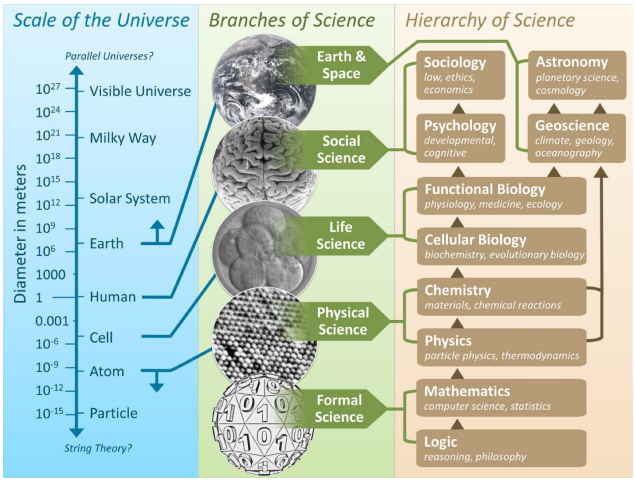
TOPIC 1: THE SCIENCE OF HEALTH

Scales of the Universe



-as we go up to down we get more pure “hard science”

-math is more a hard science than chem

-bottom to top is correlation links between variables (physics is from math, chemistry is from physics)

-still a hierarchy in each category like physics (particle physics vs thermodynamics)

Duo Pathways: Reductionism and Integration

Reductionist Approach:

The human body is divided into systems

- Neurology, immunology, pathology, endocrinology
    - “Micro” - biomedical model, biomedicine
    - Ex. advanced surgeries, pharmaceuticals

Principle - the “treatment” of disease and illnesses

- Identifying symptoms and treating them
    - Intervention is invasive
        - Cancer, diabetes, acute soft tissue injury

Limiting Factor - human motivation

-low autonomy and self empowerment

Integrative Approach:

The human body is one unit, including the environment

- “Macro” - non allopathic, population health
- Ex. alternative medicine (naturopathy, acupuncture)

Principle - the “prevention” of disease and illness

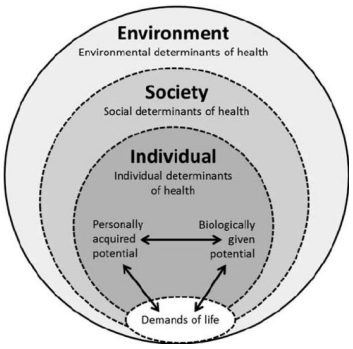
- Expression of well being
    - Intervention is non invasive
        - Nutrition, movement, yoga, stress management

Limiting Factor - research methodology

-low reliability and high variance

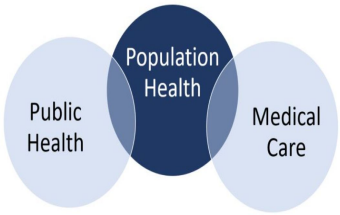
TOPIC 2: THE DETERMINANTS OF HEALTH

The Meikirch Model of Health:



- Health occurs when individuals use their biologically given and personally acquired potentials to manage the demands of life in a way that promotes well-being.
  - Process continues throughout life and is embedded within related social and environmental determinants of health.
  - Health is constituted by all three dimensions: individual, social, and environmental determinants

Population Health:



- Population health is another way of saying determinants of health
  - In order for us to find population health, we have to look at social determinants
- Public Health: how we make changes and intervene
  - vehicle in which we create change
  - ex. There was a meningitis outbreak so we started vaccinating in schools to prevent more cases

A Comparative Approach:

Conventional approach to health is the risk factor approach

- Interaction between genetic susceptibility/ resilience and behaviour

Context:

Must always factor in the situation in which it is taking place

- Ex. eating a mediterranean diet here won't produce the same effects because we don't have the same health conditions here as in Greece

Socioeconomic Influence:

The more resources you have, the higher chance you have to living a healthy and full life

- Rates of disease are higher in people with low incomes
- In every known society, the richer you are and the longer you attend school the better your health will be and the longer you will live
  - Positive correlation between money and health
- Education, income, and social class are predictive of health
  - Bar is now being raised because more and more people are getting degrees
- Positive effects from lifestyle changes are most prominent in people living in the better conditions

