KUVA: ADOBE STOCK

OTS#7 Just resilience: Rethinking climate adaptation to leave no one behind
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Characterising future socio-economic changes for enhancing climate change risk analysis and just adaptation planning

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Climate Change and Health: Adapting to Mental, Physical and Societal Challenges (CHAMPS)

CHAMPS

The research consortium CHAMPS studies the potential impacts of climate change on health.

Basic information

Start year/end year: 2020 - 2024

Project status: Completed

Project management: Timothy Carter

Project team: Stefan Fronzek, Ismo Lahtinen, Anna Lipsanen, Nina Pirttioja, Emma Terämä

Financiers: Research Council of Finland

Partners: Finnish Institute of Health and Welfare, Finnish Meteorological Institute, University of Eastern Finland, University of Helsinki

Subject area: Climate

ETC-CA Report 2024/1

Guidelines to quantify climate change exposure and vulnerability indicators for the future: an example for heat stress risk across scales

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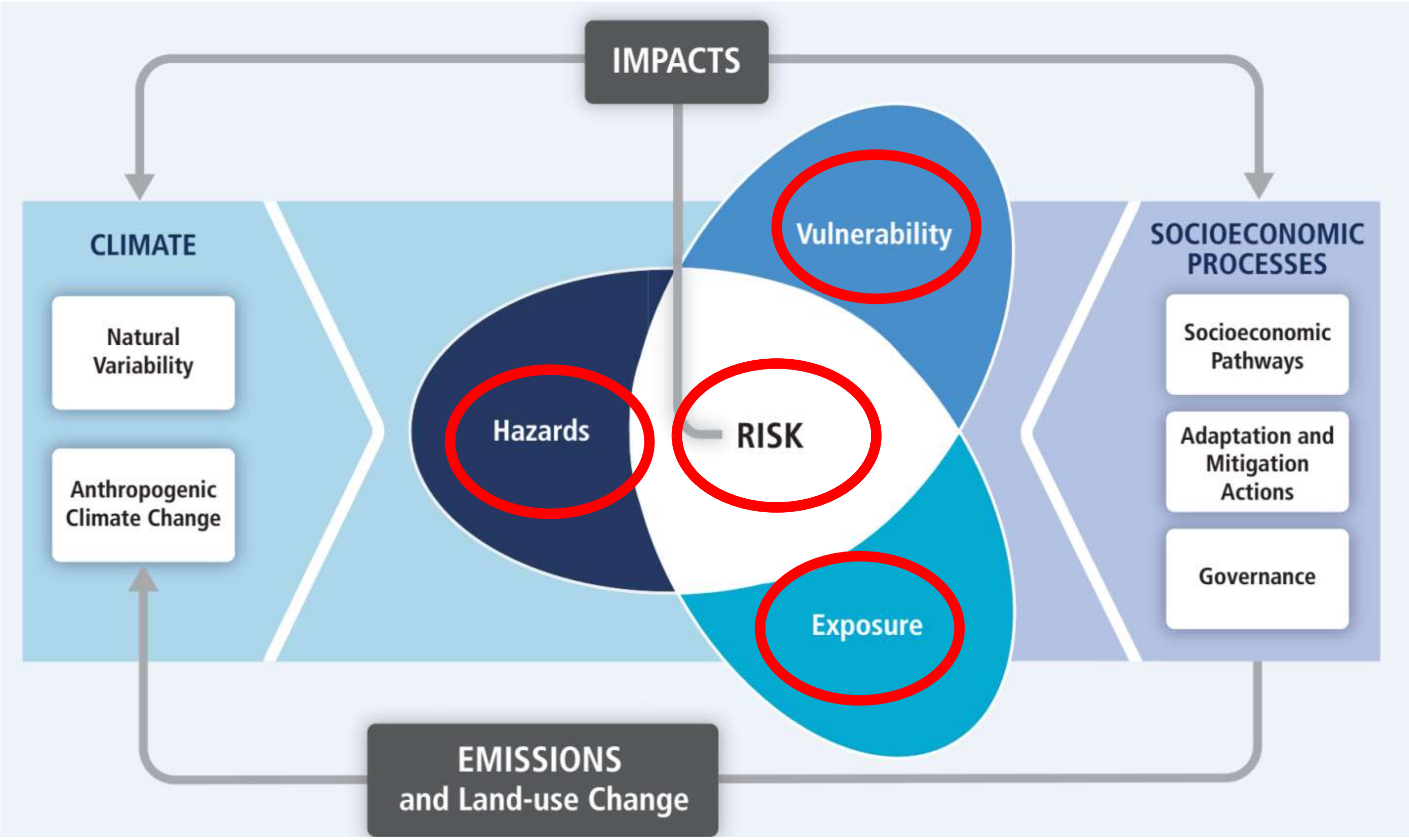
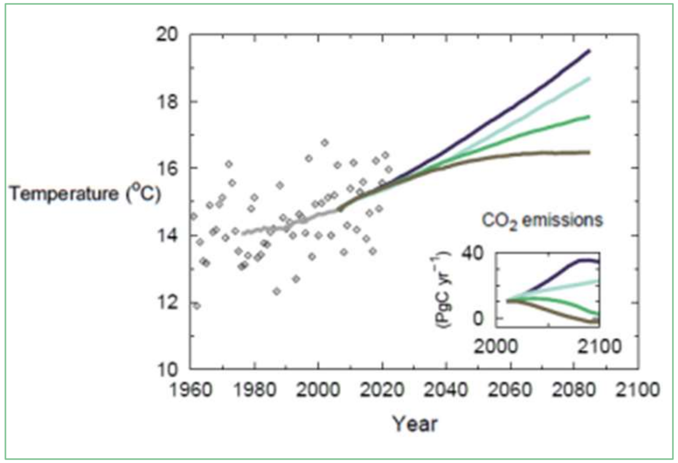
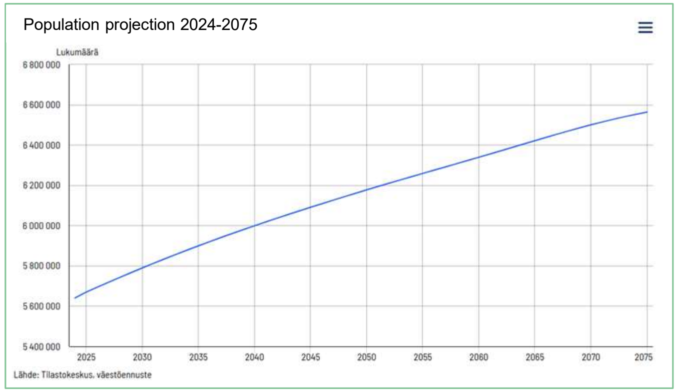
European Environment Agency
European Topic Centre
Climate change adaptation
and LULUCF





