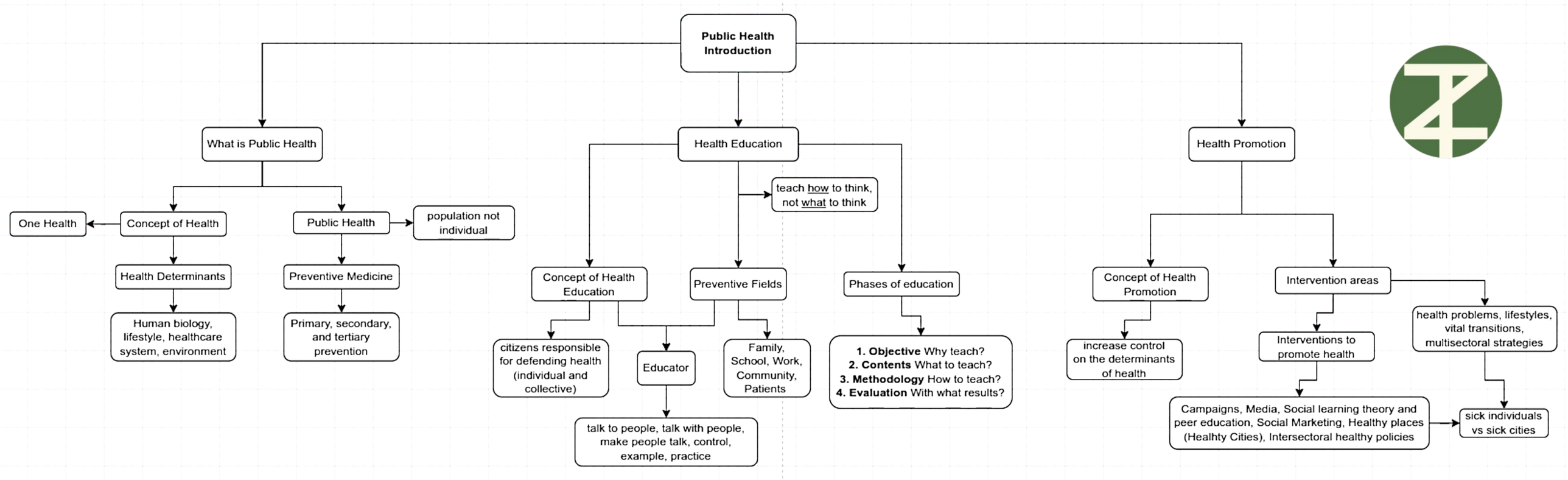
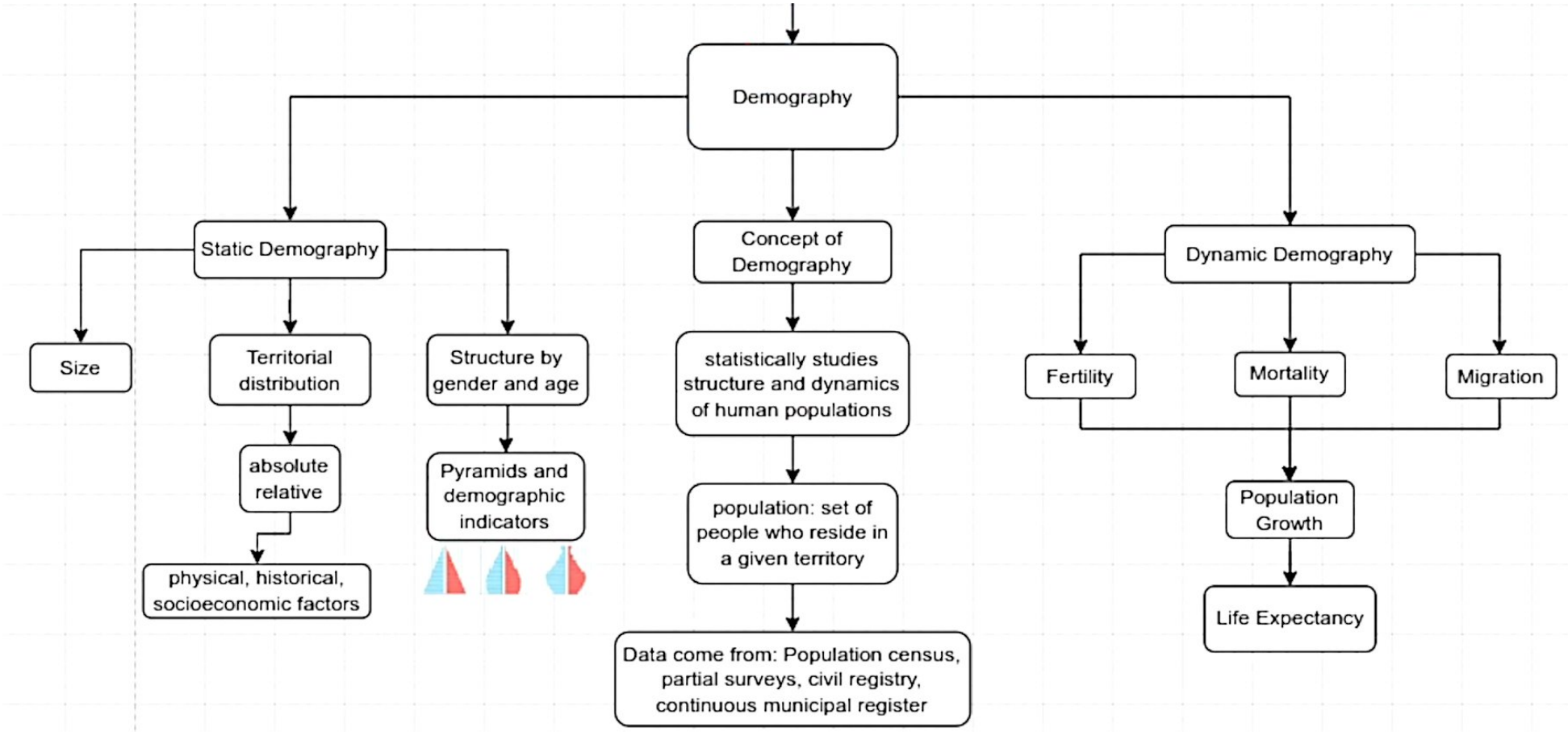
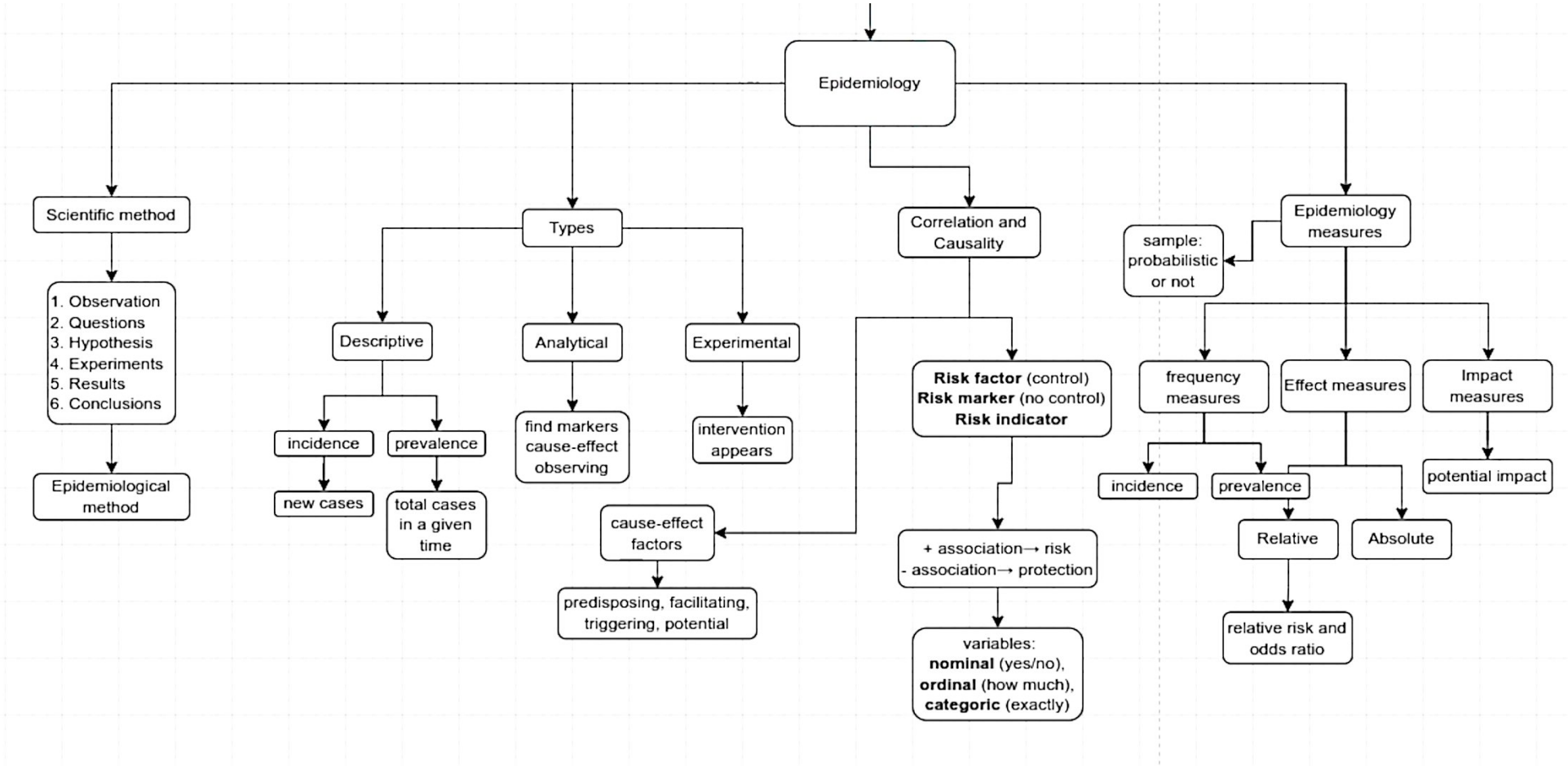
