the health of elders. Before we started measuring, the assumption was that caregiving had great negative impacts. What we found, however, was that overall caregiving had mostly positive effects on the health of grandmothers.

Slide 3

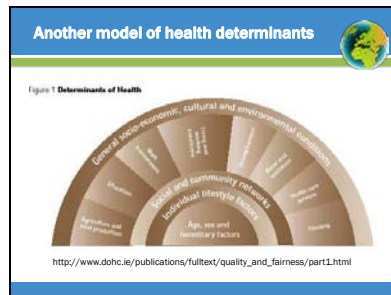


Health is complex and is determined by a combination of factors. While we tend to focus on one or two of these factors, depending on our disciplines, in fact all are important. Remember these factors as we discuss interventions throughout the course.

Slide 4



This figure from your textbook provides a little more detail about the determinants of health. As discussed throughout the course, interventions must account for these multiple factors.



This is another model of the determinant which layers individual innate factors, lifestyle factors, social and community networks with broader socio-economic, cultural and environmental conditions. So, when we think about a basic health problem—for example malaria—we can look at the disease from all of these perspectives.

Innate factors:

Pregnant women and children are more likely to get bitten by mosquitoes that carry malaria; people with sickle cell trait are equally likely to be infected, but are less affected by malaria

Lifestyle factors:

Certain occupations are more likely to put people in areas with high risk of mosquito exposure: fisherman, rice farmers. If people have standing water around their house or screens, their risk changes.

Social and community networks:

Those with stronger networks can rely on others to help care for them when they are sick.

General factors:

People who live in rice-farming regions or near lakes are at higher risks. Education is associated with higher rates of use of preventive measures. People may or may not be tested if they do not have access to healthcare facilities.

All of these layers interact with each other.

Slide 6

**Table 2.1:
Key Health Status Indicators**

Source: Data from the Public Health Agency of Canada, What Determines Health. Available at: <http://www.phac.aspc.gc.ca/ph-sp/determinants/index.php#determinants>. Accessed November 19, 2010.

TABLE 2-1 Key Health Status Indicators

Life expectancy at birth—The average number of years a newborn baby could expect to live if current mortality trends were to continue for the rest of the newborn's life

Maternal mortality ratio—The number of women who die as a result of pregnancy and childbirth complications per 100,000 live births in a given year

Infant mortality rate—The number of deaths of infants under age 1 per 1000 live births in a given year

Neonatal mortality rate—The number of deaths to infants under 28 days of age in a given year per 1000 live births in that year

Under 5 mortality rate (child mortality rate)—The probability that a newborn baby will die before reaching age 5, expressed as a number per 1000 live births.

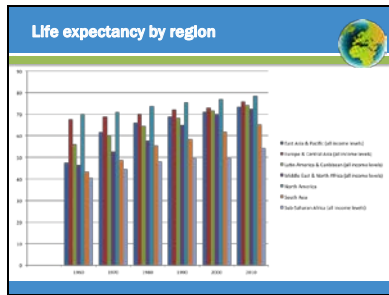
JONES & BARTLETT LEARNING
Chart Your Own Course

© 2011 Jones & Bartlett Learning, LLC
www.jonesandbartlett.com

You will see many indicators throughout the book and they are defined here in the table from your textbook.

- Life expectancy is most effected by infant and child mortality.
- Child mortality rates (particularly under 5) is often used as a general indicator of a nation's health.

Slide 7



This table presents life expectancy in broad geographic areas. Notice that there has been an increase across all regions but it is greater in some areas. Also note that sub-Saharan Africa has always and continues to lag behind the other regions.

Slide 8

Vital Registration

- Vital registration systems record births, deaths, and causes of death
- An accurate system is key to having quality data on a population
- Many low- and middle-income countries lack a vital registration system
- Developing a system is progress towards understanding and addressing health problems

JONES & BARTLETT LEARNING
Chart Your Own Course

© 2011 Jones & Bartlett Learning, LLC
www.jonesandbartlett.com

In order to track mortality rates, it is important to have an accurate and reliable vital registration system. Unfortunately, in many low and middle income countries, there is no system or the systems in place are inaccurate. It can be difficult in some places to develop a system because births often occur in homes and deaths may be handled entirely by the family. There are still many places in the world where people are unsure of their birthdate. In these regions, you have to estimate age using creative strategies.

