One Health & Planetary health: What is the difference?
Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation–Lancet Commission on planetary health

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Building on previous work e.g. Brundtland Commission, IPCC, MA, CBD/WHO, Tony McMichael
The Anthropocene epoch

Humankind is entering a new epoch, according to an influential group of geologists, ecologists and climate experts. The Holocene epoch, which began roughly 12,500 years ago, could be coming to an end due to humanity’s devastating imprint on the planet. Scientists suggest we could be entering the Anthropocene epoch.

https://vimeo.com/39048998
THE HUMAN POPULATION IS HEALTHIER THAN EVER BEFORE

LIFE EXPECTANCY
Mean global life expectancy at birth (years)

POVERTY
Population of world in poverty (%)

CHILD MORTALITY
Recorded deaths of under-fives

BUT TO ACHIEVE THIS WE’VE EXPLOITED THE PLANET AT AN UNPRECEDENTED RATE

CARBON DIoxide EMISSIONS
Atmospheric concentration of CO2 (ppm)

OCEAN ACIDIFICATION
Global ocean acidification (ppm)

ENERGY USE
World primary energy use (EJ)

TROPICAL FOREST LOSS
Global tropical forest loss compared with 2000 baseline (%)

WATER USE
Water use (thousand km³)

FERTILISER USE
Global nitrogen and phosphorus use (thousand tonnes)
Planetary boundaries
(Steffen et al Science 2015)
What is planetary health?

“Put simply, planetary health is the health of human civilisation and the state of the natural systems on which it depends.”
Links with health

Environmental changes and ecosystem impairment:
- Climate change
- Stratospheric ozone depletion
- Forest clearance and land cover change
- Land degradation and desertification
- Wetlands loss and damage
- Biodiversity loss
- Freshwater depletion and contamination
- Urbanisation and its effects
- Damage to coastal reefs and ecosystems

Examples of health effects:

Direct health effects:
- Floods, heatwaves, water shortage, landslides, exposure to ultraviolet radiation, exposure to pollutants

Ecosystem-mediated health effects:
- Altered infectious disease risk, reduced food yields (undernutrition, stunting), depletion of natural medicines, mental health (personal, community), effects of aesthetic or cultural impoverishment

Indirect, deferred, and displaced health effects:
- Diverse health consequences of livelihood loss, population displacement (including slum dwelling), conflict, inappropriate adaptation and mitigation
Emerging diseases
Effects of multiple environmental changes on food availability and quality

- Land degradation and soil erosion
- Water scarcity (from overconsumption, diversion to non-food crops, climate change and changes to ecosystem function)
- Loss of pollinators
- Overfishing/Ocean acidification
- Climate change
  - Temperature/extreme events
  - CO$_2$ fertilization
  - Ozone
  - Pests, mold and fungi
Estimates of air pollution deaths

(WHO 2014, Lim et al Lancet 2012: 380)

- Ambient particulates >3 m deaths p.a.
- Household from solid fuels >4 m deaths p.a.
- More than 7 million in total
Annual average global mortality (1997–2006) due to Landscape fire smoke

Reproduced from Johnston and colleagues 2012, by permission of Environmental Health Perspectives.
Meeting the challenges
How Forest Conservation Reduces Disease risks—examples from the Brazilian Amazon

Malaria transmission
- fewer vector breeding sites.
- larger vector predator populations and greater diversity of mammalian species (promoting dilution effects)
- microclimate inhibits anopheline mosquitoes.

Acute Respiratory Infections (ARI)
- forests may filter air particulates.

Diarrhea
- fewer fires and lower smoke emission
- reduced collection and burning of biomass fuels

- forest may reduce flooding and filter pathogens from surface water.

Bauch, Birkenbach, Pattanayak and Sills PNAS 2014
Developing sustainable and healthy cities

- Active travel/public transport
- Reduced fine particulate air pollution
- Green spaces – biodiversity, reduced heat island and mental health benefits
- Watershed conservation
- Access to healthy food
- Increased resilience to floods, storms and droughts
Multiple approaches for meeting increased food requirements

- Sustainable intensification
- Efficient use of water and fertilizer
- Sustainable aquaculture
- Support for subsistence farmers
- New sources of nutrition + diversification
- Biofortification
- Change of diets and redirect landuse back to food.
- Reduced food waste

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<th>Yield (tonnes per hectare)</th>
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Tester and Langridge (2010)
Reducing food waste

Nearly 30% of the world’s total agricultural land is used to produce food that is never eaten. Various strategies needed e.g. ---

Reducing aflatoxin through aflasafe


UN World Food Programme’s ‘Training Manual for Improving Grain Postharvest Handling and Storage’
Reduced GHG emissions and land use requirements from healthy diets

Hallstrom et al 2014
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http://www.thelancet.com/commissions/planetary-health
Implications for public health and medical education and research

• Embrace eco–social understandings of health
• Systems thinking to complement classical epidemiology
• Planetary health is relevant to all sub-specialties
• Who has sovereignty of health?
• Health and wellbeing of future generations
Beyond the Planetary Health Commission

- Wellcome Trust: *Our Planet, Our Health* funding
- *Lancet Planetary Health* next year
- Future Earth: Health Knowledge Action Network
- Planetary Health Alliance