



BlueHealth

Linking environment, climate & health



Blue spaces: how to promote health and wellbeing in Europe

Co-organised with the Seas, Rivers, Islands & Coastal Areas (SEArICA) Intergroup and European Marine Board

BlueHealth is funded by the European Union's Horizon 2020 research & innovation programme, grant agreement No 666773



Welcome from today's host



www.bluehealth2020.eu | [@BlueHealthEU](https://twitter.com/BlueHealthEU)

Ben Wheeler
Senior Lecturer
University of Exeter



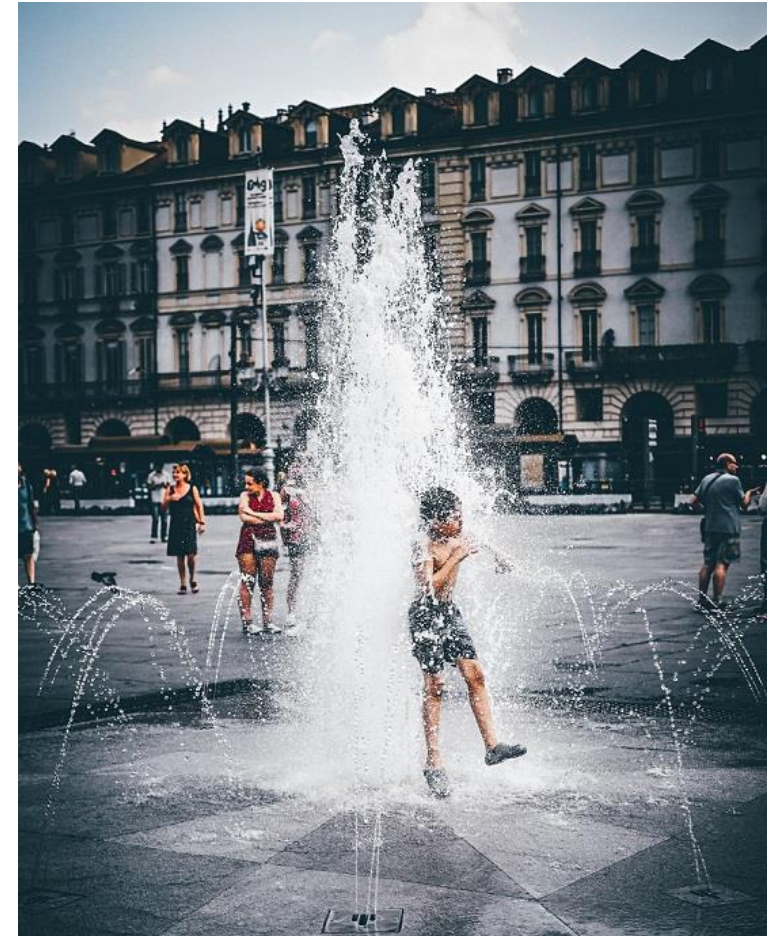
Some house keeping



To help today smoothly please...

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- Use the chat for general comments or for technical assistance
- Submit questions during the Q&A using:
 - Q&A button (Zoom)
 - Comments (YouTube)
- We will be recording today's event and will make the presentation available





Share your thoughts



Tag us on Twitter **#BlueHealth**

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@Searica_ITG



Seas, Rivers, Islands
&
Coastal Areas

@EMarineBoard



Take part in our poll



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What sector do you represent?

What's on the agenda?



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14:05: Opening remarks

14:10: Introduction to BlueHealth

14:15: Exploring evidence at scale

14:23: Examples of BlueHealth in practice

14:30: Governance and future policy

14:40: Q&A

14:55: Closing remarks

15:00: End

Opening remarks



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Tonino Picula
Member of the European Parliament
President of the Seas, Rivers, Islands &
Coastal Areas (SEArica) Intergroup



An introduction to BlueHealth



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Lora Fleming
Professor
European Centre for Environment and
Human Health (ECEHH)
University of Exeter



Funded by European Union Horizon 2020



International and interdisciplinary



National Institute for Public Health
and the Environment
Ministry of Health, Welfare and Sport



LUND
UNIVERSITY



World Health
Organization
REGIONAL OFFICE FOR
Europe



Eesti Maaülikool
Estonian University of Life Sciences
www.emu.ee

ISGlobal **Barcelona**
Institute for
Global Health



cmcc
Centro Euro-Mediterraneo
sui Cambiamenti Climatici



ΑΡΙΣΤΟΤΕΛΕΙΟ
ΠΑΝΕΠΙΣΤΗΜΙΟ
ΘΕΣΣΑΛΟΝΙΚΗΣ



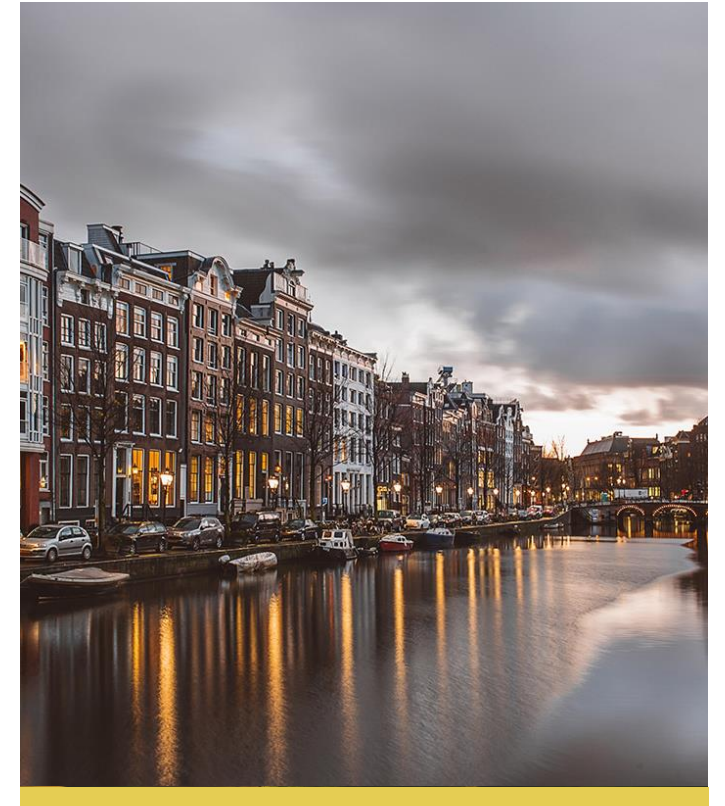
Before BlueHealth



Where were the research gaps?

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- Previous work linked natural environments and improved health and wellbeing
- Tended to focus on green spaces
- Less known about blue space and health



Why Europe?



The perfect test bed

- Over 91,000 km of coastline
- 194 coastal cities
- >50% population live within 50 km of the sea & within 2.5km of fresh water



What is blue space?



In, on, near, sense

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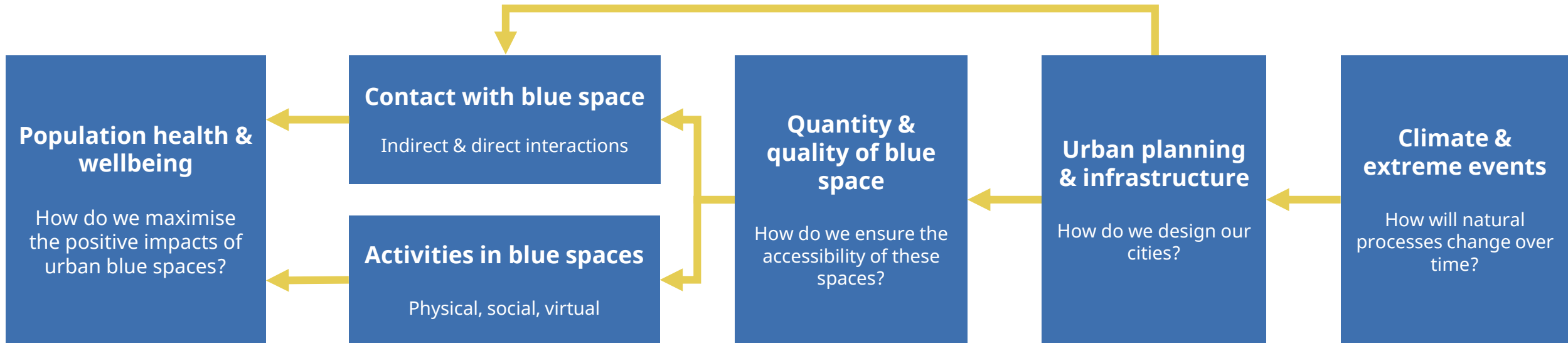
- ✓ Natural or manmade
- ✓ Outdoor environment
- ✓ Featuring water
- ✓ Accessible to humans



Relationships between blue space, health & wellbeing



And how they link together



Harnessing health benefits of blue spaces



Drawing on BlueHealth evidence

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Increase health benefits and minimise risk

Use tools to assess environments, perceptions & behaviours

Ensure inclusive access, especially for the poorest

Use virtual reality to make 'blue health' more accessible

Beyond utilitarianism: co-design infrastructure for health/wellbeing

Inform policy to prioritise urban blue spaces & co-benefits

Where are the research gaps?