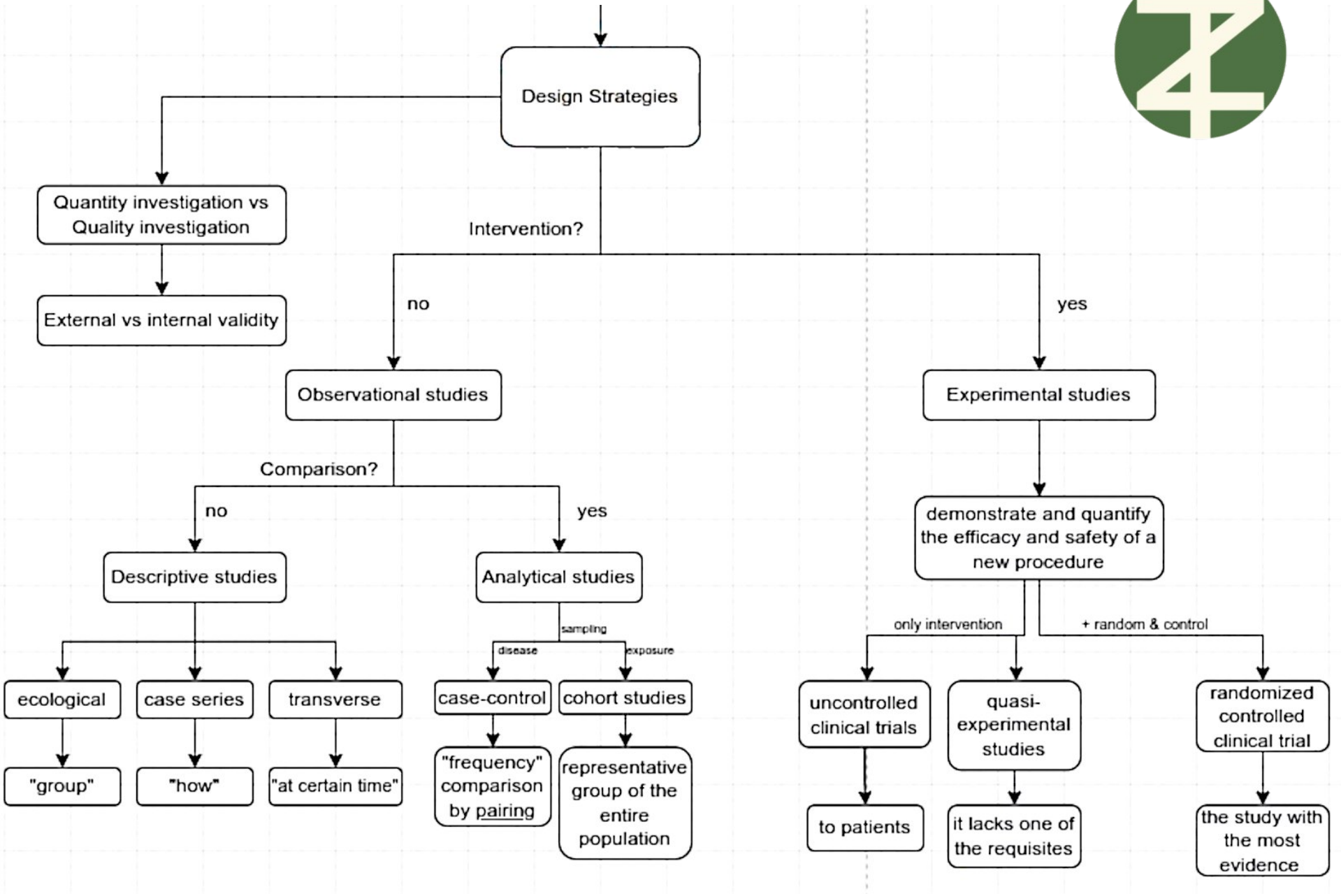
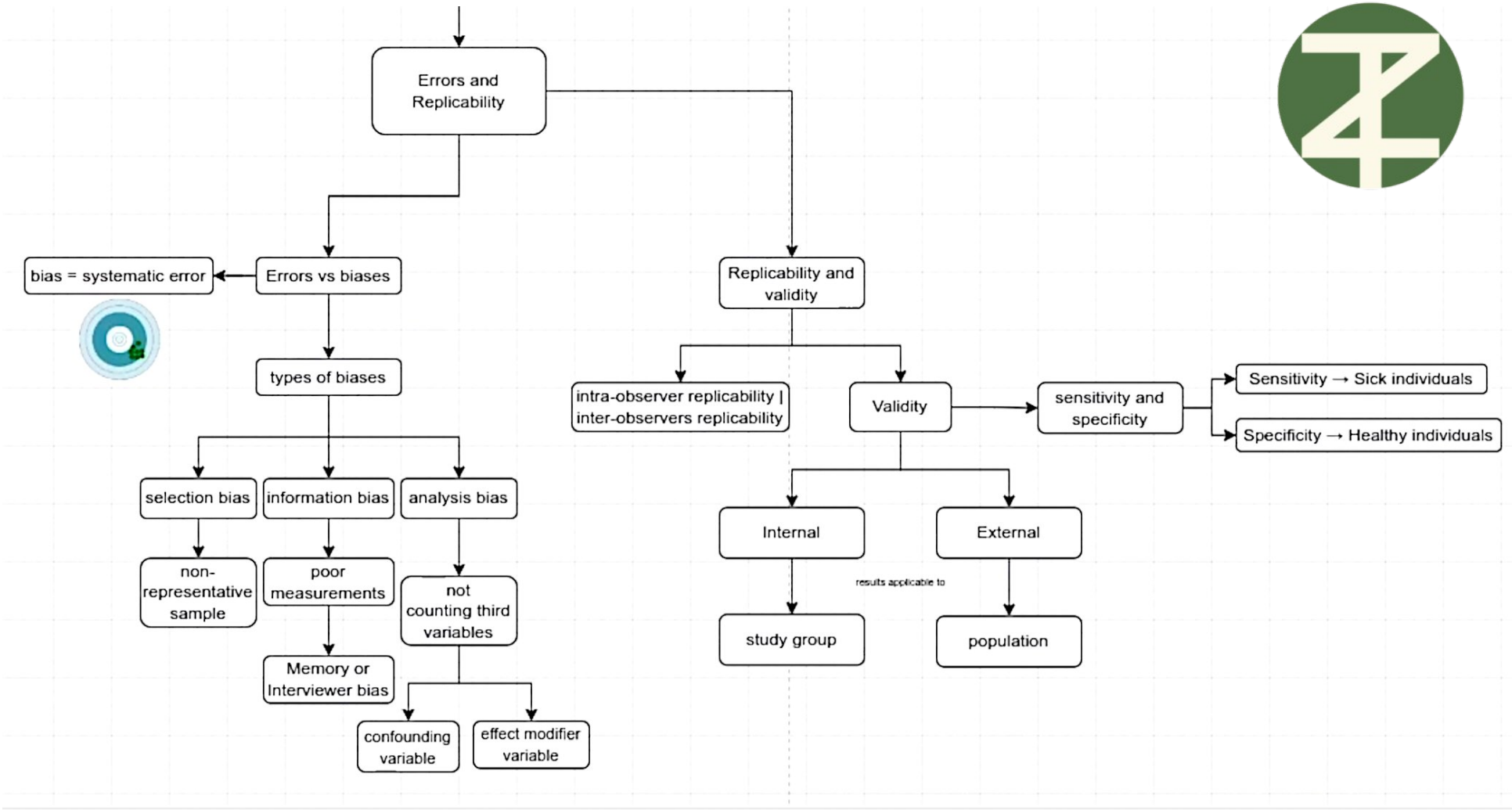
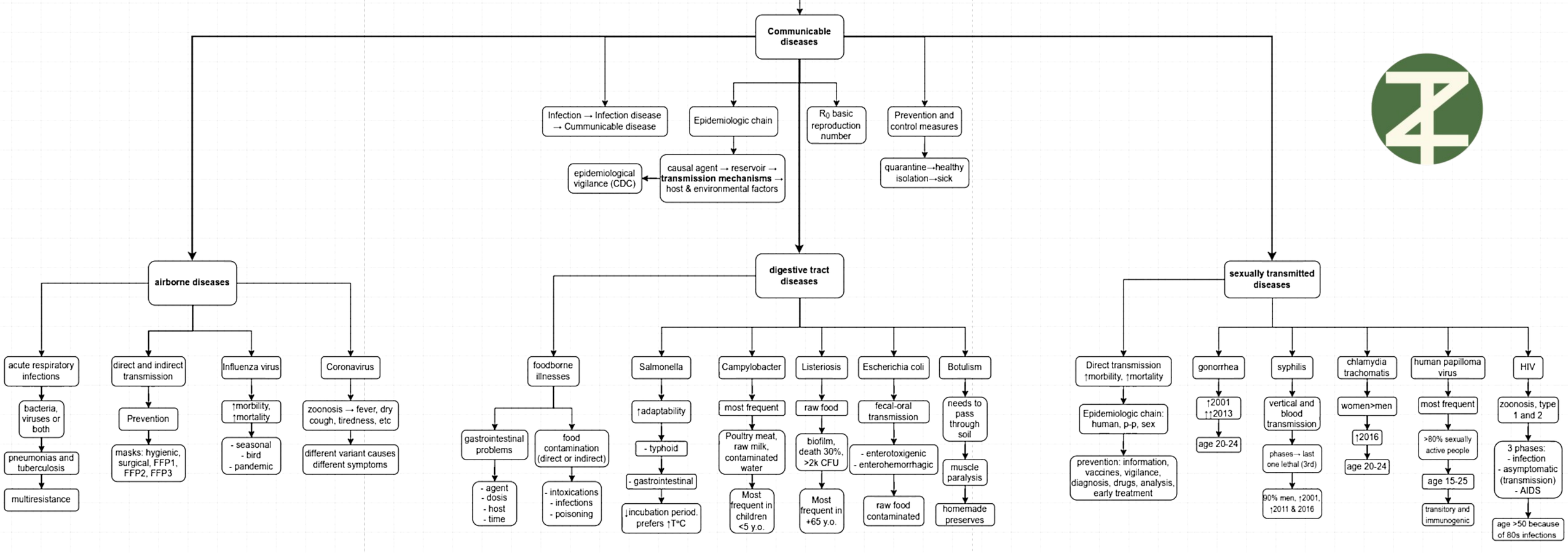