Slide 9

Burden of disease

- Overall impact of disease and injury on individuals or populations.
- Indices to compare general health of populations
 - Health adjusted life expectancy (HALE)
 - Disability adjusted life years (DALY)

Health adjusted life expectancy (HALE):

- “The HALE is based on life expectancy at birth but includes an adjustment for time spent in poor health. It is most easily understood as the equivalent number of years in full health that a newborn can expect to live, based on current rates of ill health and mortality”.
- Disability adjusted life years (DALY): “DALYs are used to help measure the burden of disease and the effectiveness of health interventions. The DALY is a health gap measure, which combines information on the impact of premature death, and of disability and other non-fatal health outcomes“.

(<http://www.who.int/trade/glossary/story036/en/index.html>).

Slide 10

Global burden of disease

- Is influenced by:
 - Leading causes of death, illness and disability
 - Varies across populations
 - Varies within population by
 - Sex
 - Age
 - Sub-population (ethnicity)
 - Socioeconomic status
 - Changes over time

WHO and other organizations have exerted great effort to measure the relative burden of disease across the globe. Burden of disease is influenced by the leading causes of mortality, morbidity and disability. The relative burden varies across populations and within populations according to age, sex, ethnicity and SES. It also changes overtime, sometimes for better, sometimes worse.

Slide 11

Leading causes of mortality and burden of disease world, 2004

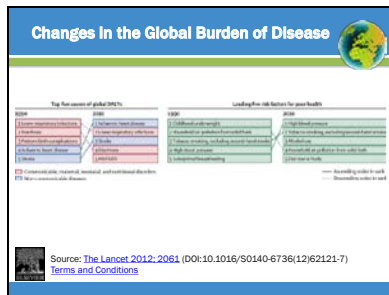
Mortality		DALYs	
	%		%
1. Ischaemic heart disease	12.2	1. Lower respiratory infections	6.2
2. Cerebrovascular disease	9.7	2. Diarrhoeal diseases	4.8
3. Lower respiratory infections	7.1	3. Depression	4.3
4. COPD	5.1	4. Ischaemic heart disease	4.1
5. Diarrhoeal diseases	3.7	5. HIV/AIDS	3.8
6. HIV/AIDS	3.5	6. Cerebrovascular disease	3.1
7. Tuberculosis	2.5	7. Prematurity, low birth weight	2.9
8. Trachea, bronchus, lung cancers	2.3	8. Birth asphyxia, birth trauma	2.7
9. Road traffic accidents	2.2	9. Road traffic accidents	2.7
10. Prematurity, low birth weight	2.0	10. Neonatal infections and other	2.7

Health Statistics and Informatics

5.3 million deaths in 2000.

This table presents the leading causes of death and leading DALYs. Note that the rank order differs because DALYs account for disability in addition to death.

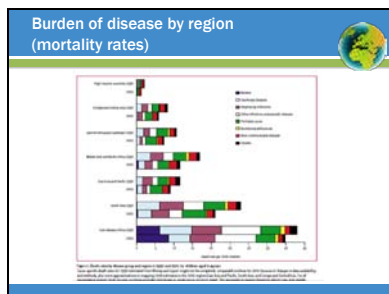
Slide 12



This table from the Lancet presents changes in DALYS and risk factors between 1990 and 2010. Note the shift from communicable to non-communicable disease. This is happening across the globe, albeit at different rates.

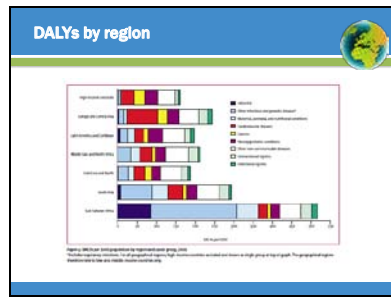
- Main causes of global DALYs and top five risk factors for poor health in 1990 and 2010.
- Data from Murray and colleagues¹ and Lim and colleagues.²
DALYs=disability-adjusted life years.

Slide 13



Note not only the pattern differences but the numerical differences. The overall death rates in Sub-Saharan Africa are almost 4 times the rate in Europe and central Asia!

Slide 14



This is similar when you look at DALYs.

Slide 15

Disease and development

- The pattern of disease varies by development.
- Watch:
<http://www.ted.com/index.php/talks/view/id/92>

This TED talk (also in your course materials) dramatically illustrates the factors which influence health indicators using worldwide data. These data are also available online to “play” at <http://hdr.undp.org/en/data/explorer/>.

After you view the Ted talk, consider how this changes your perspective on the relationship between countries, economic development and health? What are the main patterns? What are the driving forces?