Strategic Research Agenda

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- H2020 Seas, Oceans and Public Health in Europe (SOPHIE) Project
- Strategic Research Agenda (SRA) with 3 action areas:
 1. Marine biodiversity, biotechnology and medicine
 2. Sustainable seafood and healthy people
 3. Blue spaces, tourism, wellbeing
- Co-created with diverse Communities



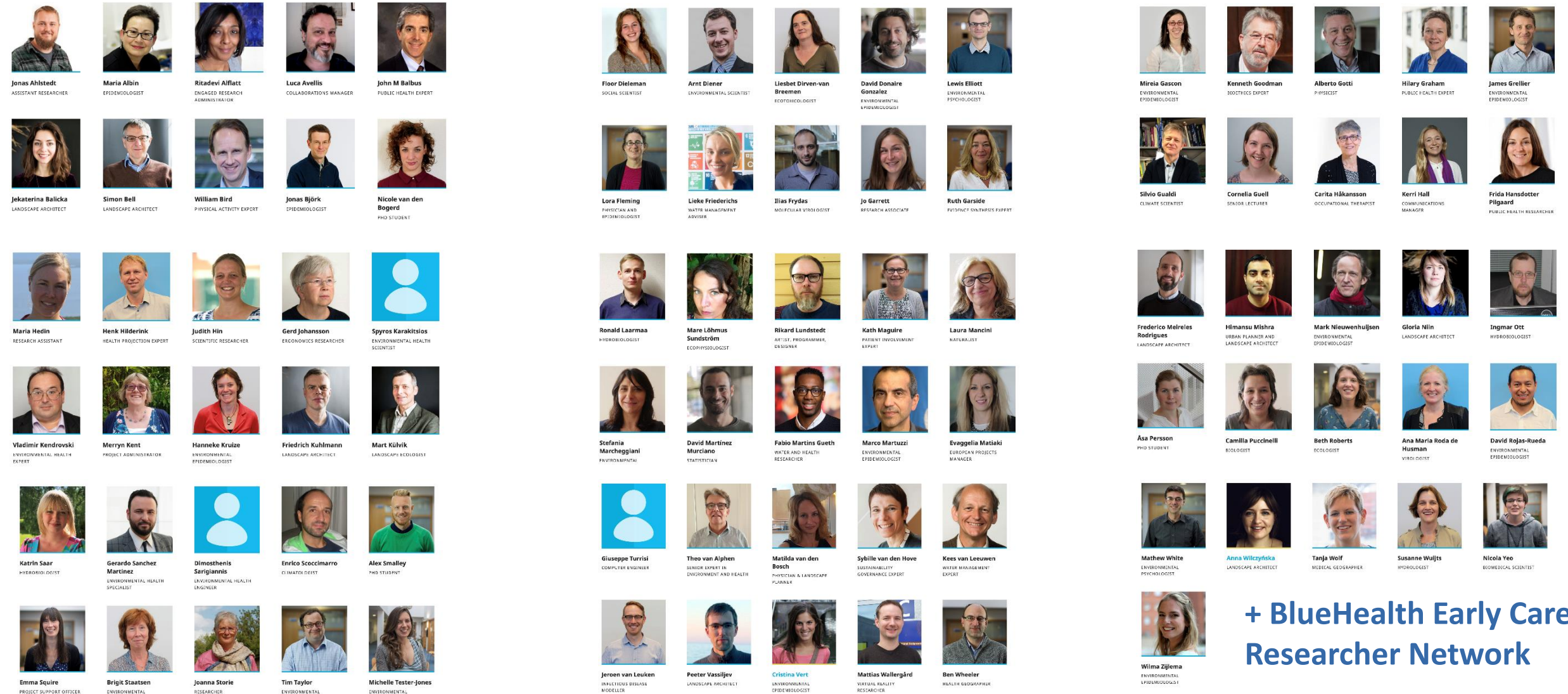
www.sophie2020.eu/SRA

The BlueHealth research team



bluehealth2020.eu/people

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Thank you



Lewis Elliott
Lecturer
University of Exeter

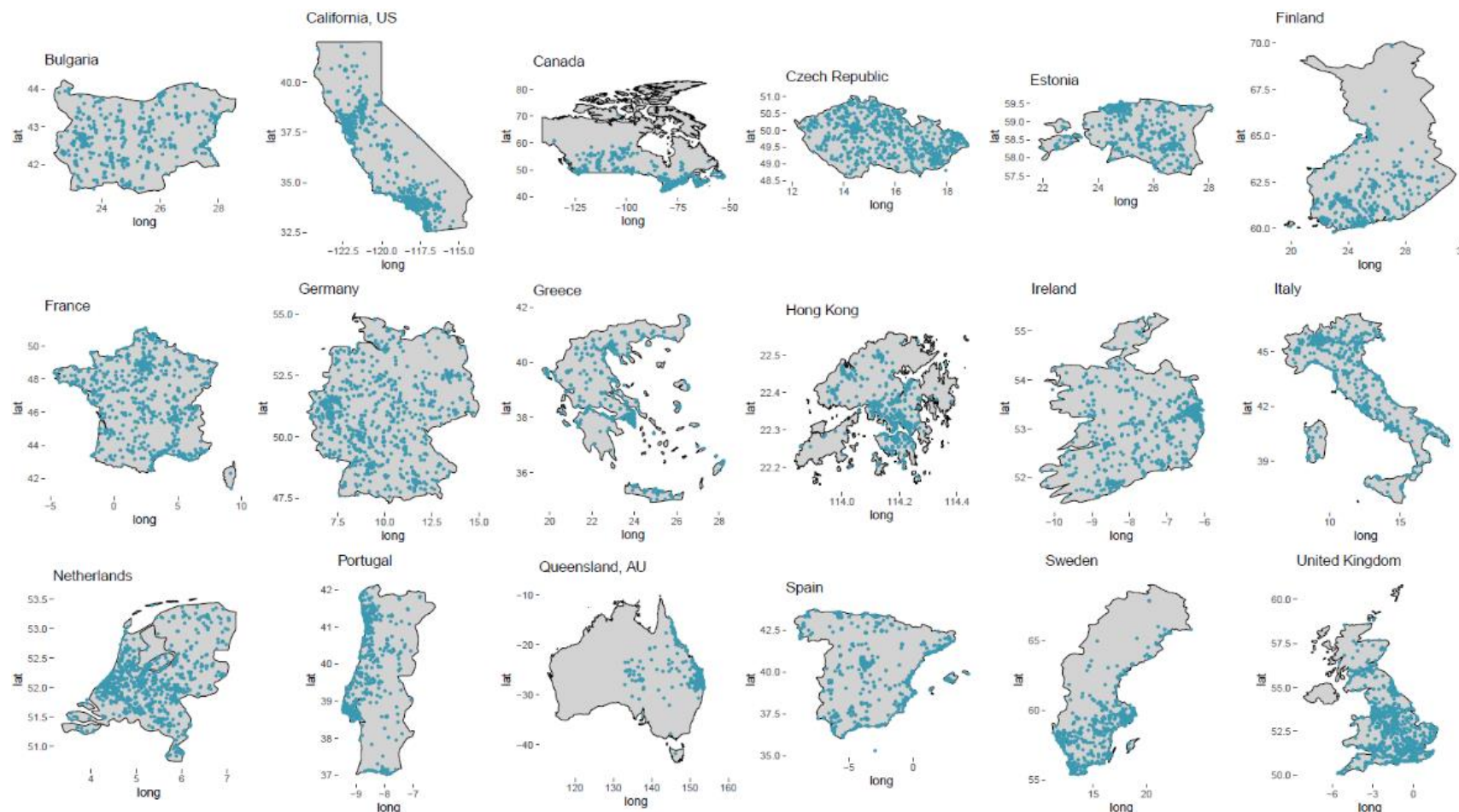


BlueHealth International Survey



Evidence at scale

- 18,838 respondents from 18 countries/territories over 2017-2018

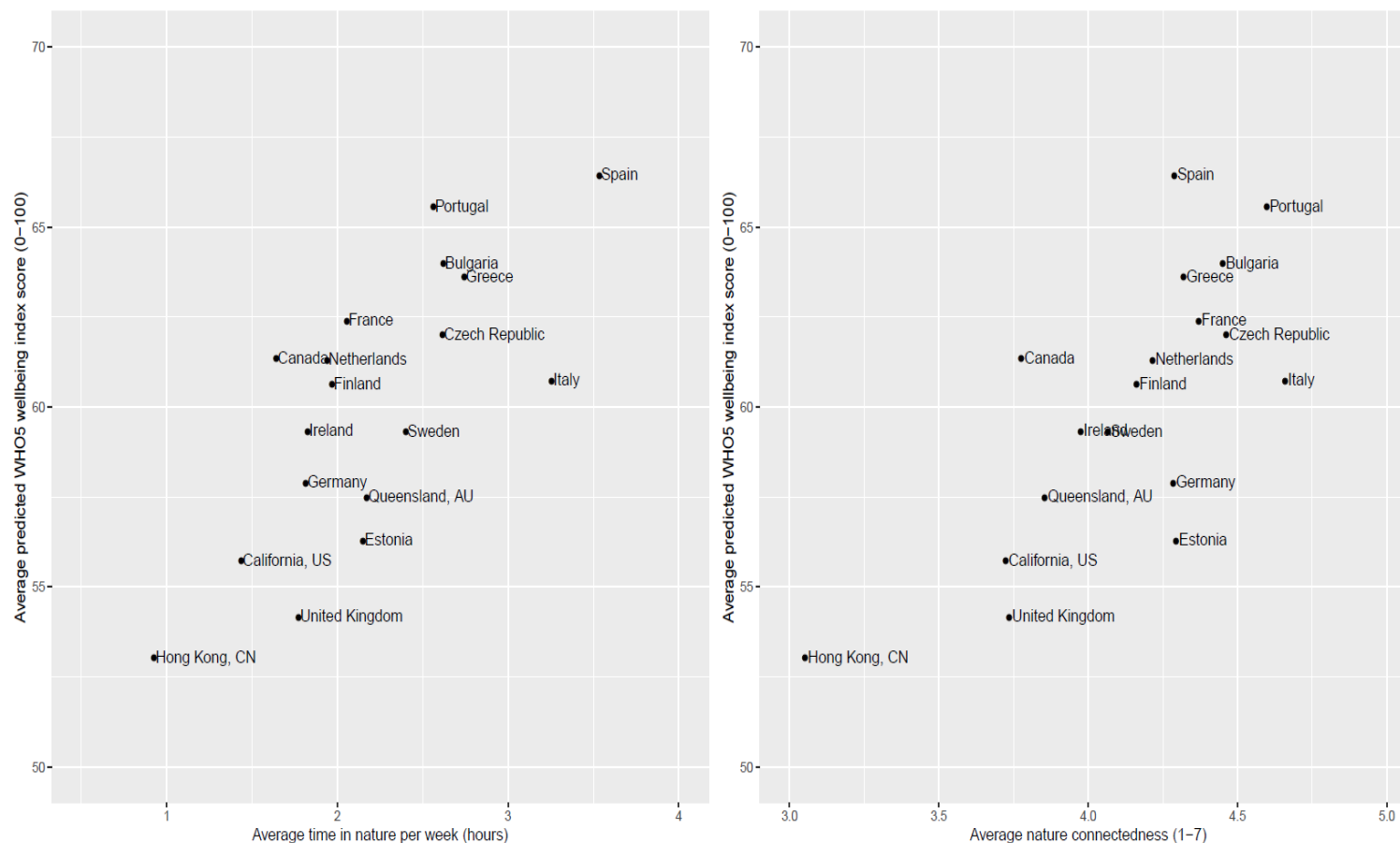


BlueHealth International Survey



Nature connectedness and mental health

- Countries with less connection to nature, or who spend less time in nature, have poorer mental wellbeing
- English-speaking or former British colonies seem to be less connected