Public Health Introduction
What is Public Health
One Health
Concept of Health
Health Determinants
Human biology, lifestyle, healthcare system, environment
Public Health
population not individual
Preventive Medicine
Primary, secondary, and tertiary prevention
Health Education
teach how to think, not what to think
Concept of Health Education
citizens responsible for defending health (individual and collective)
Educator
talk to people, talk with people, make people talk, control, example, practice
Preventive Fields
Family, School, Work, Community, Patients
Phases of education
1. Objective Why teach?
2. Contents What to teach?
3. Methodology How to teach?
4. Evaluation With what results?
Health Promotion
Concept of Health Promotion
increase control on the determinants of health
Intervention areas
Interventions to promote health
Campaigns, Media, Social learning theory and peer education, Social Marketing, Healthy places (Healhty Cities), Intersectoral healthy policies
health problems, lifestyles, vital transitions, multisectoral strategies
sick individuals vs sick cities

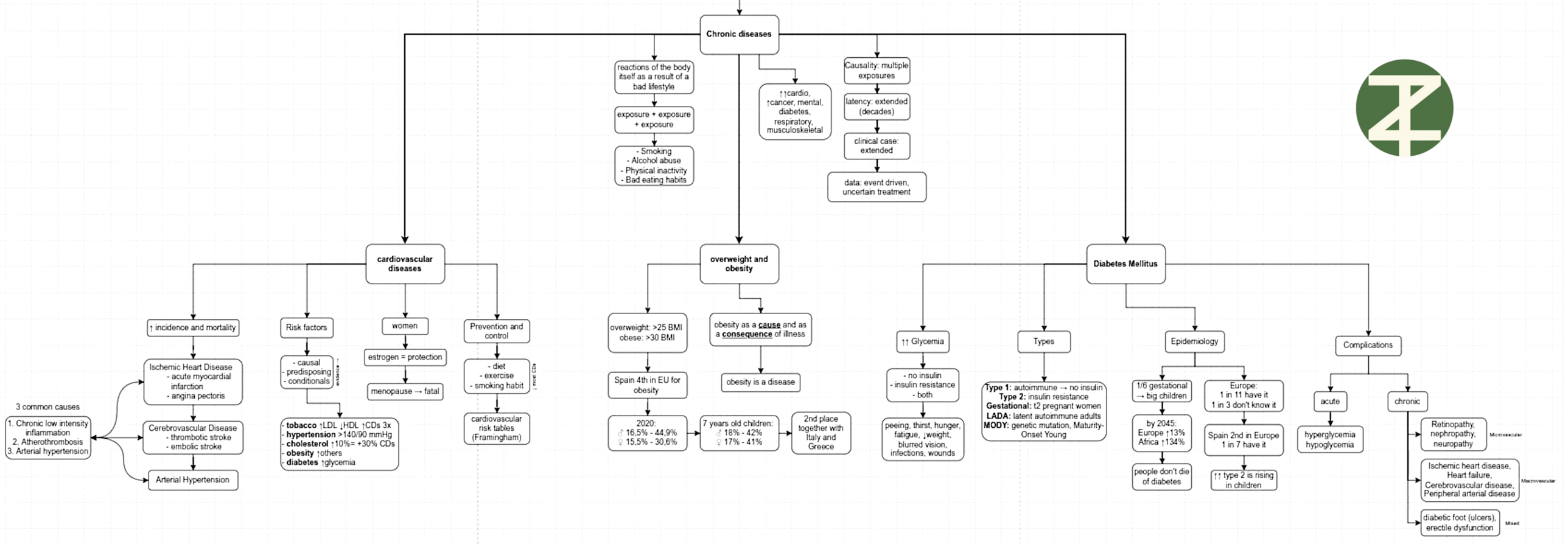

Demography
Static Demography
Size
Territorial distribution
absolute
relative
physical, historical, socioeconomic factors
Structure by gender and age
Pyramids and demographic indicators
Concept of Demography
statistically studies structure and dynamics of human populations
population: set of people who reside in a given territory
Data come from: Population census, partial surveys, civil registry, continuous municipal register
Dynamic Demography
Fertility
Mortality
Migration
Population Growth
Life Expectancy

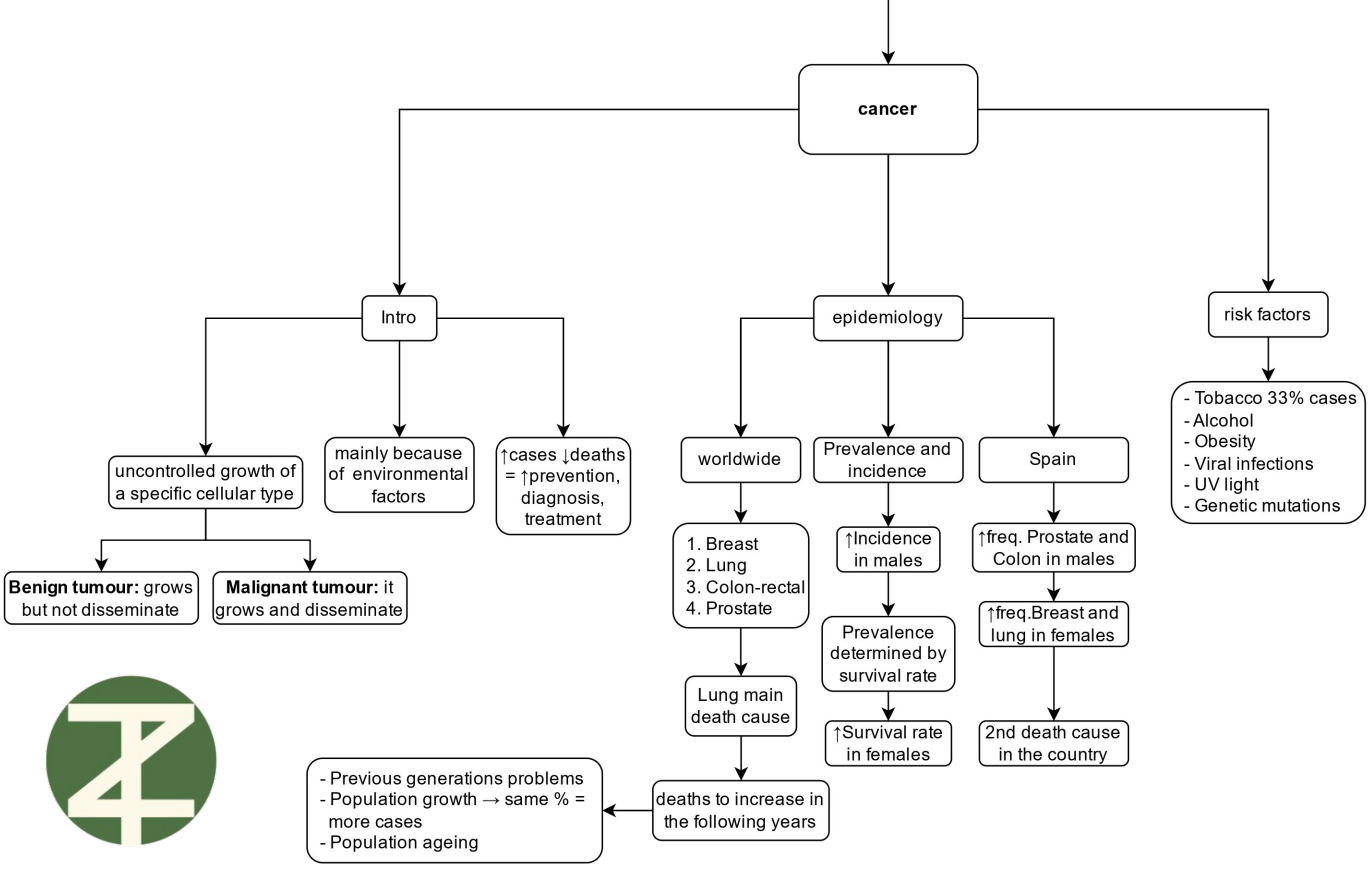

Epidemiology
Scientific method
1. Observation
2. Questions
3. Hypothesis
4. Experiments
5. Results
6. Conclusions
Epidemiological method
Types
Descriptive
incidence
prevalence
new cases
total cases in a given time
Analytical
find markers cause-effect observing
Experimental
intervention appears
Correlation and Causality
cause-effect factors
predisposing, facilitating, triggering, potential
Risk factor (control)
Risk marker (no control)
Risk indicator
+ association→ risk
- association→ protection
variables:
nominal (yes/no),
ordinal (how much),
categoric (exactly)
Epidemiology measures
sample: probabilistic or not
frequency measures
Effect measures
Impact measures
incidence
prevalence
Relative
Absolute
potential impact
relative risk and odds ratio

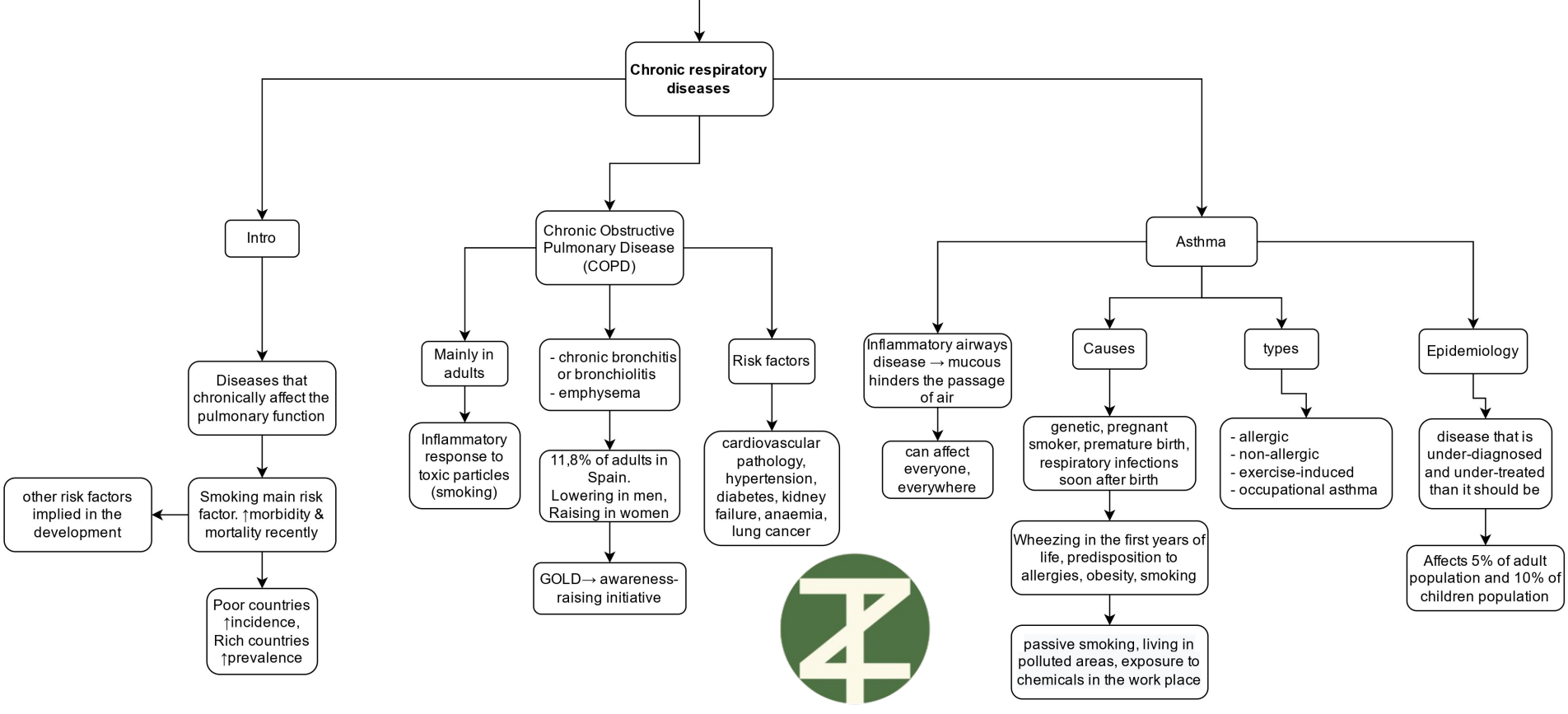

Design Strategies
Quantity investigation vs Quality investigation
External vs internal validity
Intervention?
no
yes
Observational studies
Experimental studies
Comparison?
no
yes
Descriptive studies
Analytical studies
demonstrate and quantify the efficacy and safety of a new procedure
sampling
disease
exposure
only intervention
+ random & control
ecological
case series
transverse
case-control
cohort studies
uncontrolled clinical trials
quasi-experimental studies
randomized controlled clinical trial
"group"
"how"
"at certain time"
"frequency" comparison by pairing
representative group of the entire population
to patients
it lacks one of the requisites
the study with the most evidence

