

Hva gjør plasten med helsa?

Marius Widerøe

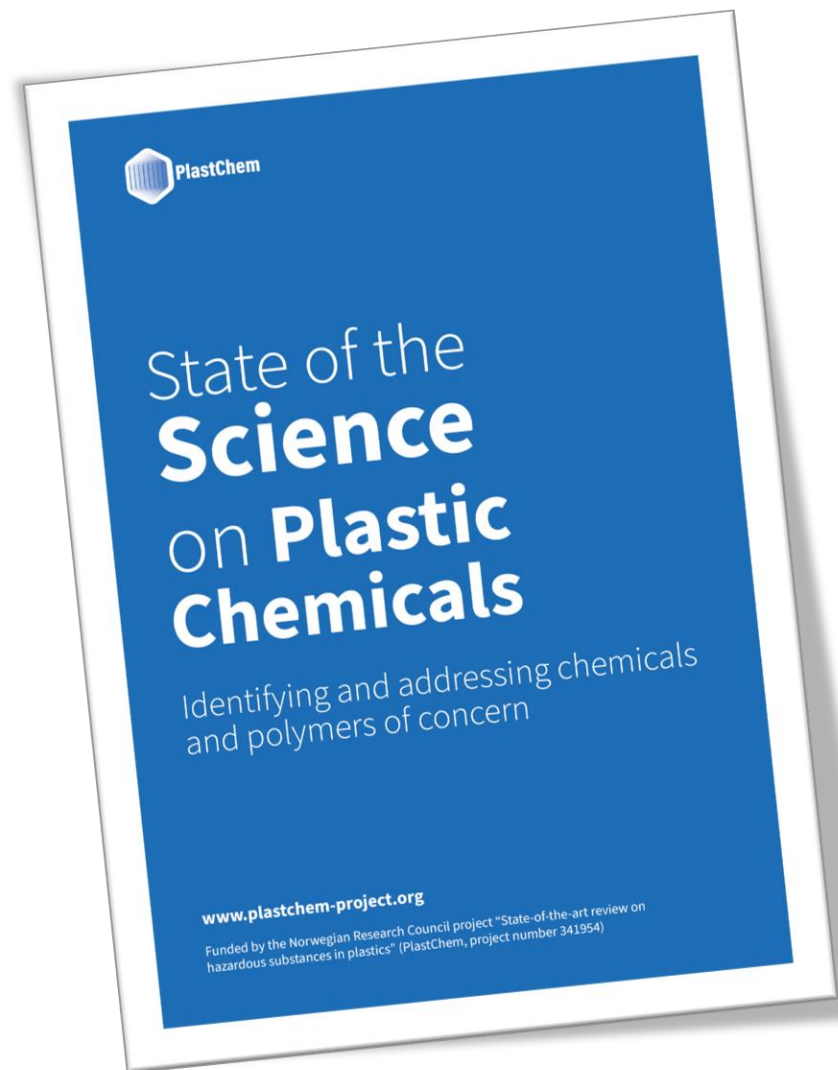
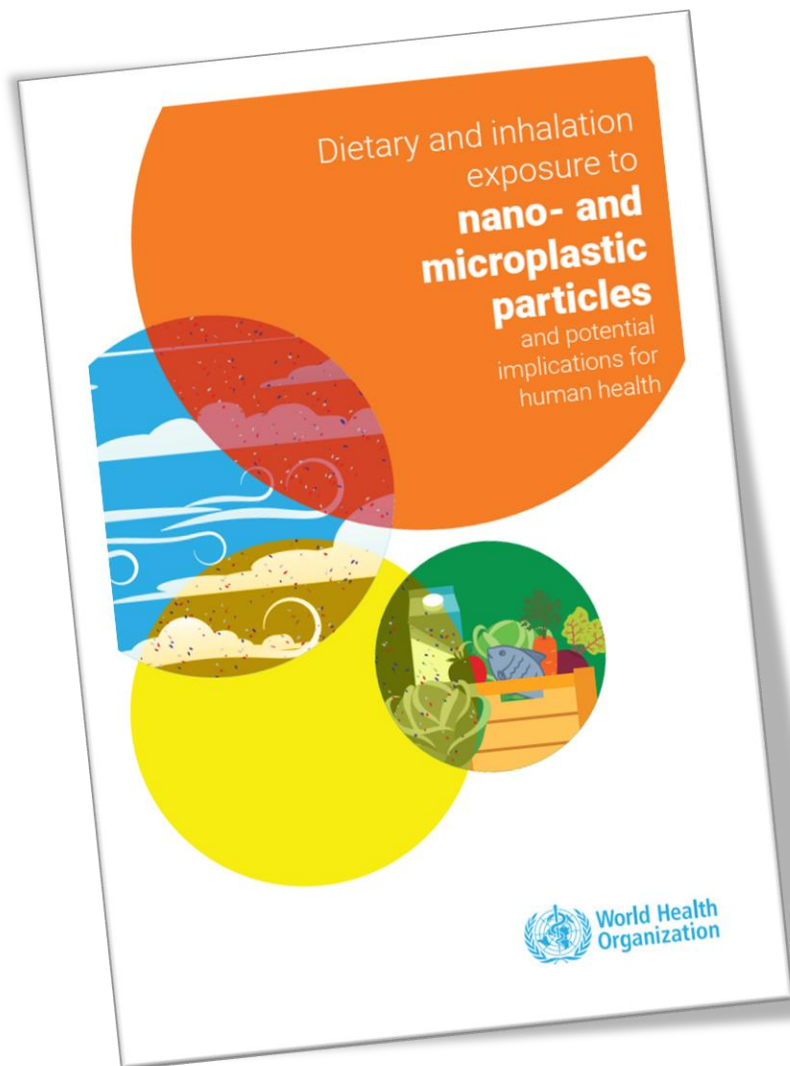
NTNU Helse og Livsvitenskap

Plastdagen 03.10.2024



Plast og helse – Hva er problemet?