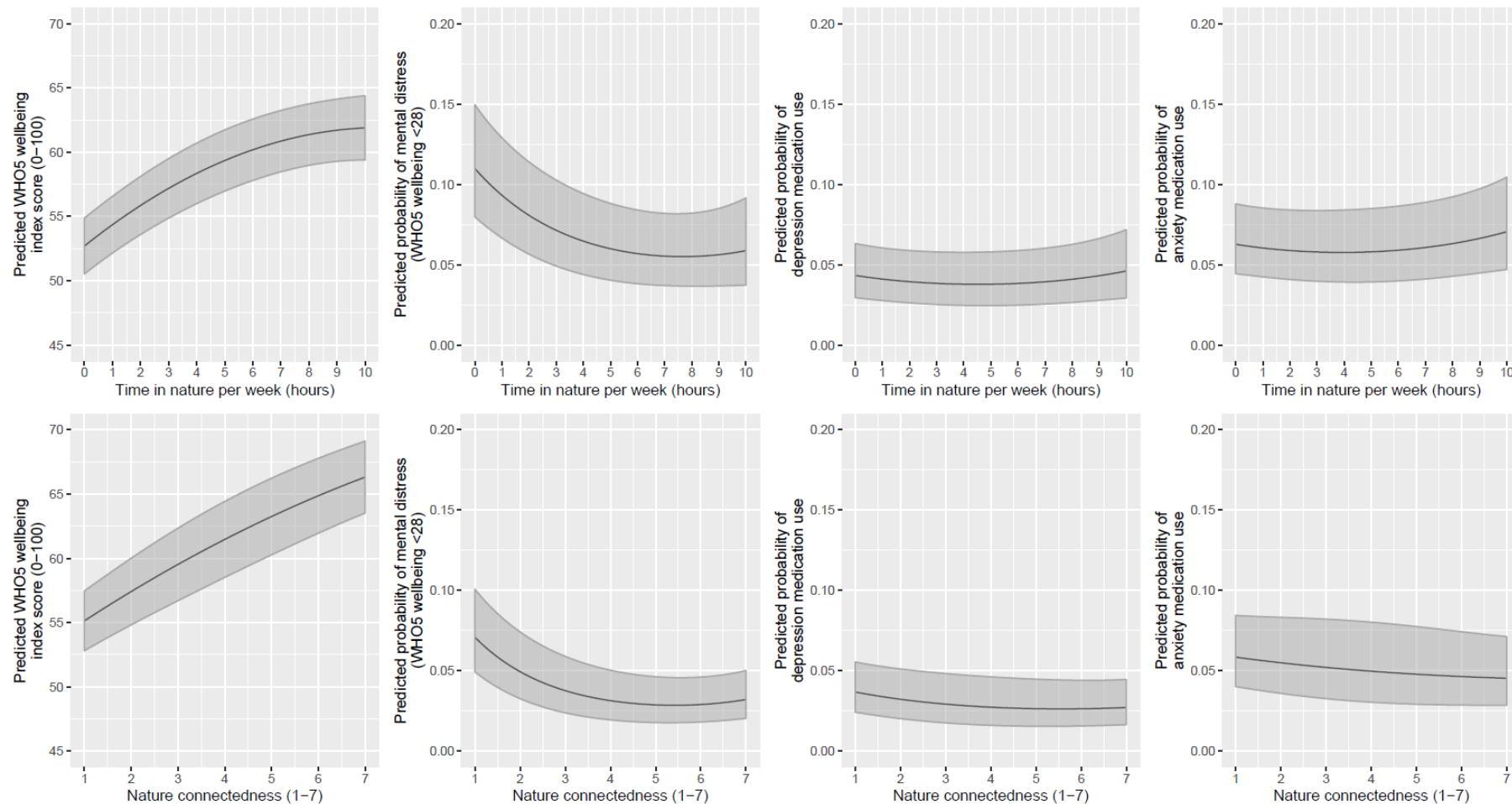


BlueHealth International Survey



Nature connectedness and mental health

- Dose-response effects for mental wellbeing and distress, but not medications

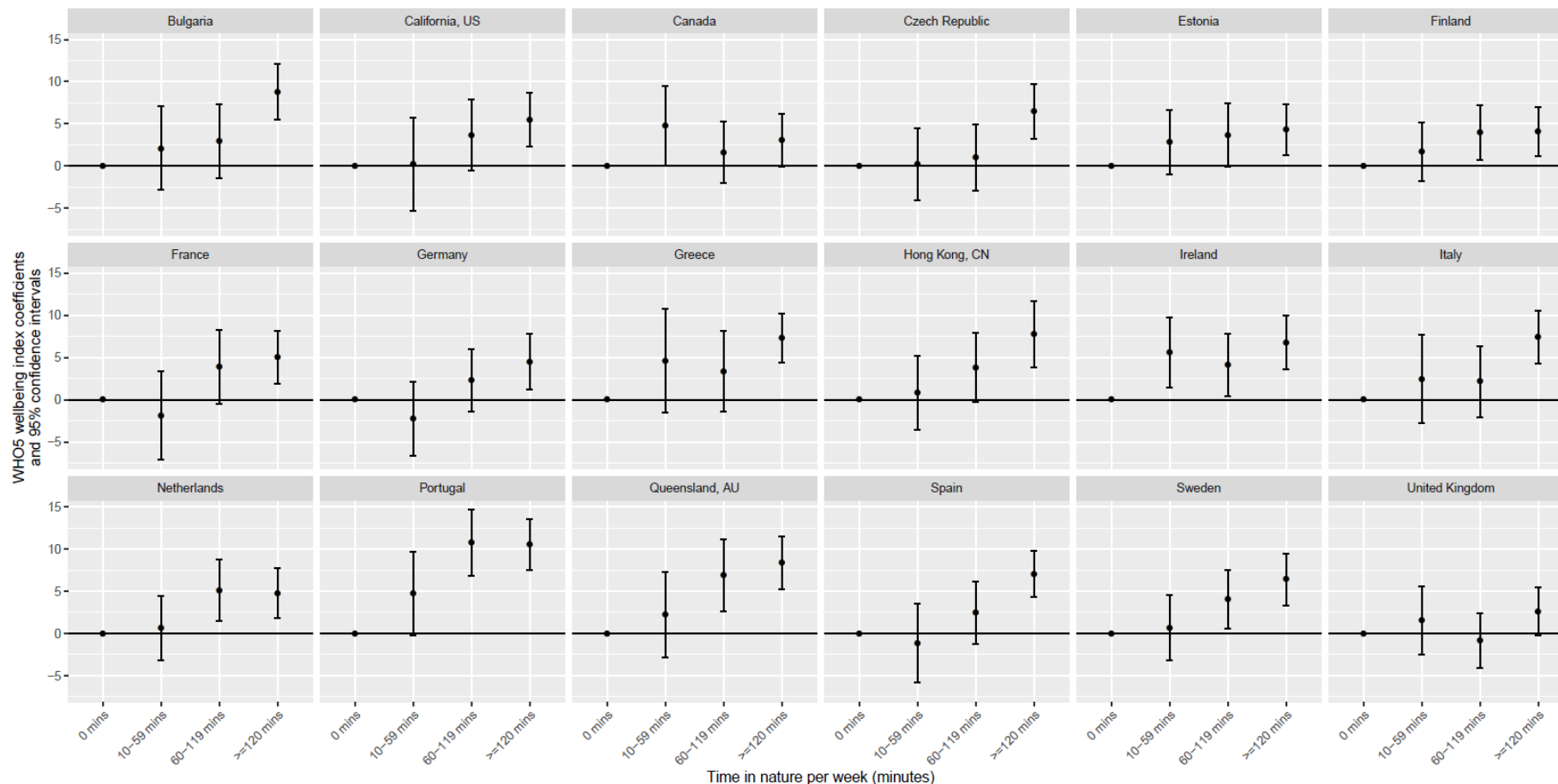


BlueHealth International Survey



Nature connectedness and mental health

- 120 minutes in nature per week an important mental health 'threshold' in 16 countries