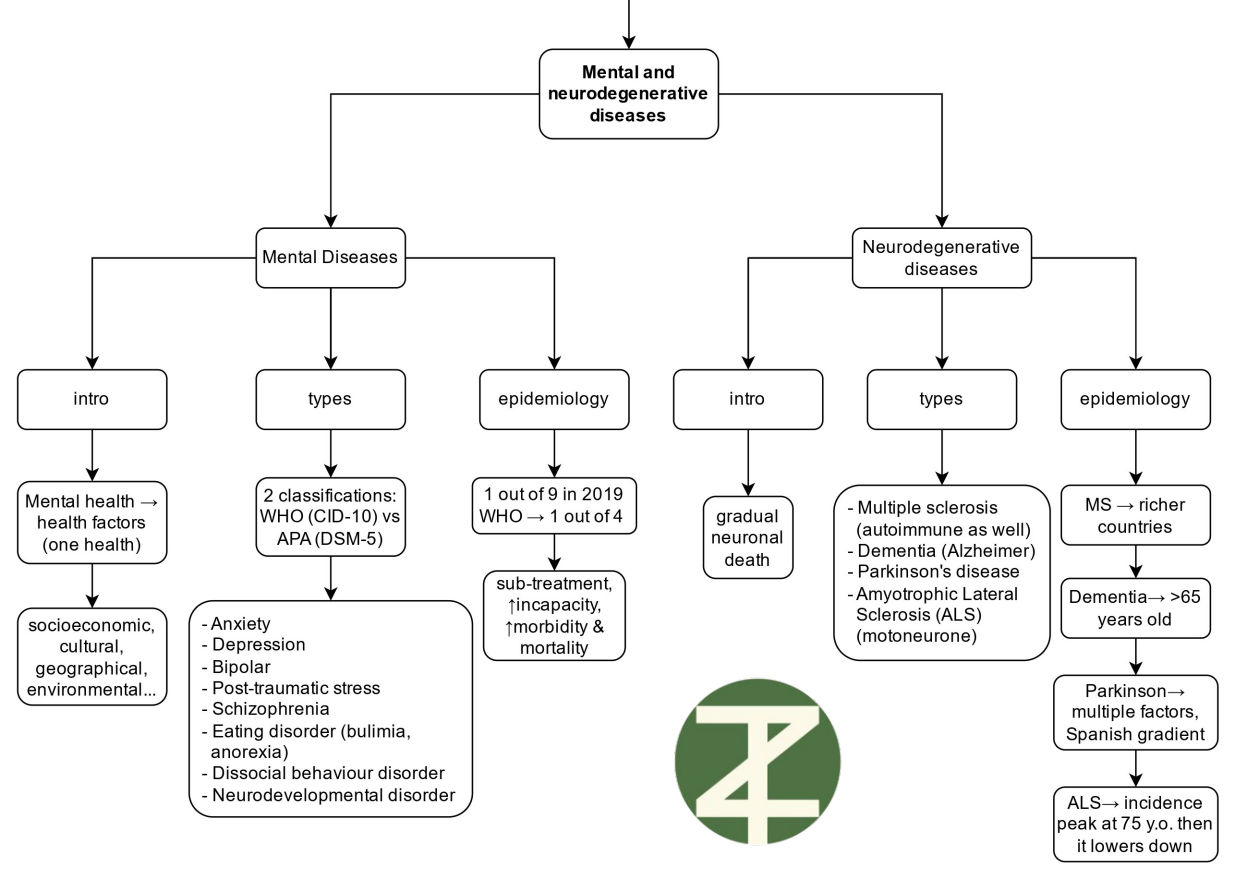

Errors and Replicability
bias = systematic error
Errors vs biases
types of biases
selection bias
information bias
analysis bias
non-representative sample
poor measurements
not counting third variables
Memory or Interviewer bias
confounding variable
effect modifier variable
Replicability and validity
intra-observer replicability | inter-observers replicability
Validity
sensitivity and specificity
Sensitivity → Sick individuals
Specificity → Healthy individuals
Internal
External
results applicable to
study group
population

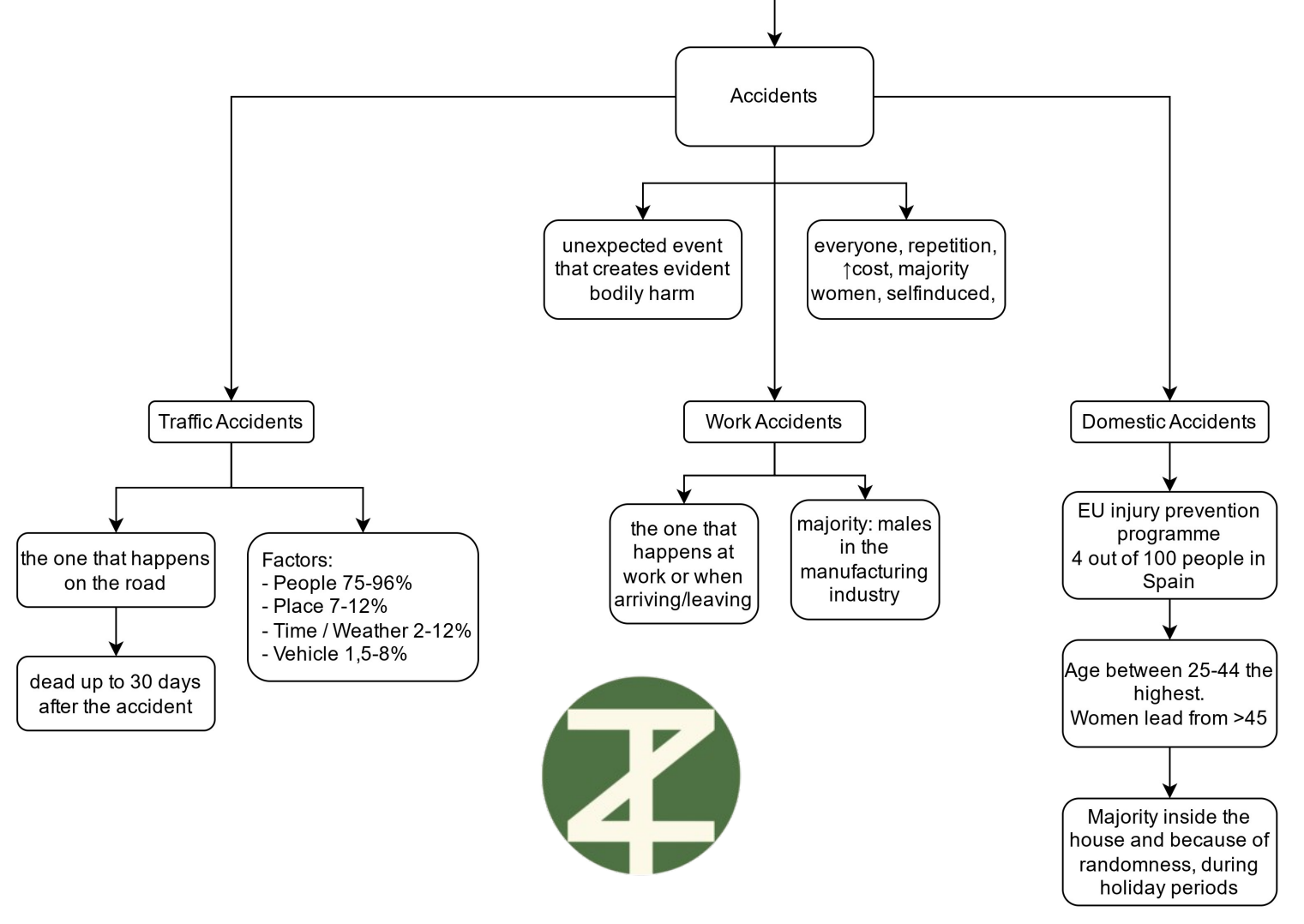

Communicable diseases
Infection → Infection disease → Cummunicable disease
Epidemiologic chain
R_0 basic reproduction number
Prevention and control measures
epidemiological vigilance (CDC)
causal agent → reservoir → transmission mechanisms → host & environmental factors
quarantine→healthy isolation→sick
airborne diseases
acute respiratory infections
bacteria, viruses or both
pneumonias and tuberculosis
multiresistance
direct and indirect transmission
Prevention
masks: hygienic, surgical, FFP1, FFP2, FFP3
Influenza virus
↑morbility, ↑mortality
- seasonal
- bird
- pandemic
Coronavirus
zoonosis → fever, dry cough, tiredness, etc
different variant causes different symptoms
digestive tract diseases
foodborne illnesses
gastrointestinal problems
- agent
- dosis
- host
- time
food contamination (direct or indirect)
- intoxications
- infections
- poisoning
Salmonella
↑adaptability
- typhoid
- gastrointestinal
↓incubation period. prefers ↑T°C
Campylobacter
most frequent
Poultry meat, raw milk, contaminated water
Most frequent in children <5 y.o.
Listeriosis
raw food
biofilm, death 30%, >2k CFU
Most frequent in +65 y.o.
Escherichia coli
fecal-oral transmission
- enterotoxigenic
- enterohemorrhagic
raw food contaminated
Botulism
needs to pass through soil
muscle paralysis
homemade preserves
sexually transmitted diseases
Direct transmission ↑morbility, ↑mortality
Epidemiologic chain: human, p-p, sex
prevention: information, vaccines, vigilance, diagnosis, drugs, analysis, early treatment
gonorrhea
↑2001 ↑↑2013
age 20-24
syphilis
vertical and blood transmission
phases→ last one lethal (3rd)
90% men, ↑2001, ↑2011 & 2016
chlamydia trachomatis
women>men
↑2016
age 20-24
human papilloma virus
most frequent
>80% sexually active people
age 15-25
transitory and immunogenic
HIV
zoonosis, type 1 and 2
3 phases:
- infection
- asymptomatic (transmission)
- AIDS
age >50 because of 80s infections