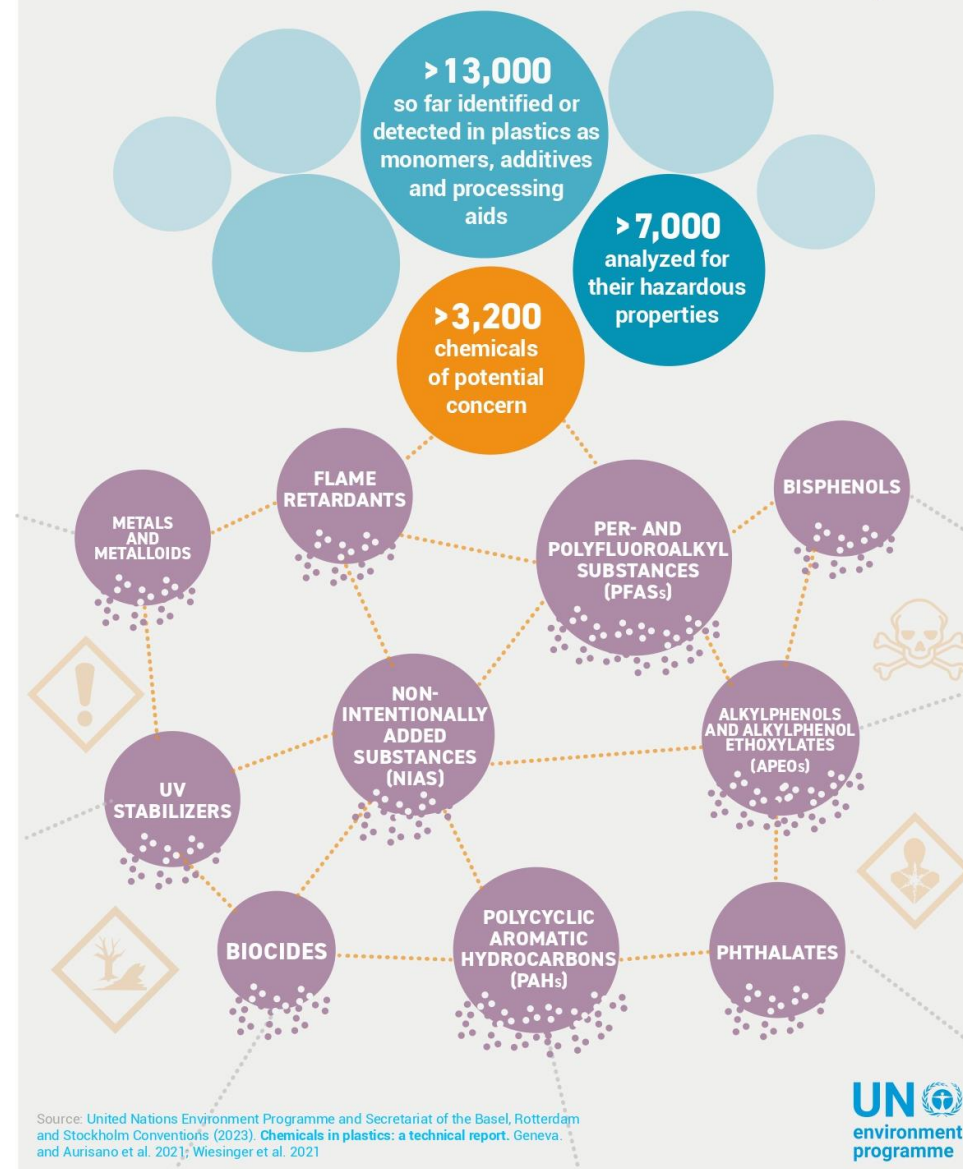






Aromatic amines
 Alkyl aldehydes
 Alkylphenols
 Salicylate esters
 Aromatic ethers
 Bisphenols
 Phthalates
 Benzothiazoles
 Organometallics
 Parabens
 Azodyes
 Aceto/benzophenones
 Chlorinated paraffins
 Per- and polyfluoroalkyl
 substances (PFAS)

CHEMICALS OF CONCERN IN YOUR PLASTICS



HUMAN EXPOSURE TO CHEMICALS IN PLASTICS

SOURCES



EVERYDAY PLASTIC PRODUCTS, e.g. plastic-based food contact materials, building materials, electronics, textile, clothing and personal care and household products



CHILDREN'S products e.g. toys, clothing or furniture.



OCCUPATIONAL exposure at various stages of the plastic value chain

EXPOSURE PATHWAYS examples

inhalation of contaminated air

ingestion of contaminated food, water and dust

dermal contact



ADVERSE HEALTH EFFECTS examples

abnormal hormone functions

reduced fertility

damaged nervous system

hypertension/
cardiovascular disease

lung and liver cancer

Source: United Nations Environment Programme and Secretariat of the Basel, Rotterdam and Stockholm Conventions (2023). **Chemicals in plastics: a technical report**. Geneva.

Know Your Plastics



PET

Polyethylene Terephthalate

Releases endocrine disrupting chemicals like acetaldehyde over time, as well as toxic antimony, use once only.

Most commonly made into polyester fibres, also used in bottles for water or soda



PE-HD

Polyethylene (high density)

Additives & softeners used in this plastic have never been tested for safety. Do you feel lucky?

Milk & detergent bottles, bottle caps, food storage containers, plastic bags and even plastic surgery



PVC

Polyvinylchloride

The most toxic plastic, leaching phthalates, carcinogens, dioxins & more, linked to reproductive problems, diabetes, organ toxicity and cancers.

Water pipes, siding, signs, insulation, clothing, furniture, pleather, shower curtains and yes, even toys



PE-LD

Polyethylene (low density)

Relatively chemically non-reactive, these plastics degrade very slowly and present a burden to the environment for centuries.

Laminates, disk drives, snap on lids, six pack rings, playground slides and plastic wraps



PP

Polypropylene

Additives & softeners used in this plastic have never been tested for safety. Do you feel lucky?

Packaging, textiles, carpets, stationary, laboratory & medical equipment, molded shapes & diapers



PS

Polystyrene

These plastics leach extremely toxic brominated flame retardants over their entire lifespan.

Packaging, foam drink cups, insulation, rigid shapes like DVD cases or frames, and packing peanuts



O

Bisphenol A and others

Bisphenol A mimics the effects of the hormone estrogen and is linked to infertility & developmental damage.