- Health promotion activities broadens the gap between the health statuses of the rich and the poor
    -is someone is on a limited budget they cant afford to try different diets
        - ex not everyone can afford going vegan
- Healthcare
    - will not close the gap between rich and poor
        - need to shift the baselines and improve conditions for the entire population
- Social Epidemiologists say that our current health problems arise mostly as a result of poor public policies stemming from a lack of democracy
    - the absence of fair, accountable, participatory, mechanisms that foster human rights and personal development
- Large scale reform leading to just institutions is not a near term probability
    - we have to get our political systems on the same page when it comes to change
    -only incentive to change is to think of children and grandchildren

Only ways to improve population health:

–Greater gender equality (mothers, children)

–Less socio cultural exclusion

–Accountable government and corporations

–Fairer employment practices

–More supportive communities

–Better environmental stewardship

- Canada can improve on securing human rights and economic sustainability
    - Norway, netherlands, australia
- Support for goals other that economic exploitation of natural and human resources has increased
    - Governments are promising better outlooks
    - Aboriginal people are more engaged in Canadian politics and policies

<u>Critical Perspectives</u>

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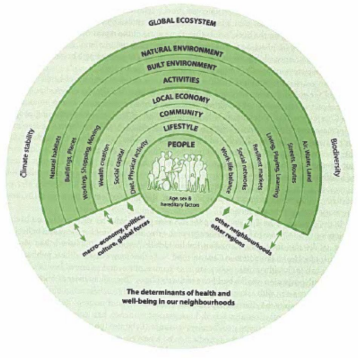
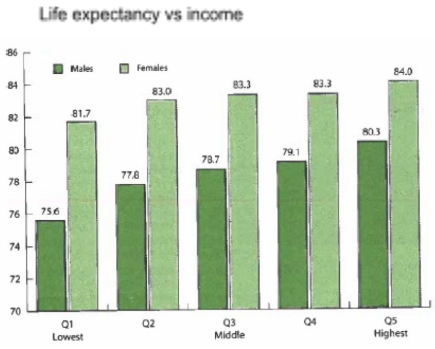


Key Determinants:

- Income and inequality
- Political regimes
- Social networks, social capital, morality
- Neighbourhoods
- Lifestyle
    - Ex food and transportation



TOPIC 3: POPULATION HEALTH MODELS

Some Definitions:

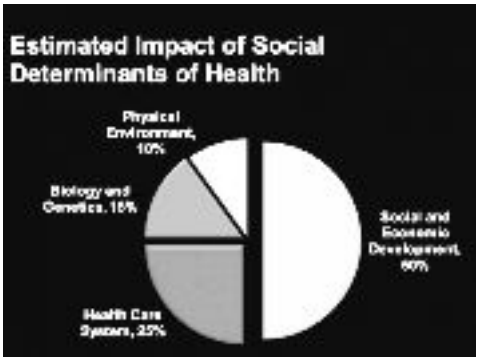
Health: the state of complete physical, mental and social well being

- Not just the absence of disease

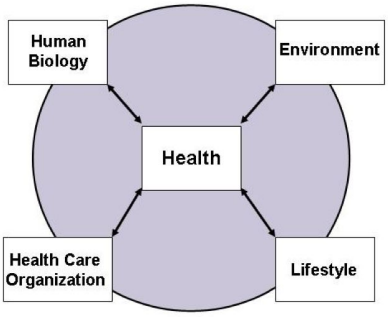
Population Health: approach to health that aims to improve the health of an entire population and to reduce health inequalities among groups

Health Inequality: avoidable inequalities between groups of people within and between countries

Social Determinants of Health: birth, growth, work, age, systems put in place to deal with illness

