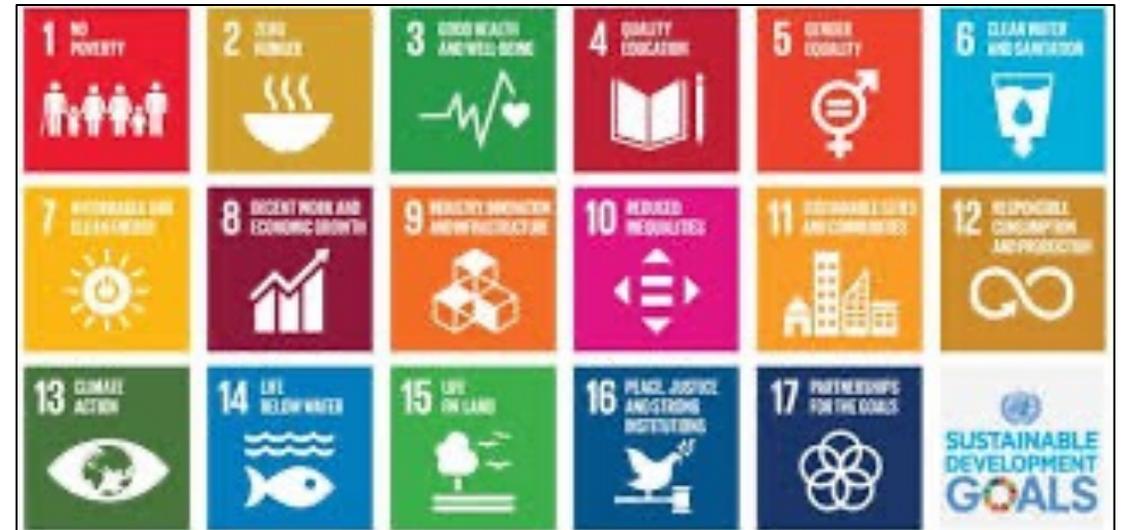




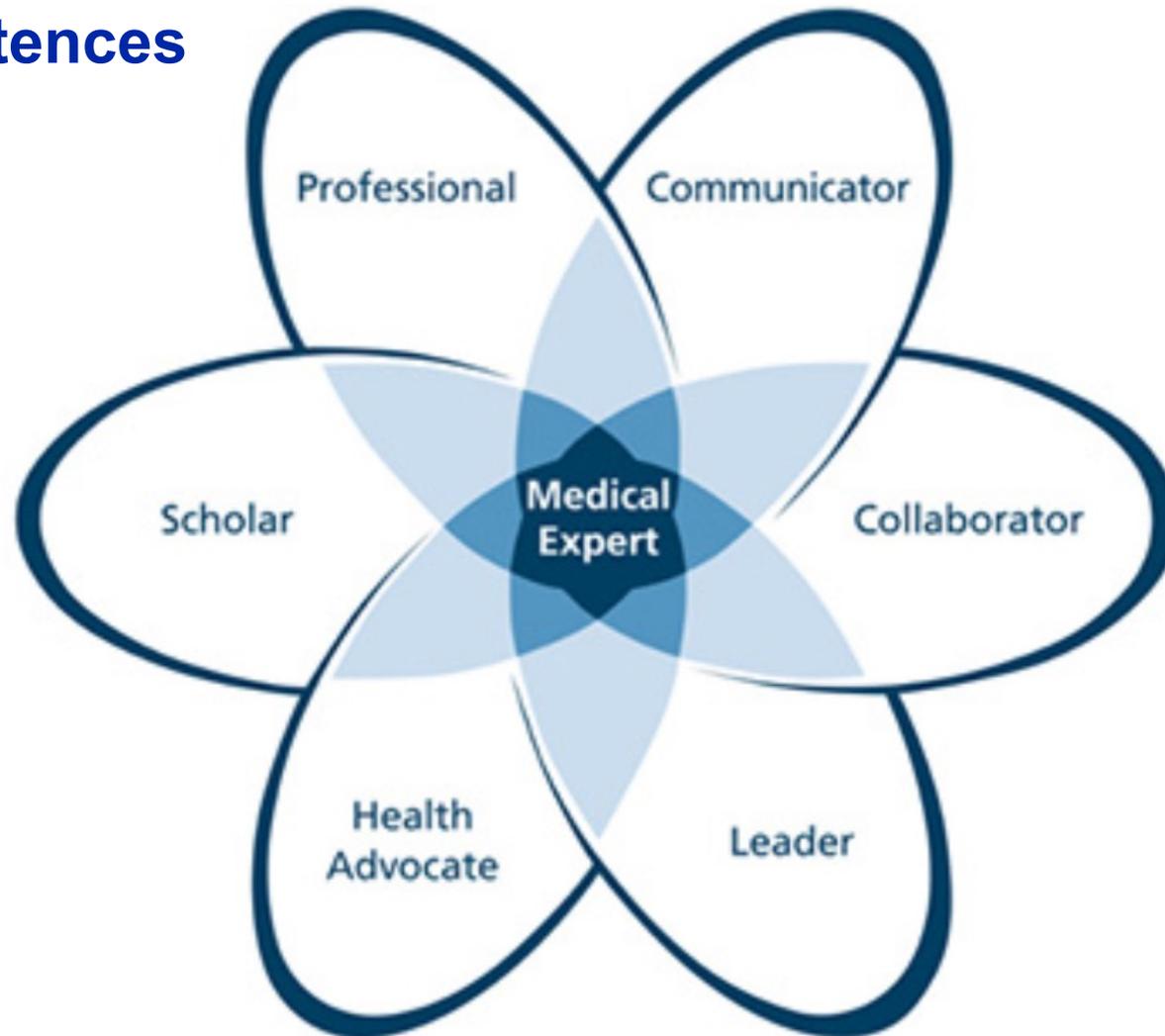
A new perspective for SSPH+ and SDGs

Frank Rühli and team





Medical Competences





Anthropocene: increasing human impact