Chronic diseases
reactions of the body itself as a result of a bad lifestyle
exposure + exposure + exposure
- Smoking
- Alcohol abuse
- Physical inactivity
- Bad eating habits
↑↑cardio, ↑cancer, mental, diabetes, respiratory, musculoskeletal
Causality: multiple exposures
latency: extended (decades)
clinical case: extended
data: event driven, uncertain treatment
cardiovascular diseases
↑ incidence and mortality
Ischemic Heart Disease
- acute myocardial infarction
- angina pectoris
Cerebrovascular Disease
- thrombotic stroke
- embolic stroke
Arterial Hypertension
3 common causes
1. Chronic low intensity inflammation
2. Atherothrombosis
3. Arterial hypertension
Risk factors
- causal
- predisposing
- conditionals
existence →
- tobacco ↑LDL ↓HDL ↑CDs 3x
- hypertension >140/90 mmHg
- cholesterol ↑10%= +30% CDs
- obesity ↑others
- diabetes ↑glycemia
women
estrogen = protection
menopause → fatal
Prevention and control
- diet
- exercise
- smoking habit
↓ risk CDs
cardiovascular risk tables (Framingham)
overweight and obesity
overweight: >25 BMI
obese: >30 BMI
Spain 4th in EU for obesity
2020:
♂ 16,5% - 44,9%
♀ 15,5% - 30,6%
7 years old children:
♂ 18% - 42%
♀ 17% - 41%
2nd place together with Italy and Greece
obesity as a cause and as a consequence of illness
obesity is a disease
Diabetes Mellitus
↑↑ Glycemia
- no insulin
- insulin resistance
- both
peeing, thirst, hunger, fatigue, ↓weight, blurred vision, infections, wounds
Types
Type 1: autoimmune → no insulin
Type 2: insulin resistance
Gestational: t2 pregnant women
LADA: latent autoimmune adults
MODY: genetic mutation, Maturity-Onset Young
Epidemiology
1/6 gestational → big children
by 2045: Europe ↑13% Africa ↑134%
people don't die of diabetes
Europe: 1 in 11 have it 1 in 3 don't know it
Spain 2nd in Europe 1 in 7 have it
↑↑ type 2 is rising in children
Complications
acute
hyperglycemia
hypoglycemia
chronic
Retinopathy, nephropathy, neuropathy
Microvascular
Ischemic heart disease, Heart failure, Cerebrovascular disease, Penpheral arterial disease
Macrovascular
diabetic foot (ulcers), erectile dysfunction
Mixed

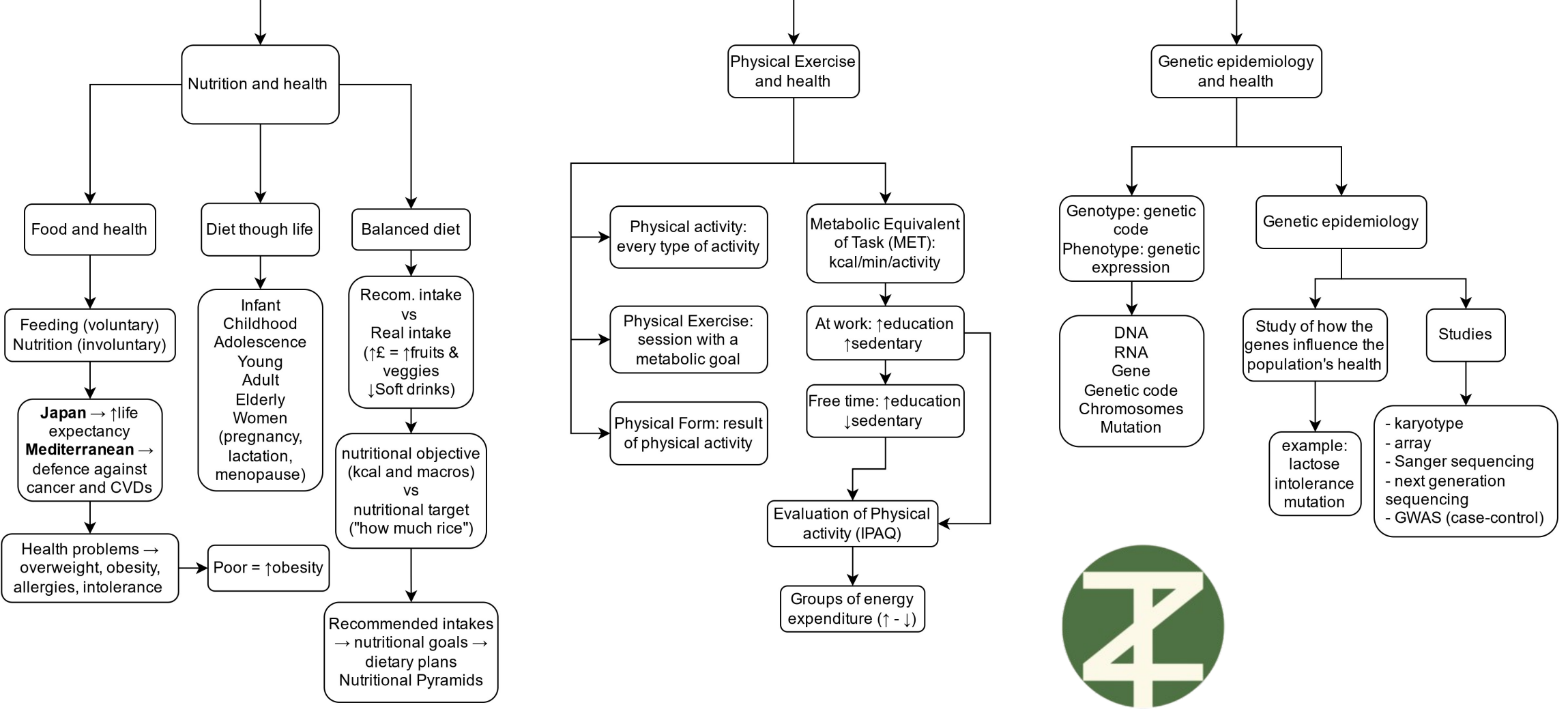

cancer
Intro
epidemiology
risk factors
uncontrolled growth of a specific cellular type
mainly because of environmental factors
↑cases ↓deaths = ↑prevention, diagnosis, treatment
Benign tumour: grows but not disseminate
Malignant tumour: it grows and disseminate
worldwide
Prevalence and incidence
Spain
1. Breast
2. Lung
3. Colon-rectal
4. Prostate
↑Incidence in males
↑freq. Prostate and Colon in males
Prevalence determined by survival rate
↑freq.Breast and lung in females
Lung main death cause
↑Survival rate in females
2nd death cause in the country
deaths to increase in the following years
- Previous generations problems
- Population growth → same % = more cases
- Population ageing
- Tobacco 33% cases
- Alcohol
- Obesity
- Viral infections
- UV light
- Genetic mutations


Chronic respiratory diseases
Intro
Diseases that chronically affect the pulmonary function
Smoking main risk factor. ↑morbidity & mortality recently
other risk factors implied in the development
Poor countries ↑incidence, Rich countries ↑prevalence
Chronic Obstructive Pulmonary Disease (COPD)
Mainly in adults
Inflammatory response to toxic particles (smoking)
- chronic bronchitis or bronchiolitis
- emphysema
11,8% of adults in Spain. Lowering in men, Raising in women
GOLD→ awareness-raising initiative
Risk factors
cardiovascular pathology, hypertension, diabetes, kidney failure, anaemia, lung cancer
Asthma
Inflammatory airways disease → mucous hinders the passage of air
can affect everyone, everywhere
Causes
genetic, pregnant smoker, premature birth, respiratory infections soon after birth
Wheezing in the first years of life, predisposition to allergies, obesity, smoking
passive smoking, living in polluted areas, exposure to chemicals in the work place
types
- allergic
- non-allergic
- exercise-induced
- occupational asthma
Epidemiology
disease that is under-diagnosed and under-treated than it should be
Affects 5% of adult population and 10% of children population


Mental and neurodegenerative diseases
Mental Diseases
Neurodegenerative diseases
intro
types
epidemiology
intro
types
epidemiology
Mental health → health factors (one health)
socioeconomic, cultural, geographical, environmental...
2 classifications: WHO (CID-10) vs APA (DSM-5)
- Anxiety
- Depression
- Bipolar
- Post-traumatic stress
- Schizophrenia
- Eating disorder (bulimia, anorexia)
- Dissocial behaviour disorder
- Neurodevelopmental disorder
1 out of 9 in 2019 WHO → 1 out of 4
sub-treatment, ↑incapacity, ↑morbidity & mortality
gradual neuronal death
- Multiple sclerosis (autoimmune as well)
- Dementia (Alzheimer)
- Parkinson's disease
- Amyotrophic Lateral Sclerosis (ALS) (motoneurone)
MS → richer countries
Dementia→ >65 years old
Parkinson→ multiple factors, Spanish gradient
ALS→ incidence peak at 75 y.o. then it lowers down


Accidents
unexpected event that creates evident bodily harm
everyone, repetition, ↑cost, majority women, selfinduced,
Traffic Accidents
Work Accidents
Domestic Accidents
the one that happens on the road
dead up to 30 days after the accident
Factors:
- People 75-96%
- Place 7-12%
- Time / Weather 2-12%
- Vehicle 1,5-8%
the one that happens at work or when arriving/leaving
majority: males in the manufacturing industry
EU injury prevention programme
4 out of 100 people in Spain
Age between 25-44 the highest.
Women lead from >45
Majority inside the house and because of randomness, during holiday periods

- Drugs
  - substance that acts on the CNS ...
    - abstinence and tolerance
      - Positive reinforcement. Dopamine reward circuit. Relative threshold.
    - Drug addiction (impulses) vs Drug dependency (long term)
    - desintoxication and dehabituation
  - Epidemiology
    - worldwide
      - Increase +22%, Cannabis 4x, 5,5% of population 15-64
    - Spain
      - ↑tobacco & alcohol, then cannabis and hypnosedatives
  - Tobacco
    - ↑morbility ↑mortality developed countries
      - prevalence 32,3%, men 57% 25-34 highest consumption
    - addiction, it relaxes acting on CNS
      - cancer 90% lung, 75% mouth, 35% kidney, 15% leukaemia
      - other respiratory and cardiovascular diseases
  - Alcohol
    - moderate drinker habitual drinker excessive drinker
      - no safe level of alcohol consumption
        - SDU Standard drinking unit
        - men: 20g women: 10g
    - epidemiology
      - very frequent, mostly beers and wine
        - people with more studies drink more (uni)
    - lasting effects
      - - Memory loss
        - Cognitive difficulties
        - Alcoholic dementia
        - Gastritis
        - Gastrointestinal ulcer
        - Liver cirrhosis
        - cancer
        - heart disease
        - tolerance and withdrawal
    - binge drinking
      - more than what we can process
        - men: +5 in 1h women: +4 in 1h


Nutrition and health
Food and health
Diet though life
Balanced diet
Feeding (voluntary)
Nutrition (involuntary)
Infant
Childhood
Adolescence
Young
Adult
Elderly
Women
(pregnancy, lactation, menopause)
Recom. intake
vs
Real intake
(↑£ = ↑fruits & veggies
↓Soft drinks)
Japan → ↑life expectancy
Mediterranean → defence against cancer and CVDs
nutritional objective (kcal and macros)
vs
nutritional target ("how much rice")
Health problems → overweight, obesity, allergies, intolerance
Poor = ↑obesity
Recommended intakes → nutritional goals → dietary plans
Nutritional Pyramids
Physical Exercise and health
Physical activity: every type of activity
Physical Exercise: session with a metabolic goal
Physical Form: result of physical activity
Metabolic Equivalent of Task (MET): kcal/min/activity
At work: ↑education ↑sedentary
Free time: ↑education ↓sedentary
Evaluation of Physical activity (IPAQ)
Groups of energy expenditure (↑ - ↓)
Genetic epidemiology and health
Genotype: genetic code
Phenotype: genetic expression
DNA
RNA
Gene
Genetic code
Chromosomes
Mutation
Genetic epidemiology
Study of how the genes influence the population's health
example: lactose intolerance mutation
Studies
- karyotype
- array
- Sanger sequencing
- next generation sequencing
- GWAS (case-control)

