Facts on the Lung

http://www.lunguk.org/media-and-campaigning/media-centre/lung-stats-and-facts/factsaboutthelungs.htm
http://yucky.discovery.com/noflash/body/pg000138.html

- Your lungs contain almost 1500 miles of airways and over 300 million alveoli.
- Every minute you breathe in 13 pints of air.
- At rest, a person breathes about 14 to 16 times per minute. After exercise it could increase to over 60 times per minute.
- New babies at rest breathe between 40 and 50 times per minute. By age five it decreases to around 25 times per minute.
- The total surface area of the alveoli (tiny air sacs in the lungs) is the size of a tennis court.
- The lungs are the only organ in the body that can float on water.
- The lungs are the largest organ in the body and the only internal organ exposed to the external environment.

Lung Health
http://www.who.int/gard/publications/GARD%20Book%202007.pdf

- Indoor air pollutants are the unrecognized killers in low and middle income countries.
- Chronic diseases account for around 60 percent of all deaths globally, and 80 percent of these deaths occur in low- and middle-income countries.
- Only 20% of cases of chronic disease occur in high income countries.
- Hundreds of millions of people of all ages, in all countries of the world are affected by preventable chronic respiratory diseases.
    - More than 50% of them live in low and middle income countries or deprived populations.
- With action, however, 36 million premature deaths worldwide could be averted by 2015, according to the World Health Organization (WHO), with nearly half prevented in people under 70 years old.
- Millions have allergic rhinitis and other often-underdiagnosed chronic respiratory diseases.

Table 4 Estimates of the prevalence of preventable chronic respiratory diseases

Chronic respiratory disease	Year of estimation	Prevalence	Reference
Asthma	2004	300 million	*15*
Chronic obstructive pulmonary disease	2000	210 million	*30–32*
Allergic rhinitis	1996–2006	400 million	*33–37*
Other respiratory diseases	2006	>50 million	*38–44*
Sleep apnea syndrome	1986–2002	>100 million	*45–48*

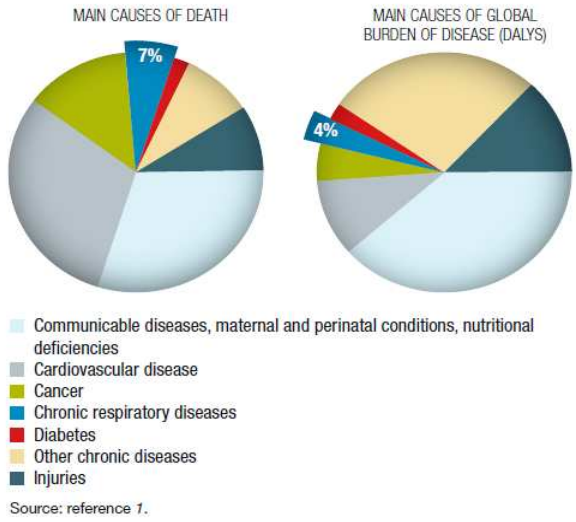
National Heart, Blood and Lung Institute
http://www.nhlbi.nih.gov/about/globalhealth/

- Chronic diseases account for around 60 percent of all deaths globally, and 80 percent of these deaths occur in low- and middle-income countries.

- With action, however, 36 million premature deaths worldwide could be averted by 2015, according to the World Health Organization (WHO), with nearly half prevented in people under 70 years old.
- More than 35 million people worldwide die from chronic noncommunicable diseases – especially heart disease and stroke, diabetes, lung diseases and cancer – twice the number of deaths from infectious diseases, maternal and perinatal conditions and nutritional deficiences combined
- Experts estimate that, unless action is stepped up, 388 million people worldwide will die of one or more such diseases within the next decade

http://www.who.int/gard/publications/GARD%20Book%202007.pdf

Figure 1 Projected global deaths and disability–adjusted life years (DALYs) in 2005



Source: reference *1*.

Table 6 Disability-adjusted life years (DALYs) attributable to disorders causing the greatest burden worldwide

Rank	Disorder	Number of DALYs ($x10^3$)
1	Lower respiratory infections	91.3
2	HIV/AIDS	84.4
3	Unipolar depressive disorders	67.2
4	Diarrhoeal diseases	61.9
5	Ischaemic heart diseases	58.6
6	Cerebrovascular disease	49.2
7	Malaria	46.5
8	Road traffic accidents	38.7
9	Tuberculosis	34.7
10	**Chronic obstructive pulmonary disease**	**27.7**
11	Congenital abnormalities	27.3
12	Hearing loss – adult onset	26.0
13	Cataracts	25.2
14	Measles	22.4
15	Violence	21.4
16	Self-inflicted injuries	20.7
17	Alcohol use disorders	20.3
18	Protein energy malnutrition	16.9
19	Falls	16.2
20	Diabetes mellitus	15.4
21	Schizophrenia	16.1
22	**Asthma**	**15.3**
23	Osteoarthritis	14.8
24	Vision loss, age-related and other	14.1
25	Cirrhosis of the liver	13.9

Source: reference *68*.