Increasing impact of human activities on the planet:

- Overpopulation
- Pollution of air, water and soil
- Climate change
- Deforestation
- Overfishing
- Loss of natural resources
- Loss of biodiversity

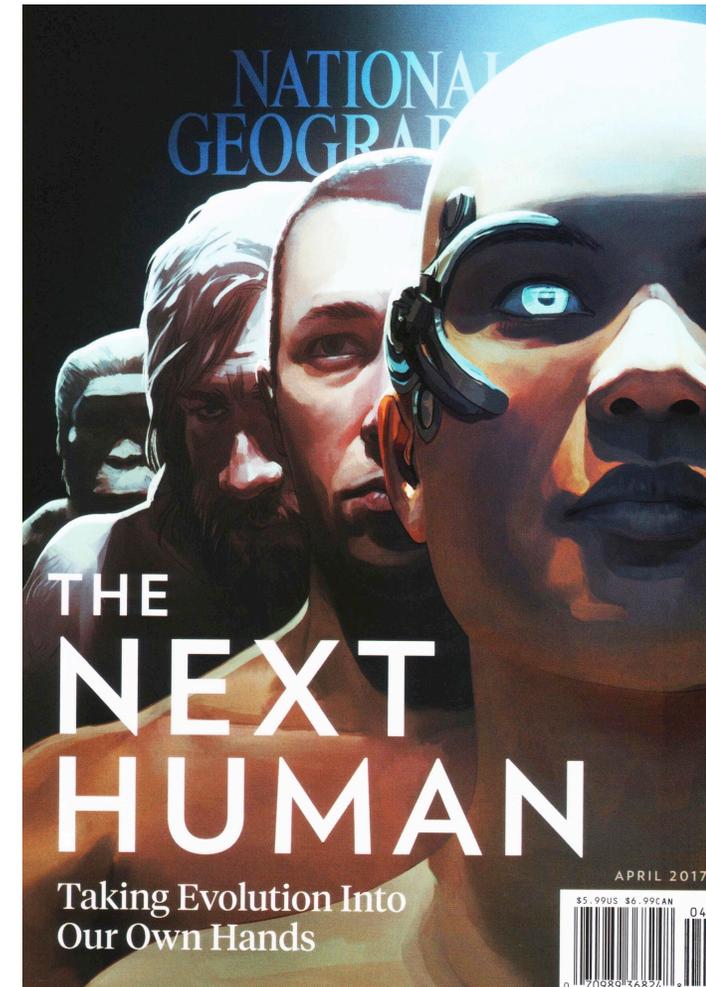
Impact on humans:

