

Human microbiome and exposure to microbial diversity in the environment

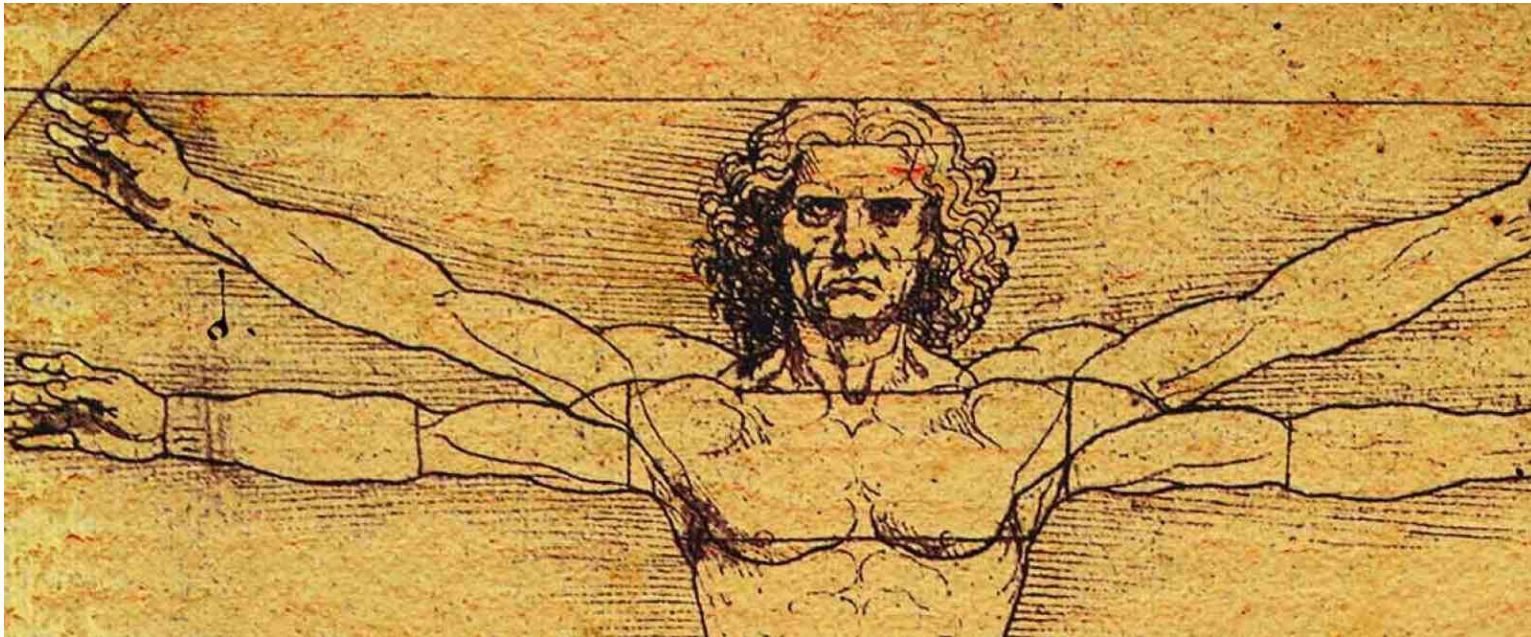
Eeva Furman

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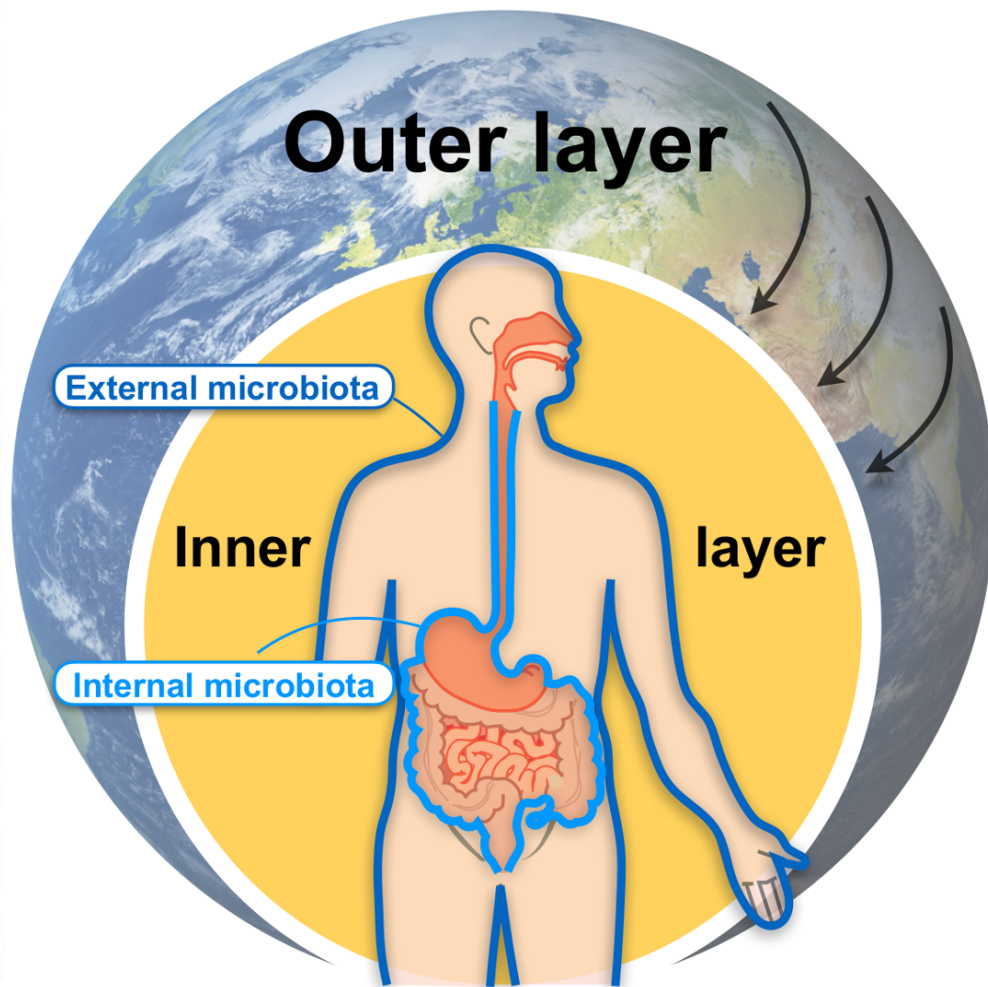
23th October, 2017