Facts on Individual Lung Diseases

Asthma

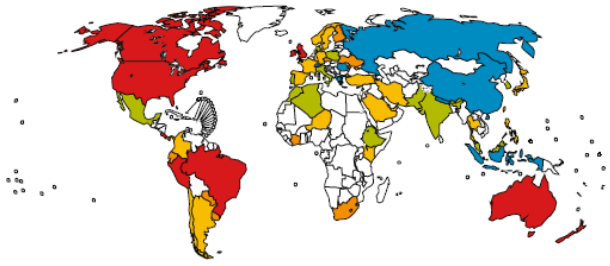
http://www.who.int/gard/publications/chronic_respiratory_diseases.pdf

http://www.theunion.org/asthma-division/asthma.html

- According to the latest WHO estimates (2007) 300 million people have asthma.

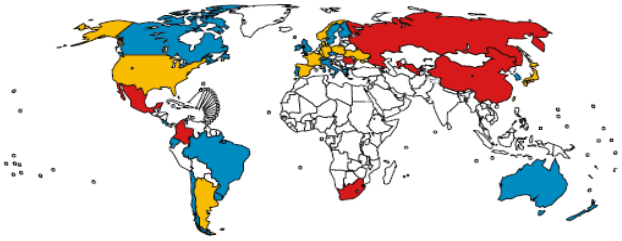
- Currently the largest number of asthma patients live in India, Latin America and Africa. There are approximately 3 million persons with asthma in Japan and in France, compared with an estimated more than 15 million in India and over 30 million in Africa.
- Globally, 250, 000 people die of asthma every year.
- Asthma deaths are related to lack of proper treatment.
- Asthma is the most common chronic disease among children.
- Most asthma-related deaths occur in low- and lower-middle income countries.
- Asthma has a relatively low fatality rate compared to other chronic diseases.
- Asthma deaths are related to lack of proper treatment.

Figure 4 World map of the prevalence of clinical asthma



Source: reference *15*.

Figure 5 World map of asthma case fatality rates: asthma deaths per 100 000 people with asthma in the 5–34 year age group



Source: reference *15*.

Tuberculosis
http://www.who.int/gard/publications/GARD%20Book%202007.pdf
http://www.theunion.org/tuberculosis/tuberculosis.html
http://www.who.int/tb/publications/global_report/2009/key_points/en/index.html

- A contagious disease that spreads through the air. Only people who are sick with TB in their lungs are infectious. When infectious people cough, sneeze, talk or spit, they propel TB germs, known as bacilli, into the air. A person needs only to inhale a small number of these to be infected.

- Left untreated, each person with active TB disease will infect on average between 10 and 15 people every year.
- Globally, there were an estimated 9.27 million incident cases of TB in 2007. This is an increase from 9.24 million cases in 2006, 8.3 million cases in 2000 and 6.6 million cases in 1990. Most of the estimated number of cases in 2007 were in Asia (55%) and Africa (31%), with small proportions of cases in the Eastern Mediterranean Region (6%), the European Region (5%) and the Region of the Americas (3%). The five countries that rank first to fifth in terms of total numbers of cases in 2007 are India (2.0 million), China (1.3 million), Indonesia (0.53 million), Nigeria (0.46 million) and South Africa (0.46 million).
- One-third of the world's population is currently infected with the tubercle bacillus, nearly 9 million new cases occur each year.
- An estimated 1.3 million deaths occurred among HIV-negative incident cases of TB (20 per 100 000 population) in 2007
- Left untreated, each person with active TB disease will infect on average between 10 and 15 people every year.
- More than one and a half million deaths are due to Tuberculosis (TB).
- Someone in the world is newly infected with TB bacilli every second.
- Overall, one-third of the world's population is currently infected with the TB bacillus.
- 5-10% of people who are infected with TB bacilli (but who are not infected with HIV) become sick or infectious at some time during their life. People with HIV and TB infection are much more likely to develop TB.

Swine Flu
http://www.who.int/csr/disease/swineflu/en/

- The virus is spread from person-to-person. It is transmitted as easily as the normal seasonal flu and can be passed to other people by exposure to infected droplets expelled by coughing or sneezing that can be inhaled, or that can contaminate hands or surfaces.
- To prevent spread, people who are ill should cover their mouth and nose when coughing or sneezing, stay home when they are unwell, clean their hands regularly, and keep some distance from healthy people, as much as possible.
- There are no known instances of people getting infected by exposure to pigs or other animals.