Intro

food: what you introduce in your mouth that has nutritional values

accessibility to safe and nutritious food

stable offer and availability of adecuate food and accessibility to it

determined by environment, culture, economy, consumption

sufficient diet, adequate diet and healthy diet

sanitary cost increased with a standard diet

6 nutritional goals

1. - 40% stunted growth

2. - 50% anemia pregnant women

3. - 30% low weight at birth

4. no overweight children

5. 50% milk only lactation up to 6 months

6. <5% children malnutrition

after 10 years they didn't reach any of those

what is food hygiene

persistent conditions that ensure health in all parts of production chain

production, storage, transformation, transport, conservation, domestic cooking

"From Farm to Fork" → normatives for each part of the chain

sustainability aspect recently added (2030)

food waste 80kg person/year

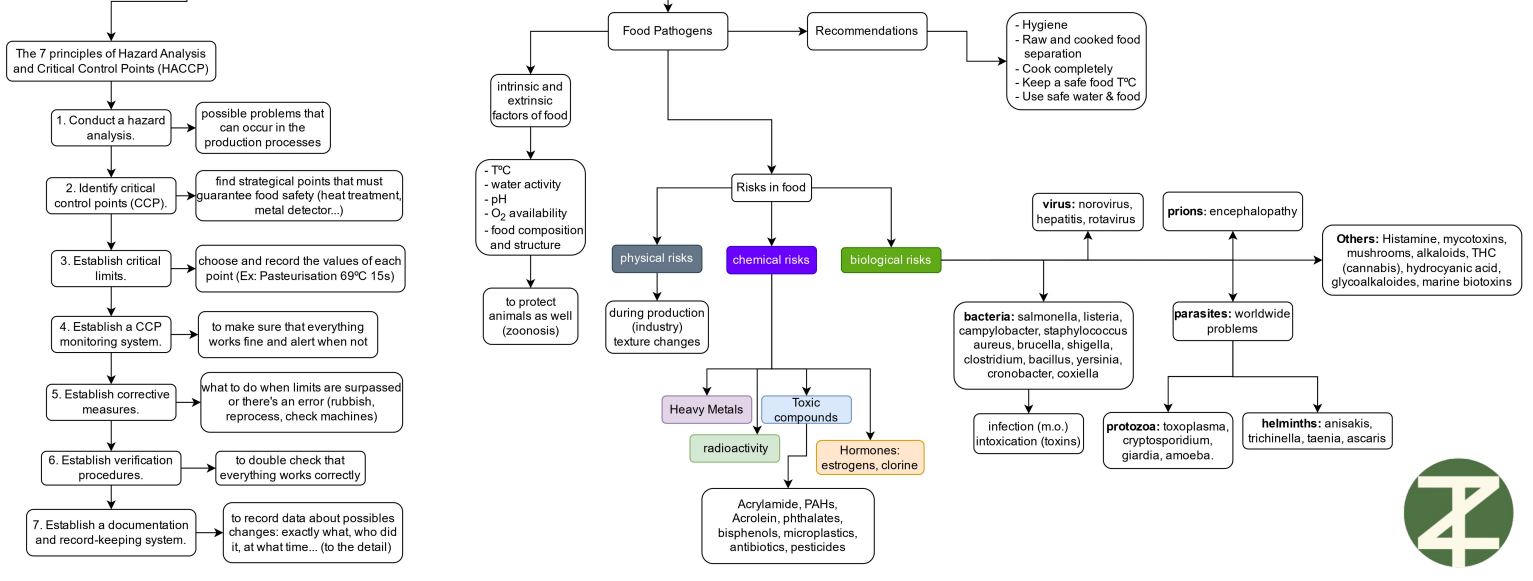
circular economy (RRR)

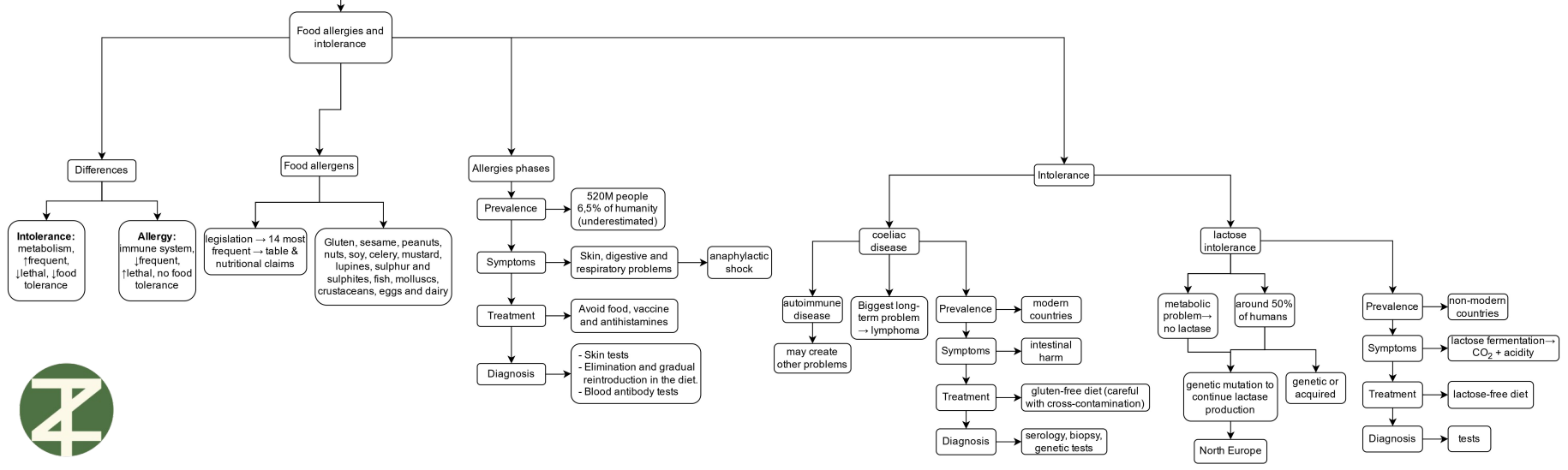
food hygiene legislation

Worldwide 180 countries

European→ more strict

risk analysis, precaution, traceability, compliance, Rapid Alert System for Food and Feed


The 7 principles of Hazard Analysis and Critical Control Points (HACCP)
1. Conduct a hazard analysis.
possible problems that can occur in the production processes
2. Identify critical control points (CCP).
find strategical points that must guarantee food safety (heat treatment, metal detector...)
3. Establish critical limits.
choose and record the values of each point (Ex: Pasteurisation 69ºC 15s)
4. Establish a CCP monitoring system.
to make sure that everything works fine and alert when not
5. Establish corrective measures.
what to do when limits are surpassed or there's an error (rubbish, reprocess, check machines)
6. Establish verification procedures.
to double check that everything works correctly
7. Establish a documentation and record-keeping system.
to record data about possibles changes: exactly what, who did it, at what time... (to the detail)
Food Pathogens
Recommendations
- Hygiene
- Raw and cooked food separation
- Cook completely
- Keep a safe food TºC
- Use safe water & food
intrinsic and extrinsic factors of food
- TºC
- water activity
- pH
- O_2 availability
- food composition and structure
to protect animals as well (zoonosis)
Risks in food
physical risks
during production (industry) texture changes
chemical risks
Heavy Metals
Toxic compounds
radioactivity
Hormones: estrogens, clorine
Acrylamide, PAHs, Acrolein, phthalates, bisphenols, microplastics, antibiotics, pesticides
biological risks
virus: norovirus, hepatitis, rotavirus
prions: encephalopathy
Others: Histamine, mycotoxins, mushrooms, alkaloids, THC (cannabis), hydrocyanic acid, glycoalkaloides, marine biotoxins
bacteria: salmonella, listeria, campylobacter, staphylococcus aureus, brucella, shigella, clostridium, bacillus, yersinia, cronobacter, coxiella
infection (m.o.) intoxication (toxins)
parasites: worldwide problems
protozoa: toxoplasma, cryptosporidium, giardia, amoeba.
helminths: anisakis, trichinella, taenia, ascaris


Food allergies and intolerance
Differences
Intolerance: metabolism, ↑frequent, ↓lethal, ↓food tolerance
Allergy: immune system, ↓frequent, ↑lethal, no food tolerance
Food allergens
legislation → 14 most frequent → table & nutritional claims
Gluten, sesame, peanuts, nuts, soy, celery, mustard, lupines, sulphur and sulphites, fish, molluscs, crustaceans, eggs and dairy
Allergies phases
Prevalence
520M people 6,5% of humanity (underestimated)
Symptoms
Skin, digestive and respiratory problems
anaphylactic shock
Treatment
Avoid food, vaccine and antihistamines
Diagnosis
- Skin tests
- Elimination and gradual reintroduction in the diet.
- Blood antibody tests
Intolerance
coeliac disease
autoimmune disease
may create other problems
Biggest long-term problem → lymphoma
Prevalence
modern countries
Symptoms
intestinal harm
Treatment
gluten-free diet (careful with cross-contamination)
Diagnosis
serology, biopsy, genetic tests
lactose intolerance
metabolic problem→ no lactase
around 50% of humans
genetic mutation to continue lactase production
genetic or acquired
North Europe
Prevalence
non-modern countries
Symptoms
lactose fermentation→ CO_2 + acidity
Treatment
lactose-free diet
Diagnosis
tests

Environment Health

one health

Environment: Physical, chemical, biological and social components that can affect the human (in/directly)

must be for everyone

vigilance, studies and normative

Problem: environmental degradation

Factors:

abiotic or biotic factors

air pollution, chemical, polluted water, radiation, noise, climate change, urbanisation

Diseases

1st diarrhoea
2nd respiratory infections

growth disorders, cancer, sudden death, immune response alteration, learning difficulties

zoonotic diseases:
- 60% of the total
- 75% of communicable
- 3/5 of new ones
- 80% of bioterrorist agents are animals

Pollution

Natural

fires, volcanos...