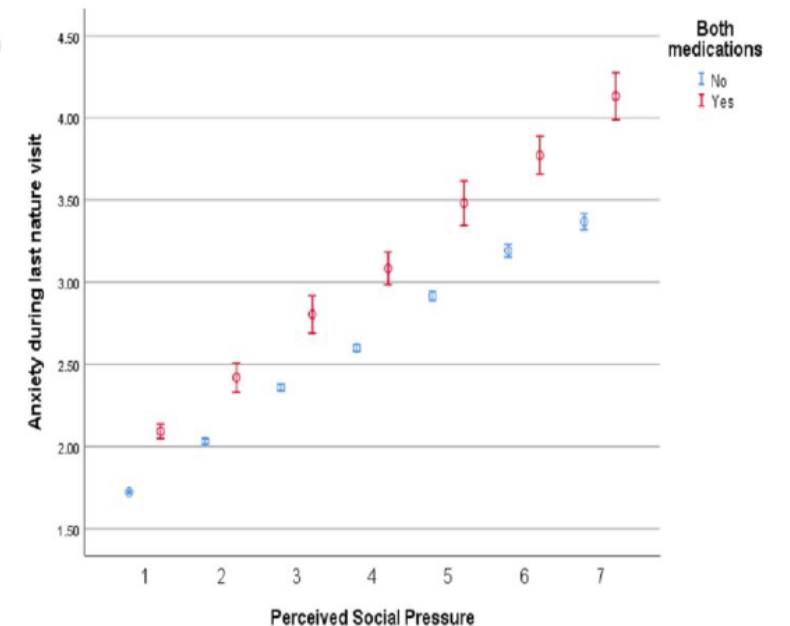
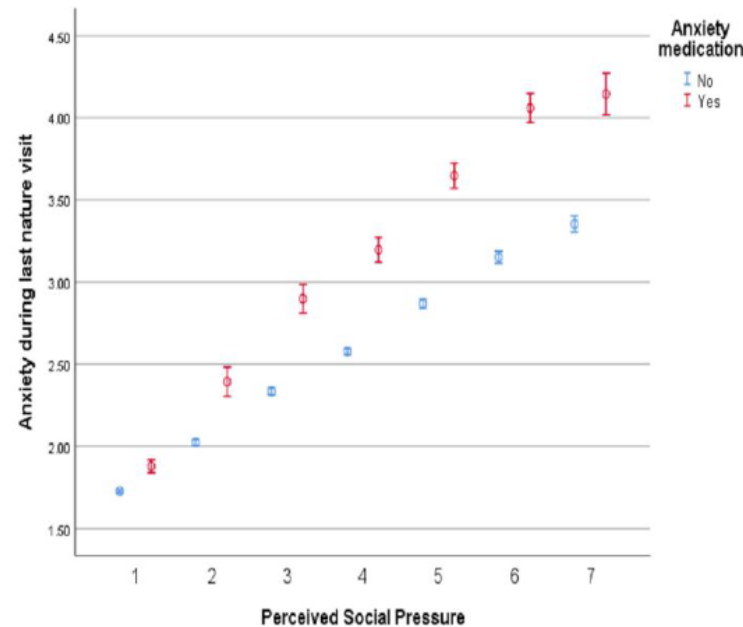
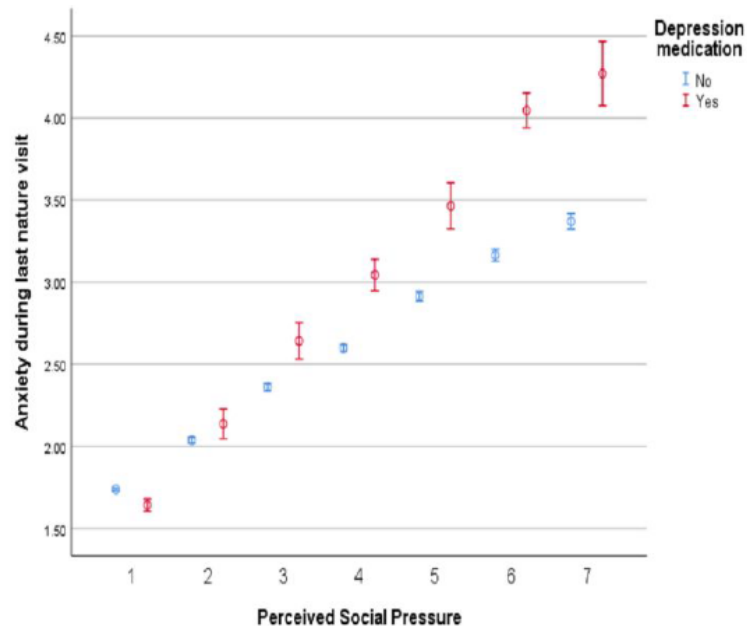


BlueHealth International Survey



Experiences of nature for people with common mental health disorders

- People with mental health disorders no less likely to visit nature
- But more pressure to visit was associated with worse experiences
- Implications for social prescribing of nature





Addictive behaviours

- NDVI (greenness) inversely associated with smoking prevalence and exceeding alcohol guidelines
- Visiting greenspace weekly associated with lower smoking prevalence
- Results unaffected by socioeconomic status
- 7% of current cases of smoking and excessive drinking could be avoided with 'optimal' greenspace (highest tertile)

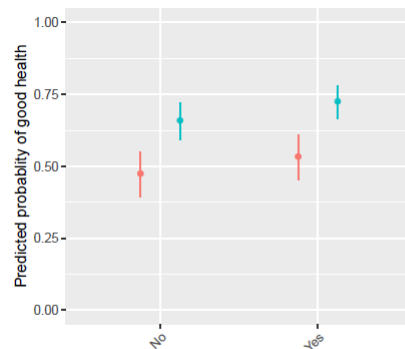
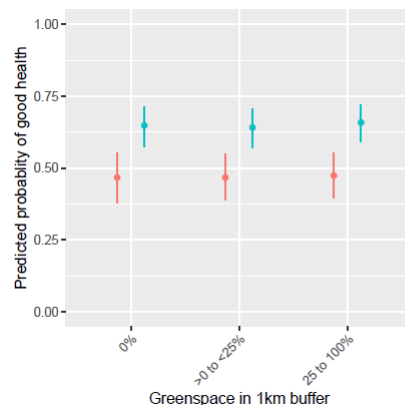
	Current Smoking	Exceeding Alcohol Guidelines
	PAF (95% CIs)	PAF (95% CIs)
Nature contact		
Neighbourhood greenspace (< 3 rd Tertile)	6.82 (1.01, 12.23)	7.46 (0.37, 17.39)
Nature Visits (< once a week)	3.80 (0.95, 6.58)	--
Greenspace + Nature Visits	10.36 (4.20, 16.11)	--
Socio-demographic comparators		
Male	5.34 (2.15, 8.43)	34.97 (29.21, 40.26)
Less than higher education	13.18 (9.77, 16.46)	3.19 (0.30, 0.90)
Income < 5 th (highest) quintile	6.89 (0.57, 13.35)	-16.82 (-30.24, -4.79)

BlueHealth International Survey

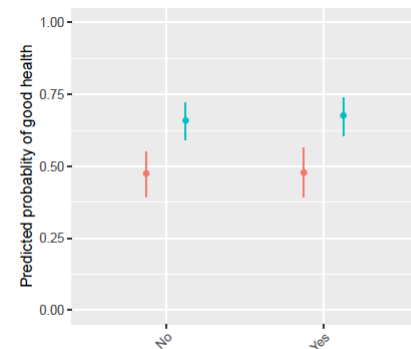
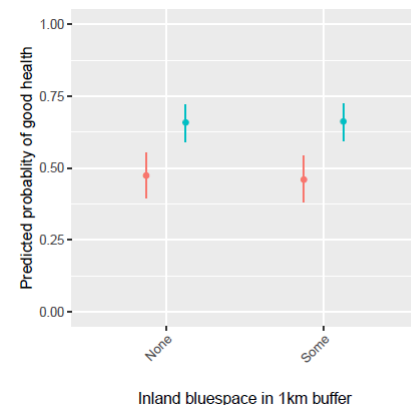


Nature exposure and health inequalities

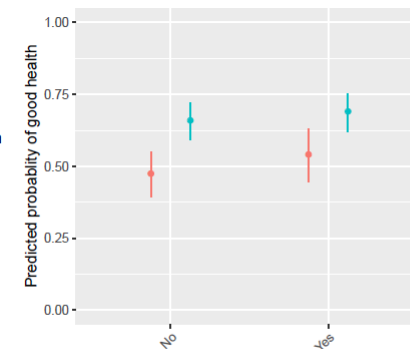
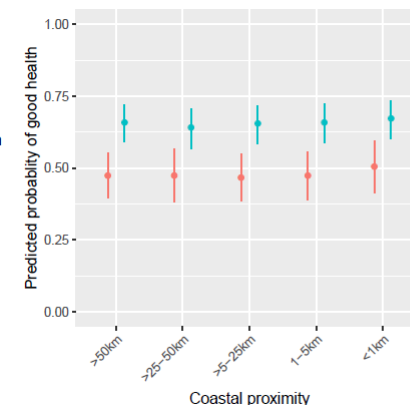
- Weekly visits to green space and coasts associated with better general health
- Residential access had no association with general health
- No evidence of reduced income-related health inequalities



