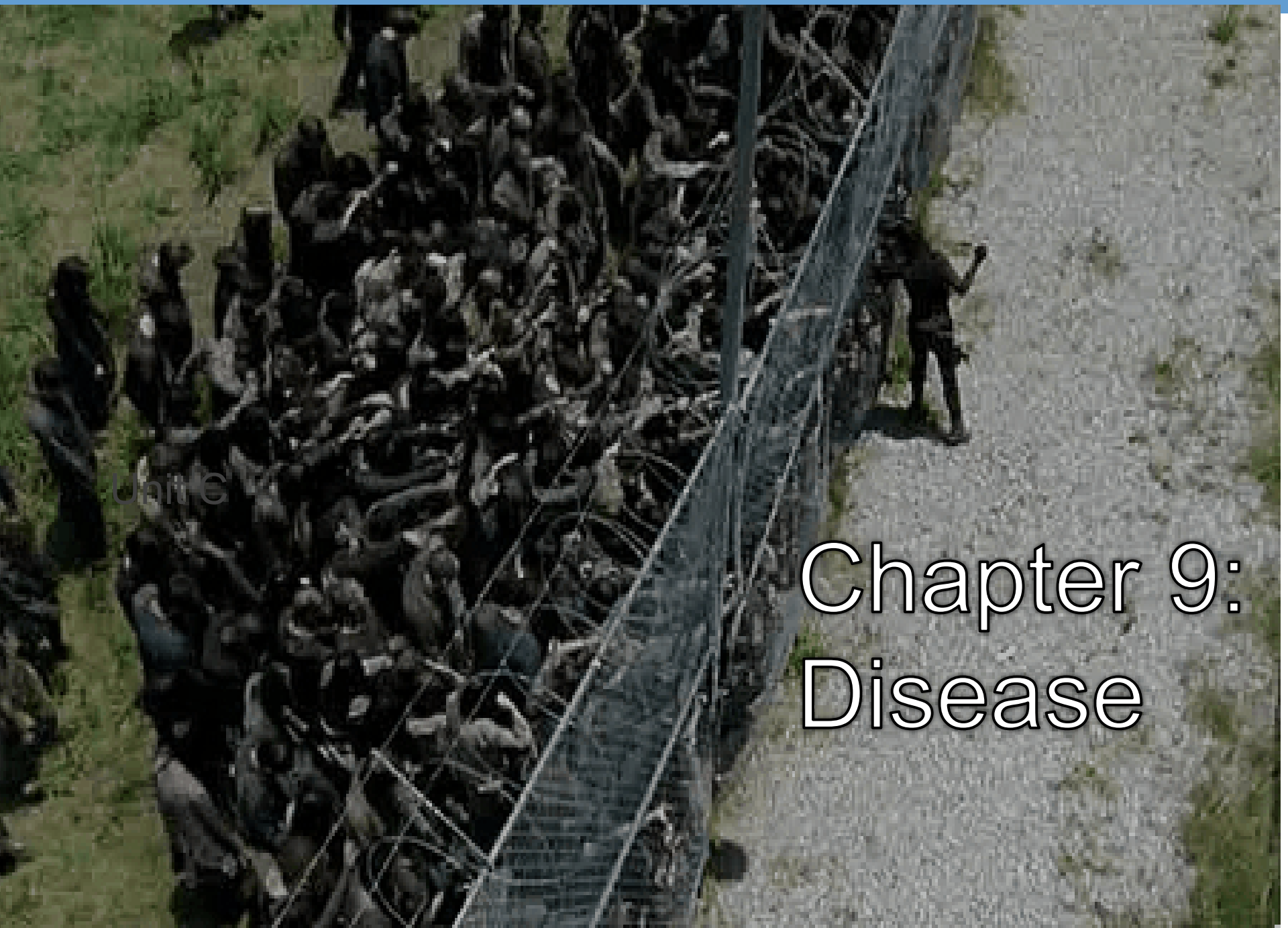


Unit C

Chapter 9: Disease

Disease

- We are exposed to thousands of different germs each day
- Only some are able to effect us, and to different magnitudes
- How do they spread?
- How do lifestyle, diet, and environmental factors affect them?