S Y K E



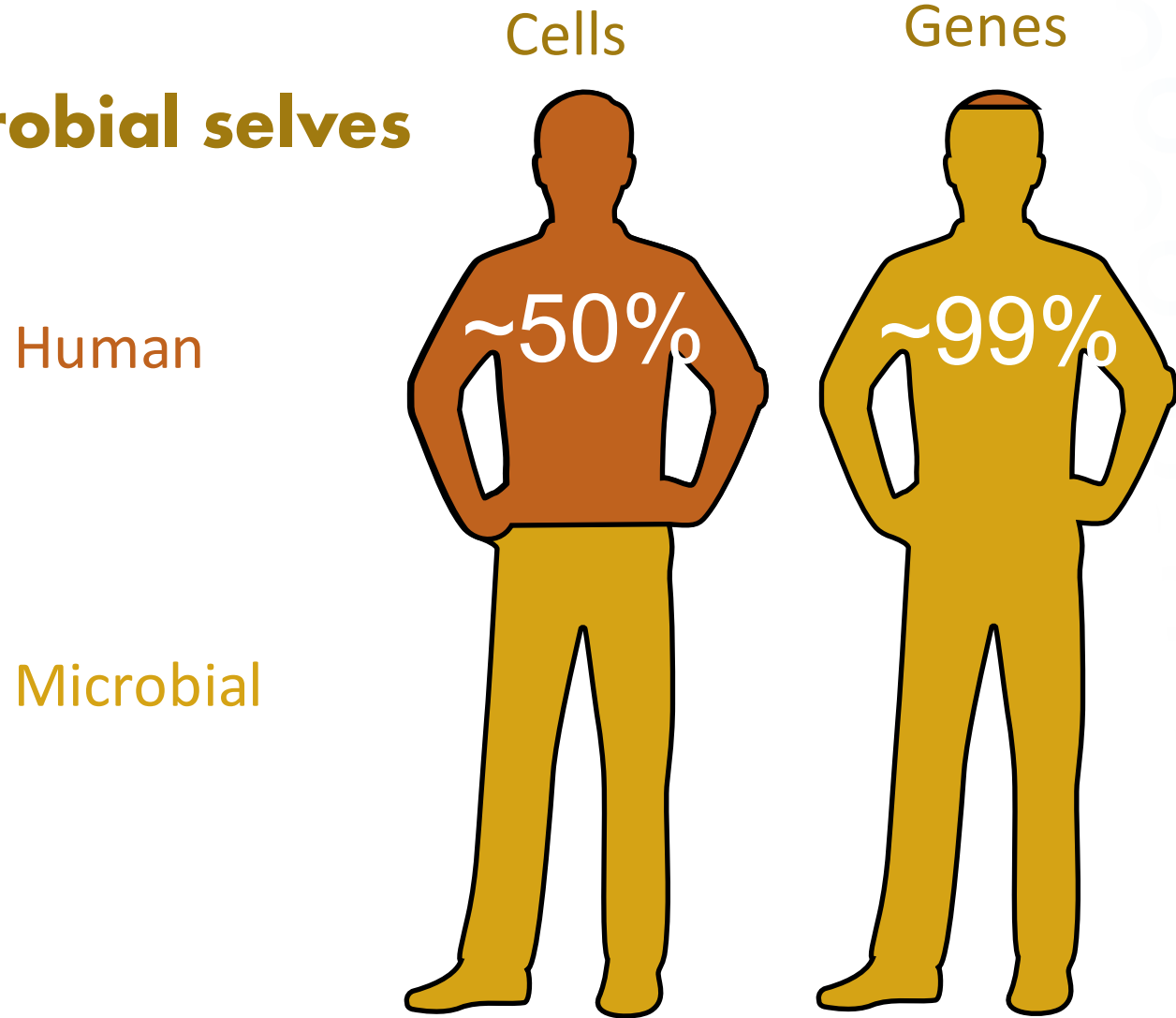
workings of the human body an analogy for the workings of the universe