Visited greenspace at least weekly in the last 4 weeks



Visited inland bluespace at least weekly in the last 4 weeks



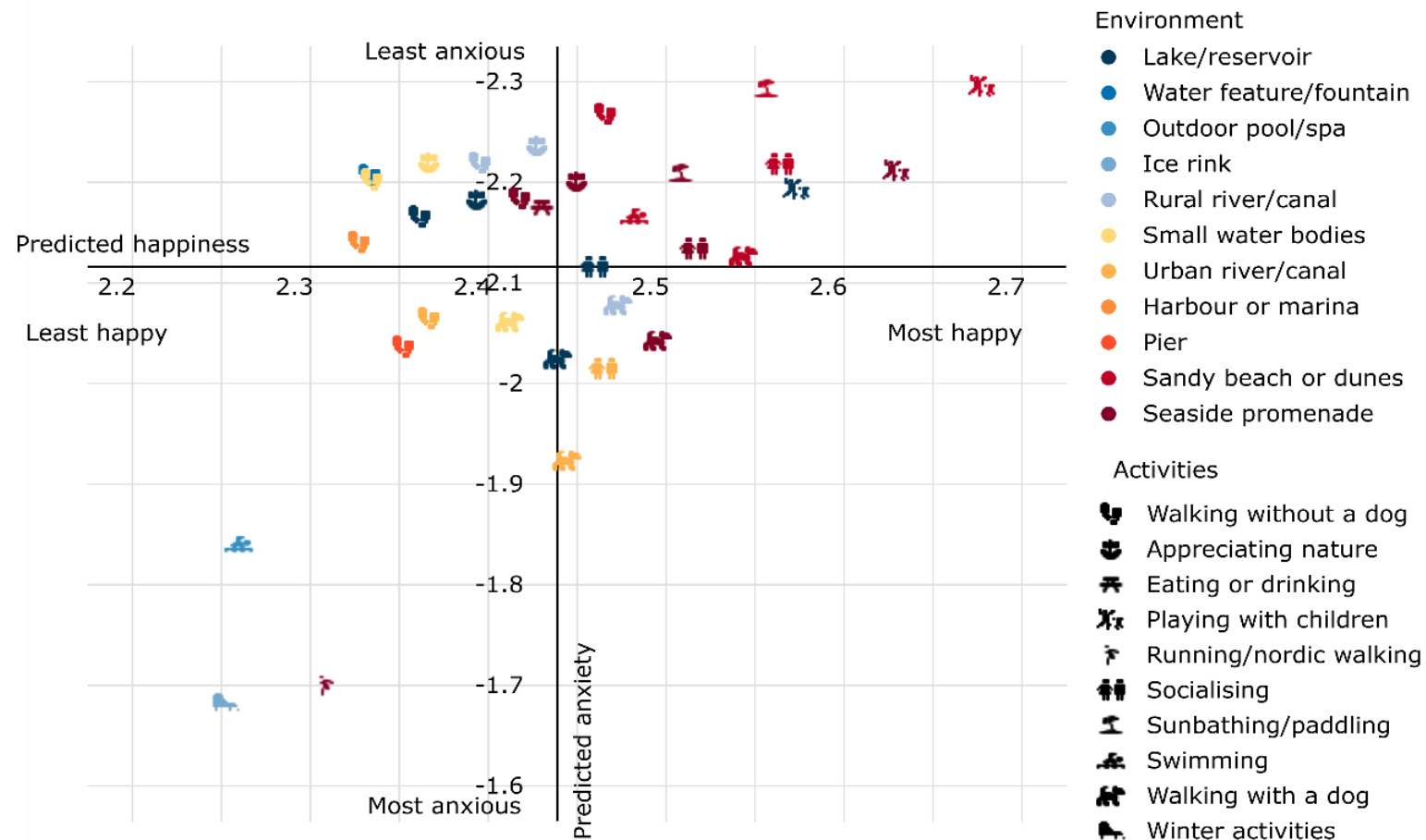
Visited coastal bluespace at least weekly in the last 4 weeks

BlueHealth International Survey



Bluespace visit characteristics

- Coastal visits and less formal activities typically associated with the most positive outcomes

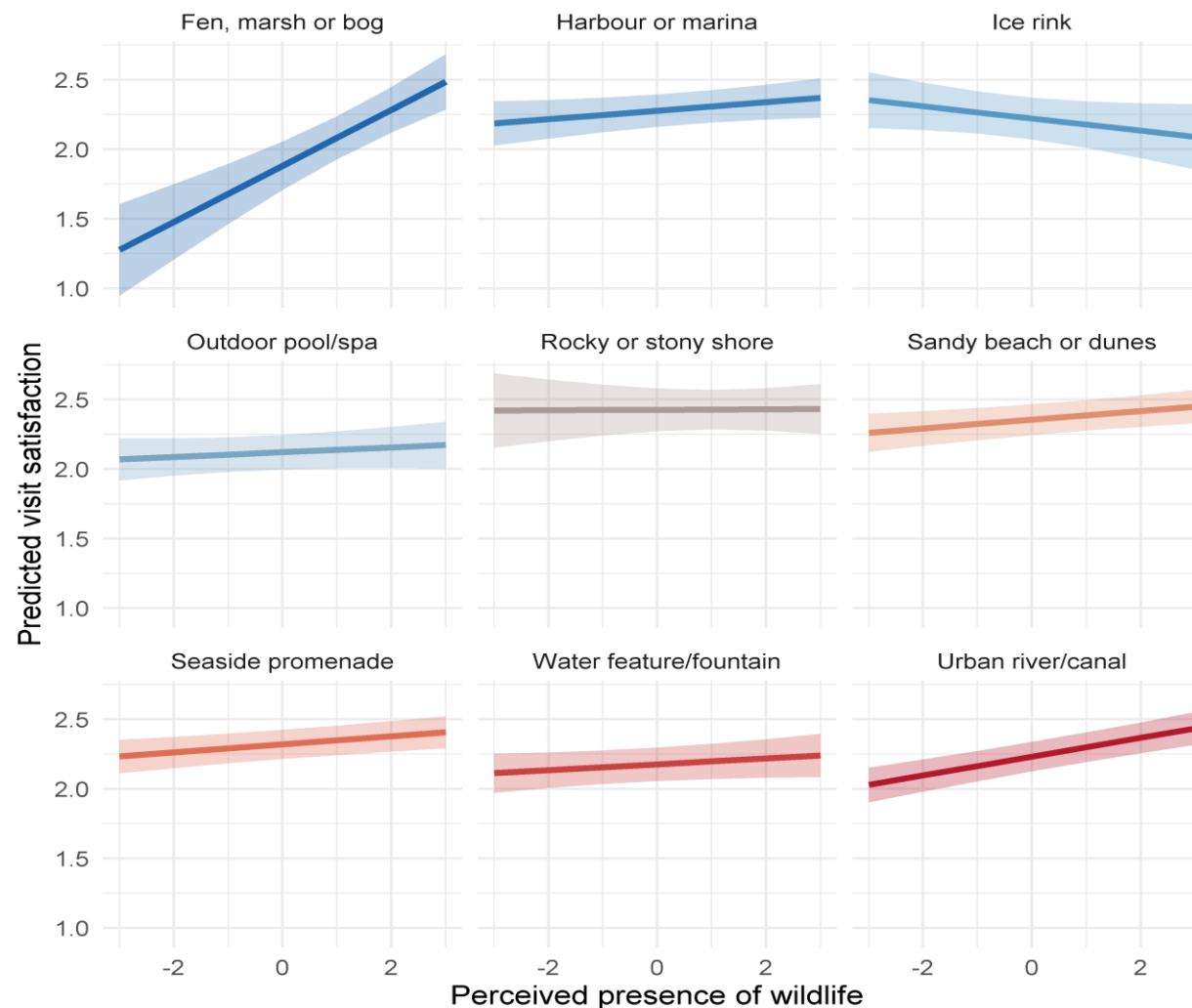


BlueHealth International Survey



Bluespace visit characteristics

- Different environmental qualities matter more/less in different environments

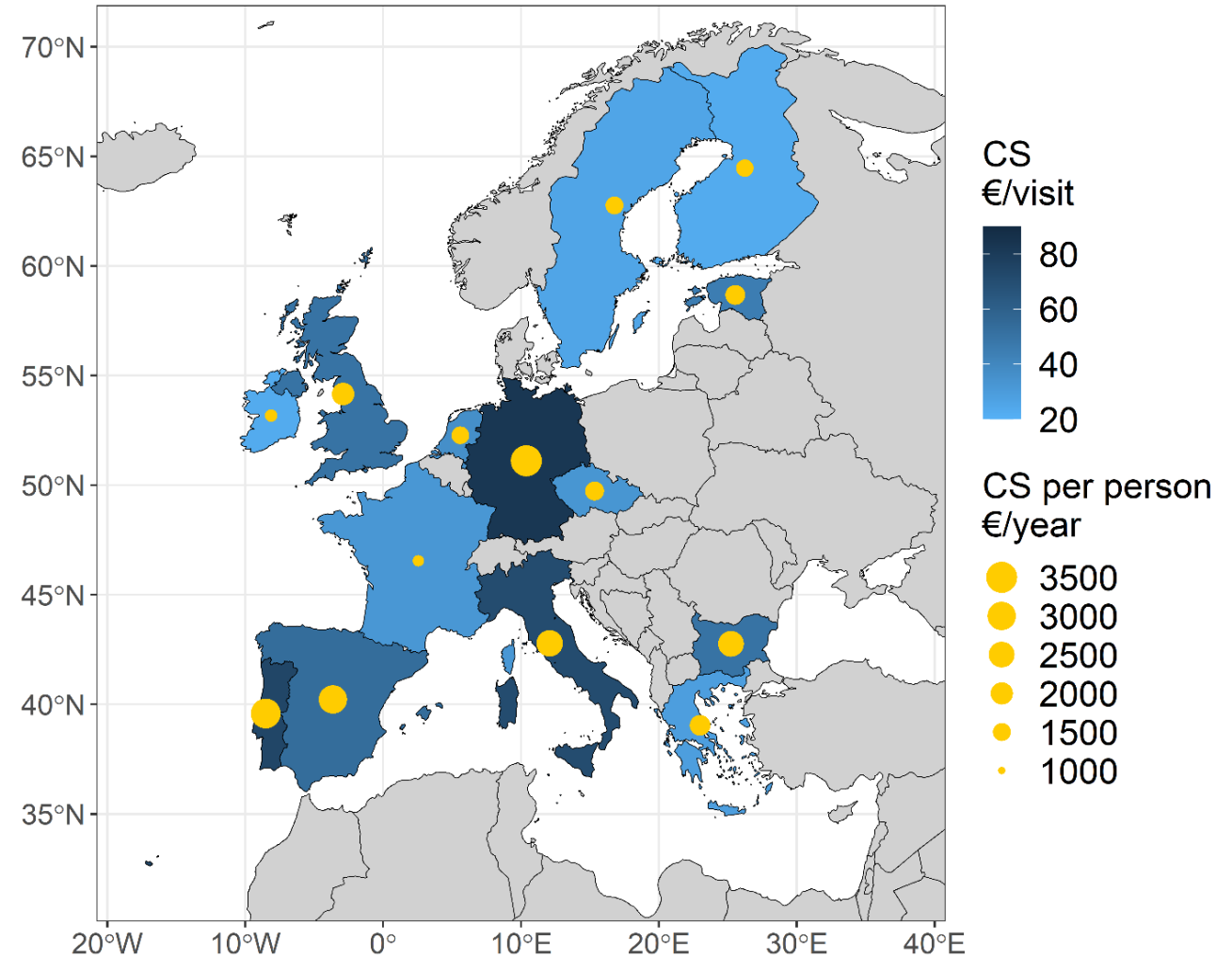


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Contingent valuation of blue space depending on water quality