Cause of Human Disease

- In the past people believed diseases were the curses of spirits or gods
- Scientists tend to disagree
- **Disease** or illness prevents the body from preforming regularly
- As a result of the microscope, Louis Pasteur and Robert Koch were able to identify micro-organisms known as **microbes**
- Microbes that cause disease are known as **pathogens**

Pathogens Not The Only Problem

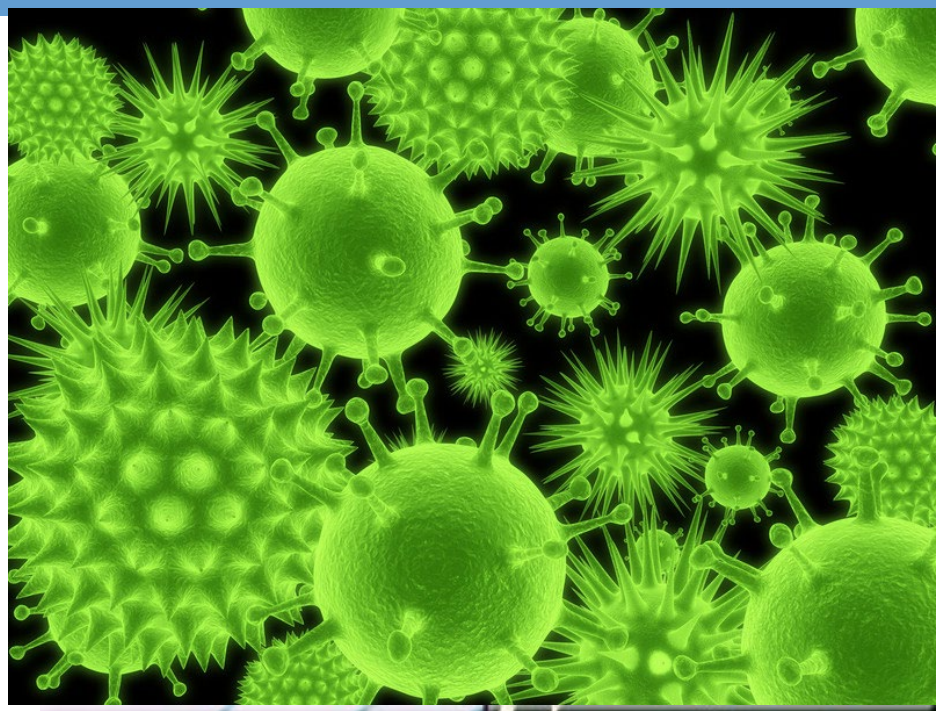
- Some disease can be caused by the environment
- Ex. Living in area with high amount of air pollution can lead to lung disease, or asbestos from buildings
- Other disease stems form **genetics**
- Ex. Diabetes, cystic fibrosis, colour blindness