- Inequality
- Poverty
- Hunger
- Conflicts
- Migration and refugees
- Transmittable and non-transmittable diseases



What have we done to us ?

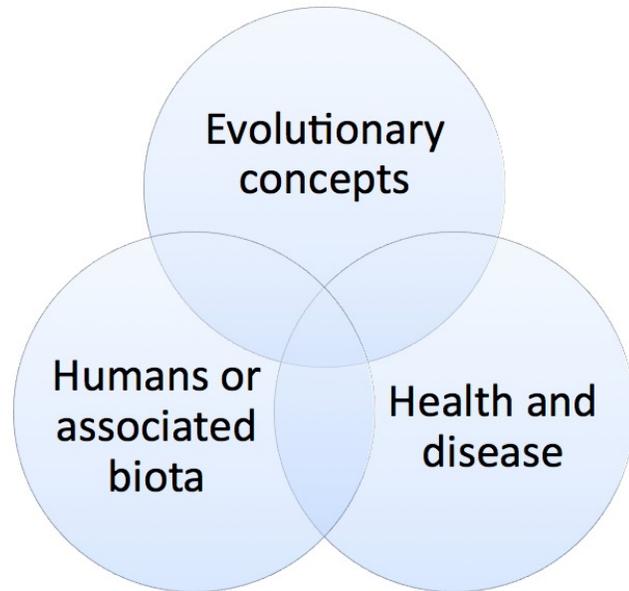
- Insulated our bodies from climate / environment
- Produced our food (fermentation, additives, vitamins etc.)
- Removed parasites, hygiene
- Repaired our bodies (prosthetics)
- Increased our physical performance (tools, cars, binoculars etc.)





Evolutionary Medicine: “*Why?*” not only “*How?*”

- Evolutionary medicine or Darwinian medicine investigates **human disease vulnerability and disease aetiologies** (genetics, behaviour, environment, pathogens etc.) from an evolutionary perspective