COPD (chronic obstructive pulmonary disease) also known as emphysema or chronic bronchitis
http://www.nhlbi.nih.gov/health/public/lung/copd/index.htm

- The airways—tubes that carry air in and out of your lungs—are partially blocked, which makes it hard to get air in and out.
- 210 million people have chronic obstructive pulmonary disease (COPD)
- More than 3 million people died of COPD in 2005, which is equal to 5% of all deaths globally that year.
- Almost 90% of COPD deaths occur in low- and middle-income countries.
- The primary cause of COPD is tobacco smoke (through tobacco use or second-hand smoke).
- COPD is not curable, but treatment can slow the progress of the disease.
- Total deaths from COPD are projected to increase by more than 30% in the next 10 years without interventions to cut risks, particularly exposure to tobacco smoke.
- The most important risk factors for COPD are:
    - Tobacco smoking
    - Indoor air pollution (such as biomass fuel used for cooking and heating)

- Outdoor air pollution
- Occupational dusts and chemicals (vapors, irritants, and fumes)

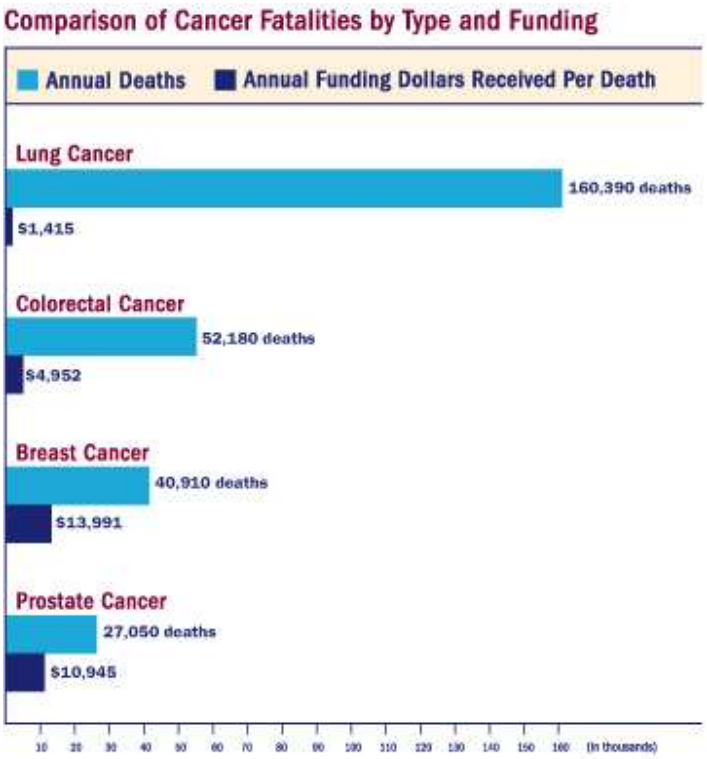
Pneumonia
http://www.who.int/mediacentre/factsheets/fs331/en/

- Pneumonia is the leading cause of death in children worldwide.
- Pneumonia kills an estimated 1.8 million children every year – more than AIDS, malaria and measles combined.
- Pneumonia can be caused by viruses, bacteria or fungi.
- Pneumonia can be prevented by immunization, adequate nutrition and by addressing environmental factors.
- Pneumonia can be treated with antibiotics, but less than 20% of children with pneumonia receive the antibiotics they need.

Lung Cancer
http://www.who.int/mediacentre/factsheets/fs297/en/index.html

- Smoking is responsible for upwards of 80% of all lung cancers.
- Lung cancer accounts for 1.3 million deaths each year.

http://www.nationallungcancerpartnership.org/index.cfm?page=faq#comparison_chart



Estimated deaths by cancer type in the U.S. for 2007 from the American Cancer Society, *Surveillance Research 2007*. Annual funding figures represent the National Cancer Institute's estimated 2007 spending. Death estimates are rounded to the nearest 10, Annual Funding Dollars Per Death rounded to the nearest dollar.

Importance of the Lung

The American Association for Respiratory Care
http://www.aarc.org/media_center/press_releases/respiratory_therapists_explain_why_lung_Health_is_important_heart_month.asp

- Although the heart and lungs are two separate organs, they are intimately connected through a series of major blood vessels
- The lungs transport oxygen to the heart, and the heart pumps the oxygen, carried in the blood, to all the organs and tissues of the body
- When the lungs are not functioning properly, either due to acute or chronic disease, the ability of the lungs to bring in adequate oxygen is affected
- Lung disease can help uncover early heart problems

Lack of Attention on the Lungs

http://www.who.int/gard/publications/GARD%20Book%202007.pdf

In all countries, the prevalence and incidence of chronic respiratory diseases are under-investigated.