Slide 16

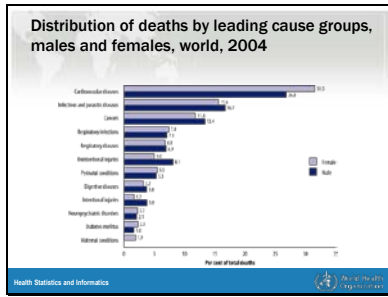
Causes of death vary by

- Population (across & within countries & regions)
- Age
- Income/SES/education
- Gender

Consider for example:

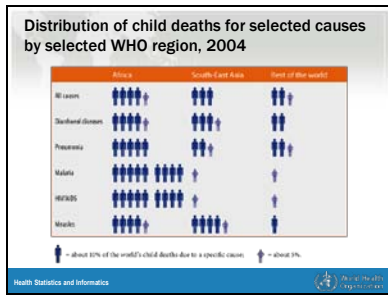
- Among low/middle income countries, leading causes are more likely communicable (infectious).
- Within countries (low/middle and high income), SES is associated with pattern of disease, with communicable diseases being more common with low SES and non-communicable with higher income –although this is dynamic.

Slide 17



This table shows the sex differences in the leading causes of death. Note, that despite our preconceptions, women suffer more mortality from CVD than men. Men are more likely to succumb to infection, cancer and injury than women.

Slide 18



This figure shows the relative impact of several communicable diseases and dramatically demonstrates the overwhelming burden in SE Asia and Africa relative to the rest of the world combined.

Slide 19

Risk Factor

- An attribute associated with a target condition. It can help to predict outcomes but might not cause the target condition.
- Modifiable Risk Factor
 - can be changed
- Non-modifiable Risk Factor
 - cannot be changed

We often look at risk factors for disease. Sometimes it is difficult to distinguish between MRF and NMRF if there is no agency to change. The collection of salient risk factors varies by population, development, SES, gender, etc.

Slide 20

Demography and health: key issues

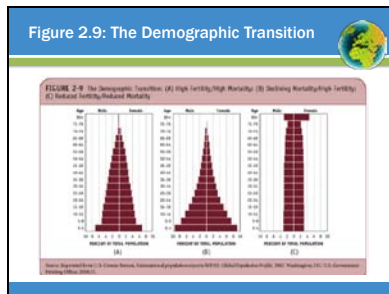
- Population growth
- Population aging
- Urbanization
- Demographic divide
- Demographic and epidemiological transitions

As populations grow, pressure is put on natural resources and infrastructure. These can impact health (for example access to clean water).

The world population is becoming older. This is partially due to increases in life expectancy and partially due to some large birth cohorts (in the US = baby boomers). While populations in the developed world are currently much older than the developing world, the rate of increase in the aged is actually faster in the developing world. Aging of the population changes the patterns of disease that we observe AND strains infrastructure.

- Urbanization: much of population has moved to urban areas in search of jobs → over crowding, strains infrastructure, increases disease.
- Demographic divide: interconnection between development and demography.
- Demographic transition: refers to the shift from high fertility/high mortality to low fertility & low mortality.
- Epidemiological transition: shift from infectious to chronic diseases.

Slide 21



High income countries have gone through a demographic transition from a pyramid shape (progressive smaller populations at older ages, to now, a more rectangular shape with fewer births and more people surviving to old age. Population transitions are occurring in low/middle income countries but not in exactly the same pattern. The HIV epidemic has really altered the shape of the population, given that the middle ages (15-49) have such high mortality rates.

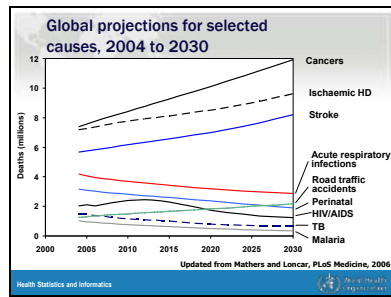
Slide 22

Progress in health

- Increases in life expectancy
- Variable by region and within region
- Gains in sub Saharan Africa largely reversed with HIV/AIDS epidemic in many countries

We have made progress in many areas of health across the globe. This is reflected in changes in life expectancy. This progress is variable within and between regions/countries. There were many gains in SSA that have been reversed in many countries due to the burden of the HIV/AIDS epidemic.

Slide 23



WHO predicts that rates of NCD will continue to increase while communicable disease and accidents will have small decreases.

Slide 24

In the future

- Environmental changes
- Economic development
- Science & technology
- Political stability & change
- Emerging and “re-emerging” infections

There are many factors that will lead to increases in some disease and decreases in others. We will explore these in greater detail throughout the course.