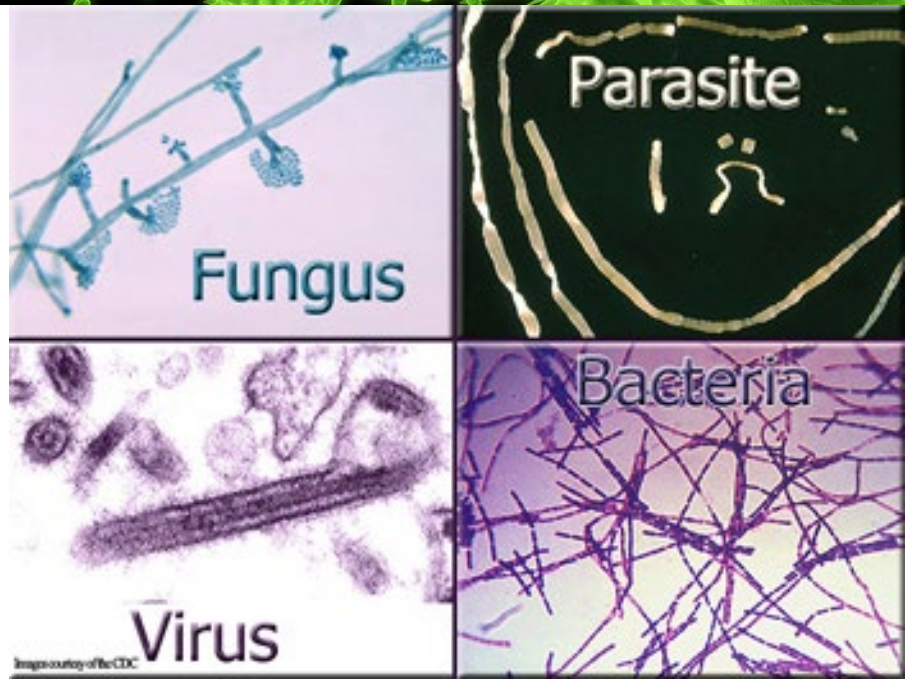
Combination

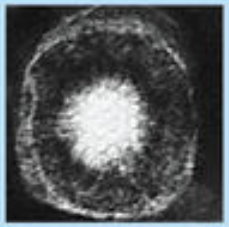
- A disease or illness can also develop as a product of different factors
- Including environment, diet, lifestyle, genetics, pathogens, and stress
- These factors can also effect each other to either worsen or better your condition

Pathogens

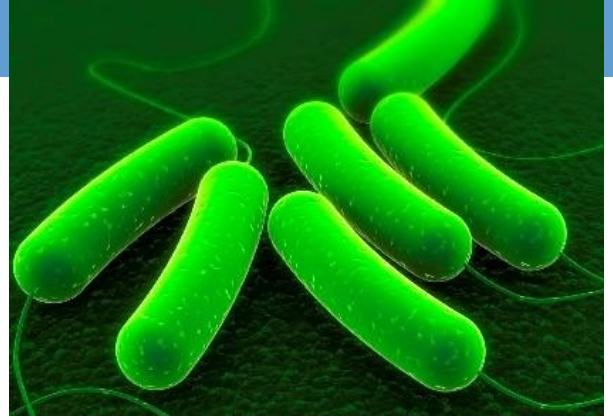
- Disease causing microbes
- Include bacteria, viruses, fungi, and protists
- Can live in many different areas and can affect different people differently





Type of pathogen	Description	Human diseases caused by pathogens of that type
Bacteria *Escherichia coli* 	Single-celled organisms without a nucleus	Strep throat, staph infections, tuberculosis, food poisoning, tetanus, pneumonia, syphilis
Viruses *Herpes simplex* 	Thread-like particles that reproduce by taking over living cells	Common cold, flu, genital herpes, cold sores, measles, AIDS, genital warts, chiken pox, small pox
Fungi *Death cap mushroom* 	Simple organisms, including mushrooms and yeasts, that grow as single cells or thread like filaments	Ringworm, athlete's foot, tinea, candidiasis, histoplasmosis, mushroom poisoning
Protozoa *Giardia lamblia* 	Single-celled organism with a nucleus	Malaria, "traveler's diarrhea" giardiasis, trypanosomiasis ("sleeping sickness")

Bacteria



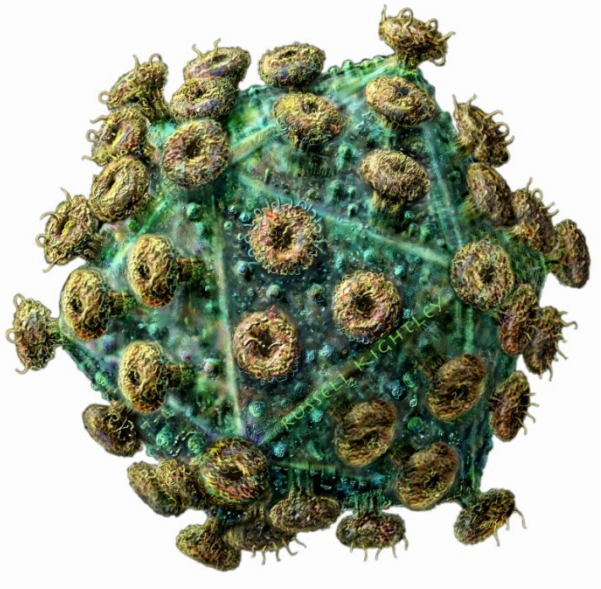
- Very small single celled organisms
- Live pretty much anywhere – on your skin, on your desk, in the food you eat, etc.
- Are they all bad?
- No, some bacteria are essential to our health
- Both harmful and healthy bacteria reproduce quickly and form colonies were conditions are good