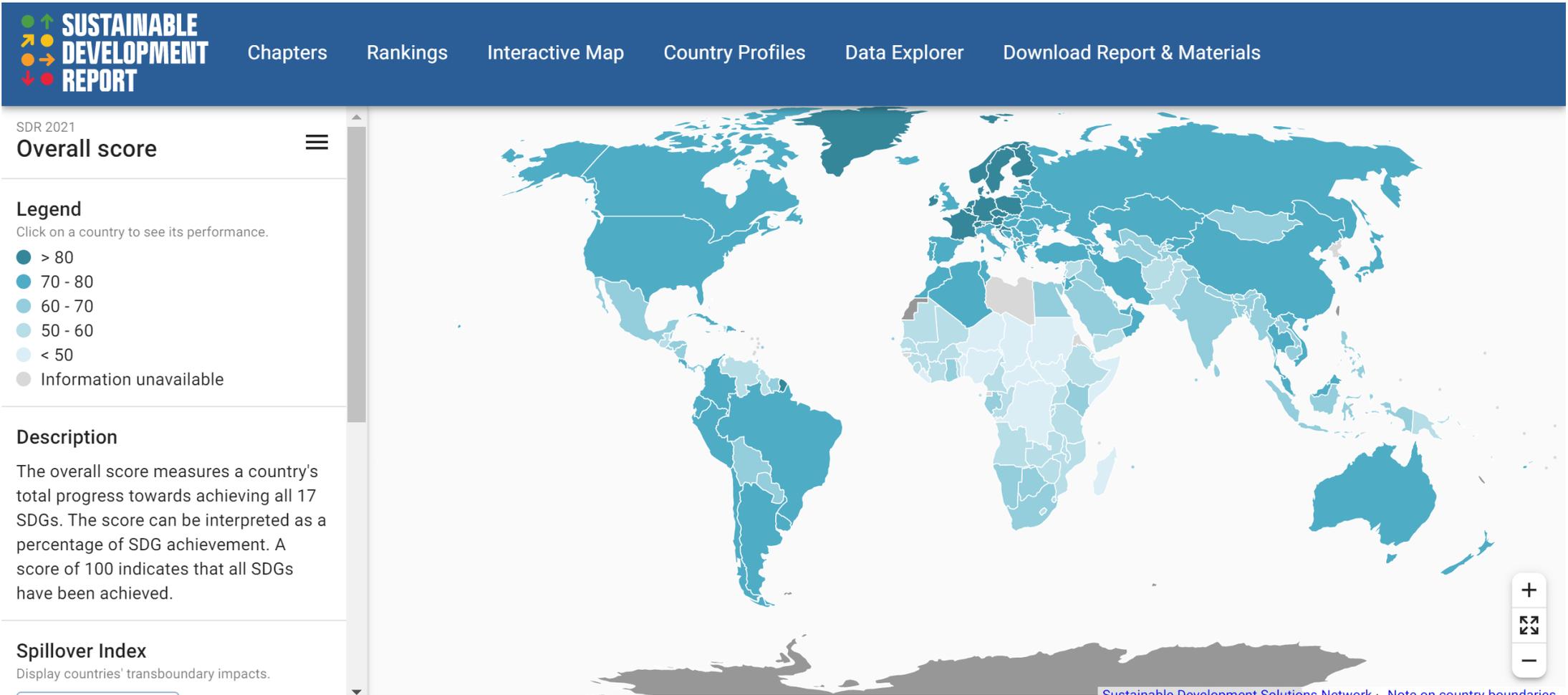


Current situation

- 26% of people do not have access to clean drinking water
- 720-811 million people are undernourished
- Children under 5 years of age: 22% are stunted, 7% suffer from wasting
- The global temperature reached 1.2°C above pre-industrial baseline
- More than 25% of species are threatened with extinction
- One third of all fish stock are overfished