- Average recreational value (travel cost) of a blue space visit across 14 EU countries is €41.32
- Total annual recreational value for the population of all 14 countries (78% of the adult population of the EU) is €630.93bn
- Per capita annual values range from €1,071 (France) to €3,527 (Germany)

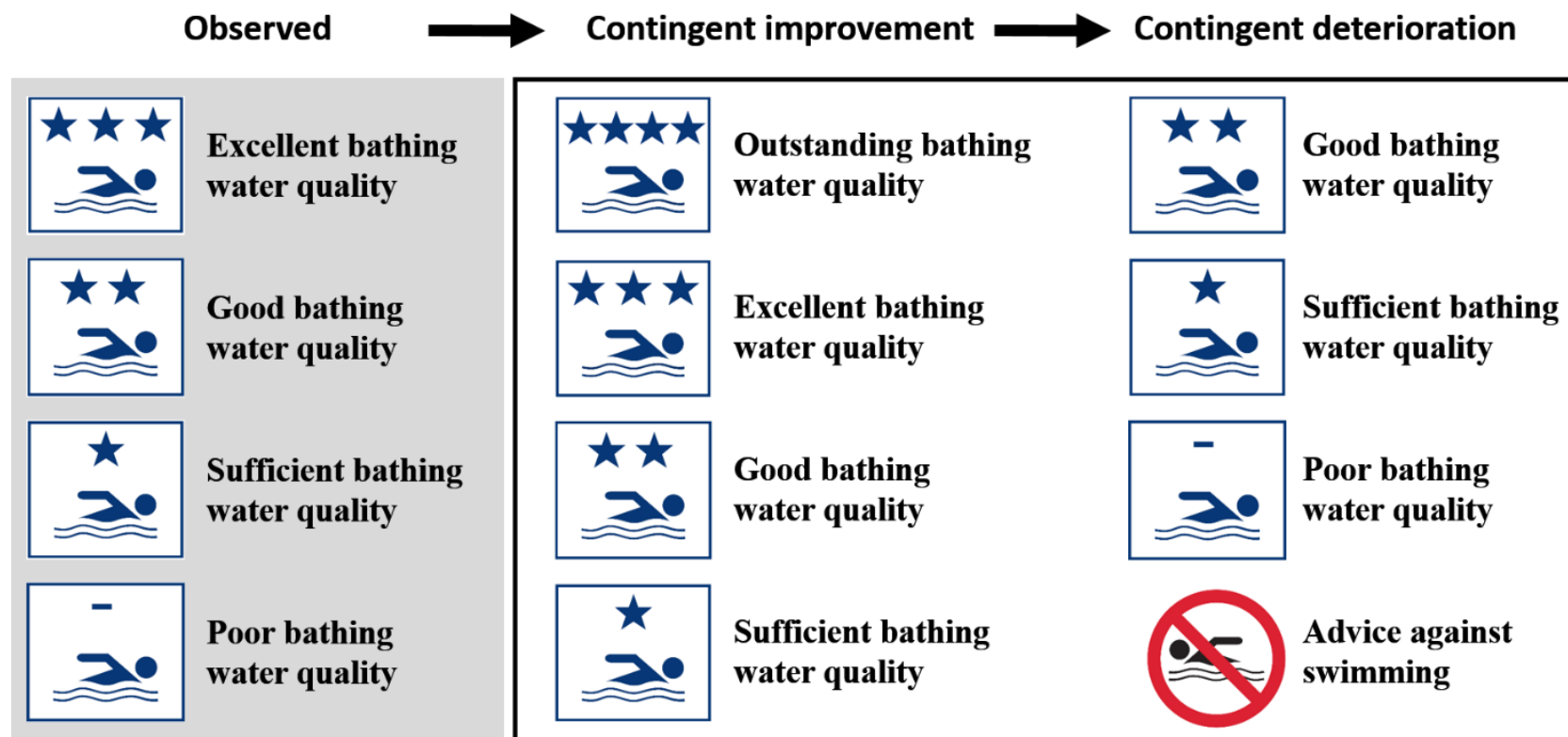


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Contingent valuation of blue space depending on water quality

- *Increases* in water quality associated with €41.89bn added value
- *Decreases* in water quality associated with €130.79bn less value





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Thank you

Examples of BlueHealth in practice



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Mireia Gascon
Assistant Research Professor
ISGlobal



Interventions can be physical or behavioural



Interventions in Estonia, Spain, Sweden

- Physical
 - Community interaction/co-design
 - Redesign to improve access
 - Assess physical and mental health impacts
- Behavioural
 - Assessing sociodemographic differences
 - Using virtual reality to access blue spaces



Quantifying health outcomes



Measuring changes to environments and behaviour

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- BlueHealth Toolbox for planners, architects, decision makers, communities:
 - Collaboration between BlueHealth partners
 - Evaluate and monitor blue space use
 - Make assessments pre/post intervention
 - Inform blue infrastructure projects
 - Provide robust, transparent, repeatable evidence



www.bluehealth2020.eu/toolbox

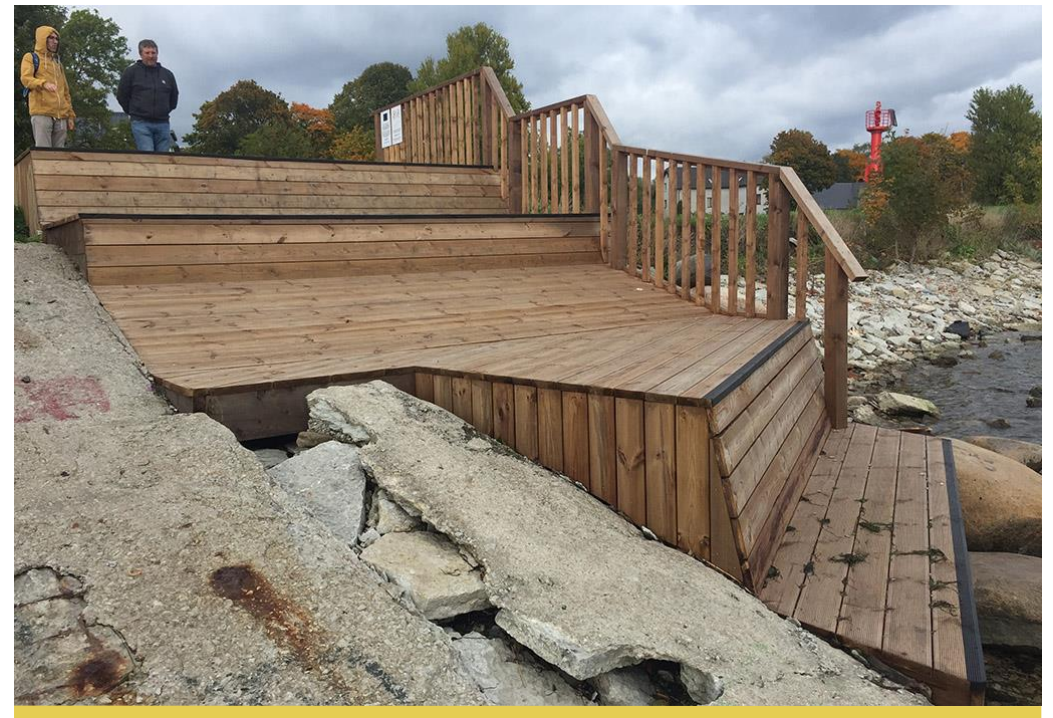
Improved access to canal and coast in Estonia



Social & structural interventions

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- Two small-scale interventions in Tallinn (pictured) and Tartu, Estonia
 - Improving access to water, safety, spaces to sit/socialise
 - Making before and after observations
- Public and stakeholder participation
- Increased use of the areas, especially Tallinn as the larger site had more impact
- Increased use of the water
- More use by females of all ages - interviews with users showed that the site felt safer and more welcoming, especially by female users