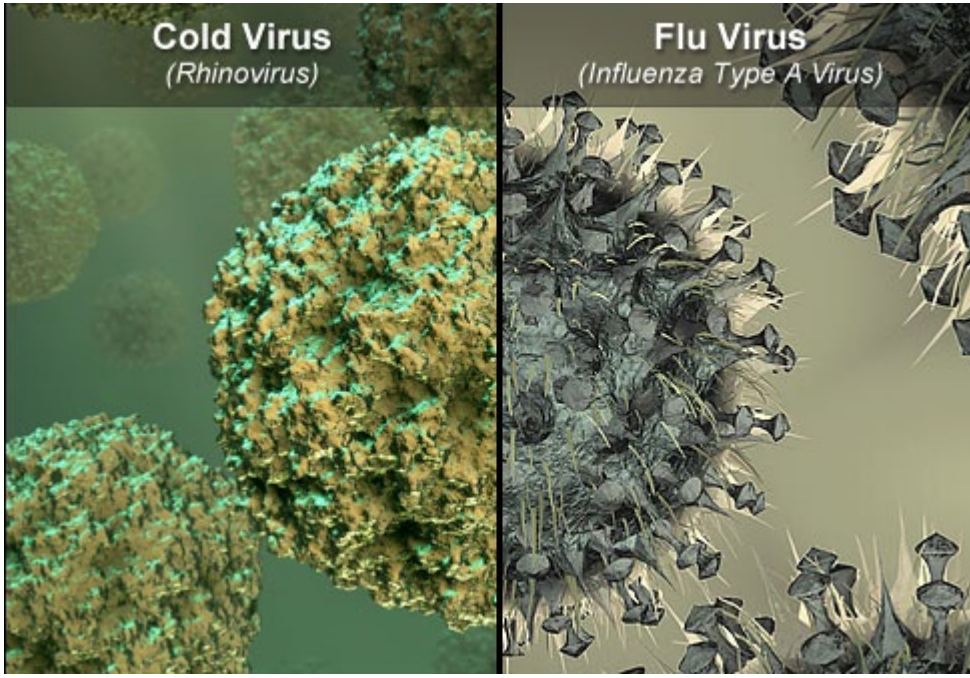
Favourable Conditions

- 1. **Temperature** – Most bacteria prefer warm climates. Extreme heat or cold temperatures will stop bacteria from growing, or kill them
- 2. **Moisture** – Need water. May not be able to produce without it
- 3. **Food** – Need sugars, proteins, or fats for energy

Viruses

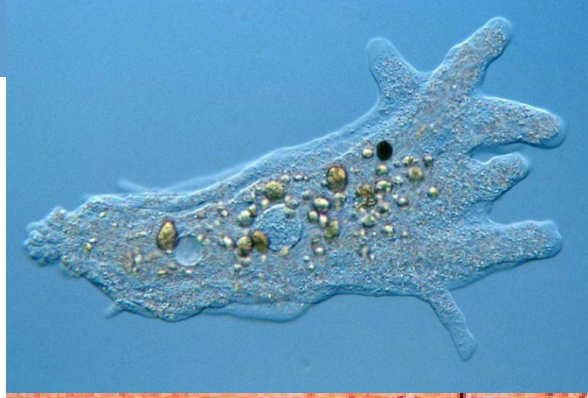
- Like bacteria, viruses can be found anywhere there are cells to infect – and you have trillions of cells
- Much smaller than bacteria in size
- Reproduce by taking over cells in the body
- Use these cells to reproduce and multiply quickly to take over other cells