A catch-all category for all other plastic types, includes bioplastics & multi layered resins, toxic bisphenol A may also be in other plastics

SOME PLASTIC PRODUCTS ARE MORE TOXIC THAN OTHERS

PET

HDPE

PP

LDPE

PS

PLA

PVC



ENVIRONMENTAL HEALTH

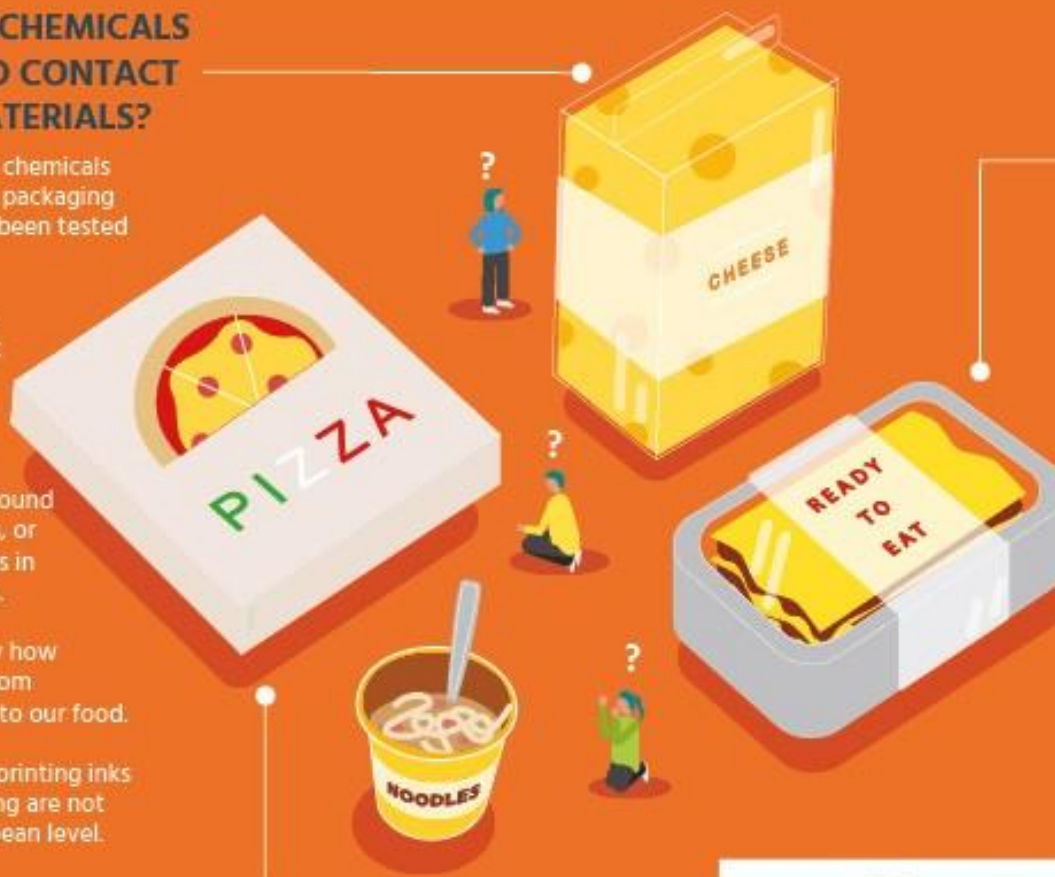
Health and Environment Alliance (HEAL) <https://www.env-health.org/>

CHEMICALS IN FOOD WRAPPINGS CAN IMPACT PEOPLE'S HEALTH: WE NEED MORE PROTECTIVE REGULATION



WHICH HARMFUL CHEMICALS ARE USED IN FOOD CONTACT ARTICLES AND MATERIALS?

- ⚠ In Europe, some 8,000 chemicals can be used in articles packaging our food. Not all have been tested for toxicity.
- ⚠ At least 63 substances that are used in plastic packaging are toxic for health, including endocrine disruptors.
- ⚠ Consumer tests have found bisphenols, phthalates, or fluorinated compounds in various food packages.
- ⚠ Scientific studies show how chemicals can move from packaging materials into our food.
- ⚠ Paper, cardboard and printing inks used for food packaging are not regulated at the European level.



CHEMICALS USED IN THE PROCESSING AND PACKAGING OF OUR FOOD CAN:



Cause
cancer



Harm
reproduction



Build up in
our bodies



Persist in the
environment



Affect
DNA



Disrupt
hormones

#HealthNotToxics

...ARTICLES:

the actual articles that contain or wrap our food, e.g. a yogurt cup, a juice bottle...

...MATERIALS:

the materials used in the articles, e.g. plastics, inks, paper, cardboard, coatings...

...CHEMICALS:

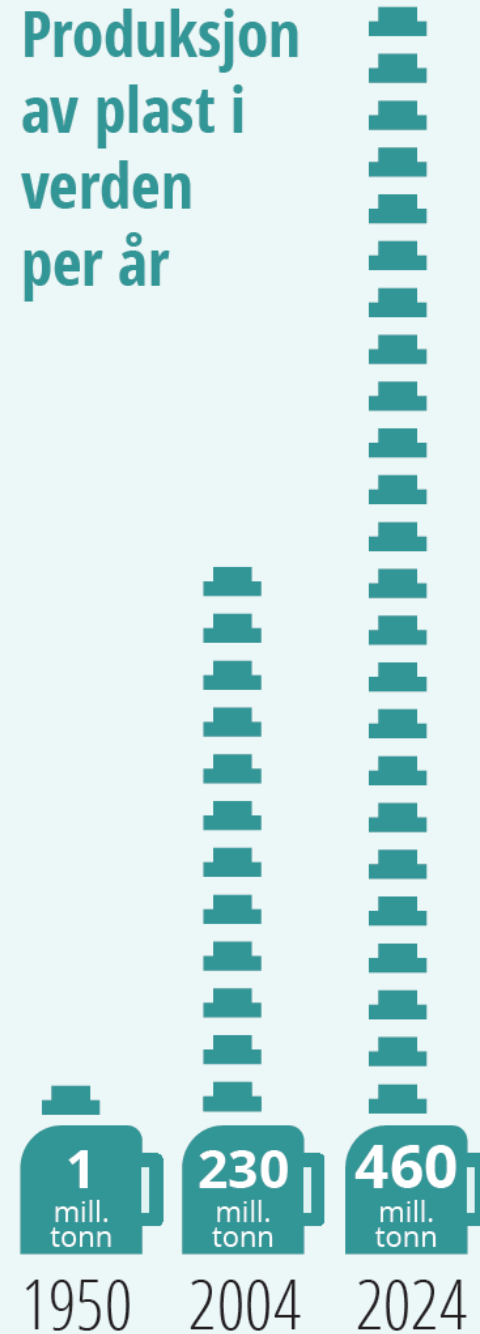
the chemicals entering in the composition of the food contact materials, e.g. monomers such as bisphenol A, additives such as phthalates, or fillers such as titanium dioxide.