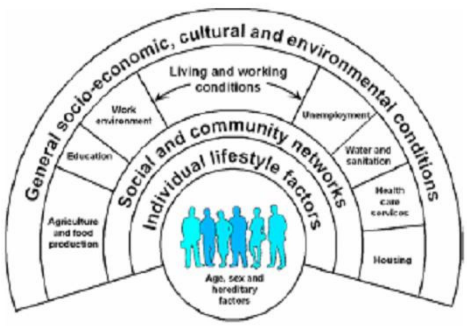


Lalonde's Health Field Concept

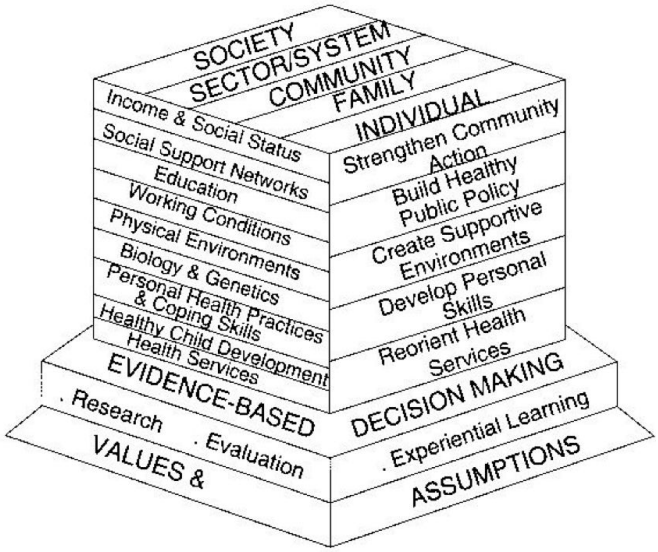


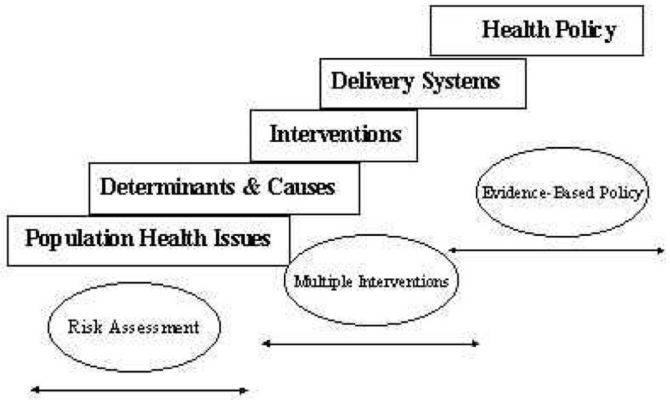
First model in canada to look at health from a "bigger picture"

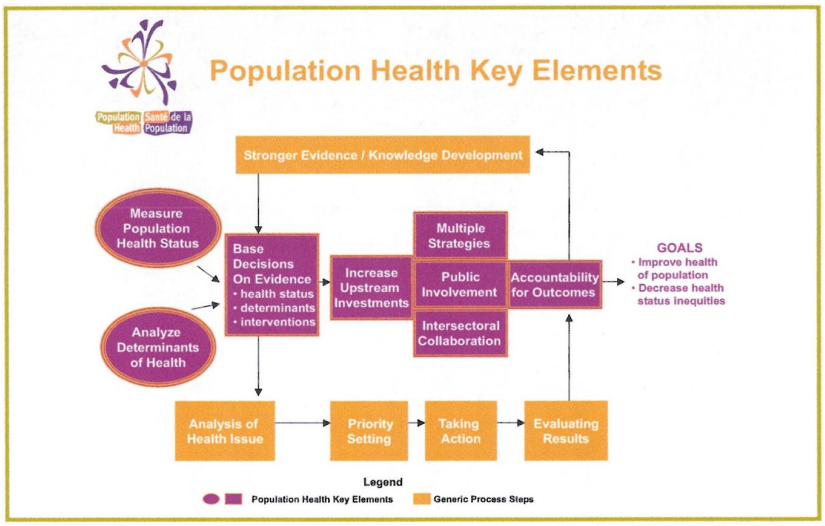
Dahlgren and Whitehead's layered influences on health, 1992

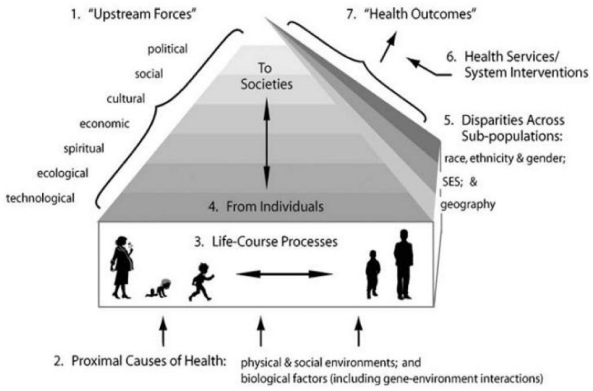


Source: G. Dahlgren and M. Whitehead. (1992). *Policies and strategies to promote social equity and health.* Copenhagen: World Health Organization.