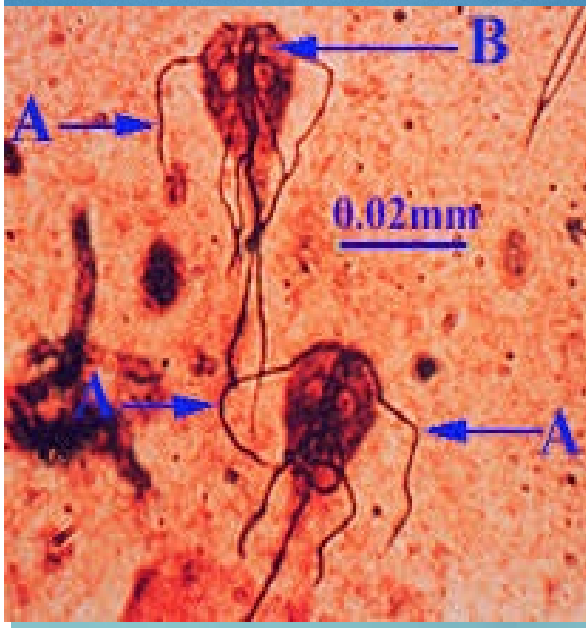




Protists

- Single celled organisms that share characteristics with both plant and animals
- Some can cause serious diseases such as malaria, African sleeping sickness, and amoebic dysentery
- Spread by different insects or contaminated water





Fungi

- Includes different molds, yeasts, and mushrooms
- **Cannot** make their own food via photosynthesis
- Some are **parasites** and need a host organism to survive
- Ex. Athletes foot, or ringworm
- Some can also cause disease if ingested

Communicable and Non-communicable Diseases

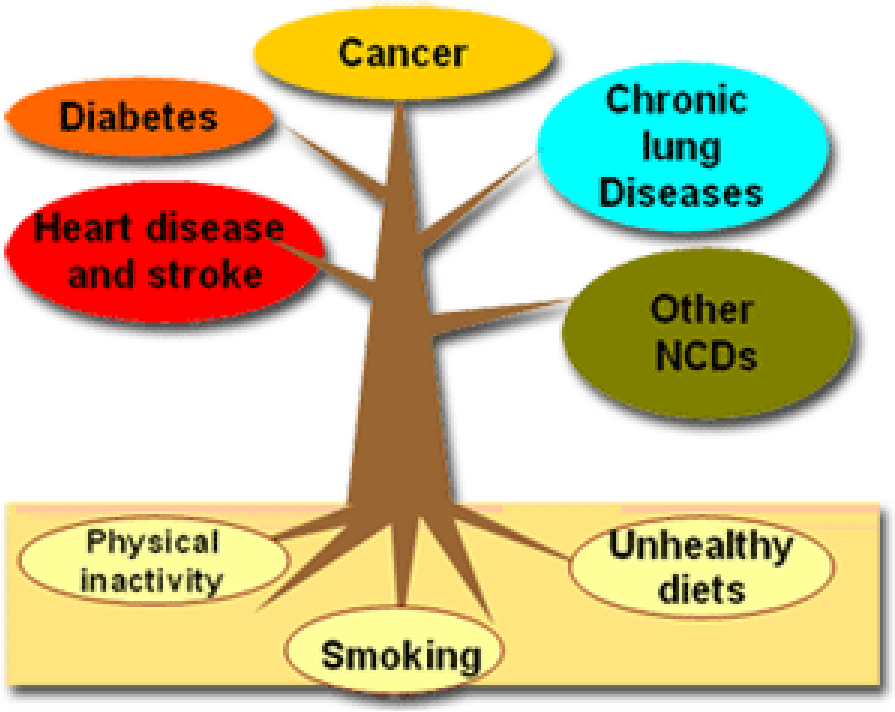
- There are certain diseases that you can catch from people and others that can't
- **Communicable** – disease caused by pathogens. Pathogens carrying the disease can pass from one organism to another.
- **Non-communicable** – disease not caused by pathogens. Cannot be spread from one organism to another.