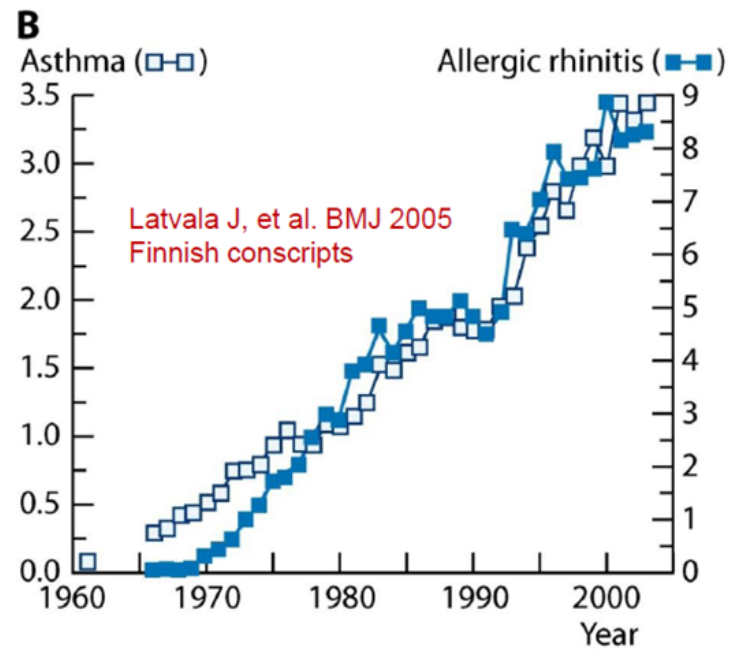
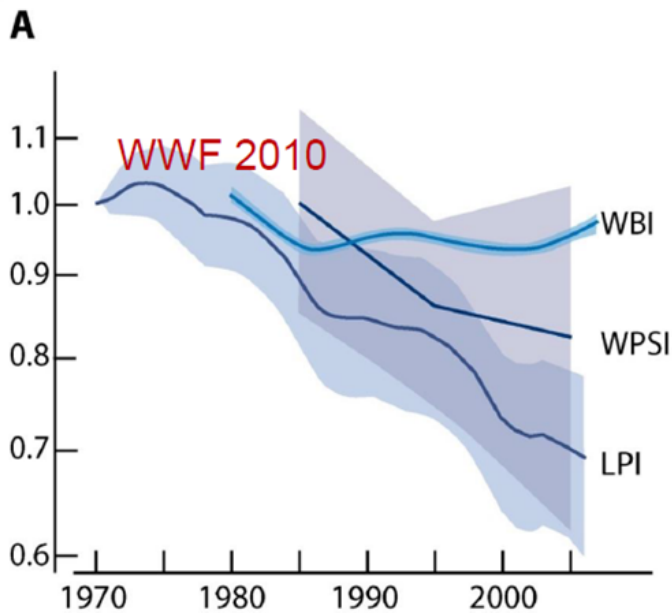
— Two protective layers of biodiversity —

from: Ruokolainen et al. 2017

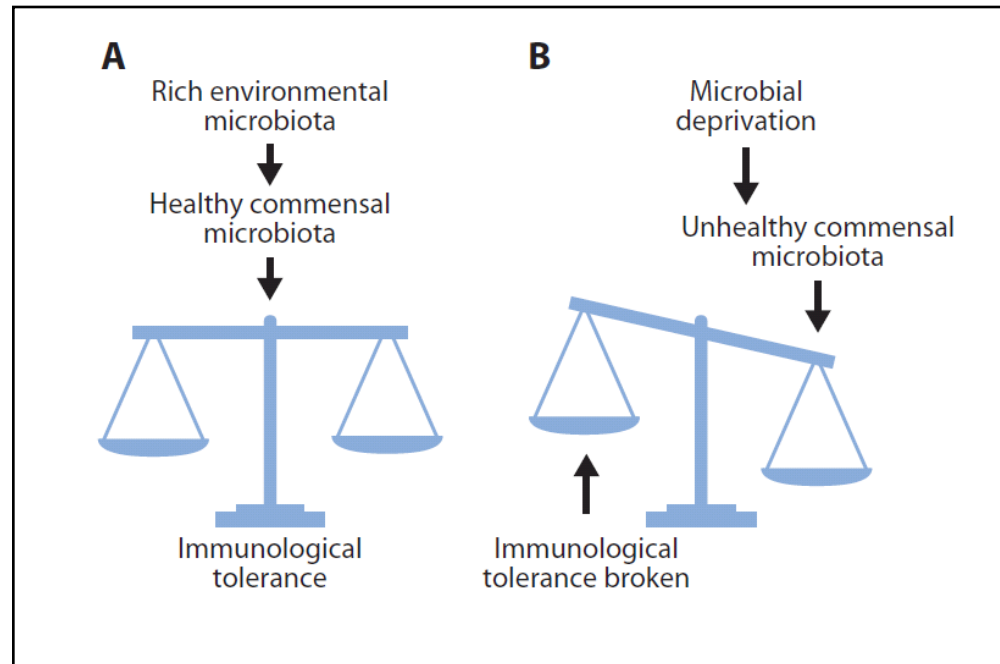
Our microbial selves



Biodiversity loss and rising trends of inflammatory diseases: Two global megatrends that may be related