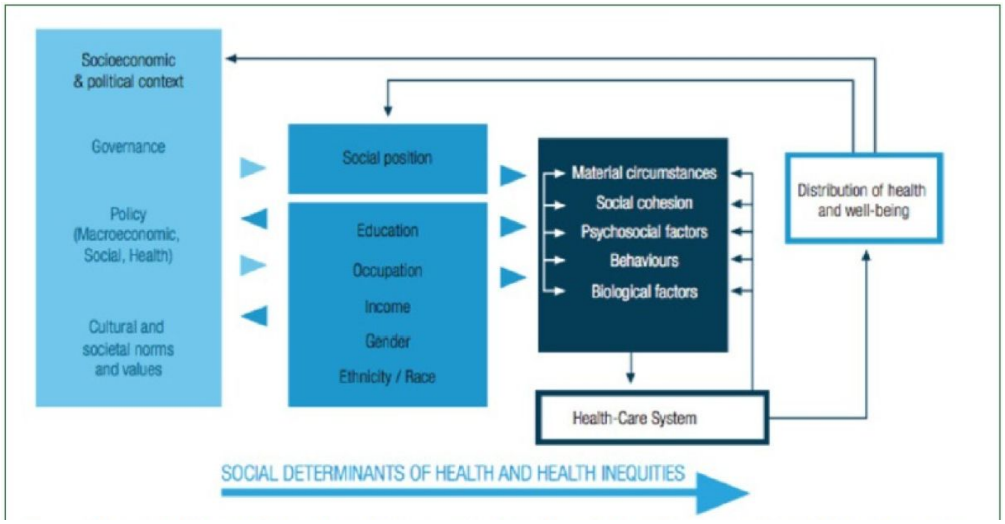








V. Etches, J. Frank, E. DiRuggerio, and D. Manuel. (2006). Measuring population health: a review of indicators. *Annual Review of Public Health*, Volume 27, pp. 29-55.



TOPIC 4: PERSONAL RHYTHM FOR HEALTHY LIVING

What is Health?

-originally was seen as an absence of disease

- no longer true

Morbidity vs Mortality

- Morbidity: not dying but sick and not feeling good
- Mortality: death (lifespan)

Health vs Wellness

Health: a static point in time

- State of being

Wellness: status of your life

- State of being

Your life can be unwell but you can still be healthy if it hasn't been long enough to affect your health

- Chronic diseases happen when you aren't well

Subcategories of Health:

Physical - body size, shape, physical activity
Social- interaction, communication skills, think before you speak
Intellectual - think and analyze, learn from mistakes, manage time
Occupational - satisfaction from job, balance between work and leisure
Emotional - ability to feel and express feelings, limit worrying, accept change
Environmental - bond between you and environmental, want to preserve it
Spiritual - meaning and purpose to your life, reflect who you want to be/believe

Health Promotion

-optimal conditions and efforts made to improve health of individual or population

- requires educational, organizational, environmental, financial supports
- build positive health attitudes and change negative ones

Sex Bias:

- Many diseases are common in a certain gender
  Androcentricity: viewing from a male perspective
  Overgeneralization: does study and applies info to both genders
  Insensitivity: overlooking sex as a variable
  Double Standard: measuring the same thing in different ways
- Account for things that might not used to have been an issue
  - Ex. more women are now having heart conditions as they are put in positions of power which cause more stress

Prevention:

Primary: stop problem before it starts ex. Yoga
Secondary: small intervention after mild symptoms ex taking advil

Tertiary: cutting edge procedures when looking at life threatening illness ex. surgery, chemo

