HOW CAN DATA HELP US TO UNDERSTAND AND ADDRESS COMPLEX PROBLEMS?

A single policy intervention can have hundreds of impacts – large and small, intended and unintended, positive and negative. Research supported by LSE's Data Science Institute with Dr Alexandra Gomes and her team, in partnership with the Ordnance Survey (OS) and NHS England, highlights the importance of understanding the complexity of data-driven systems behind health and wellbeing interventions.

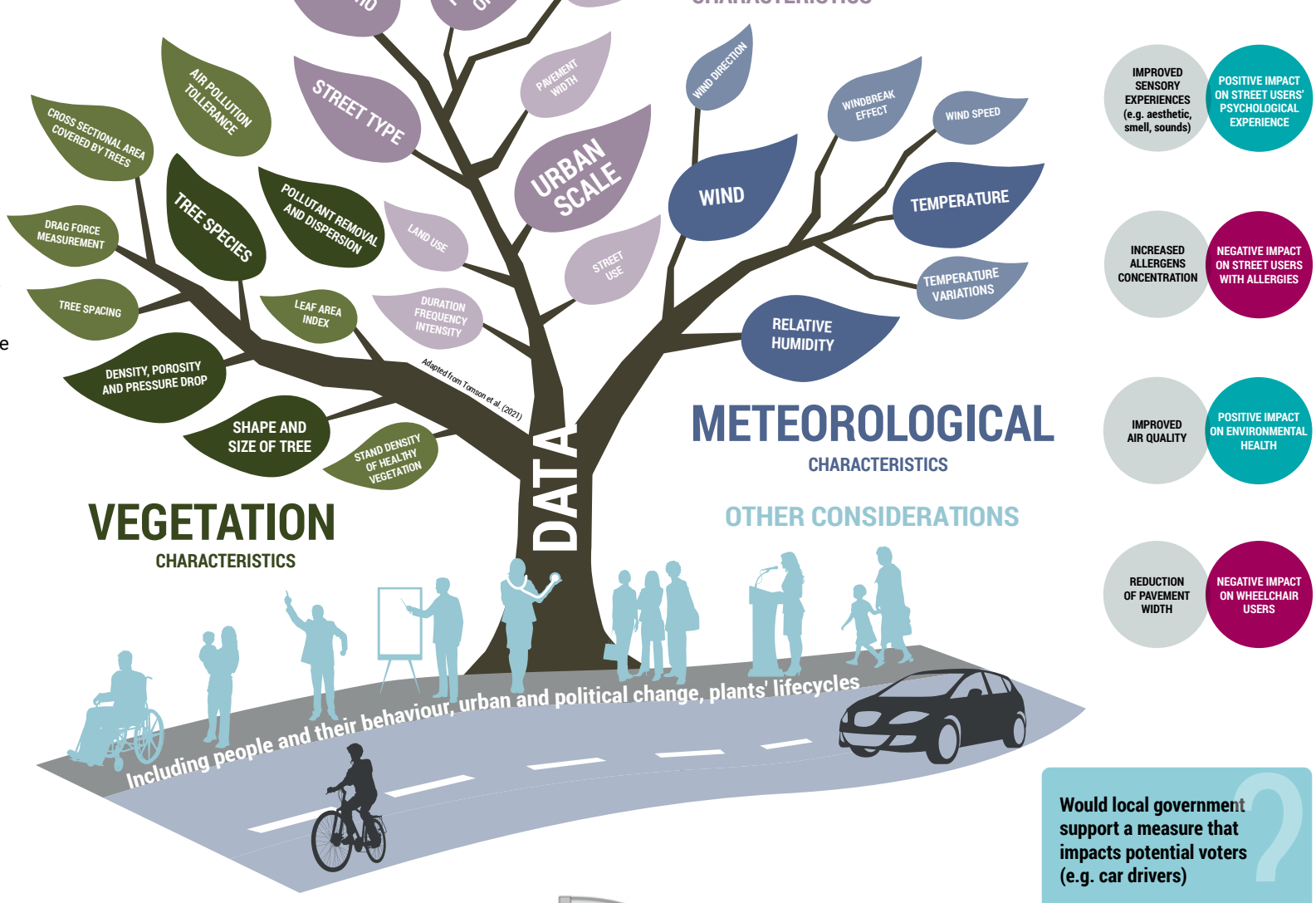
Understanding the complexity of the problem and having the right variety of data to map and visualise these interactions and trade-offs is crucial in supporting policymakers. It enables them to make informed decisions about interventions for today's increasingly complex challenges.