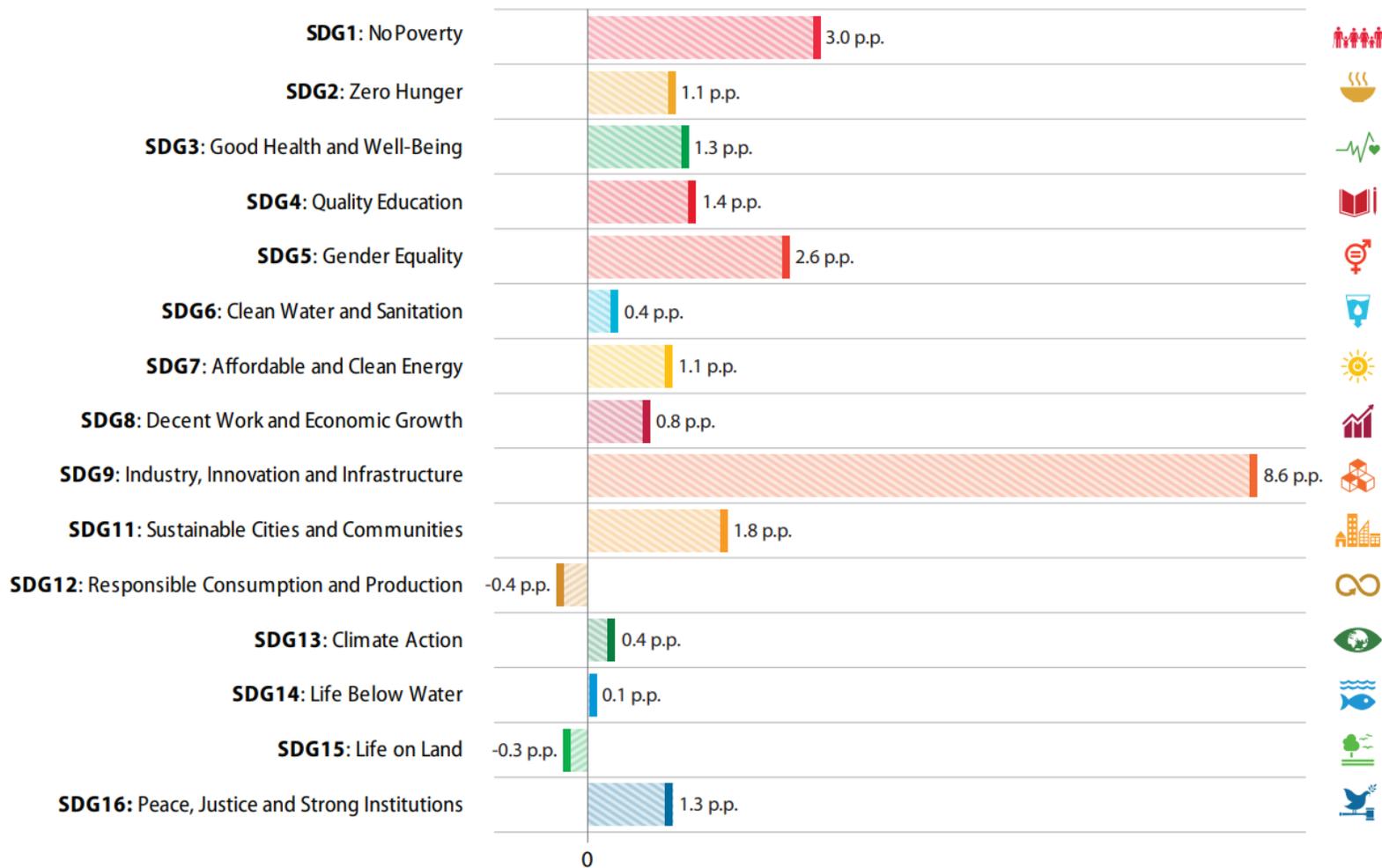
SDGs, where do we stand? Overall situation in 2021