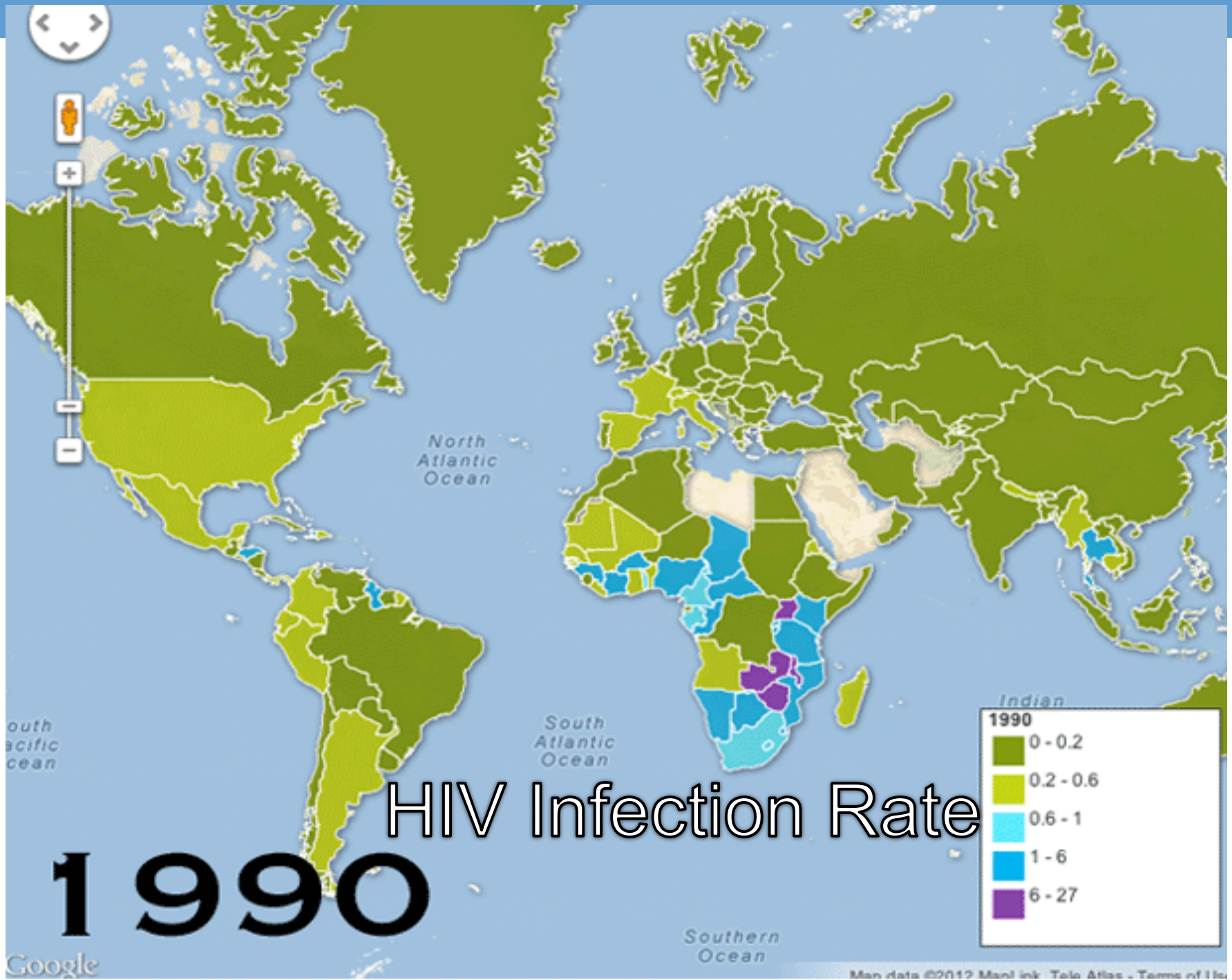
Examples

Communicable	Non-communicable
Flu Cold AIDs chicken STIs Pox	Cancer Diabetes Asthma

Non-communicable

- We still do not know all the causes of these diseases
- Doctors have a good idea of people get diseases like diabetes, cancer, and arthritis
- But are still not sure why some are diagnosed with depression or multiple sclerosis
- The do know is they can't pass these diseases onto others




North Atlantic Ocean
South Atlantic Ocean
Indian
Southern Ocean
1990
0 - 0.2
0.2 - 0.6
0.6 - 1
1 - 6
6 - 27
HIV Infection Rate
1990
Google

Communicable Diseases

How they spread	Examples	Effects
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

Importance of a Clean Environment

- We know disease can spread through air, water, food, and contact so why aren't we sick all the time?
- Mostly due to our environment – clean environments reduce the number of **viruses** and **bacteria** present
- Environment should be kept sanitary to avoid becoming contaminated – especially those more vulnerable to pathogens
- Done with use of chemical cleansers, plastic gloves, hair nets, and other proper maintenance techniques