PLANTING A TREE

To highlight the complexity of analysing a single intervention, this display explores how planting a tree in a roadside pavement reveals some of the diverse and interconnected data underpinning the exploration of the system's risks and benefits.

Air pollution is a global environmental health risk, and interventions to tackle it are still insufficient. Passive interventions, like planting vegetation and creating green spaces, can reduce concentrations of air-borne pollutants, but there is still limited guidance on how best to use them for air quality control. There is also limited data-driven evidence of the real impact of such interventions, which can go beyond just air quality.

How can we measure the impact of a tree? It might improve environmental health, yet also reduce mobility (e.g. wheelchair users)

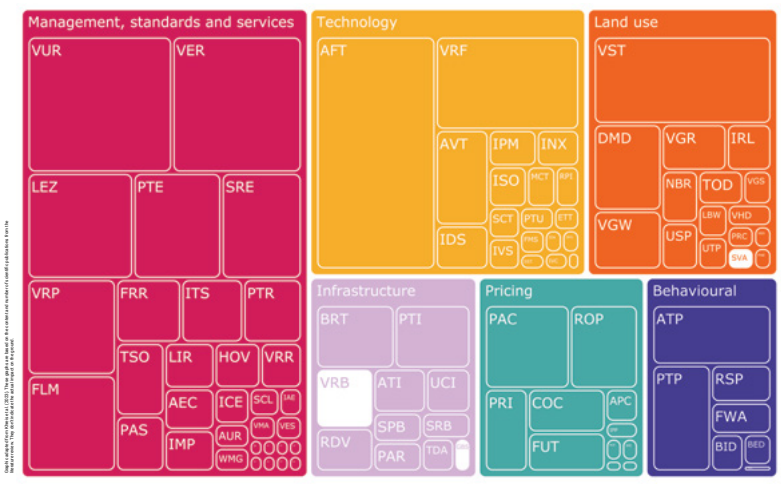


When we increase pavement width, who are we constraining? Which other modes of transport might be affected?

- INCREASED SHADE AND COMFORT → POSITIVE IMPACT ON STREET USERS
- INCREASED PAVEMENT WIDTH → NEGATIVE IMPACT ON CAR SPACE FOR DRIVERS
- IMPROVED SENSORY EXPERIENCES (e.g. aesthetic, smell, sounds) → POSITIVE IMPACT ON STREET USERS' PSYCHOLOGICAL EXPERIENCE
- INCREASED ALLERGENS CONCENTRATION → NEGATIVE IMPACT ON STREET USERS WITH ALLERGIES
- IMPROVED AIR QUALITY → POSITIVE IMPACT ON ENVIRONMENTAL HEALTH
- REDUCTION OF PAVEMENT WIDTH → NEGATIVE IMPACT ON WHEELCHAIR USERS

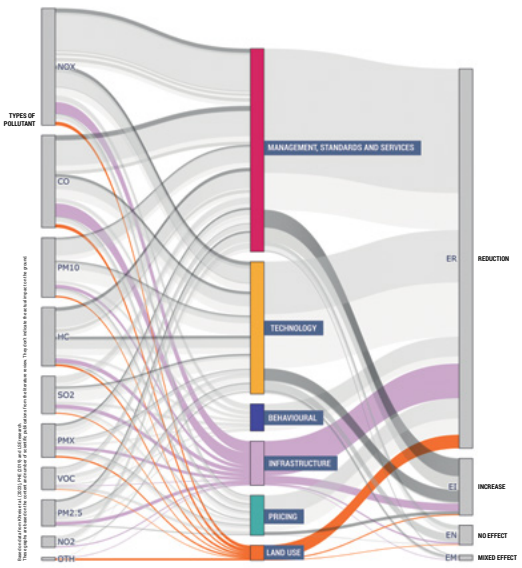
Would local government support a measure that impacts potential voters (e.g. car drivers)

A COMPLEX PICTURE



This diagram illustrates the complexity of air pollution interventions, showcasing the diverse categories of policy measures designed to reduce air pollution, as identified through academic research and a literature review. Planting or removing vegetation can fall into at least three interventions within two categories in this classification:

(Within infrastructure)
Vegetative roadside barrier, surface, or roof (VRB);
Greenspace or bluespace (GBS);
(Within land use)
Street ventilation or open space creation (SVA).



This graph explores the complex relationship between air particles and the impact—whether positive, negative, neutral, or mixed—of the various categories of policy. Imagine the complex system around every intervention in this visualisation and you start to see the scale of the challenge for policymakers.

SCAN TO HEAR MORE FROM ALEXANDRA GOMES ABOUT THE RESEARCH

Project funded by the OS under the Public Geospatial agreement.