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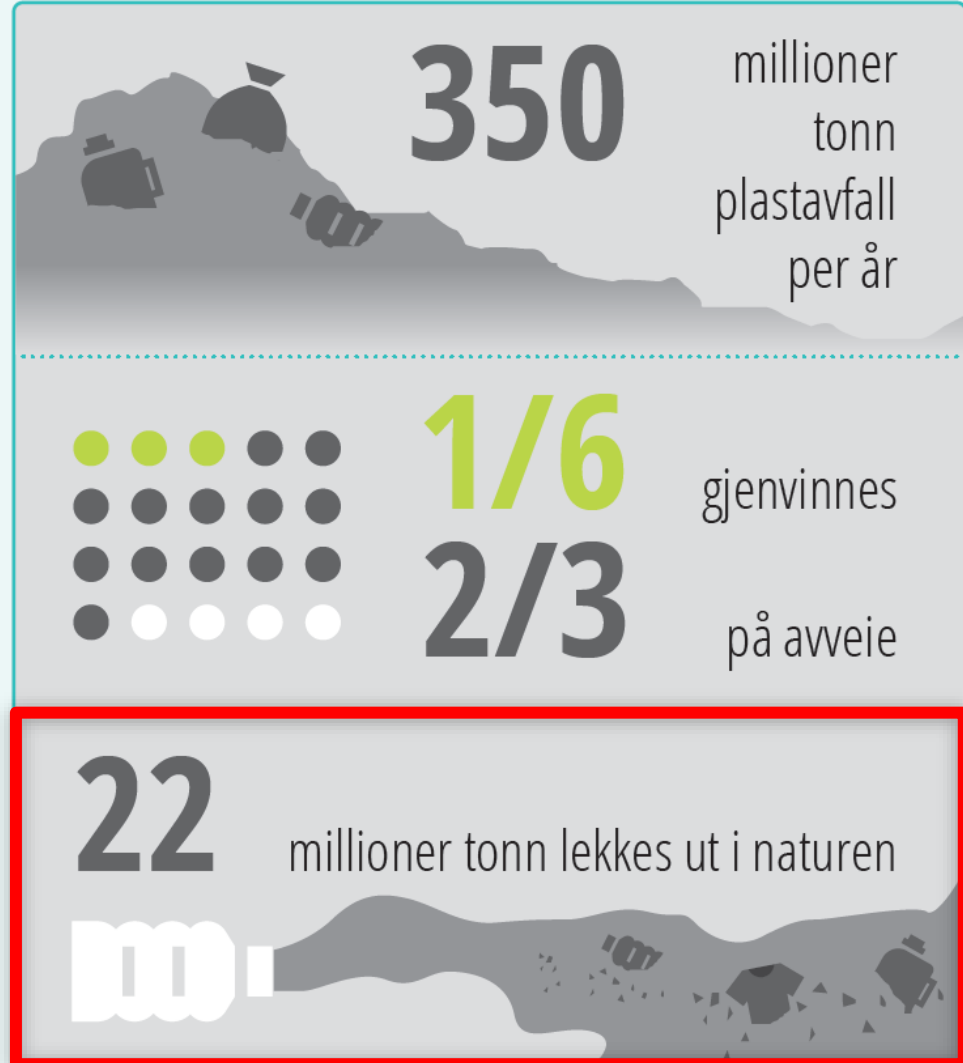