Urban coastline intervention in Tallinn, Estonia

www.bluehealth2020.eu/projects/tallinn/

Improved access to an urban river in Spain



The Besòs River, Barcelona Metropolitan Area

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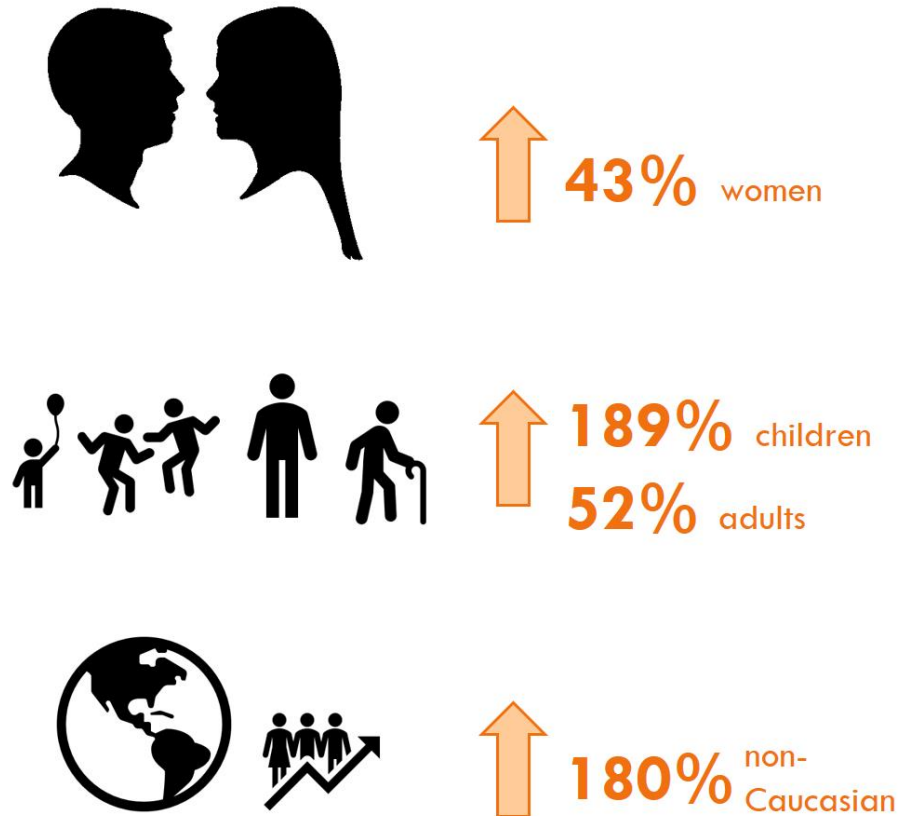
Use of the area



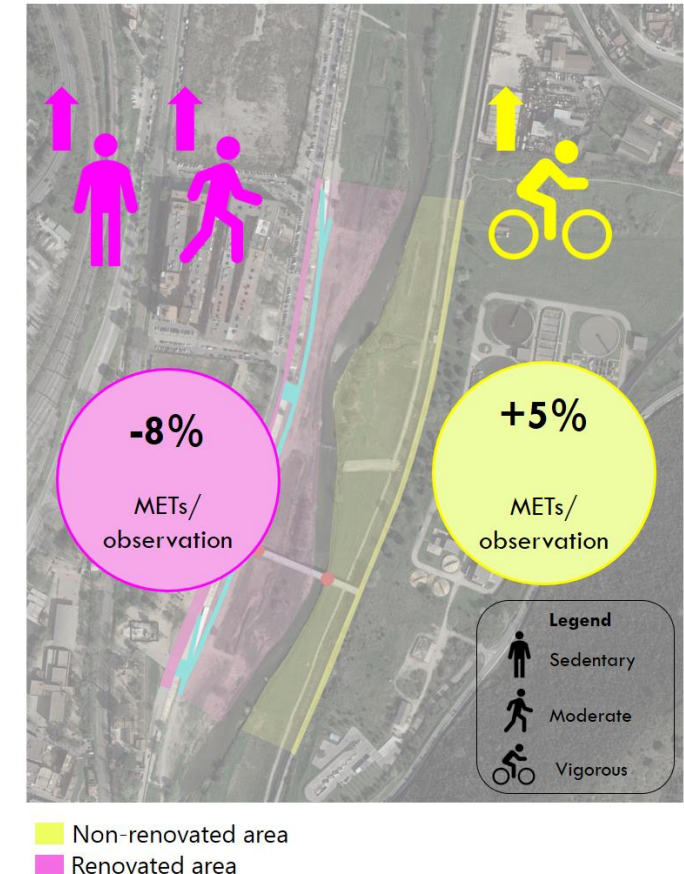
Non-renovated area
Renovated area

U = Upper part of the river
L = Lower part of the river

Sociodemographic characteristics



Physical activity levels



www.bluehealth2020.eu/projects/besos-river/

Getting office workers walking in Barcelona



Health and wellbeing benefits

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Analysis Scenario 1



Reference

Analysis Scenario 2



Reference

	Exposure (analysis scenario 1)			Exposure (analysis scenario 2)	
	Control (Ref.)	Blue IRR (95% CI)	Urban IRR (95% CI)	Urban (Ref.)	Blue IRR (95% CI)
WHO-5 Well-being	Ref.	1.32 (1.25; 1.38)*	0.99 (0.94; 1.05)	Ref.	1.34 (1.27; 1.40)*
TMD (Total mood disturbance)	Ref.	0.94 (0.92; 0.96)*	0.97 (0.95; 0.99)*	Ref.	0.97 (0.95; 0.99)*
Vitality	Ref.	1.08 (1.06; 1.11)*	1.01 (0.99; 1.04)	Ref.	1.07 (1.04; 1.09)*
Mental health	Ref.	1.08 (1.05; 1.10)*	1.02 (1.00; 1.05)	Ref.	1.05 (1.03; 1.08)*

IRR= Incidence Rate Ratio

www.bluehealth2020.eu/projects/walking-workers/

What makes children learn how to swim?



Socioeconomic differences in swimming ability, Malmö, Sweden

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- Swimming is a life-saving skill
- Swimming ability is strongly affected by socioeconomic differences
- The introduction of a community-level swimming intervention program did not decrease the socioeconomic differences in children's swimming ability in Malmö
- Social support, optimism for the future and an active lifestyle are positively associated with children's swimming skills; but compared to socioeconomic factors, health and lifestyle factors contribute very little

Sociodemographic variables	High socioeconomic status	4.11 (2.86, 5.92)
	Low School Deprivation Index	2.35 (1.74, 3.18)
Health- and behaviour-related mediators of learning to swim	Having many activities	1.19 (1.13, 1.24)
	Spending time outdoors	1.19 (1.08, 1.30)
	Eating regularly	1.05 (0.93, 1.04)
	Sleeping well	0.98 (0.93, 1.04)
	Mental wellbeing at school	0.97 (0.88, 1.07)
	Work environment at school	1.03 (0.99, 1.08)
	Social relations at school	0.93 (0.86, 1.01)
	Social relations at home and during free time	1.10 (1.00, 1.20)
	Positivity about future	1.22 (1.05, 1.42)



www.bluehealth2020.eu/projects/swimming-sweden/

Virtual blue and green space



Bringing nature to care homes in Sweden

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- Testing bespoke environments
- Older adults as a target for Virtual Nature (VR)
 - Often: Aging = disconnection from nature
 - Nature is valued by older people
 - Nature contact is beneficial for older people
- Creating an interactive VR island
 - Real-time VR developed with different 3D modelling techniques and VR programming



www.bluehealth2020.eu/projects/virtual-environments/

Virtual blue and green space



Conclusions

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- VR may provide diversification to every-day routines in the elderly care settings
- VR helps to mitigate boredom and increase the quality of life in the elderly
- VR offers an alternative way to experience outdoor surroundings for individuals with reduced mobility





Thank you

BlueHealth governance and future policy



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Susanne Wuijts
Senior Researcher and Policy Advisor
National Institute for Public Health
and the Environment (RIVM)



Why assess risks and benefits of blue spaces?



Decision Support Tool (DST)

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- Improve public health, wellbeing and the environment
- DST to inform planning, designing and management of blue spaces
- Potential users are planners, authorities, engineers, policy makers, businesses, the public



www.bluehealth2020.eu/DST

Informing local and inter/national decisions



Emphasising the benefits of intersectoral collaboration

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- Future scenarios: long-term planning
 - Cases for 5 European cities with planners, architects, environment and healthcare experts
 - To inform decision makers how to design, manage and protect blue space
 - Considering risks from flooding, increased heat, social inequalities and more



www.bluehealth2020.eu/scenarios

Governance conditions for blue space



Insights from BlueHealth interventions

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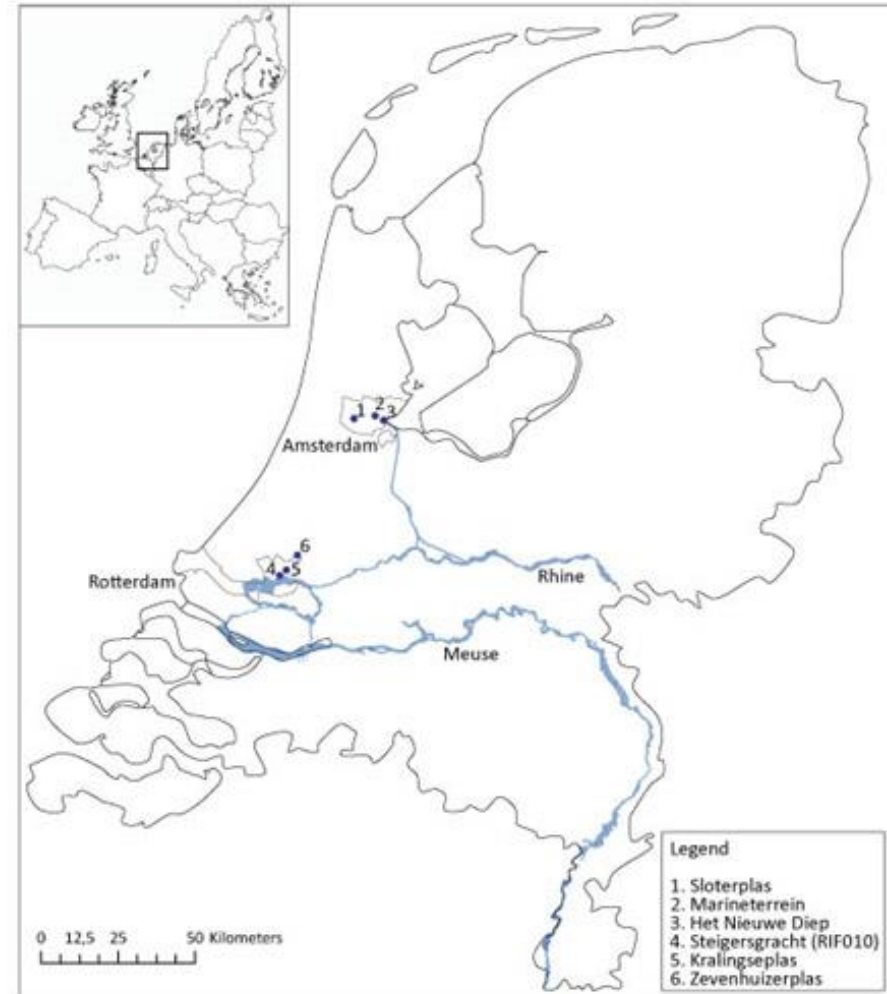
- Currently limited empirical studies on water quality governance, little focus on realisation of changes
- Carried out qualitative analysis of governance conditions for Amsterdam, Rotterdam and Plymouth (7 cases)
- Documented analysis and interviews, reflecting on the results with an interdisciplinary and intersectoral expert panel