Anthropogenic

Acoustic, light, visual and technological pollution

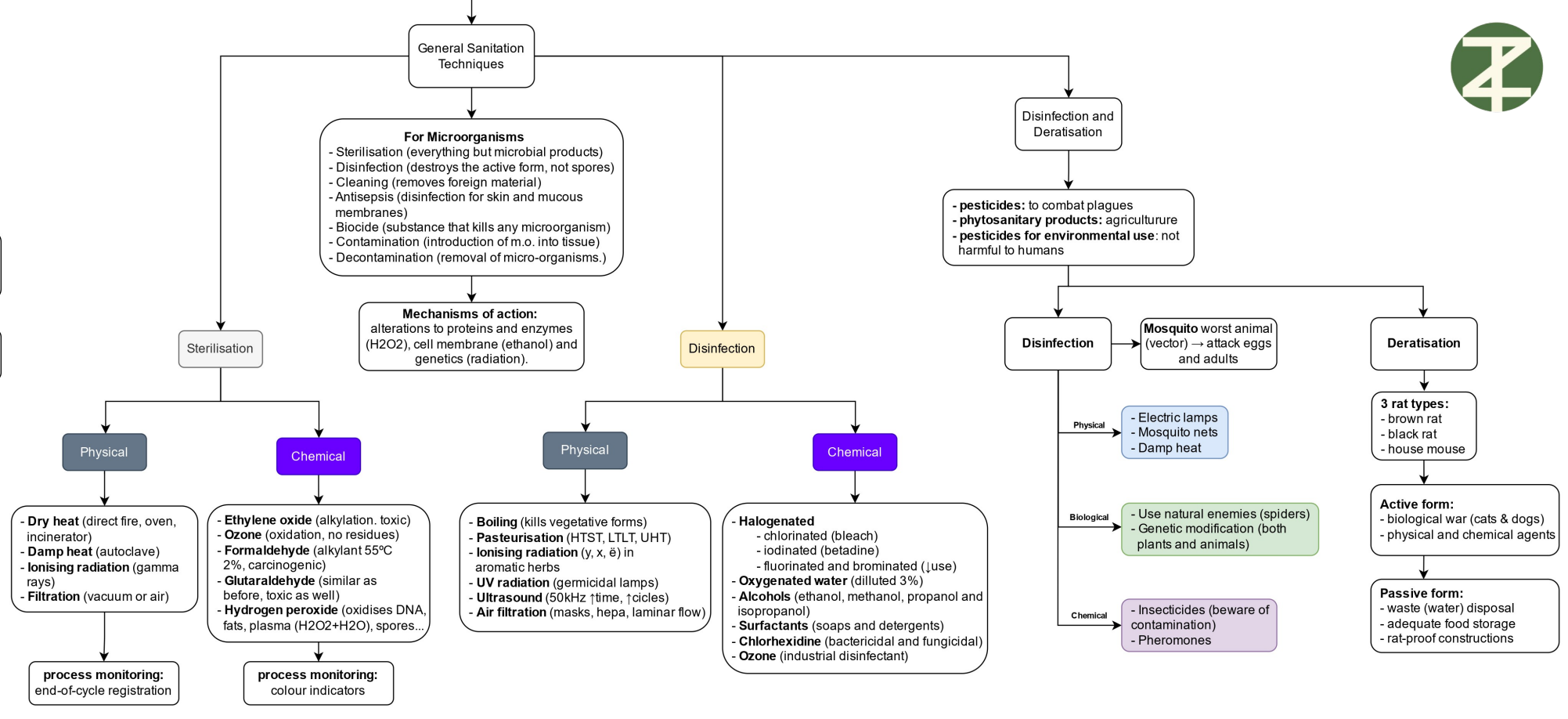
↑pollution because of:
- Population growth
- Industrial development
- Technified agriculture

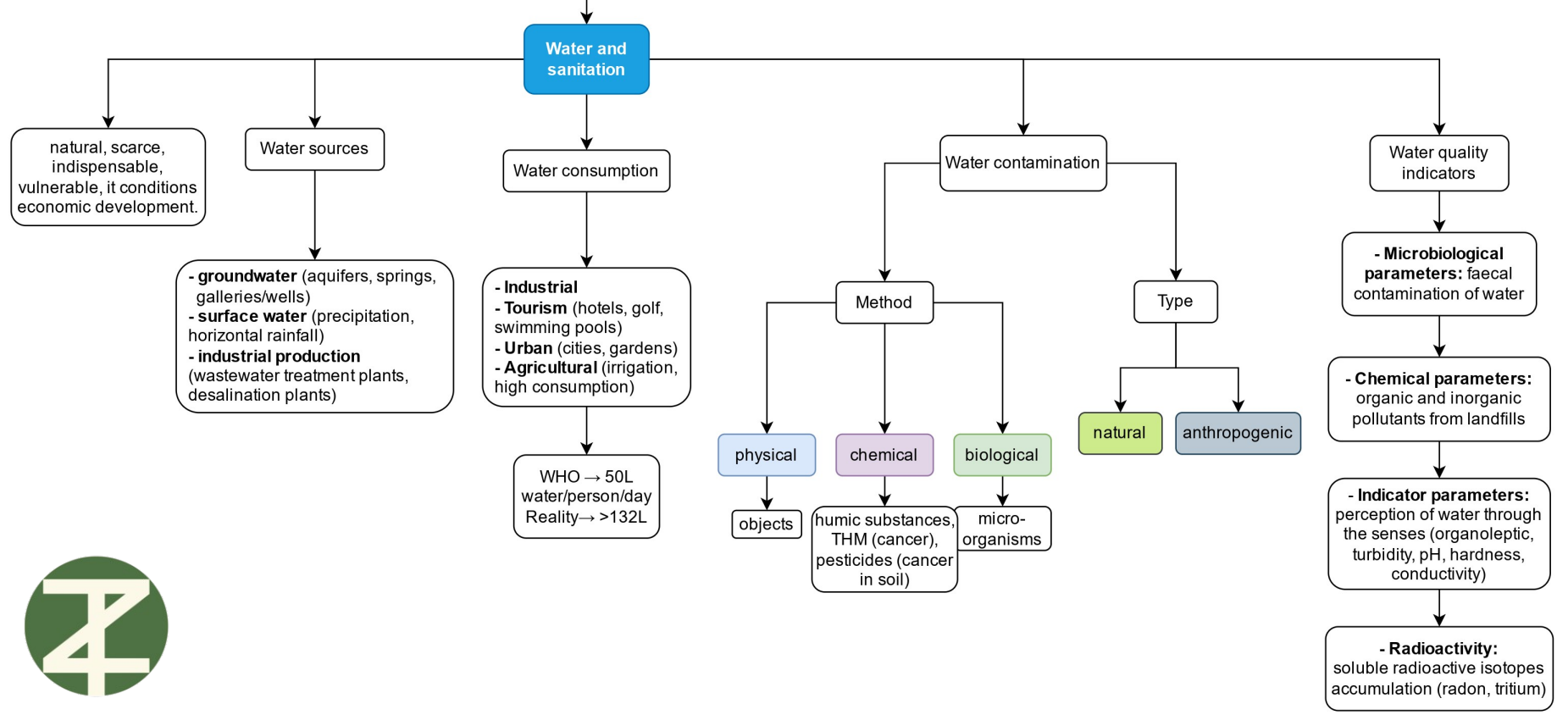
Legislation

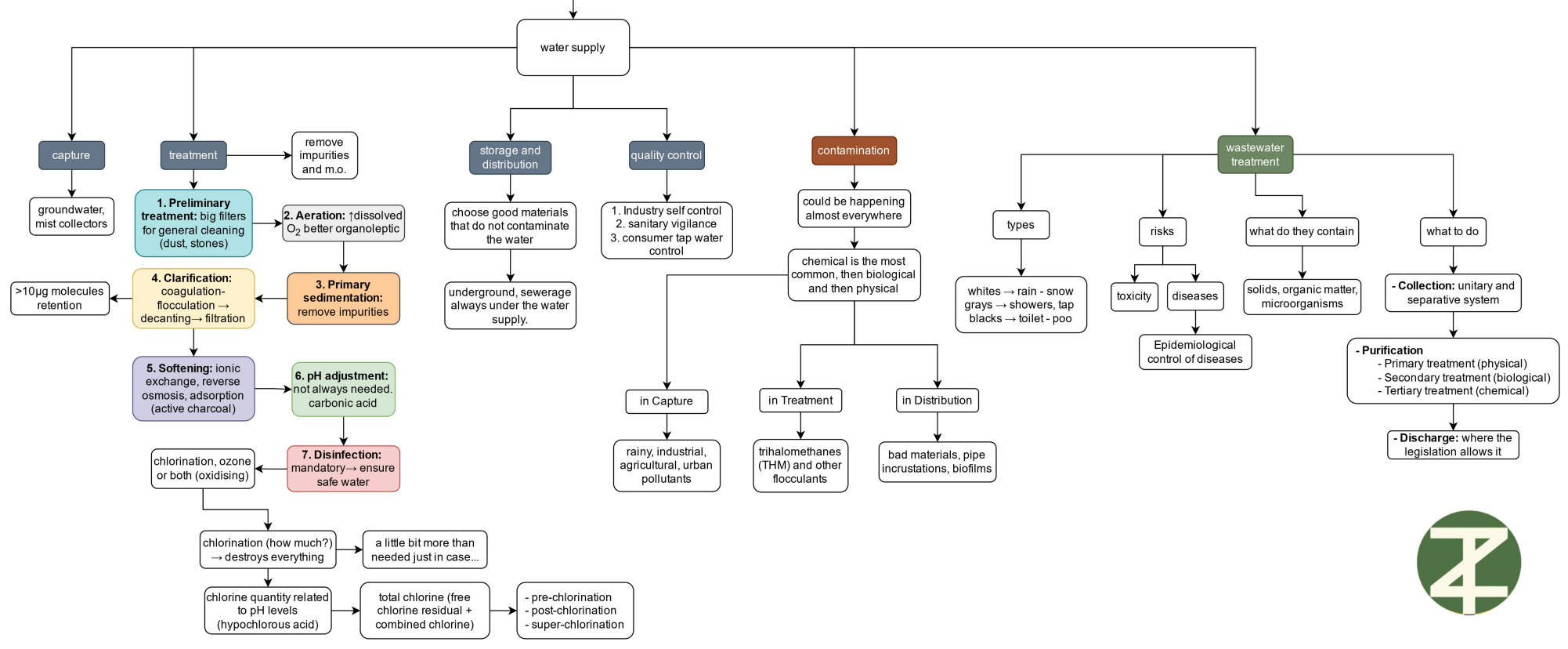
1. Central (country)
2. Autonomic (county)
3. Local (municipality)

