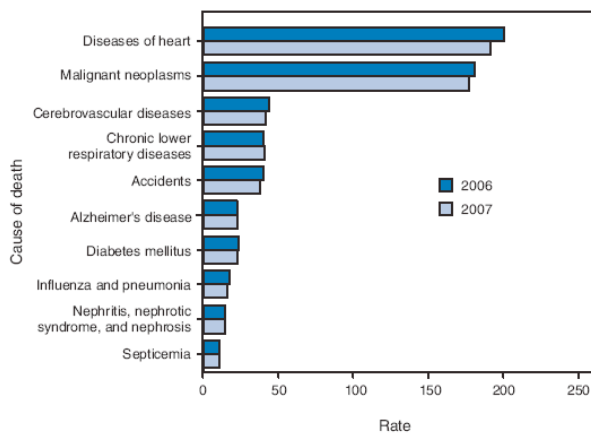


Diseases and their causes

US275 Scientific Ethics
John R. Hoffman
Arcadia University



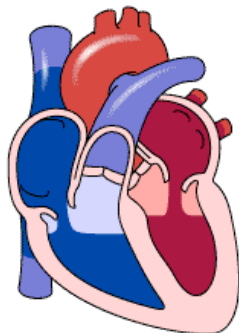
Leading Causes of Death in the United States



Age-adjusted Death Rate per 100,000 U.S. standard population
(MMWR, CDC, 2009)

Diseases of the Heart

- atherosclerosis
 - blockage of arteries
 - disrupt blood flow to heart
- heart arrhythmia
 - irregular heart rate
- cardiomyopathy
 - thickening or enlarging of heart muscle



Malignant Neoplasm

- cancer
 - wide range of diseases
- tumor
 - uncontrolled growth of cells
- malignant
 - spread and invade other body parts

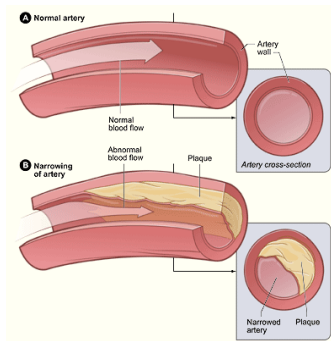


Rare and benign cutaneous neoplasm of sweat glands (Hidradenoma) in 77-year-old man

4

Cerebrovascular Disease

- stroke / transient ischemic attack (TIA)
 - blood supply to the brain disrupted
- subarachnoid hemorrhage
 - bleeding in the brain

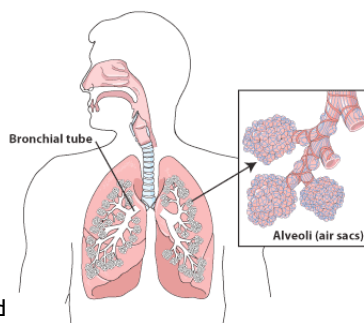


The illustration shows a normal artery with normal blood flow (top) and an artery containing plaque buildup (bottom)
http://www.nhlbi.nih.gov/health/ohci/Diseases/Hbc/HBC_WhatIs.html

5

Chronic Lower Respiratory Diseases

- Chronic Obstructive pulmonary disease (COPD)
 - emphysema
 - damaged air sacs
 - chronic bronchitis
 - lung airways narrowed and/or partially clogged with mucus

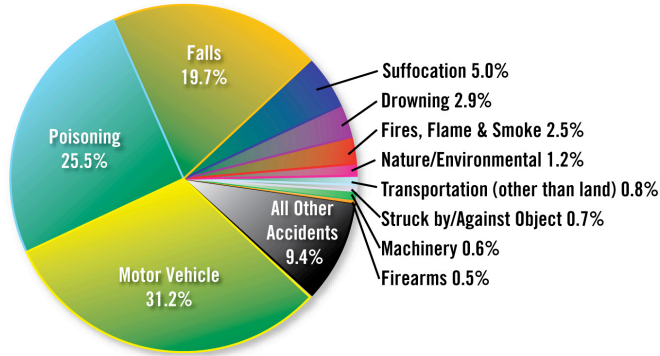


www.womenshealth.gov
 U.S. D.H.H.S

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Accidents

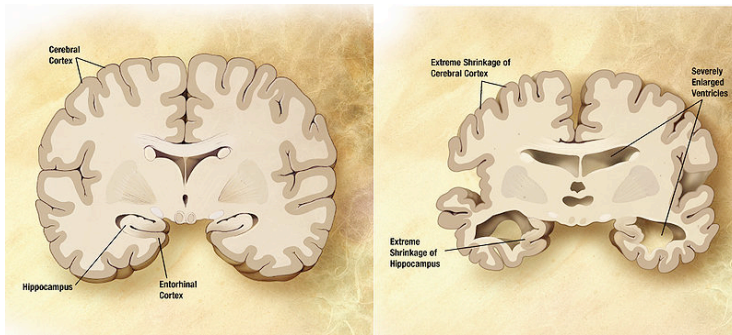
UNINTENTIONAL FATALITIES



Source: CDC WISQARS Injury Mortality Reports

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Alzheimer's disease is associated with brain cell death and dementia



Combination of two brain diagrams in one for comparison. In the left normal brain, in the right brain of a person with Alzheimer's disease.