Assessing urban bathing water sites



Amsterdam and Rotterdam, NL, case studies 1-6

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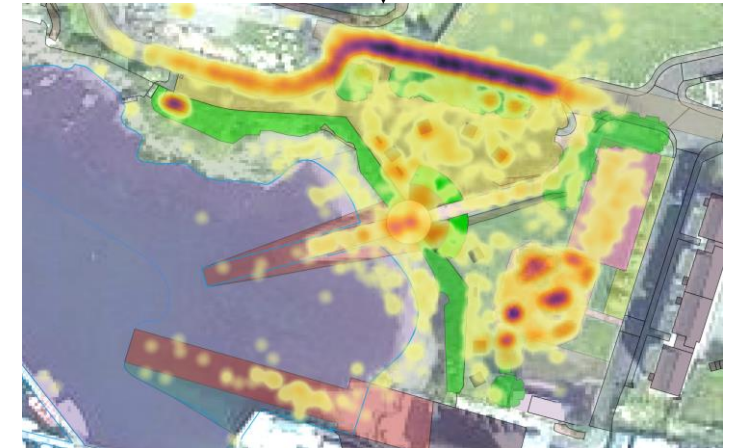
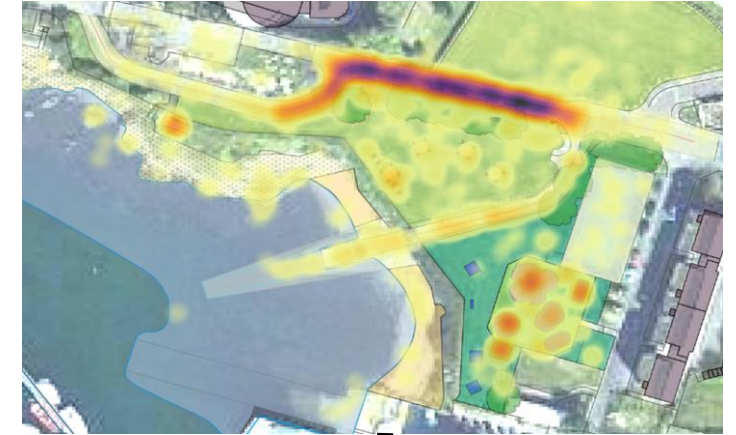
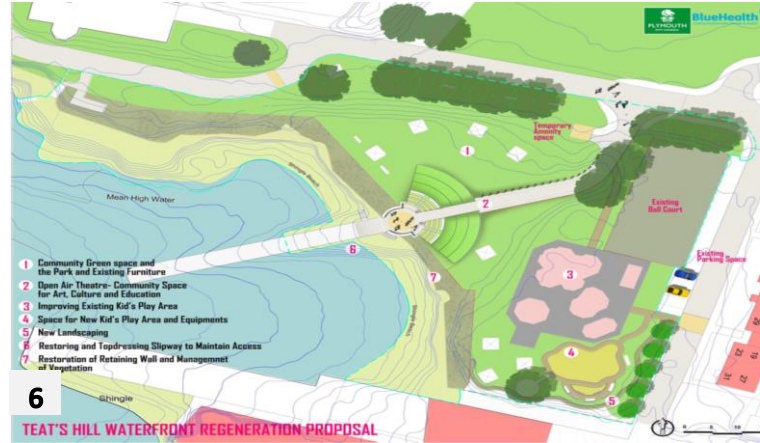


Teats Hill, Plymouth, UK



Case study 7

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Governance of urban blue spaces



For effective realisation of urban water quality

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- Need to account for:
 - Complex relationships between urban water and governance
 - Stage of a policy process
 - Using co-benefits
- Regulatory framework (EU) sufficient but urban issues require further guidance

Outcomes for policy makers



Governance of urban blue spaces

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- Shared vision, incentives and administrative support, and communication
- Healthy design, evidence based decisions
- Stakeholder engagement at all stages and beyond usual networks
- Allocation of roles, guiding framework
- Resources for management and maintenance



Thank you

We now invite questions to speakers

Closing remarks



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Sigi Gruber
Head of Unit, Directorate-General for
Research and Innovation
C4 – Healthy Oceans and Seas
European Commission



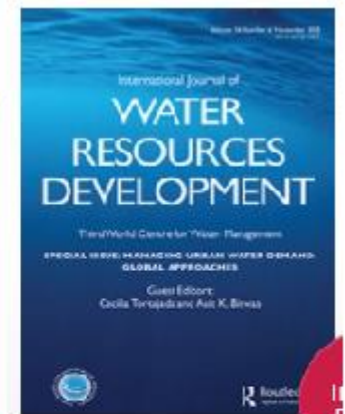
Some recent academic publications



Read more: www.bluehealth2020.eu/publications

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- Experiences of nature: mental health disorders
- Delivering virtual nature to improve mood
- Blue space, health and wellbeing: A narrative overview synthesis of potential benefits
- Urban nature and physical activity
- Health effects of walks in an urban blue space
- Safe urban bathing water
- Urban blue acupuncture: A protocol
- Residential distance and recreational visits



scientific reports

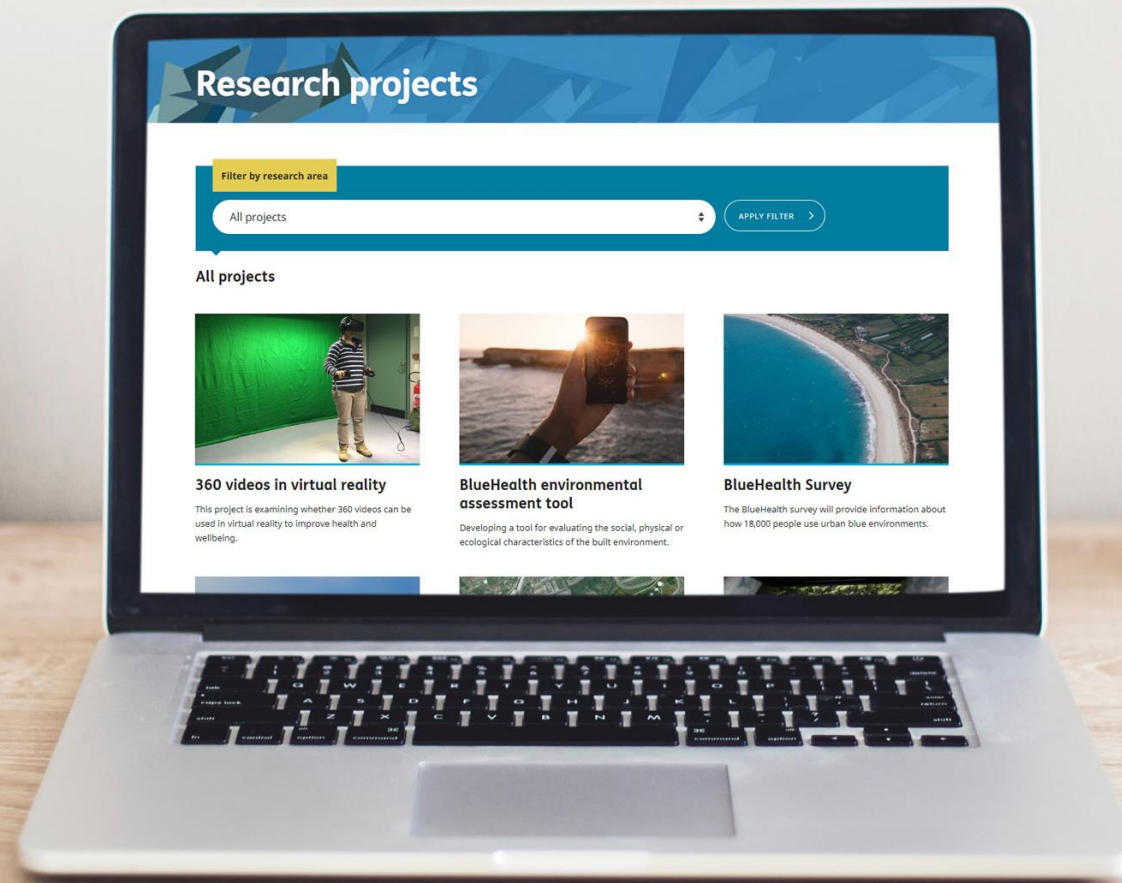


sustainability

More information about our research



www.bluehealth2020.eu/research



New resource ready for download



www.bluehealth2020.eu/resources/bluebenefits/

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A photograph of a young boy playing in a city fountain. He is shirtless and wearing dark shorts, splashing water. In the background, there are city buildings and other people. A semi-transparent blue rectangle is overlaid on the left side of the image, containing white text.

**Using urban
blue spaces to
benefit health
and wellbeing**

BlueHealth

Linking environment, climate & health



Thank you

Find out more at www.bluehealth2020.eu

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& innovation programme, grant agreement No 666773