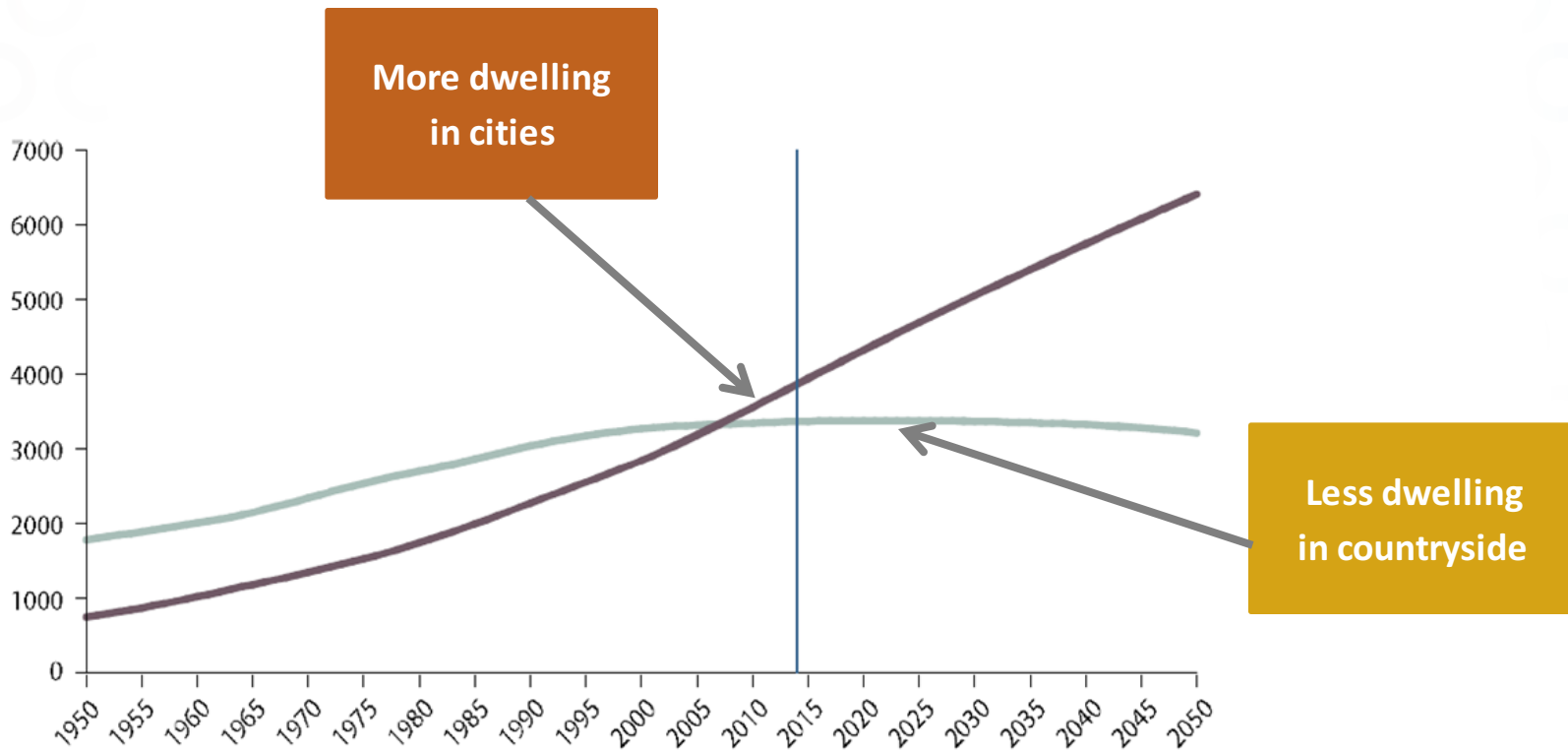
The biodiversity hypothesis



von Hertzen, Hanski & Haahtela 2011 EMBO Reports

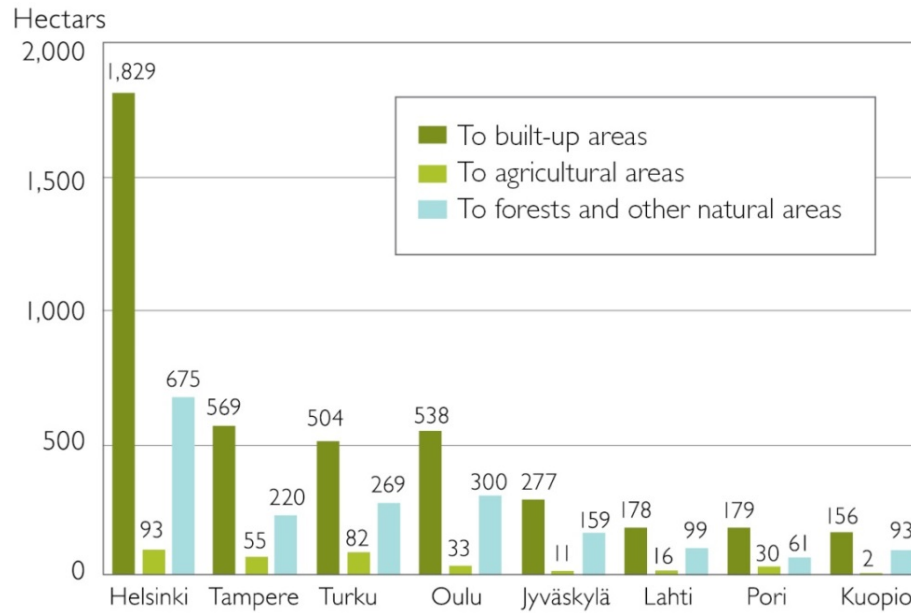


Challenge of increasing urbanisation



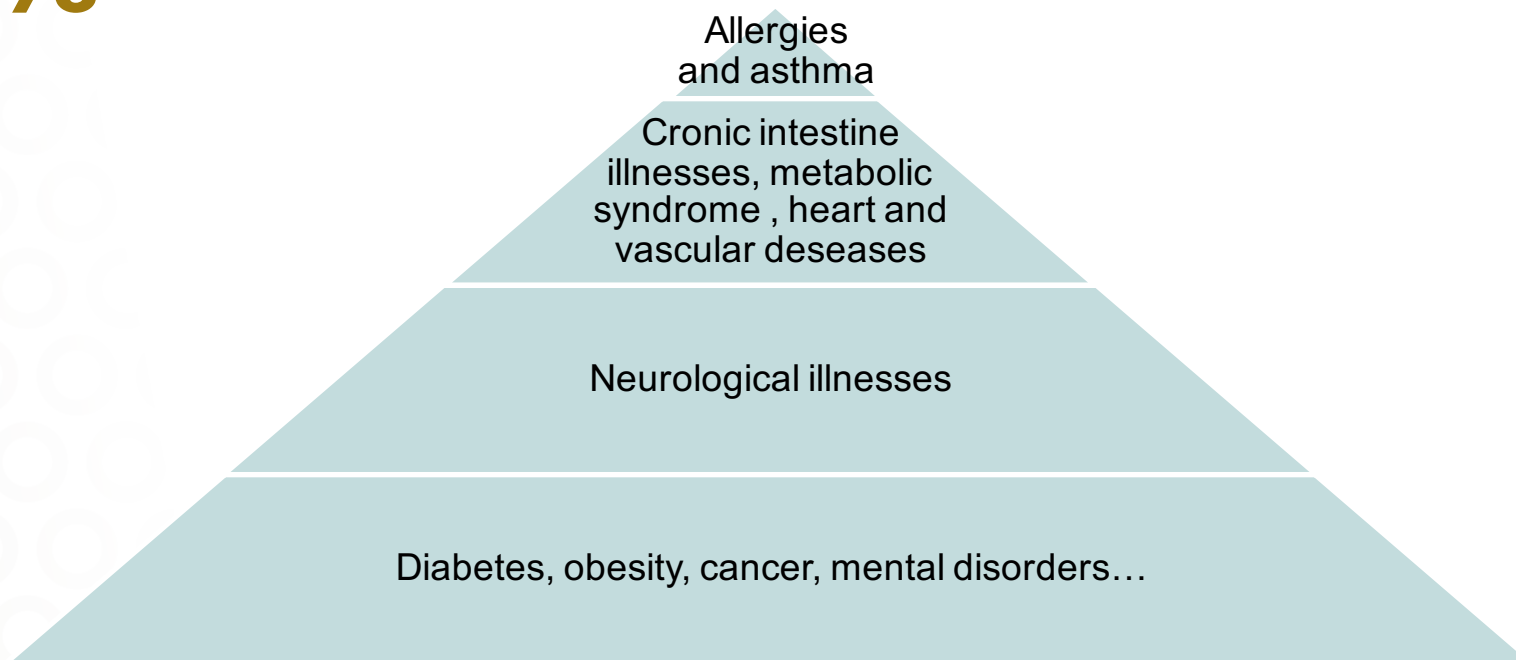
Urbanisation: lifestyles and green infrastructure change -> connection to nature breaks