Produksjon
av plast i
verden
per år

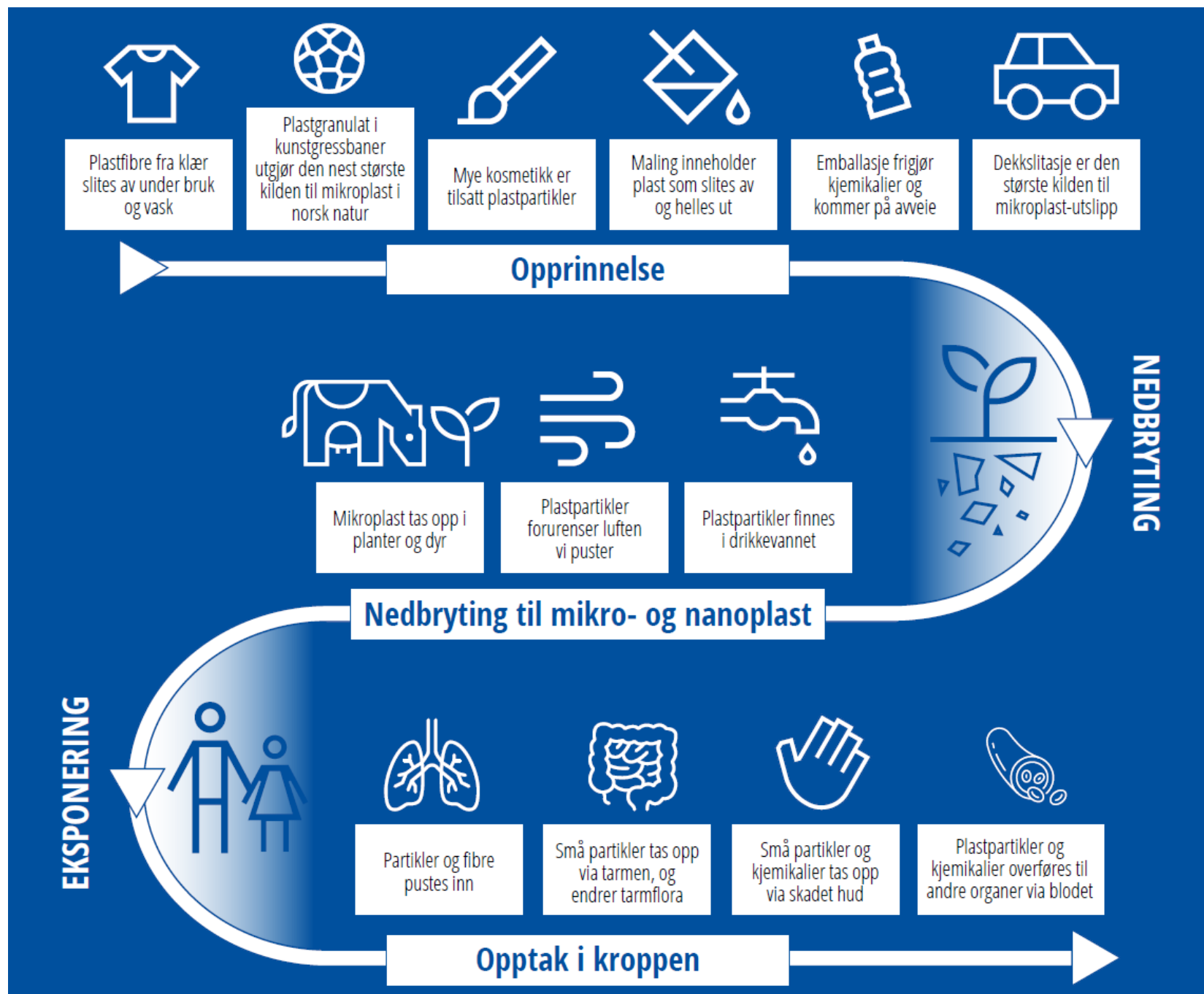


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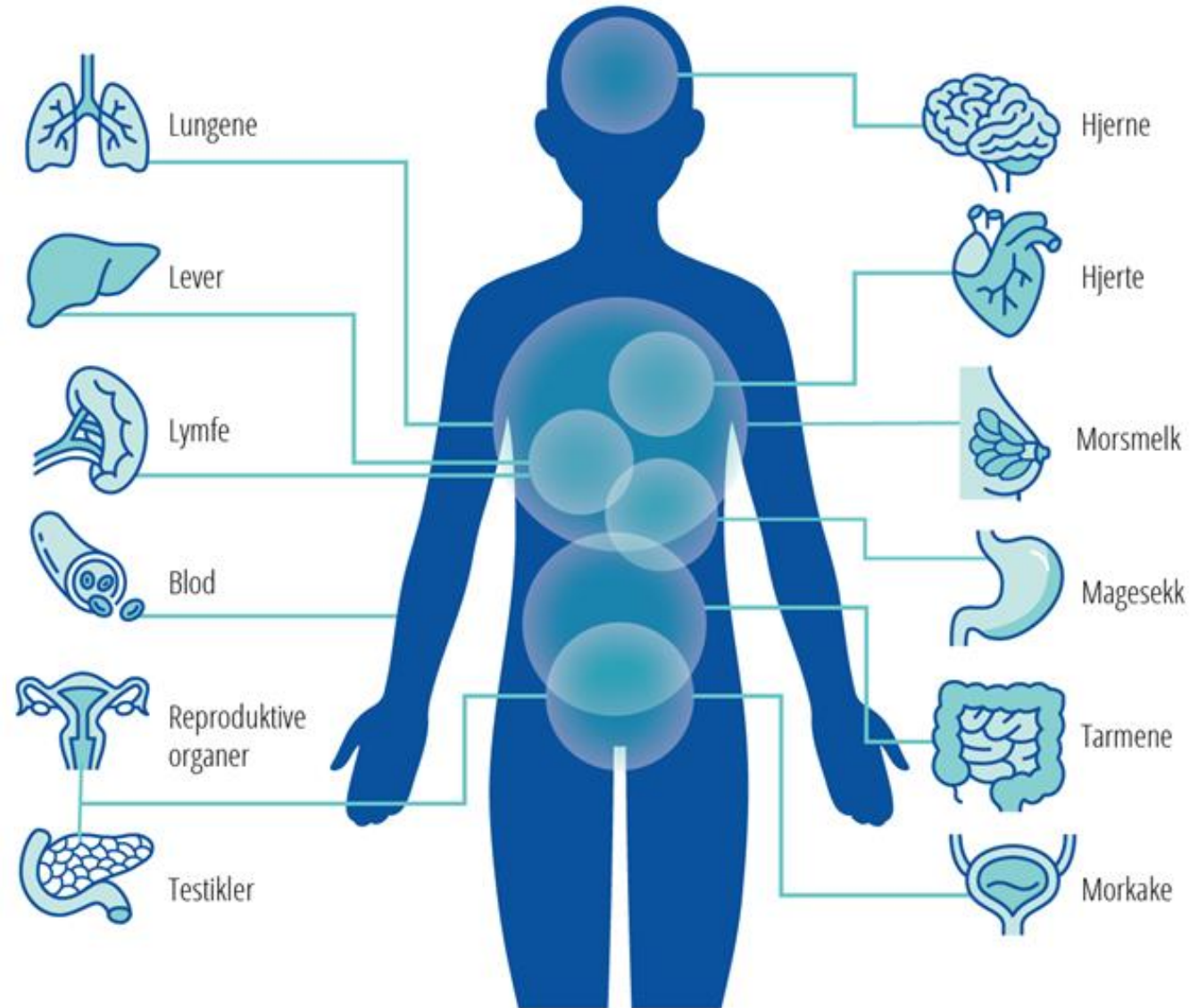
millioner
tonn
produsert
per år