https://www.syke.fi/sites/default/files/documents/finscapes_scenarios_ostrobothnian_counties.pdf



Source: Statistics Finland

How hot is too hot, depends on how exposed and vulnerable we are!

A narrow adaptation approach focusing only on future climate hazards, ignoring evolving exposure and vulnerability, will lead to maladaptation and injustice by failing to address changing local needs.

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Specifying future trends and aspirations

Futures analysis and scenarios

Methods

Purpose: In the context of high uncertainty, futures analysis characterizes alternative plausible future conditions (scenarios) that can be used in CCIAV research and by decision-makers for exploring options available to them.

- Exploratory scenarios combine qualitative descriptive narratives of the underlying causes (or drivers) of change with quantitative projections from computer models.
- Normative scenarios reflect an aspirational or target-seeking future.

Construction: Co-development with stakeholders is common to ensure salience, credibility and legitimacy.

Application: Scenarios are commonly applied in conjunction with analytical tools described earlier (e.g., models)(IPCC, 2019)

Principal methods used in climate futures analysis (focus on land)

Futures method	Description and subtypes	Application domain	Time horizon
Exploratory scenarios. Trajectories of change in system components from the present to contrasting, alternative futures based on plausible and internally consistent assumptions about the underlying drivers of change	*Long-term projections* quantified with models	Climate system, land system and other components of the environment (e.g., biodiversity, ecosystem functioning, water resources and quality), for example the SSPs	10–100 years
	Business-as-usual scenarios (including 'outlooks')	A continuation into the future of current trends in key drivers to explore the consequences of these in the near term	5–10 years, 20–30 years for outlooks
	Policy and planning scenarios (including business planning)	*Ex ante* analysis of the consequences of alternative policies or decisions based on known policy options or already implemented policy and planning measures	5–30 years
	Stylised scenarios (with single and multiple options)	Afforestation/reforestation areas, bioenergy areas, protected areas for conservation, consumption patterns (e.g., diets, food waste)	10–100 years
	Shock scenarios (high impact single events)	Food supply chain collapses, cyberattacks, pandemic diseases (humans, crops and livestock)	Near-term events (up to 10 years) leading to long-term impacts (10–100 years)
	Conditional probabilistic futures ascribe probabilities to uncertain drivers that are conditional on scenario assumptions	Where some knowledge is known about driver uncertainties, for example, population, economic growth, land-use change	10–100 years
Normative scenarios. Desired futures or outcomes that are aspirational and how to achieve them	*Visions, goal-seeking or target-seeking scenarios*	Environmental quality, societal development, human well-being, the Representative Concentration Pathways (RCPs,) 1.5°C scenarios	5–10 years to 10–100 years
	Pathways as alternative sets of choices, actions or behaviours that lead to a future vision (goal or target)	Socio-economic systems, governance and policy actions	5–10 years to 10–100 years