Benefits of Achieving Health:

1. Quality of life - decreased morbidity, healthy and well
2. Ability to manage stress - directly proportional to the immune system strength
3. Enhances self confidence - healthier relationships
4. Environmental awareness - take a walk, time to self
5. Reduced reliance on the healthcare system
6. Meaning and purpose - people who have a meaning in life take care of themselves

TOPIC 5: EATING FOR OPTIMAL HEALTH AND PERFORMANCE

Healthy Eating:

Hunger: the feeling associated with the NEED to eat
Appetite: the WANT to eat, psychological
Essential: need to get from outside sources

Terms:

Caloric control: weight management, body composition
Adequacy: getting enough ex. Getting 100mg of Ca
Moderation: not too much or too little
Balance: proportional intake ex. Not 700mg of iron, 200mg of Ca, 300mg of potassium
- Get equal amounts

Variety: get nutrients from a variety of sources
- New food guide incorporates less starchy grains because we are not doing as much physical activity as we used to so therefore we need foods that are easily digested

Digestive Process

1. **Mouth:** prepares for food by increasing saliva
    - Contains water and enzymes to break down food and help with swallowing
    - Mechanical breakdown

2. Esophagus: food passes down it by a series of contractions (peristalsis)
3. Stomach: food mixes with enzymes and acid
    - Chemical breakdown

4. Small intestine: three parts secrete enzymes that combine with liver and pancreas enzymes to break down macromolecules

1. Duodenum
2. Jejunum
3. Ileum

- Once broken down nutrients are absorbed into the bloodstream
    - Liver determines what nutrients are kept or considered waste

5. Large intestine: fibre, salts and water are sent here
    - Salts and water absorbed and fibre is passed through

<u>Macronutrients:</u>

Carbs: 4 cal/g
    - Simple carbs: mono and disaccharides
        - Digested quickly
    - complex carbs: polysaccharides- more time to digest
        - hierarchy of foods within macromolecule groups because of micronutrients
    - **Glycogen:** the more fit someone is, greater glycogen storage therefore store less fat

Proteins: 4 cal/g
- Composed of amino acids
- 10 essential: some become non essential once older
- Tissue development and repair

Fats: 9 cal/g
- Triglycerides, cholesterol, phospholipids
- Unsaturated fat = good
    - Have more room for H atoms

Water: 50%-60% body weight
- Need to drink more water to digest excess amount of food

<u>Micronutrients:</u>

Vitamins:
1. Fat Soluble: ADEK
    - Must be stored in body, can be toxic if too much consumed
2. Water Soluble: B-complex, C
    - Can be excreted, not toxic
    - Supplements are not necessary and can be helpful

Minerals:
1. Macro: large amounts (more than 5g)
2. Micro small amounts (less than 5g)

- Sodium: usually consumed too much
- Calcium: vit D increases absorption
- Iron: deficiency can cause anemia and fatigue

Vegetarians:

Vegans, lacto, lacto-ovo, pesco, semi
- Typically have lower cholesterol

Eating As A Student:

- Don't shop when hungry
- Use coupons and specials
- Pan ahead - look at big meals and store proteins

Fast foods:

- Limit deep fried foods
- Order veggies and and salads
- Limit dressing and sauce
- Water instead of pop
- Alcohol in moderation

Health Claims:

Reduced: at least 25% less
Light: reduced in fat and calories
Source: high (good) very high (excellent)

<u>Safety Concerns:</u>

Food Borne Illness:

- Keep food at appropriate temp
- Avoid cross contamination
- Thaw food fridge
- Eat leftovers in 1-3 days

Common symptoms: cramping, nausea, vomiting, diarrhea

Food Additives:

- Reduce risk of foodborne illness
- Prevent spoilage
- Enhance look and taste
- Enhance nutrient

Allergies:

Intolerance - imitate allergy symptoms

- Body overreacts to harmless proteins
    - Perceives them allergens, produces antibodies that activate immune cells

Organic Food - pesticide and chemical free

- More expensive
- Unclear health benefit
- Benefit environment because locally grown