22 millioner tonn lekkes ut i naturen

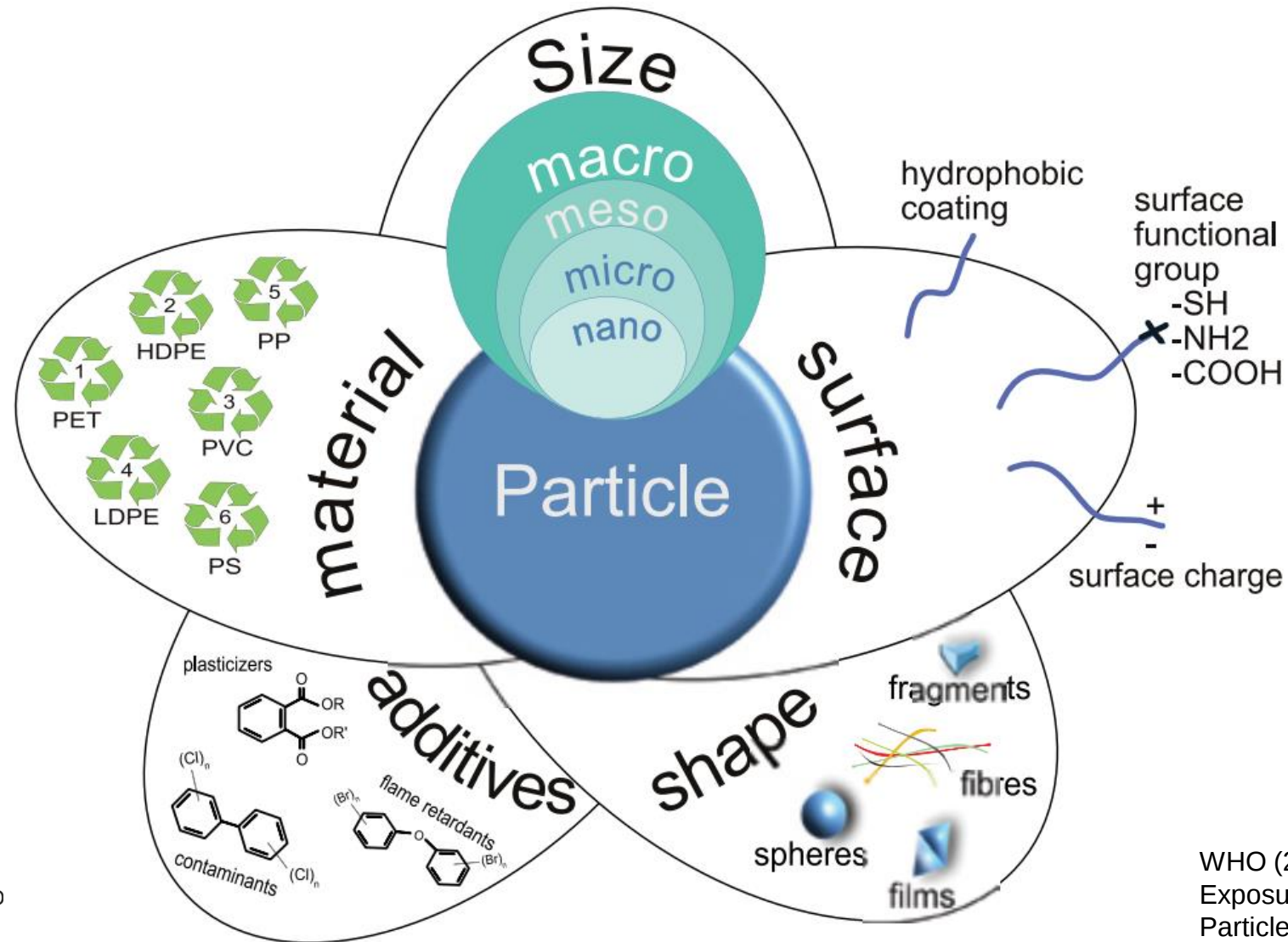


Hvor finner vi plastpartikler?