Reduced from (IPCC, 2019)

Specifying future trends and aspirations

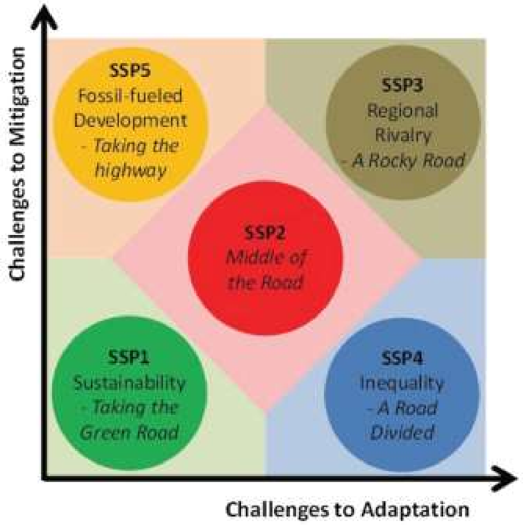
Aim

To offer a common global framework for facilitating climate change research that collectively can characterize a range of uncertainties in:

- Factors determining **exposure and vulnerability to impacts** of climate change.
- **Mitigation** challenges to achieve a given climate outcome.
- **Adaptation** challenges for ameliorating the impacts of climate change.

(Moss et al., 2010)

Shared Socio-economic Pathways (SSPs)



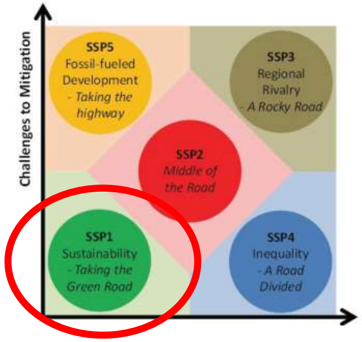
Based on (Frame et al., 2018)

Five global narratives (published)

Quantitative elements (SSP database at IIASA; e.g., population, income, urbanization, technology, educational attainment).

Extensions possible for sectors or regions.

Source: (O'Neill et al, 2017)



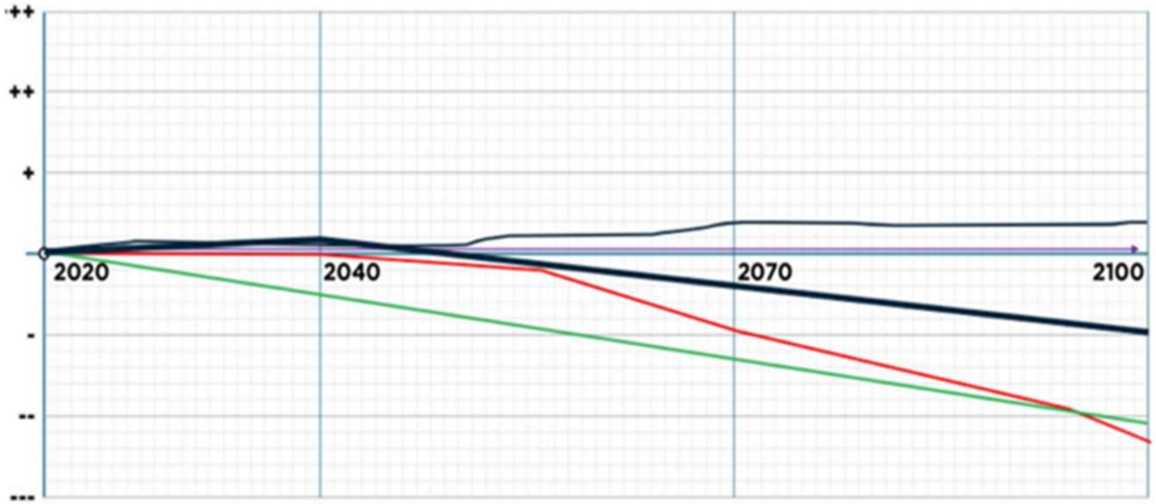
Based on Frame et al, 2018.