Basic epidemiological data on the chronic respiratory disease risk factors, burden and surveillance are reported for less than 25% of the world's population and are largely from high-income countries. However, it is the low- and middle-income countries which will experience the largest increase in chronic diseases. Data on chronic respiratory disease risk factors, burden and surveillance are fragmented and often incomplete in high-income countries. Prevalence and morbidity data can underestimate the burden of chronic respiratory diseases because these diseases are not usually diagnosed until they are clinically apparent and moderately advanced. (pg. 61)

Chronic respiratory diseases are under-diagnosed in all countries, but particularly in low- and middle-income countries. Many patients are not diagnosed until chronic respiratory diseases are severe enough to prevent normal daily activities, including attendance at school or work. Wheezing is often considered to be the expression of an acute infection. The diagnosis of chronic respiratory diseases is delayed, being made only after several exacerbations. There are a limited number of diagnostic tests for the early screening of predisposition to COPD, asthma or allergy. These tests are generally not used correctly to establish preventive measures in groups at risk. Training on the indications for diagnostic testing, and on the use and interpretation of diagnostic tests, is insufficient. Furthermore, in low- and middle-income countries, much medical equipment is not in use because of a lack of maintenance or spare parts, because it is too sophisticated, or simply because the health personnel do not know how to use it. (pg. 78)

In all countries:

- Chronic respiratory diseases are unrecognized and under-treated.
- Education of health-care providers needs to be improved.

- Integration of care for chronic respiratory diseases between primary and referral levels is essential for optimal management of these chronic diseases.
- In low- and middle-income countries:
- Most patients with asthma or COPD receive treatment only during exacerbations, rather than benefiting from continuous care.
- Drugs are often unavailable or not affordable. (pg. 82)

Laws/Regulations Pertaining to Lung Health

The United States Environmental Protection Agency
http://www.epa.gov/air/urbanair/
The Clean Air Act requires EPA to set National Ambient Air Quality Standards for six common air pollutants.

Financial Burden of Lung Disease

Thorax
An International Journal of Respiratory Medicine
http://thorax.bmj.com/cgi/content/extract/53/4/239
Although lung disease is the second largest cause of mortality in the UK, accounting for one in five deaths, its research funding attracts only 2% of government funding.

Public Health Agency of Canada
http://www.phac-aspc.gc.ca/publicat/2007/lbrdc-vsmrc/index-eng.php#tphp
Presently, almost 6.5% of total health care costs were related to respiratory diseases (not including lung cancer). This accounts for nearly $5.70 billion in direct (visible) costs of health care, such as for hospitalization, physician visits, research and drugs, as well as an additional $6.72 billion for less visible (indirect) expenses associated with disability and mortality.

Economic burden of lung disease
http://www.brit-thoracic.org.uk/Portals/0/Library/BTS%20Publications/burden_of_lung_disease.pdf

European Lung White Book
http://www.loveyourlungsbreatheforlife.com/images/european_white_book.pdf
(European data from 2004)

- In Europe, respiratory diseases rank second (after cardiovascular diseases) in terms of mortality, incidence, prevalence and costs.
- Lung cancer, pneumonia and chronic obstructive pulmonary disease (COPD) are the main respiratory causes of death in Western Europe, as well as in Central and Eastern Europe. In both parts of Europe, lung cancer ranked third in 1990 (after ischaemic heart and cerebrovascular diseases), followed by pneumonia in the fourth position, and COPD in positions five and eight, respectively. It is already estimated that in 2010, COPD will have risen to fourth place.
- Lung cancer is predicted to remain the number three killer in Western as well as in Eastern Europe.

Financial burden on Europe
http://www.pneumacare.com/index_files/Page662.htm

- The total financial burden of lung disease in Europe amounts to nearly €102 billion.
- COPD contributes almost one half of this figure followed by asthma, pneumonia, lung cancer and TB. This includes direct and indirect costs of these diseases: inpatient care (17.5%); ambulatory care (8.9%); drug supply (6.6%): mortality and rehabilitation (19.6 %); and lost working days (47.4%).

Worldwide stats
http://www.pneumacare.com/index_files/Page662.htm

- Chronic respiratory diseases caused over 4 million deaths in 2005.
- Lung disease already costs the UK and US more than $15 Billion
- Drug costs to patients and insurance providers will top $14.4 billion p.a. by 2010.

http://www.reuters.com/article/pressRelease/idUS42390+29-Jun-2009+PRN20090629

- COPD is currently the fourth most common cause of death and by 2030 is predicted to become the third most common cause of death and the fourth most important disability causing illness.
- The total financial burden of lung disease in Europe amounts to nearly EUR102 billion with COPD contributing almost one half of this figure.