GMOs - enhance production

- Improve appearance

<u>Factors:</u>

Frequency - 3 feedings vs 6
Quantity - 2 pieces vs 10

Quality - grilled vs fried

TOPIC 6: USING ALCOHOL AND CAFFEINE RESPONSIBLY AND REFRAINING FROM TOBACCO USE

Alcohol: An Overview:

- 78% of adult canadians consume alcohol
    - Males more likely to drink than females

Heavy Drinking:

Males - 15+ drinks/week Females - 10+ drinks/week

-males 20-34 have the highest rate of heavy drinking

Binge drinking:

Males 5+ drinks/sitting Females - 4+ drinks/sitting

- More males binge drink
- A Lot more binge drinking in the territories
- Can result in alcohol poisoning and death

Revenue:

- +20 billion last year in canada
- Beer accounts for 45%
- Lowest sales in ontario and manitoba

Benefits/dangers:

- Can have benefits in industrialized countries like canada
    - Physical activity levels are low with bad diets
    - Alcohol can decrease the risk of coronary heart disease and stroke
        - In certain age groups in moderate amounts

- have dangers as it leads to reckless behaviour
    - sexual activity, injury, property damage, miss class

Alcohol in University:

- Most prominent: 90% of student drink
    - Leads to many deaths

Risks:

1. Alcohol increases risks, falls, car accidents
2. Universities have an environment where alcohol abuse is normalized
3. Campuses are highly targeted for liquor advertising
4. More common for college students to drink excessively than non students
5. Strong need to be accepted therefore they drink

Rights vs Responsibilities:

-should drink responsibly knowing all the risks

- must follow the rules of prevention

1. No more than 10 drinks / week females, 15 drinks / week males
2. No more than 2/day females, 3/day males

3. Several days without drinking
4. Do not drink and drive, pregnant, mentally ill

-eat before drinking

Production of Alcohol:

- Intoxicating substance is ethanol
- Made by fermentation
    - Continues until 14% alcohol - alc then kills yeast
    - Can then be diluted (beer and wine) or concentrated by distillation (vodka)

-proof is double percent ex. 80 proof is 40%

<u>Psychological and Behavioural Effects of Alcohol</u>

BAC: blood alcohol level (g/100ml of blood)

Learned Behavioural Tolerance:

- People can get tolerances through regular use
    - Nervous system adapts over time so more alcohol so more alcohol is required to produce the same effect
    - Does Not affect BAC, just behaviours

<u>Absorption and Metabolism:</u>

BAC factors:

1. Amount consumed in given time
2. Size, sex, body, metabolism
3. Type and amount of food in stomach
    - Stress and anxiety cause the body to dump food in small intestine and therefore you will be more drunk because you have an empty stomach

Weight :

- Heavier people have large surface area to diffuse alcohol
    - Lower concentration

Women and alcohol:

- Women have ½ the enzymes to break down alcohol
    - Get more drunk

-usually have higher % body fat, increases BAC

Breathalyzer Tests:

- Determine BAC

Immediate Effects:

Depressant - slows down CNS, eventually results in coma

Dehydration - water is pulled from the cerebrospinal fluid

- Causes mitochondrial dehydration
- Hangover headaches because function properly

Diuretic - increased urine output

Long Term Effects:

- Liver disease:
    - Cirrhosis: liver is completely scar tissue and does not function
    - Fibrosis: liver starts to form scar tissue
    - Hepatitis: chronic inflammation

-cardiovascular and nervous system:
    - cardiomyopathy and neuropathy
-cancer: GI tract cancer
- bones weaken because the absorption of calcium causes osteoporosis

<u>Fetal Alcohol Spectrum Disorders</u>

- Caused by prenatal exposure to alcohol
    - Lifelong cognitive delay and disabilities
- alcohol passes through the placenta into the fetus
    - BAC will be really high in small fetus and have damaging effects

Fetal Alcohol Syndrome (FAS):

- Mental retardation, small head, tremors, abnormalities
- severe

Fetal Alcohol Effects (FAE):

- Fetuses with some exposure but not all FAS effects

<u>Alcoholism:</u>

- Consumption interferes with school, work and relationships
- Man ages 20-35 most common

Causes:

Biologic and Family - heavy family drinkers lead to heavy drinking children

- Type 1: most cases - after age 25, care about what people think,
- Type 2: before age 25, sons of fathers who are alcoholics, violent acts, no concerned with approval of others

Social and cultural - peer pressure, drink when sad, escape problems, family attitudes toward drinking, urbanization, weakening of family ties changing religion

<u>Recognizing your Personal Risk</u>

If you say yes to 2 of the following questions it is a warning sign:

- Feel guilty about drinking?
- Feel the need to drink in the morning?
- Need to reduce drinking?
- Feel annoyed by the criticism of drinking

Alcoholism on the Family:

To minimize feelings, the family members take on roles:

Family Hero: too good to be true

Scapegoat: delinquency or misbehaviour
Lost Child: withdraws from family life
Mascot: comic relief

Costs to Society:
14.6 billion dollars
- Loss of productivity, car accidents, healthcare costs

Women and Alcohol:
- More women are now choosing to drink

Differences between men and women:
1. Attribute drinking to life stress more
2. Starts later and progresses faster
3. Have more mood altering drugs which increase the risk of drug interactions
4. Men alcoholics tend to divorce leaving women without a family to help in recovery
5. Don't receive as much social support
6. Single moms don't have the money for treatment

<u>Recovery:</u>
Family role: intervention, express love and support
- Sit with family and councillors

Withdrawal: convulsions, anxiety, agitation, seizures, depression
- Delirium Treamens: state of confusion, withdrawal systems
    - Hallucinations, tremors, anxiety
    - Carried out in medical facility where they can be monitored

Family Therapy:
- Examine psychological reasons underlying addiction

Group and Individual Therapy:
- Positive coping skills for the reasons they started drinking

Other Treatments:
- Drug therapy: take drug that makes you extremely nauseous after drinking
    - Eventually stops person from drinking

- Aversion Therapy: conditioning, teaches person to associate alcohol with bad feelings

<u>Relapse:</u>
- 60% relapse within the first 3 months

<u>Smoking:</u>
- #1 preventable cause of death - kills 5 million a year

Tobacco and effects:
Snuff - powdered form
Chewing tobacco - sucked and chewed in mouth
- Contains as much nicotine as cigarette

Nicotine: impairs cleaning function of cilia by impairing them
Tar: contains carcinogens, forms sludge on the lungs
Carbon Monoxide: part of tobacco smoke

- Higher conc than considered safe
- Reduces oxygen carrying capacity of blood cells
- Causes oxygen deprivation

Nicotine Effects:

- Stimulates CNS and adrenal glands
- Increased heart rate and respiratory rate
- Constricts blood vessels
- Reduces appetite
-

Smoking: A Learned Behaviour

Gradual Process: starts with vision that smoking is normal, the socially smoking then daily smoking, addiction

- 85% start before the age 16

Promotion:

- Targets youth and young women
- Creates perception that it is cool and glamorous

Smokeless Tobacco:

- Is as addictive as cigarettes because of high nicotine

Leukoplakia: leathery, white patches inside mouth

Dental Problems: receding gums, tooth decay, discoloured teeth,

- Impairs snes eof taste and smell

ENvironmental Smoke:

Secondhand: smoke from burning end of the cigarette

- Breathed by people around (passive smokers)
- Can cause heart disease and lung cancer
- Children exposed can develop respiratory problems

Mainstream Smoke: smoke that goes into the smokers lungs

Quitting:

- Tough addiction
- Irritability, restlessness, headaches, cravings for tobacco

Replacement Products: patch and chewing gum

- Slowly reduce amount of nicotine each day to prevent withdrawal symptoms

Caffeine:

- Most widely used recreational drug

Effects: insomnia, irregular heartbeat, dizziness, nausea, indigestion

Caffeine Addiction:

Tolerance: when we become tolerant we drink more

- Can develop a dependency
- Withdrawal can cause severe headaches

Energy Drinks: stimulant effects

        - Belongs to a class of stimulants called xanthines

Long Term Use:

- Linked to heart disease, cancer, mental dysfunction
    - Birth defects and high low-density lipoproteins
    - People with irregular heartbeats should not have caffeine
        - Increase in heart rate can be life threatening