EU-SSP1

- Strong support for regionalisation, green development in lifestyle changes and innovation the technology, economic and energy sectors lead to policies and technologies that maximise sustainability across EU countries

Source: Kok et al., 2019.

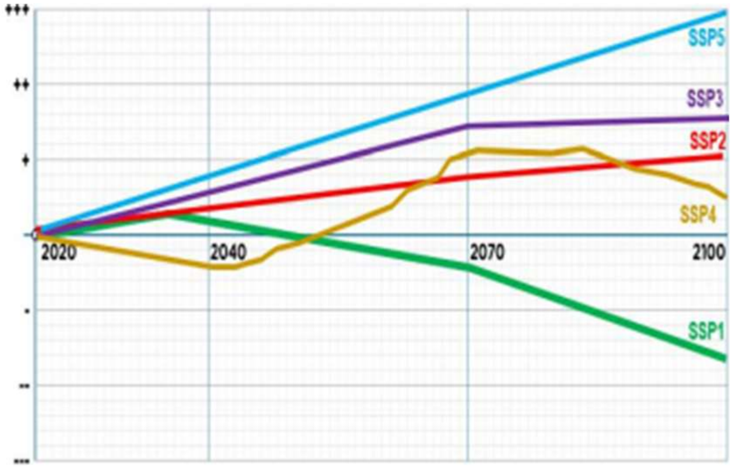
Qualitative scenario trends in a sustainability scenario (SSP1) of proportion of **elderly living alone** as a deviation from present-day (2020) throughout the 21st century.

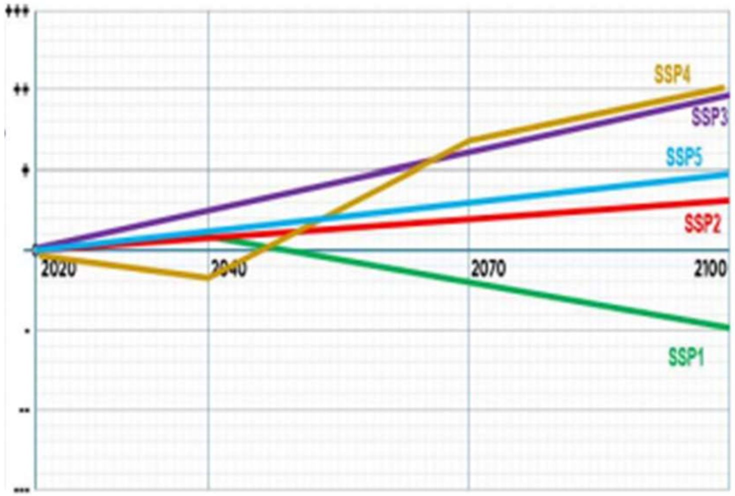


Source: Pedde et al. 2024, doi: 10.25424/cmcc-n52a-ad48

Scenario trends were prepared individually in an elicitation by four experts (coloured lines) based on interpretation of the same storyline; the divergent individual trends are combined with a consensus process (thicker black line).

Qualitative scenario trends in **grey surfaces** that increase the urban heat island effect (top) and in the proportion of elderly living alone (bottom).