Locations of new developments in urban areas



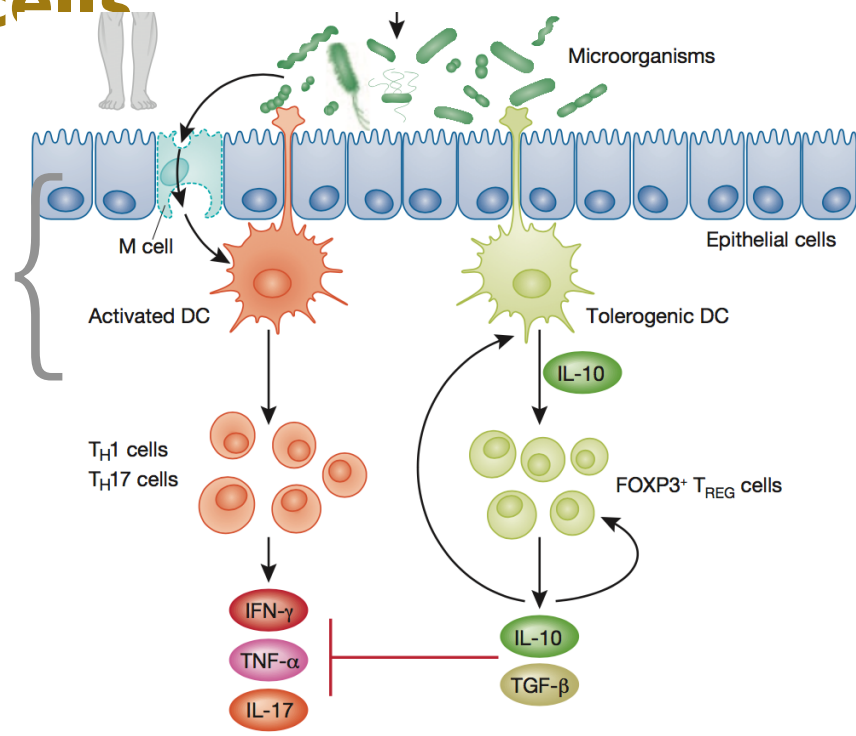
Urban nature. State of the Environment report 3/2017

Inflammatory diseases increased in countries with high standard of living and high level of hygiene



Haahtela, 2013

Nature's microbes create health: Communication between *microbiota* and immune cells