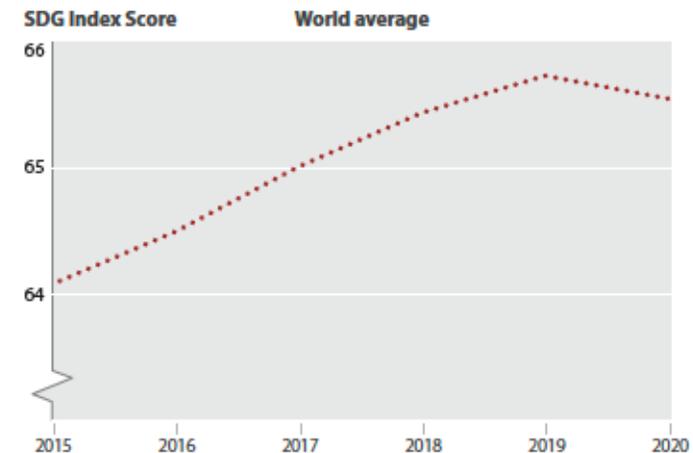


Worldwide progress since 2015 in %

CHANGE SINCE 2015



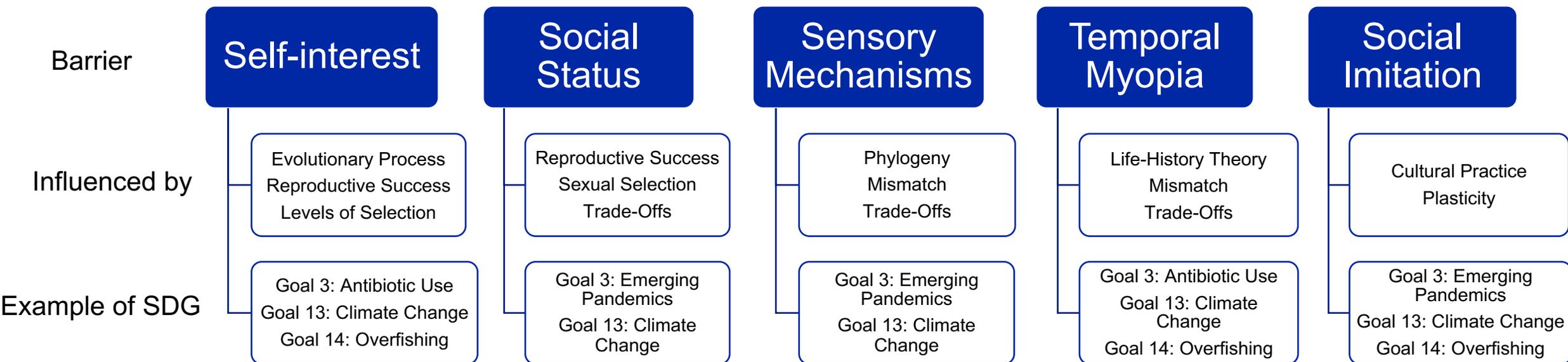
Progress on the SDG Index



Note: Population-weighted average
Source: Authors' analysis



Behavioral barriers and underlying evolutionary principles





Evolved behavioral barriers to the implementation of the SDGs

- **Self-interest:** people prioritize particular interests over collective interests (TOC). It “is worth” to exploit a resource at the cost of the community
- **Social status:** people behave to increase the own status, especially if the behavior is publicly perceivable
- **Sensory mechanisms:** people cannot grasp threats that they cannot see, smell, or feel (like viruses), or that are too slow (like climate change). People cannot understand extremely small or large numbers, or exponential growth
- **Social imitation:** people copy the behaviors of others around them, or of peer-groups. These can also be virtual. Danger of conspiracy theories and fake-news
- **Temporal discounting:** People value the present more than the future. Adaptation to enhance survival and reproductive success



Evolutionary considerations

- **Selfishness:** stress the benefit of sharing (maintenance of common good for own use), stress the benefit for own progeny
- **Conspiracy theories:** correct information should be spread in social media to correct fake news in the same channels as the fake news, desired behaviours should be spread within peer-groups to reach the correct sub-cultures.
- **Very large numbers:** simplify complex data to render them understandable. Show very small or large numbers as analog in a different scale, like millions of years as minutes of a clock.
- **Temporal myopia:** according to life history theory, people of higher socioeconomic status (SES) appreciate more the future than people of lower SES. Fighting social inequality might help fighting temporal myopia.



Evolutionarily informed considerations at the population level

- Public interventions must offer **individual incentives**
 - For high income individuals: link desired behaviors to high status
 - For low income individuals: link desired behaviors to financial rewards
- Adapt solutions locally and to population subgroups
- Communication of data / facts should be ideologically **neutral and easy to understand**
- **Goals must be reachable**, otherwise motivation decreases (Nesse 2011)