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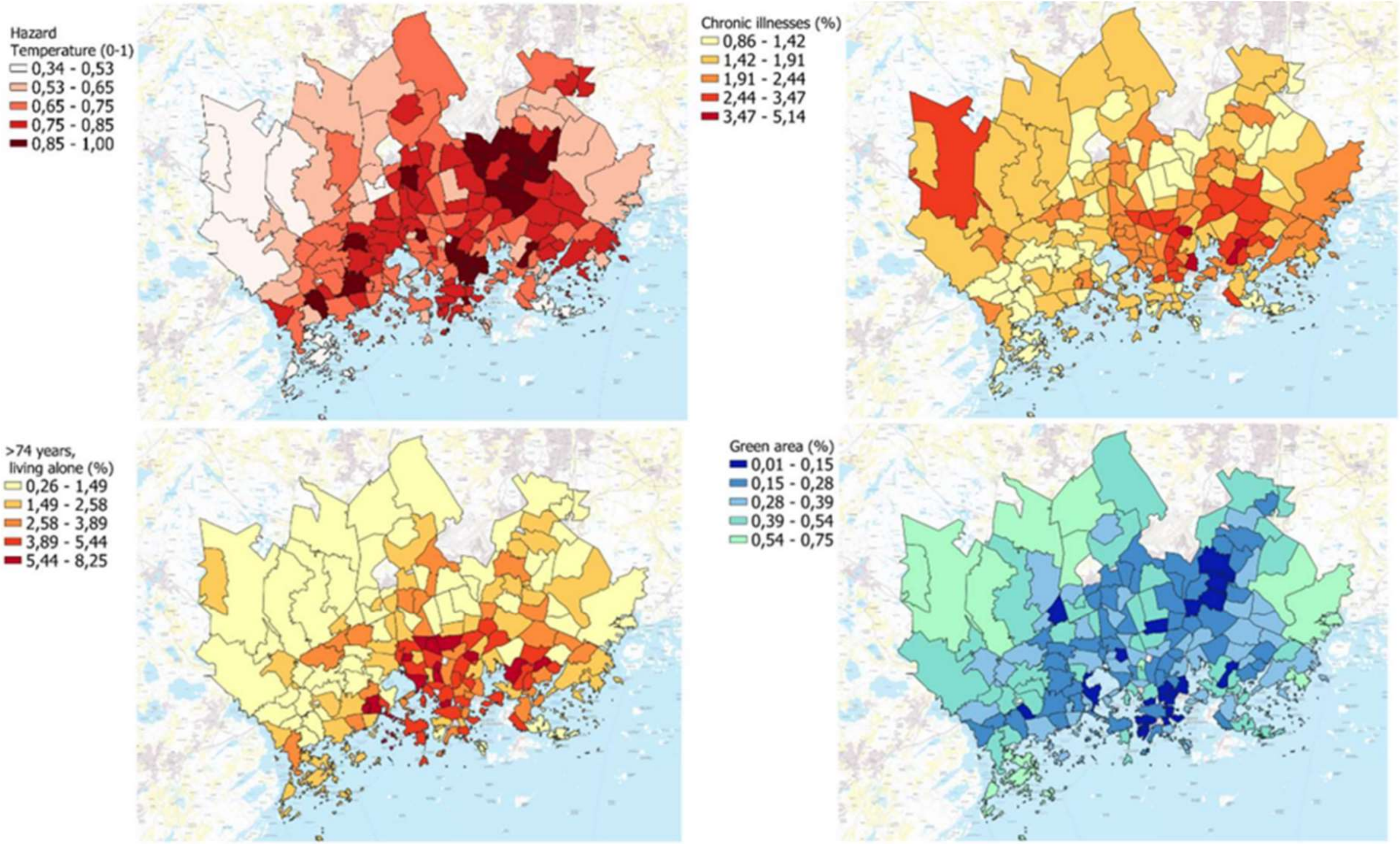
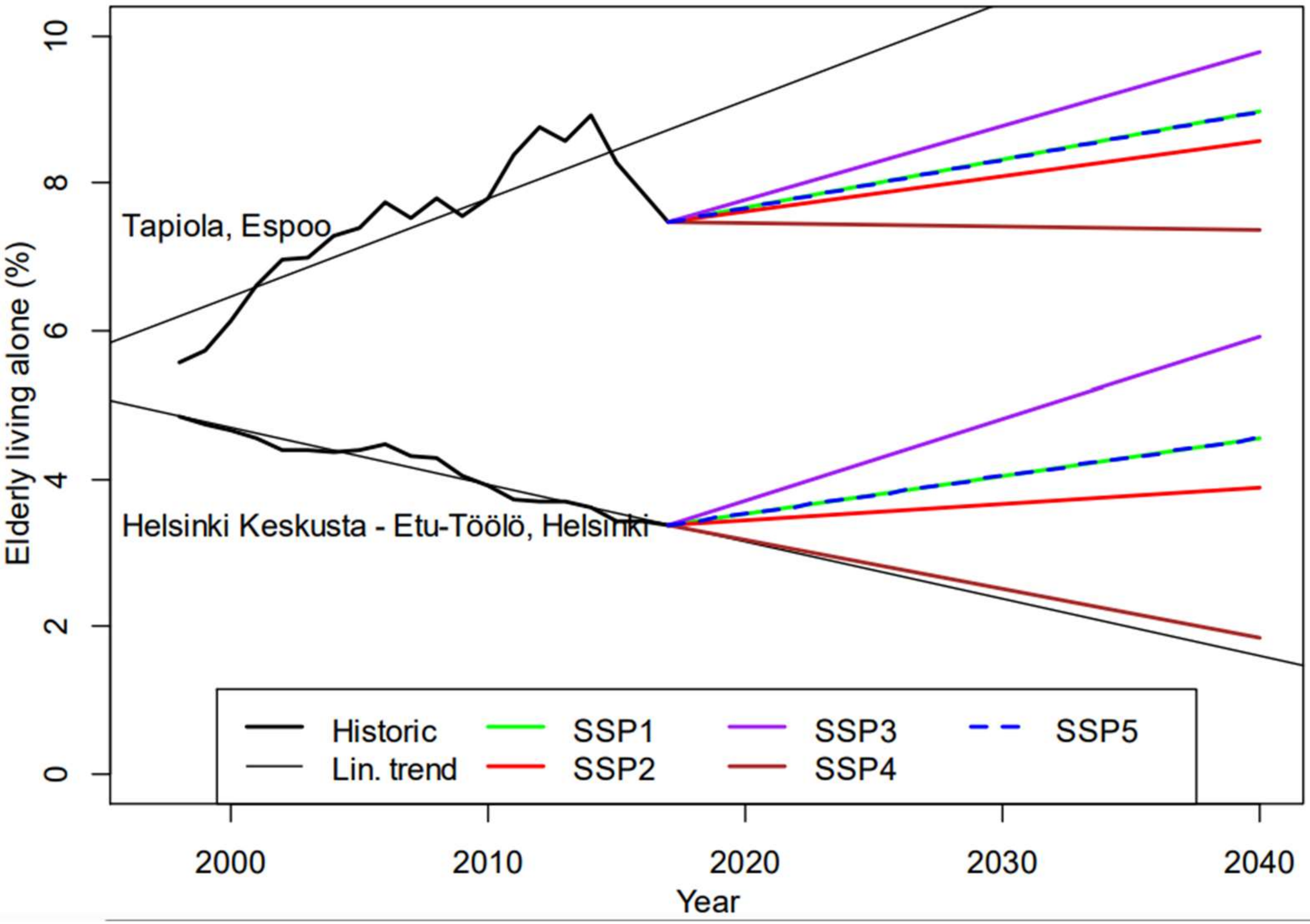
Selected indicators of observed (mean over 2000 to 2017) heat-health risk in the Helsinki Metropolitan area