from: von Hertzen *et al.* 2011

Risk management

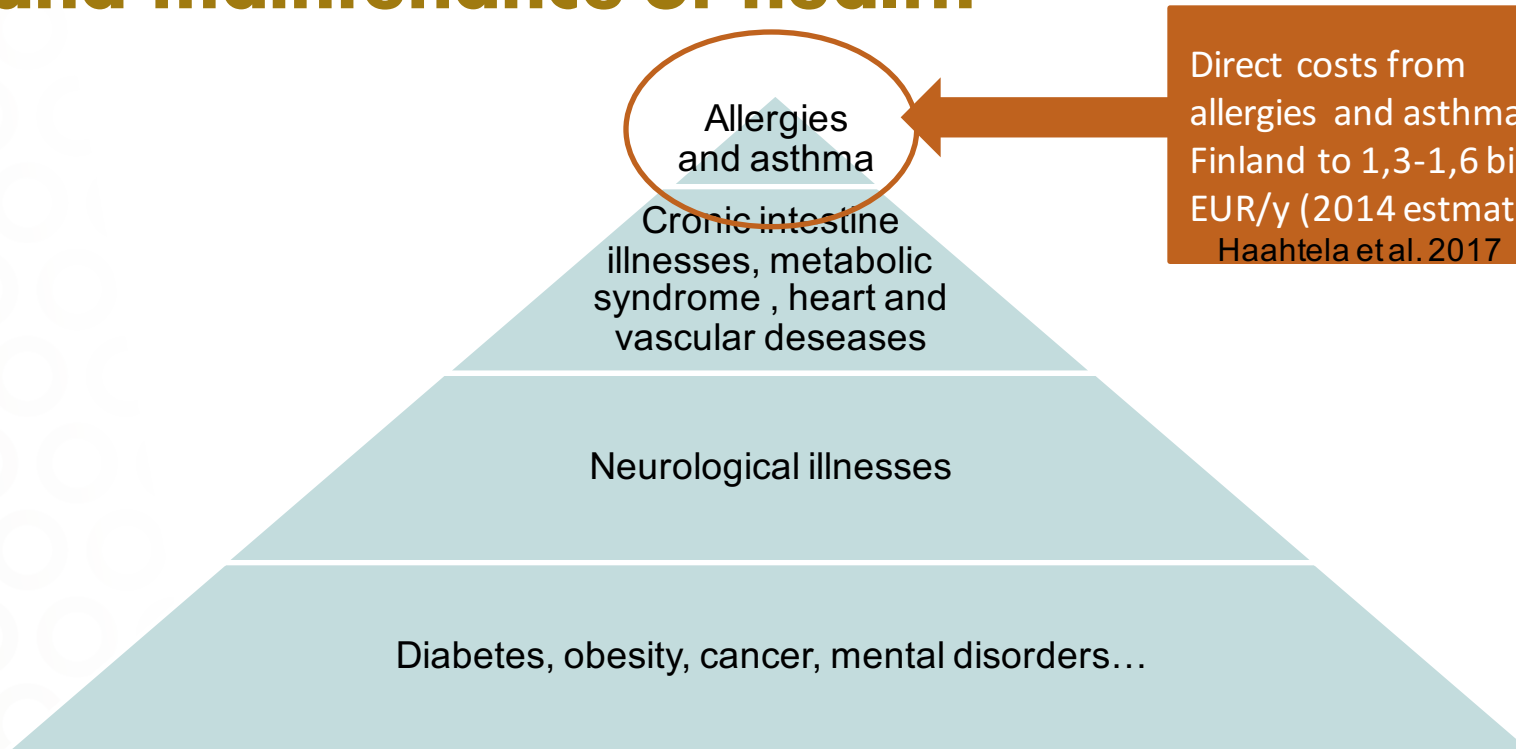
Traditional thinking: control risks that arise from nature

- Tuberculosis, colera...
- before: avoid nature contact
- now: contacts to allergens needed

In biodiversity-rich microbiota

- species are keeping each others populations under control though competition
- single species (often deleterious) outbursts avoided
- instead, the balanced, rich microbiota community supports human health

Prevention of inflammatory diseases and maintenance of health



Haahtela, 2013

Getting exposed to the microbiota: OUR MICROBIAL SELVES

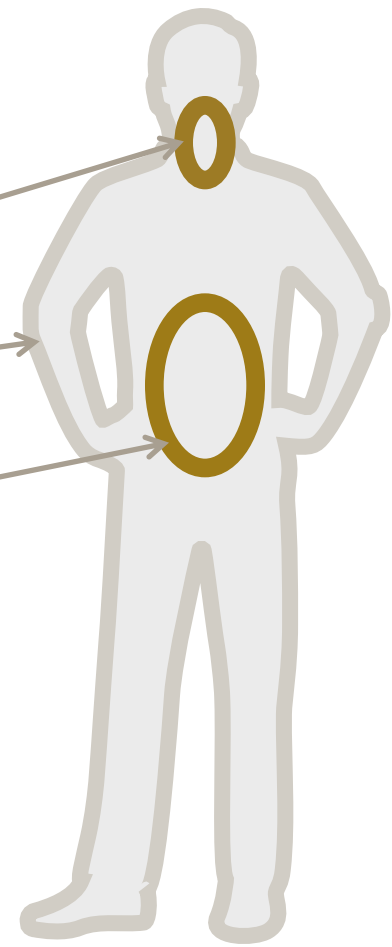
Input from
environmental
microbiota

Microbiota in:

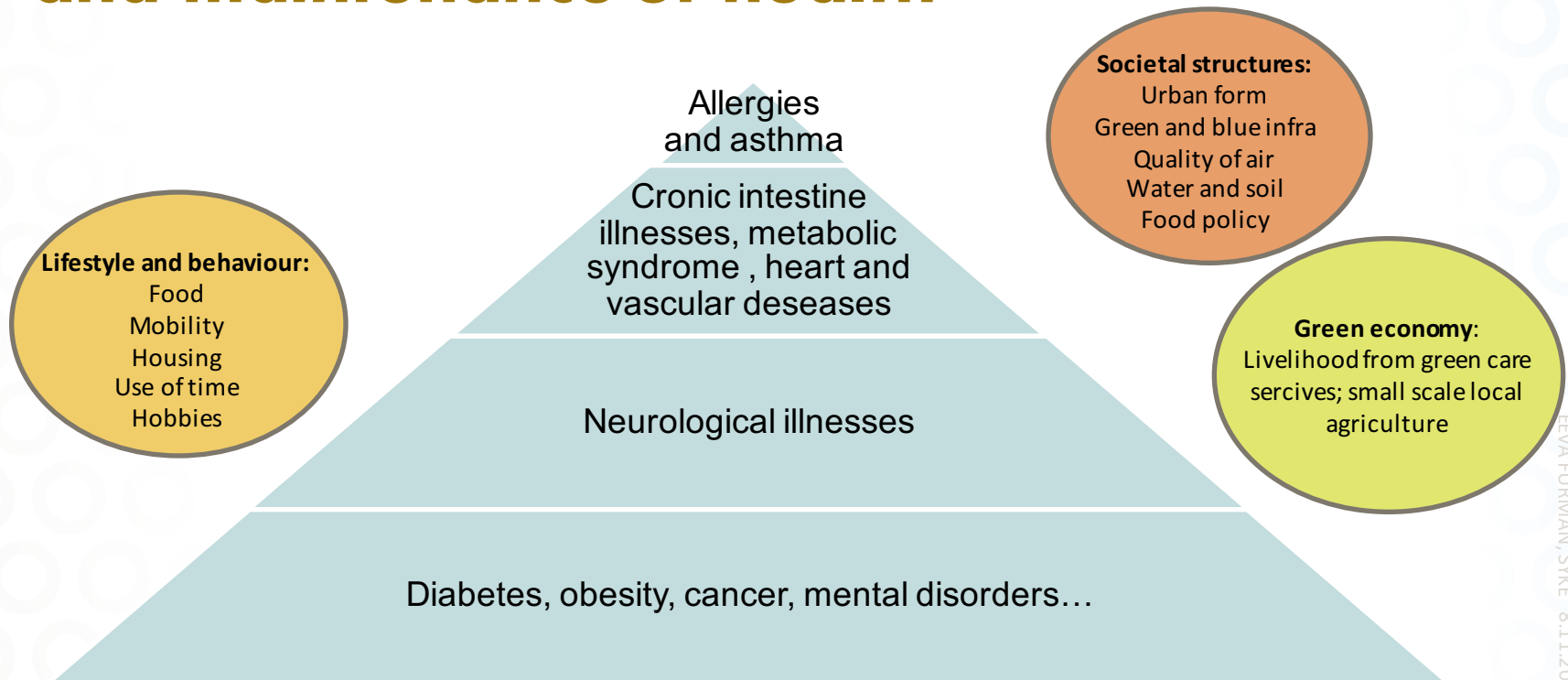
Respiratory
tract

Skin

Gut



Prevention of inflammatory diseases and maintenance of health



Exposure of pregnant women and children to nature most crucial - but to maintain the effect, contact important all life through to old age



**We can increase nature
contact despite the fact
that more knowledge is
needed**

Easy answers?

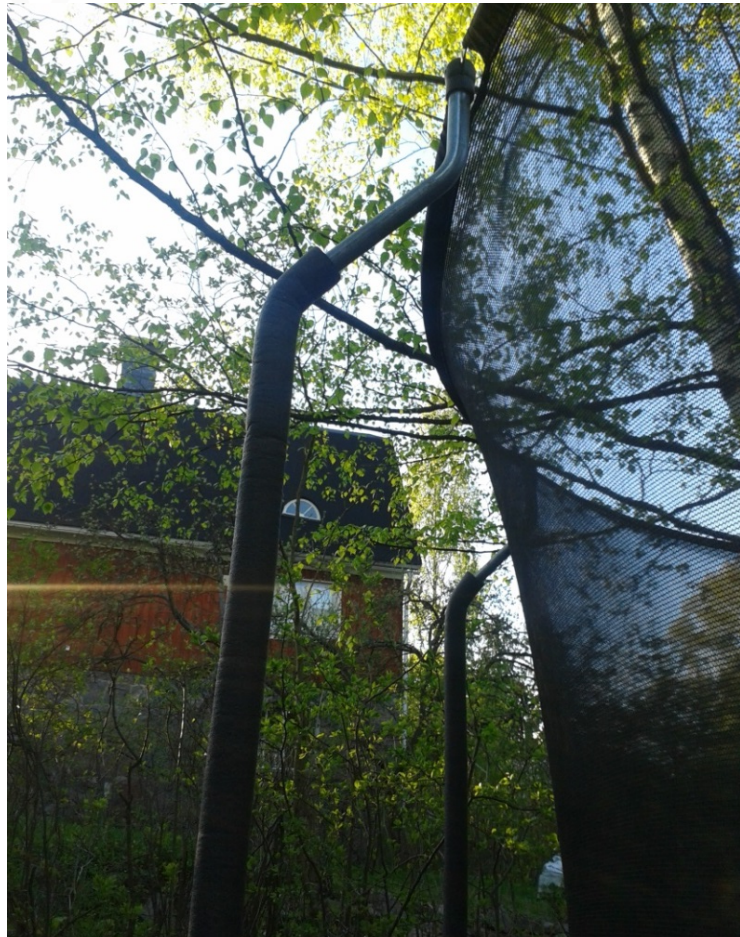


We can increase nature contact, despite the fact that more knowledge is needed

Easy answers?



Holistic approach by actively using green spaces especially in the urban context



How urban planning with nature-based solutions can enhance daily exposure to nature?