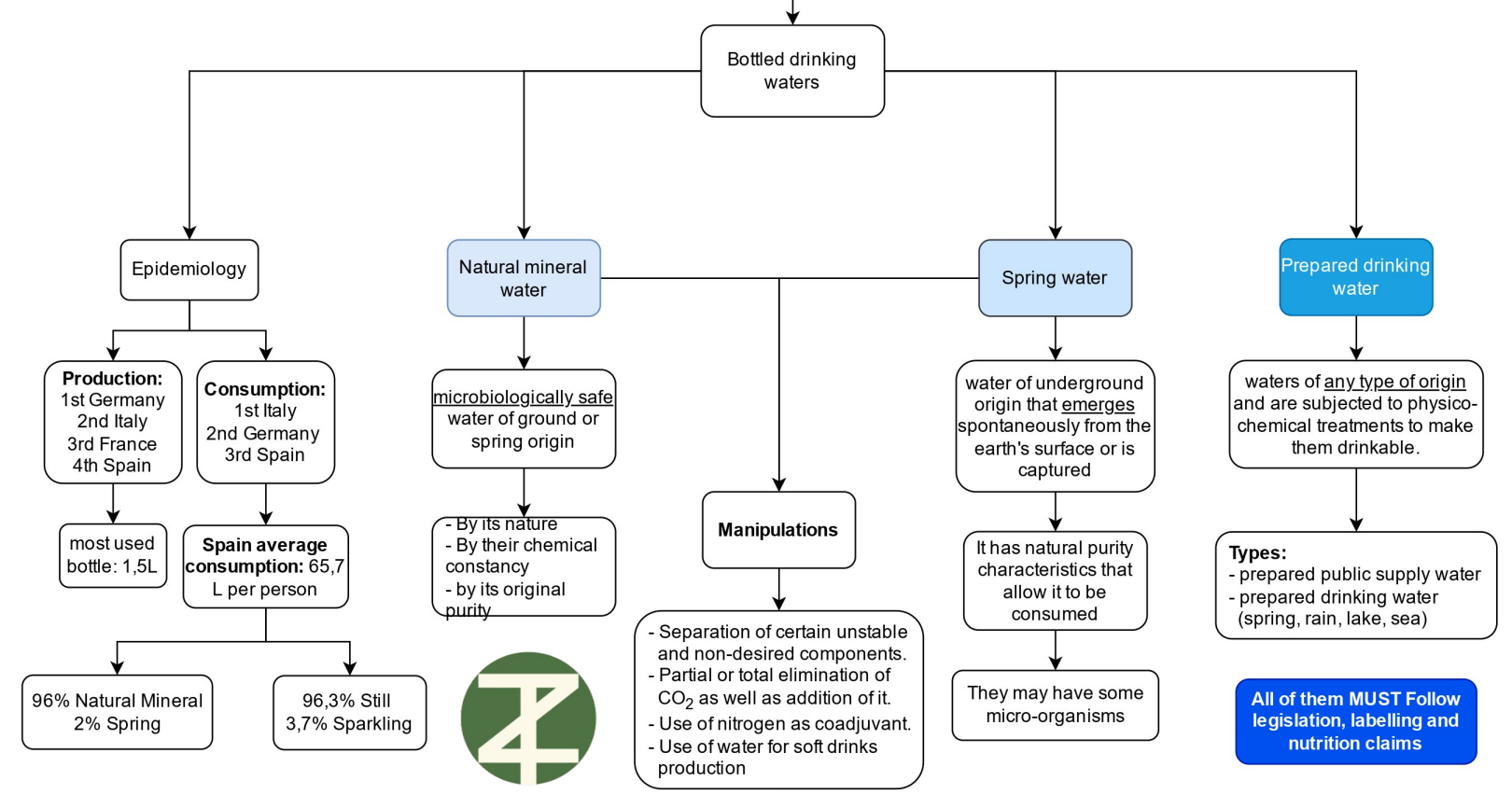
social, economic and environmental factors

Mental, physical and social health


General Sanitation Techniques
For Microorganisms
- Sterilisation (everything but microbial products)
- Disinfection (destroys the active form, not spores)
- Cleaning (removes foreign material)
- Antisepsis (disinfection for skin and mucous membranes)
- Biocide (substance that kills any microorganism)
- Contamination (introduction of m.o. into tissue)
- Decontamination (removal of micro-organisms.)
Mechanisms of action:
alterations to proteins and enzymes (H2O2), cell membrane (ethanol) and genetics (radiation).
Disinfection and Deratisation
- pesticides: to combat plagues
- phytosanitary products: agriculturure
- pesticides for environmental use: not harmful to humans
Sterilisation
Physical
- Dry heat (direct fire, oven, incinerator)
- Damp heat (autoclave)
- Ionising radiation (gamma rays)
- Filtration (vacuum or air)
process monitoring:
end-of-cycle registration
Chemical
- Ethylene oxide (alkylation. toxic)
- Ozone (oxidation, no residues)
- Formaldehyde (alkylant 55ºC 2%, carcinogenic)
- Glutaraldehyde (similar as before, toxic as well)
- Hydrogen peroxide (oxidises DNA, fats, plasma (H2O2+H2O), spores...
process monitoring:
colour indicators
Disinfection
Physical
- Boiling (kills vegetative forms)
- Pasteurisation (HTST, LTLT, UHT)
- Ionising radiation (y, x, ë) in aromatic herbs
- UV radiation (germicidal lamps)
- Ultrasound (50kHz ↑time, ↑cicles)
- Air filtration (masks, hepa, laminar flow)
Chemical
- Halogenated
- chlorinated (bleach)
- iodinated (betadine)
- fluorinated and brominated (↓use)
- Oxygenated water (dilluted 3%)
- Alcohols (ethanol, methanol, propanol and isopropanol)
- Surfactants (soaps and detergents)
- Chlorhexidine (bactericidal and fungicidal)
- Ozone (industrial disinfectant)
Disinfection
Mosquito worst animal (vector) → attack eggs and adults
Physical
- Electric lamps
- Mosquito nets
- Damp heat
Biological
- Use natural enemies (spiders)
- Genetic modification (both plants and animals)
Chemical
- Insecticides (beware of contamination)
- Pheromones
Deratisation
3 rat types:
- brown rat
- black rat
- house mouse
Active form:
- biological war (cats & dogs)
- physical and chemical agents
Passive form:
- waste (water) disposal
- adequate food storage
- rat-proof constructions


Water and sanitation
natural, scarce, indispensable, vulnerable, it conditions economic development.
Water sources
- groundwater (aquifers, springs, galleries/wells)
- surface water (precipitation, horizontal rainfall)
- industrial production (wastewater treatment plants, desalination plants)
Water consumption
- Industrial
- Tourism (hotels, golf, swimming pools)
- Urban (cities, gardens)
- Agricultural (irrigation, high consumption)
WHO → 50L water/person/day
Reality→ >132L
Water contamination
Method
physical
objects
chemical
humic substances, THM (cancer), pesticides (cancer in soil)
biological
micro-organisms
Type
natural
anthropogenic
Water quality indicators
- Microbiological parameters: faecal contamination of water
- Chemical parameters: organic and inorganic pollutants from landfills
- Indicator parameters: perception of water through the senses (organoleptic, turbidity, pH, hardness, conductivity)
- Radioactivity: soluble radioactive isotopes accumulation (radon, tritium)


water supply
capture
groundwater, mist collectors
treatment
remove impurities and m.o.
1. Preliminary treatment: big filters for general cleaning (dust, stones)
2. Aeration: ↑dissolved O_2 better organoleptic
3. Primary sedimentation: remove impurities
4. Clarification: coagulation-flocculation → decanting→ filtration
>10µg molecules retention
5. Softening: ionic exchange, reverse osmosis, adsorption (active charcoal)
6. pH adjustment: not always needed. carbonic acid
7. Disinfection: mandatory→ ensure safe water
chlorination, ozone or both (oxidising)
chlorination (how much?) → destroys everything
a little bit more than needed just in case...
chlorine quantity related to pH levels (hypochlorous acid)
total chlorine (free chlorine residual + combined chlorine)
- pre-chlorination
- post-chlorination
- super-chlorination
storage and distribution
choose good materials that do not contaminate the water
underground, sewerage always under the water supply.
quality control
1. Industry self control
2. sanitary vigilance
3. consumer tap water control
contamination
could be happening almost everywhere
chemical is the most common, then biological and then physical
in Capture
rainy, industrial, agricultural, urban pollutants
in Treatment
trihalomethanes (THM) and other flocculants
in Distribution
bad materials, pipe incrustations, biofilms
wastewater treatment
types
whites → rain - snow
grays → showers, tap
blacks → toilet - poo
risks
toxicity
diseases
Epidemiological control of diseases
what do they contain
solids, organic matter, microorganisms
what to do
- Collection: unitary and separative system
- Purification
- Primary treatment (physical)
- Secondary treatment (biological)
- Tertiary treatment (chemical)
- Discharge: where the legislation allows it


Bottled drinking waters
Epidemiology
Natural mineral water
Spring water
Prepared drinking water
Production: 1st Germany 2nd Italy 3rd France 4th Spain
Consumption: 1st Italy 2nd Germany 3rd Spain
most used bottle: 1,5L
Spain average consumption: 65,7 L per person
96% Natural Mineral 2% Spring
96,3% Still 3,7% Sparkling
microbiologically safe water of ground or spring origin
- By its nature
- By their chemical constancy
- by its original purity
Manipulations
- Separation of certain unstable and non-desired components.
- Partial or total elimination of CO_2 as well as addition of it.
- Use of nitrogen as coadjuvant.
- Use of water for soft drinks production
water of underground origin that emerges spontaneously from the earth's surface or is captured
It has natural purity characteristics that allow it to be consumed
They may have some micro-organisms
waters of any type of origin and are subjected to physico-chemical treatments to make them drinkable.
Types:
- prepared public supply water
- prepared drinking water (spring, rain, lake, sea)
All of them MUST Follow legislation, labelling and nutrition claims

Health management

Levels of health care

	Primary care	Secondary care	Tertiary care
Definition	ensure the highest possible level of health and well-being through health promotion and disease prevention	early identification of disease and prevention of the progression of any pathology found at an early stage	prevent worsening of the individual's health, complications or disability. Treatment and rehabilitation
Entities included	Health centres	hospitals, paediatrics, general surgery, psychiatry, psychiatry	specialised health centres (rehabilitation), tertiary health centres
Key features	comprehensive, integrated, continuous, decentralised, decentralised, accessible, programmed, longitudinal, research-based, participatory, coordinated, ongoing	detecting disease at an early stage and limiting pathological damage	Long processes, high costs, high possibility of relapse (depending on the disease)
Importance in Population's Health	prevention, ↓incidence of a disease acting on the pre-pathogenic state	detection of a possible disease within its earliest stages	decrease in disease prevalence and improvement in the quality of life of people with advanced pathological stages

Community health programmes

Definition: a set of services, carried out with the aim of achieving the objectives determined in relation to the precise health problems of a given population

What does it consist of?
to solve health problems and promote optimal living by:
- Health diagnosis
- System implementation
- Results evaluation

Who carries them out?
People, families and the health care services

Sanitary models

	Liberal model	Socialist model	Bismark model	Beveridge model
Definition	private healthcare, the private insurance companies compete with each other	health care financing is entirely covered by the general budget of the state.	workers pay taxes to finance social security benefits	health care to all citizens through the payment of income taxes income taxes
Sources of funding	The Government makes a contribution only for the poorest people without resources. The others pay with their money	in its entirety by general state budget	the employee and employer contributions	taxation of the entire population
Population covered	people that pay with their money	everyone	everyone that is/was a worker	everyone
Countries	USA, China, India	Cuba and North Korea	Germany, Austria, France, Belgium, Luxembourg and The Netherlands	United Kingdom, Sweden, Finland, Norway, Denmark, Italy, Spain and Portugal
Pros	competence → scientific improvement and research. The population is free to choose.	The government does it all for the population, boosting prevention medicine and health	Freedom of choice, no waiting lists and population satisfaction	Flexibility, socialisation of risk. The articulation of a fair financing system.
Cons	Increased bureaucracy, profit-oriented, discrimination and inequity, no free market, delayed visits	Citizens don't value the cost of health care, individual freedom is limited	Protecting the worker rather than the citizen. It does not favour organisational planning coordination.	misallocation of resources, Conflicts between public objectives, individual interests and public institutions