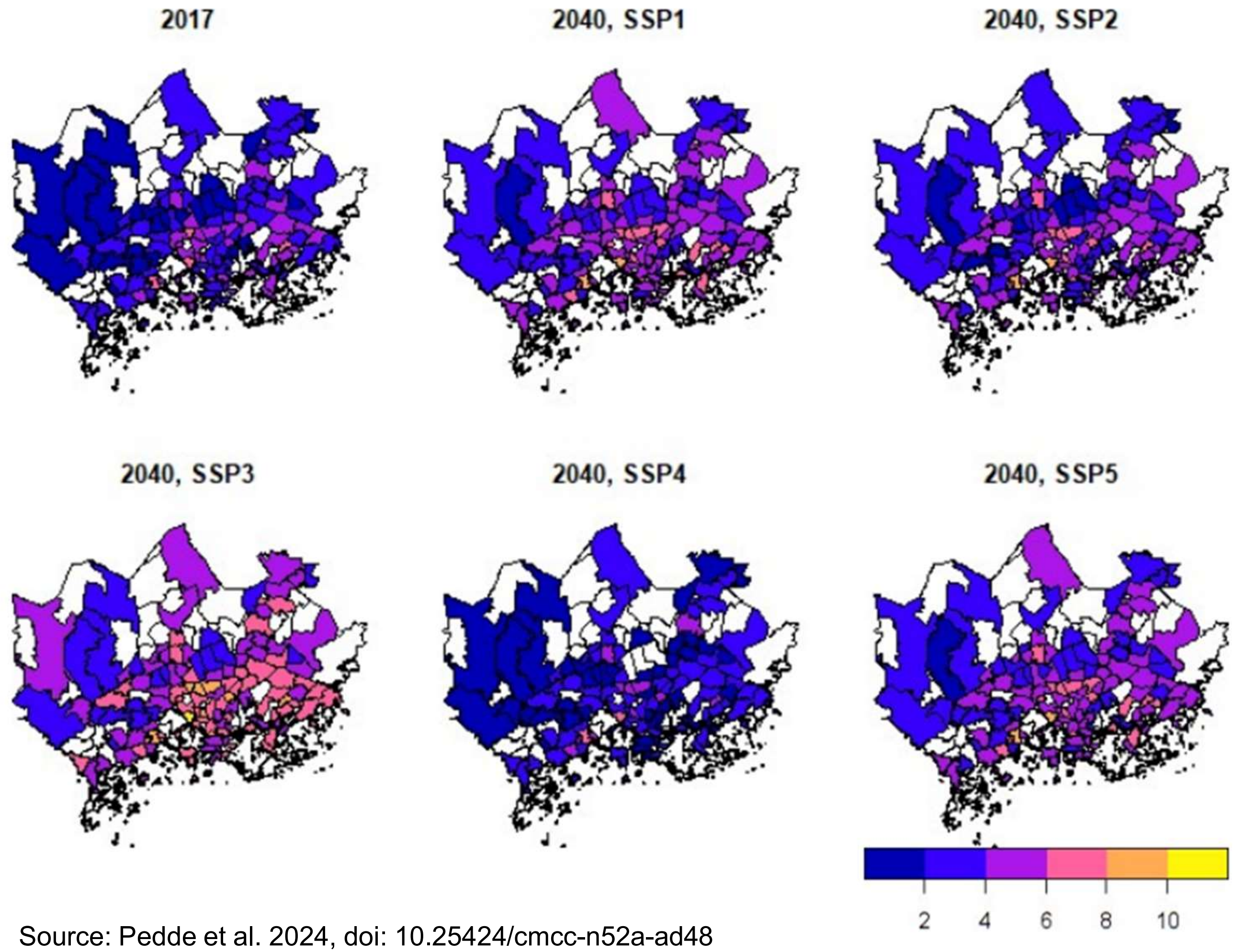
Source: Pedde et al. 2024, doi: 10.25424/cmcc-n52a-ad48