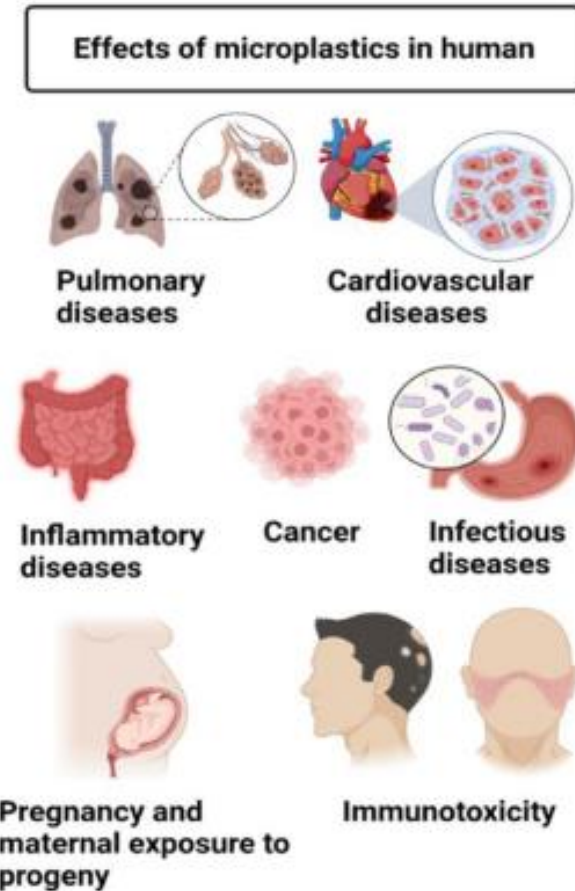
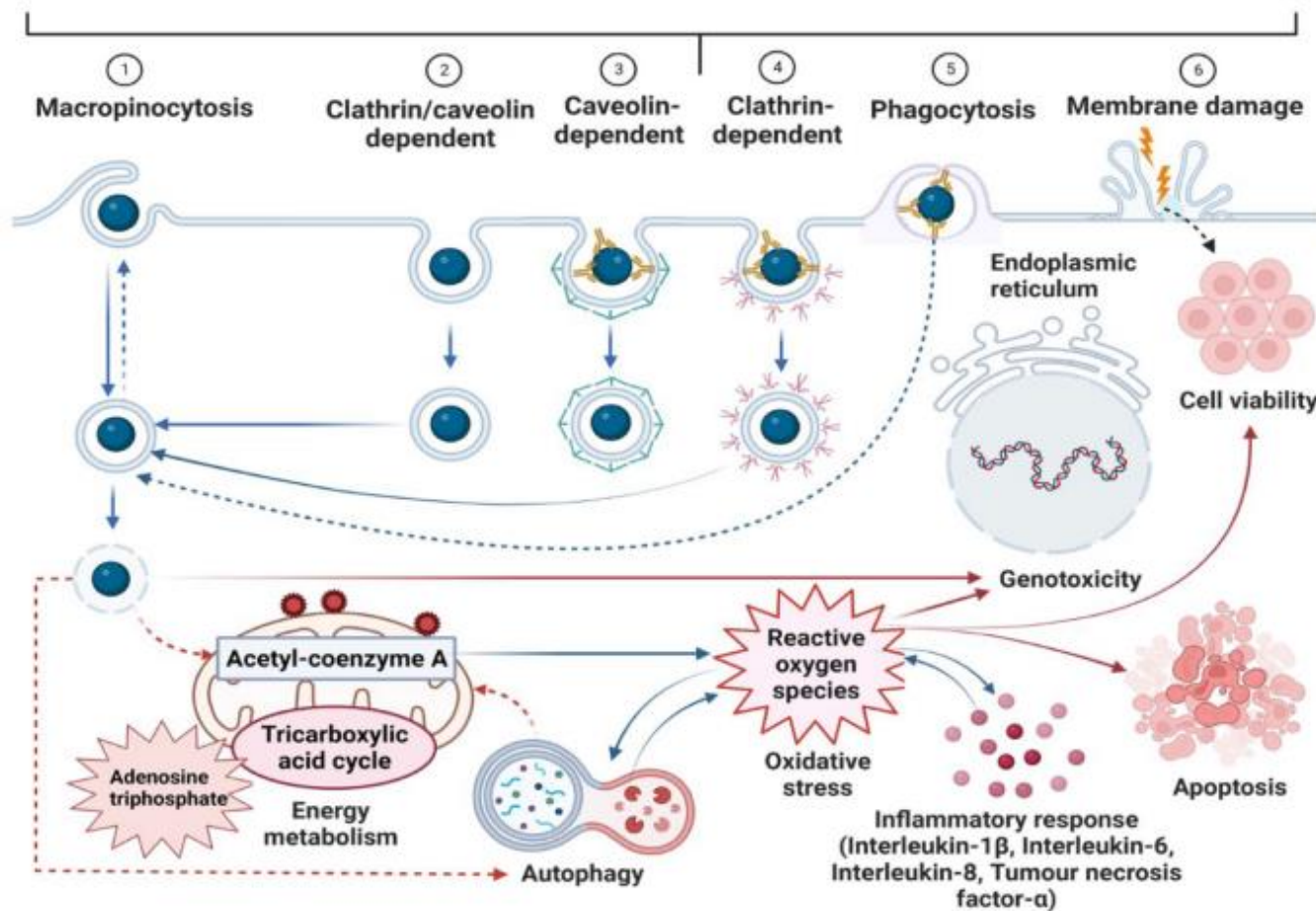


Oppsummering av forskning i
*Verdens plastproblem – går
det på helsa løs?* (2024),
Widerøe et al.