NIH National Institute of Aging

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Patients with diabetes mellitus have difficulty controlling the sugar levels in their body

- Insulin
 - hormone released by body after eating to store sugar
- chronic high sugar levels leads to damage of
 - blood vessels
 - kidney
 - nerves



WhatIsdiabetesmellitus.org

9

Influenza and pneumonia affect the lungs of patients.

- serious lung infections
 - difficulty breathing
 - oxygen deprivation
 - infection can spread

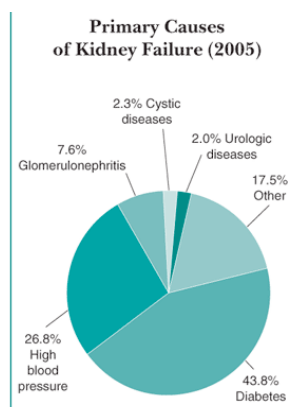


Typist wearing mask, New York City, October 16, 1918, during the "Spanish flu" influenza pandemic. National Archives.

10

Kidney Diseases affect the ability of the body to remove waste materials from blood.

- wastes build up in body
- can be caused by
 - diabetes
 - high blood pressure

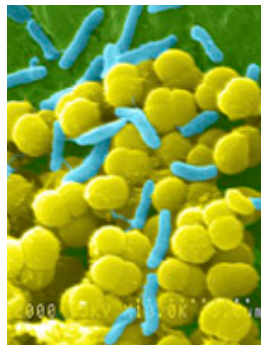


National Kidney & Urologic Diseases Information Clearing House, U.S. Dept. of Health & Human Services.

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Septicemia is a bacterial infection of the blood

- bacteria rapidly divide and spread through the body.
 - widespread inflammation
 - blood clots
 - can cause organ failure
- requires hospitalization and high doses of antibiotics.



http://www.nigms.nih.gov/Education/factsheet_sepsis.ht

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Bacterial infections are common illnesses that can be treated with antibiotics

- antibiotics
 - natural or manmade chemicals that kill bacteria
- widespread use of antibiotics
 - leading to antibiotic resistant bacteria



Streptococcal pharyngitis (strep throat)
Centers for Disease Control, 1958

13

Viral infections often have similar symptoms to bacterial infections.

- Viruses
 - RNA or DNA transported by outer covering
 - treat with antiviral medications
- examples:
 - cold, flu, chicken pox, HIV



Child with varicella disease (chickenpox)
Wikimedia Commons

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Assignment

Assignment

How should we allocate funds to research cures for diseases?

The National Institutes of Health are the primary funder of biomedical research in the United States. Even with an annual budget of approximately 32 billion dollars, the funds have to be allocated to research investigating a range of diseases and many projects are not funded. Each year people argue for more money for specific areas. Disparity appears when you look at the amount of funds by number of deaths from the disease, number of people affected by the disease, cost of treating the disease, etc.

In your discussion group:

Discuss what criteria should be used in deciding what proportion of available funds should be allocated to support research for a specific disease type.

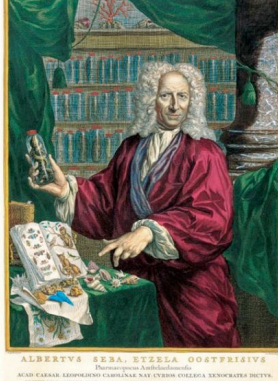
Readings

Healthy Living: Centers for Disease Control and Prevention

<http://www.cdc.gov/HealthyLiving/>

Healthy living: MedlinePlus. U.S. National Library of Medicine, National Institutes of Health.

<http://www.nlm.nih.gov/medlineplus/ency/article/002393.htm>



ALBERTVS SEBA, STELLA GUSTFRISVS
Pharmacopoeiae Amstelredamensis
ALUM. CASARI. UNIVERSITATIS COMITIS. ET. PRAES. SILLAE. J. HOUBRACKEN. DELINXIT.
Portrait of Albertus Seba,
a 18th-century Dutch pharmacist
Jacob Houbraken, 1731

Any Questions?

Email me at:
hoffmanj@arcadia.edu



<http://www.pippibullpensets.com/images/animated-question-mark.gif>