Proportion of **elderly >74 years living alone** in two postal code areas in the Helsinki metropolitan area, Tapiola in Espoo and Etu-Töölö in Helsinki, in the observed time-series 1998- 2017 and for projections for up until 2040 for five SSP-based scenarios.



Source: Pedde et al. 2024, doi: 10.25424/cmcc-n52a-ad48

Proportion of **elderly >74 years living alone** in the Helsinki metropolitan area in official statistics for 2017 and for projections for 2040 for five SSP-based scenarios (in % per postal code area). White indicates postal code areas with missing data in 2017, the last year of the observation period, for which no scenario values were prepared.



Source: Pedde et al. 2024, doi: 10.25424/cmcc-n52a-ad48

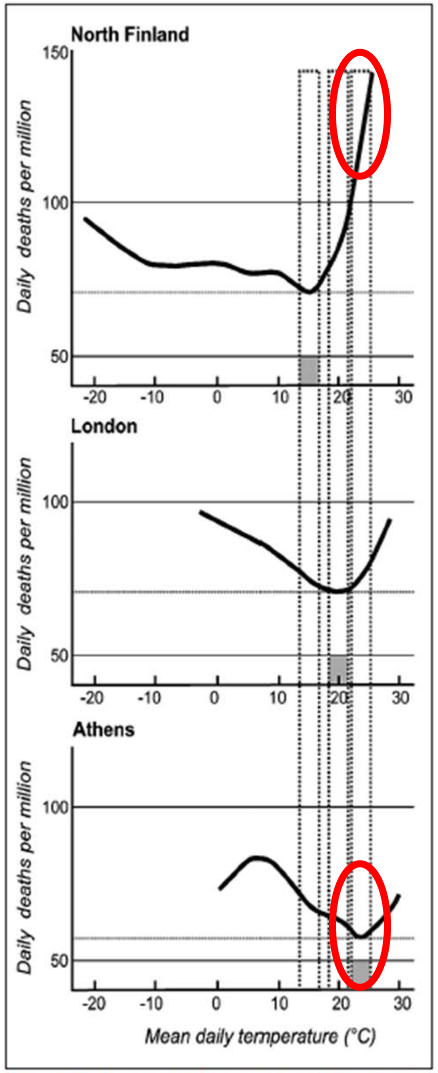


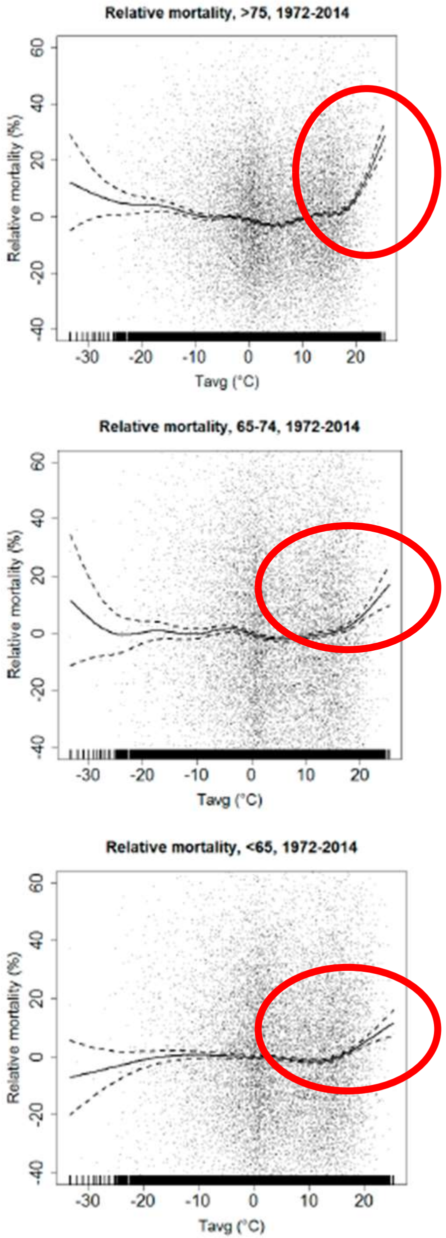
Figure 2. Daily mortality of people aged 65.74 in relation to mean daily temperatures in regions with the coldest, median, and warmest summer temperatures (May to August). The gray squares indicate the 3°C band of minimum mortality for the region (calculated at 0.1°C intervals) and the horizontal lines show mortality in this band. (Figure modified from Keatinge et al. 2000, ref. 25).

Source: Näyhä 2005

≥75 years

65–74 years

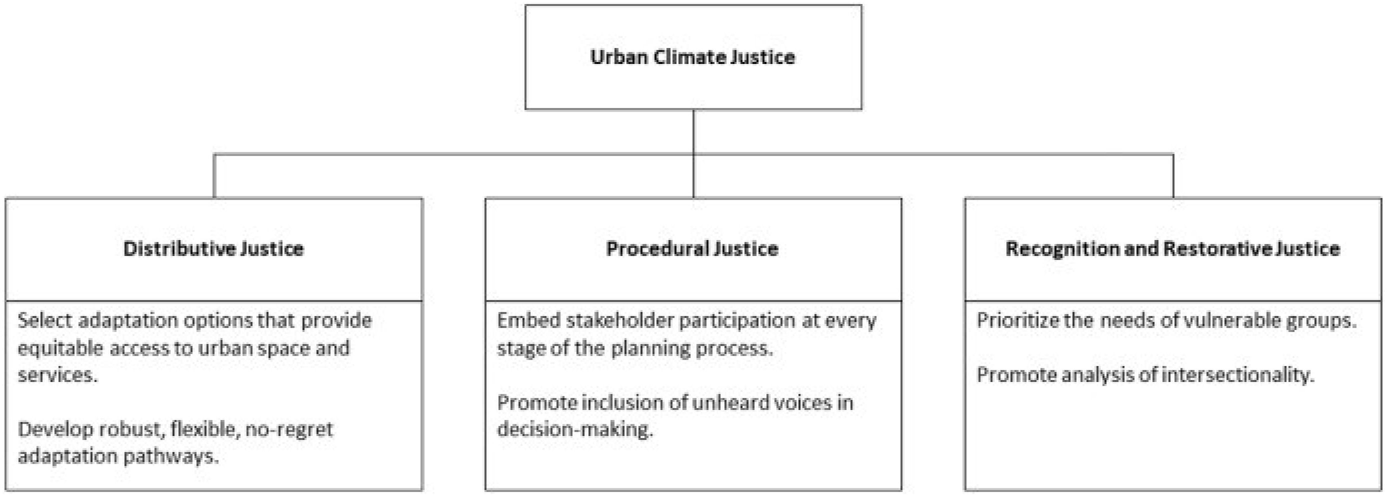
<65 years



Source: Ruuhela et al 2017

Next steps

- Co-development of SSP scenarios with local experts in the Helsinki Metropolitan area
- Ideas to explore: stakeholders workshop, review of city plans, grouping postal code areas according to their characteristics, application of a urban development model



Source: Prall et al 2023. https://doi.org/10.1016/j.habitatint.2023.102946

Thank you!

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