Vastaajien rajaamat alueet

käytetään opetukseen

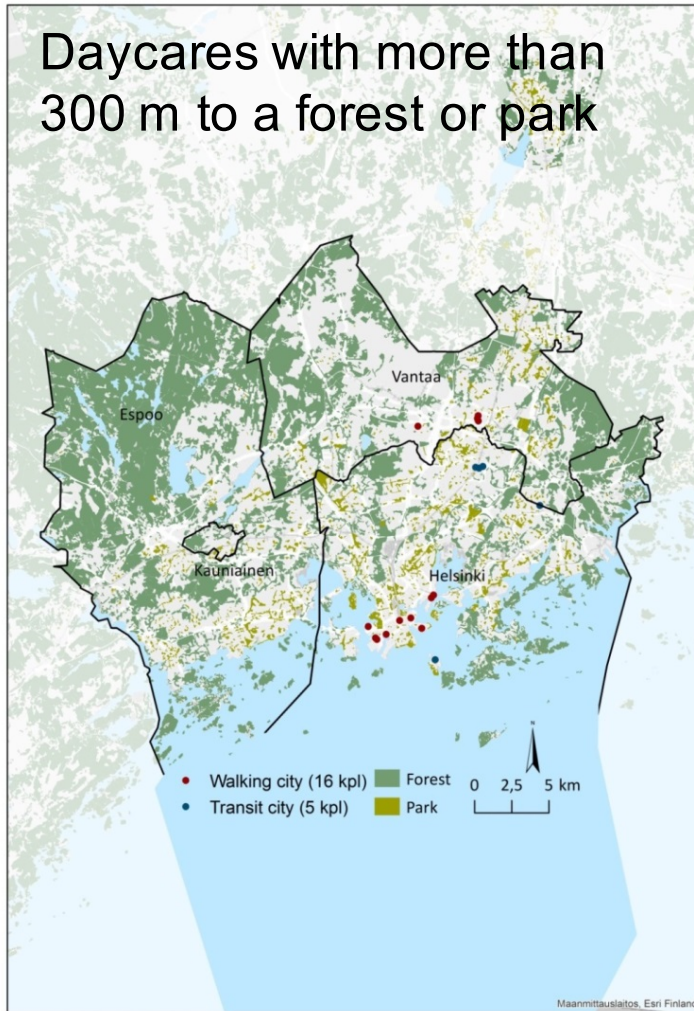
haluttaisiin käyttää opetukseen

● Koulu

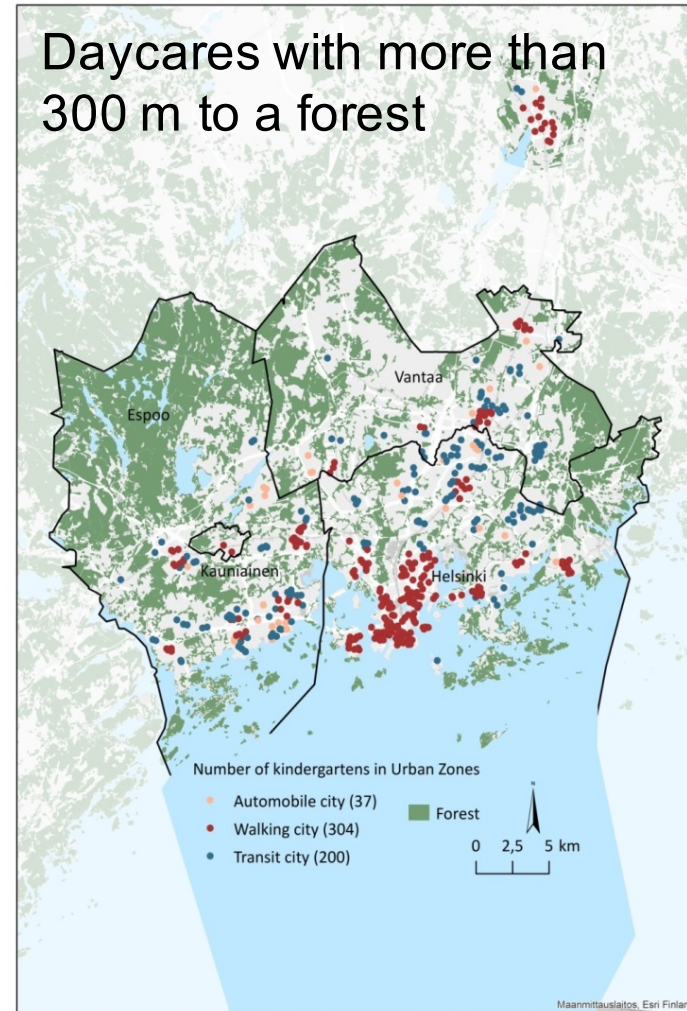
▲ Päiväkoti

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Daycares with more than 300 m to a forest or park



Daycares with more than 300 m to a forest



S Y K E

Paloniemi, Tiitu & Viinikka SYKE

Planning healthy environments require collaboration across administrative sectors on local level

- Planning
- Recreation
- Sports
- Green area management
- Building
- Environment
- Health
- Education

Järvenpään viherrakenne

- metsät
- maatalousmaat
- niityt
- viljelypalstat
- siirtolapuutarha
- puistot
- tonttivistä
- suojaviheralueet
- pinnoittamattomat urheilualueet
- kierrätysalue
- suot ja kosteikot
- vesistöt
- pienvedet

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0 750 1 500 3 000 m



Green infrastructure
in Järvenpää municipality

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Global policies to mainstream exposure to biodiversity



Recommendation: country level implementation with Nature Step Programme

- Strengthening citizens' mobility in and contact with nature
- Enhancing an increased use of fresh vegetables and fruit in diet
- Nature to be part of childrens' and old peoples' care system
- Prevention of illnesses such as blood pressure, diabetes, asthma, metabolic syndrome with exposure to nature
- Control the costs of these illnesses with exposure to nature
- Include ecosystem-health theme as core element in health research agenda

Message to
scientists and
policy makers

Access to nature is important but not enough - we need to understand better the interconnection between the use of GI, access to it and people's behaviours to ensure the active contact with nature



• Thank you!

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www.syke.fi

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