Plastpartiklers egenskaper



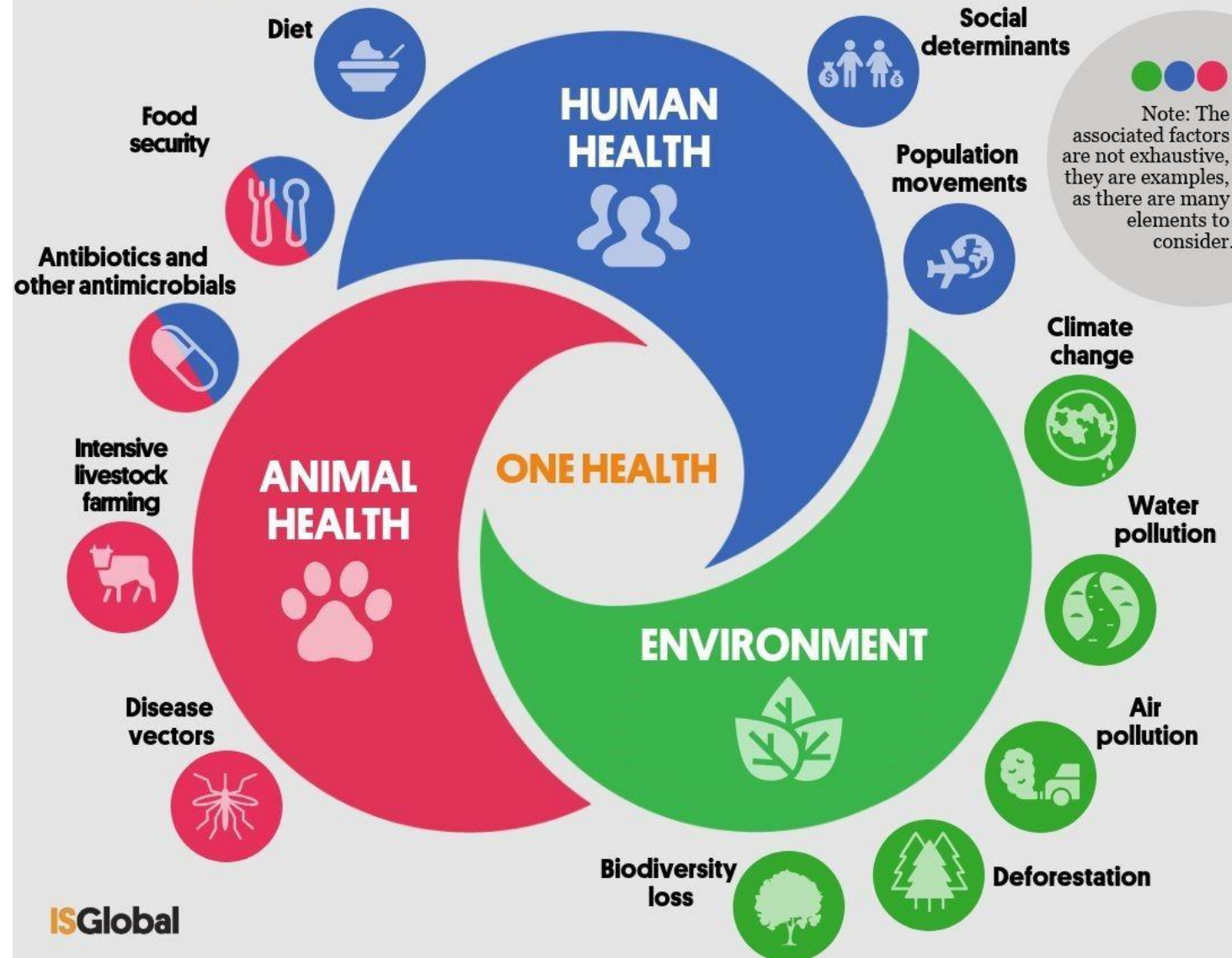
Biologiske effekter



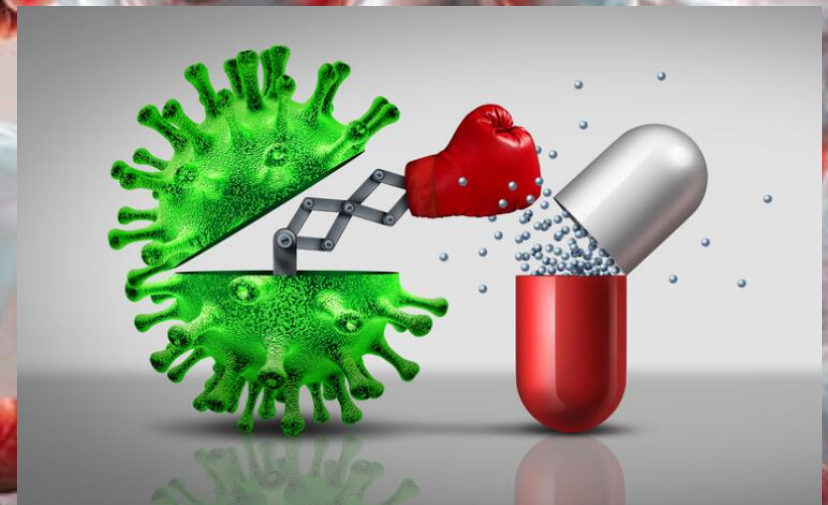
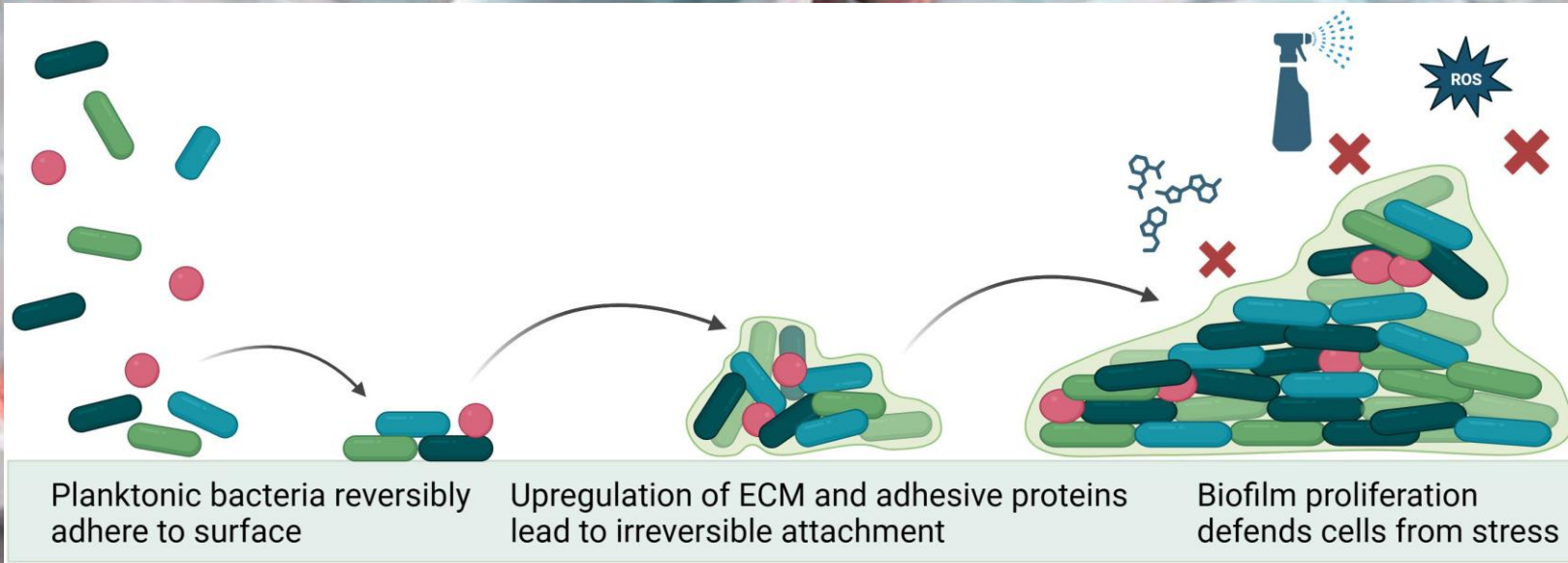


ONE HEALTH

Human health and animal health are interdependent.
At the same time, both depend on the environment.



Biofilm: infeksjon og resistens



Veien videre

- Bli med på laget!
 - NTNU Helse og Livsvitenskap søker team, utlysning med frist 1. november:
www.ntnu.no/helse-og-livsvitenskap/team
- Kom gjerne med innspill til samarbeid:
 - Forskning
 - Bachelor/master?
 - Industripartnere





SAMFUNNSSIKKERHET | HAV OG KYST | FELLESSKAP | ENERGI | HELSE OG LIVSVITENSKAP