Clean Environment for N.C. Diseases

- Many non-communicable diseases are the result of bad environmental conditions, poor diets, unhealthy lifestyles, and genetics
- At home if your furnace isn't properly maintained the air can become polluted and lead to diseases like emphysema which makes breathing difficult
- Lack of regular activity can lead to obesity, which makes you more likely to get cardiovascular disease and diabetes
- If you have a chronic poor diet then you will have a high level of foods that aren't good for you and could lead to heart disease

Who is Most Likely to Get Sick

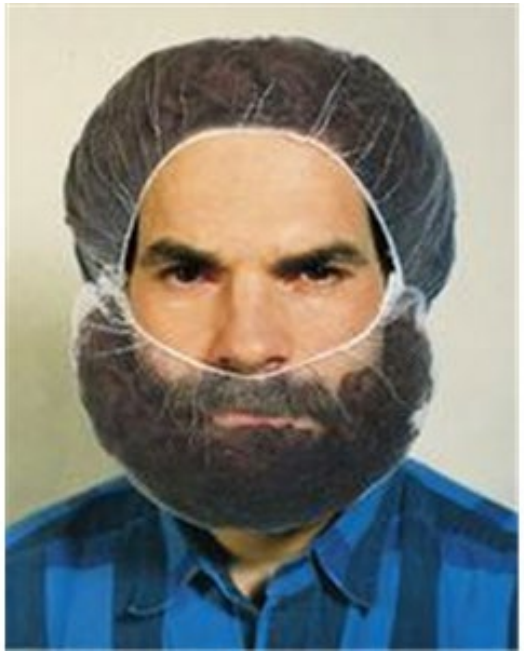
- In Canada the average female lives to 81 years old and the average male lives to 75
- In Sierra Leone (country in Africa) the average female lives to 35 years old and the average male to 33 years old.
- Difference is due to living conditions – Canada has a higher standard of living compare to Sierra Leone
- Canada has access to food, clean water, fresh air, health care and public education. These luxuries may not be available in other countries that are in **poverty**

Risk Factors

Risk Factors	Possible Diseases	Source of Risk

Stopping Disease

- Food industry takes many precautions to make sure their food doesn't get you sick
- The **staph bacteria** which causes food poisoning can enter food when coughed, sneezed, or touched without proper sanitary techniques



Favourable Conditions

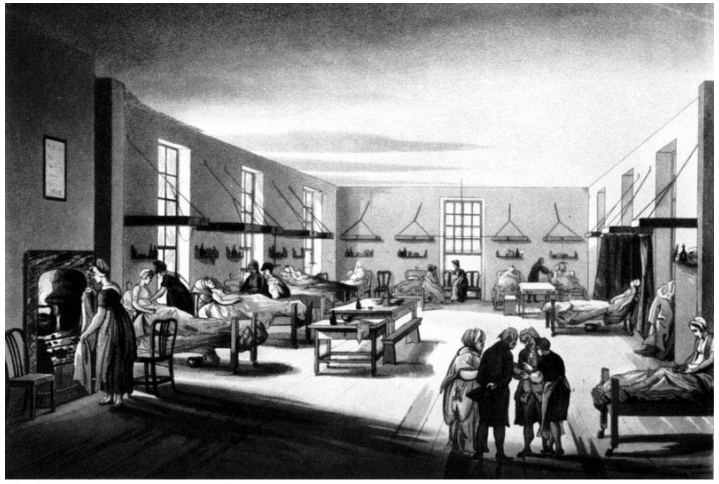
- 1. **Temperature** – Most bacteria prefer warm climates. Extreme heat or cold temperatures will stop bacteria from growing, or kill them
- 2. **Moisture** – Need water. May not be able to produce without it
- 3. **Food** – Need sugars, proteins, or fats for energy

Food Preservative

Technique	Process and Effect

Hospitals

- 200 years ago most people went to the hospital would die, as it was a building full of sick people
- In the 1800s Florence Nightingale worked in a military hospital in Turkey
- She made sure the hospital and patients were kept clean which reduced the death rate
- Robert Koch discovered that hot steam could kill pathogens and this became known as **sterilization**



Ward at the Middlesex Hospital, London, early 19th century.