Public outreach

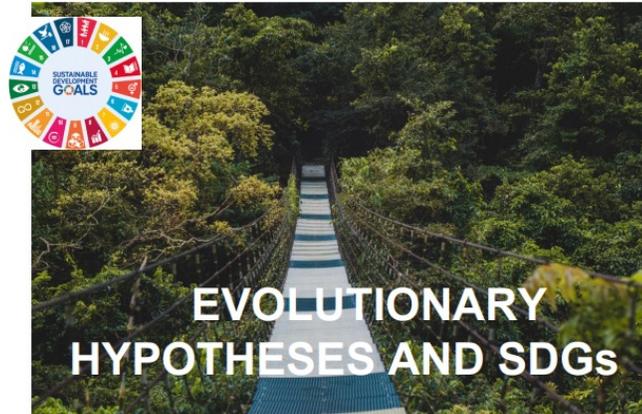


AN EVOLUTIONARY PERSPECTIVE



Scan me for more information!

امسح الرمز لتكتشف المزيد!



Life History Hypothesis

Readiness to save resources for the future depends on own wealth

Mismatch Hypothesis

Mismatch between organisms and the fast changing environment

Tragedy of the commons

Depletion of common resources by individual and selfish overuse



Selfish Behaviour With Proximate Profit

Inappropriate use of antibiotics: resistance

Ultimate Consequence

Depletion of antibiotics as resource through resistance evolution

Action Required

- Should we ration our use of antibiotics to save them for future generations?
- Can evolutionary based strategies decelerate resistance progression?



Selfish Behaviour with Proximate Profit

- Dependence on fossil fuel
- Releasing pollutants

Ultimate Consequences

Collapse of biodiversity and ecosystems

Action Required

- Should we sacrifice rapid /cheap development to focus on renewable energy?
- Can sharing of knowhow accelerate green technology development?



Selfish Behaviour with Proximate Profit

- Overfishing
- Polluting Oceans

Ultimate Consequences

- Collapse of marine ecosystems
- Polluting oceans

Action Required

- Can fishing in international waters be regulated more efficiently?
- Can eco-tourism offer local fishermen higher incomes than depleting coastal habitats?



Urgent Changes

- Prioritizing global solutions over local selfish profit
- Ultimate consequences over immediate benefit
- Making sustainable practical solutions

Ultimate Consequences

Sustainable long-term survival of mankind and other species



University of
Zurich^{UZH}

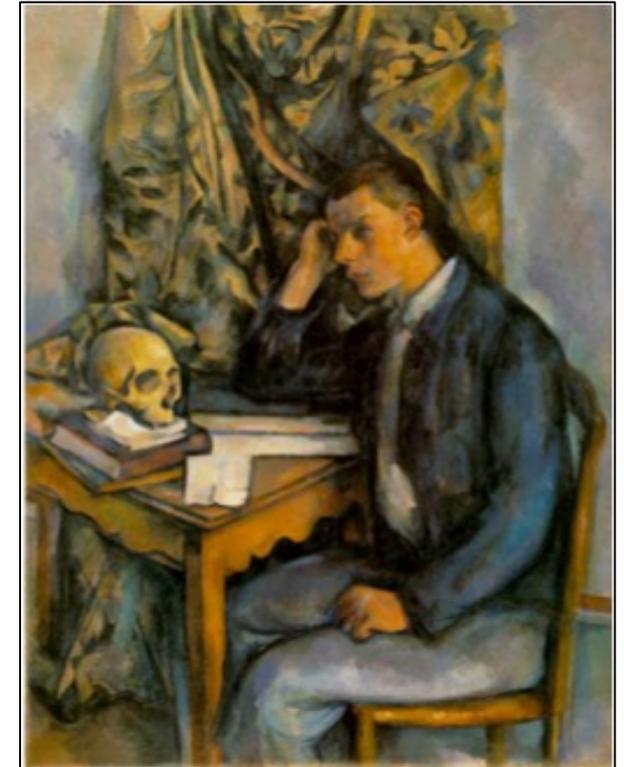
Institute of Evolutionary Medicine

Thank you



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P. Cézanne, Young Man with a
Skull, 1896-98