TRUUD

Tackling **R**oot causes **U**pstream of
Unhealthy **U**rban **D**evelopment

Strategic planning for healthy city regions: Beyond Covid-19

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University Consortium

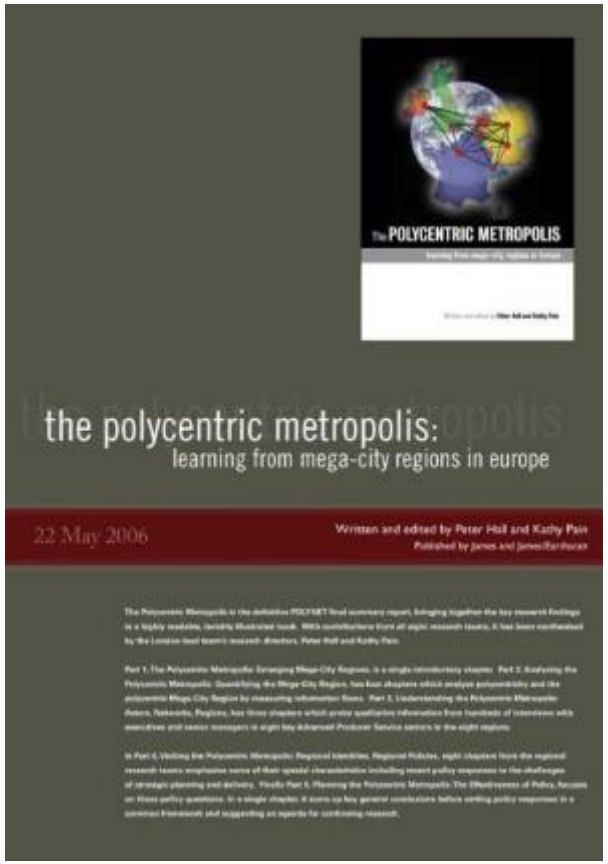
Local Authority Partners

Research Funders

Professional Membership Partners

Context – C21st urban demographic

- Research by Hall and Pain (2006, 2008) on the emergence of **functionally networked** ‘mega-city regions’ **interconnected by dense travel flows** in the US, China, Europe etc. .
- Research and policy have emphasised the **positive spillovers** arising from intense flows of labour, knowledge and capital, while potential **negative spillovers** have lacked attention.



Travel flows – Spillover effects

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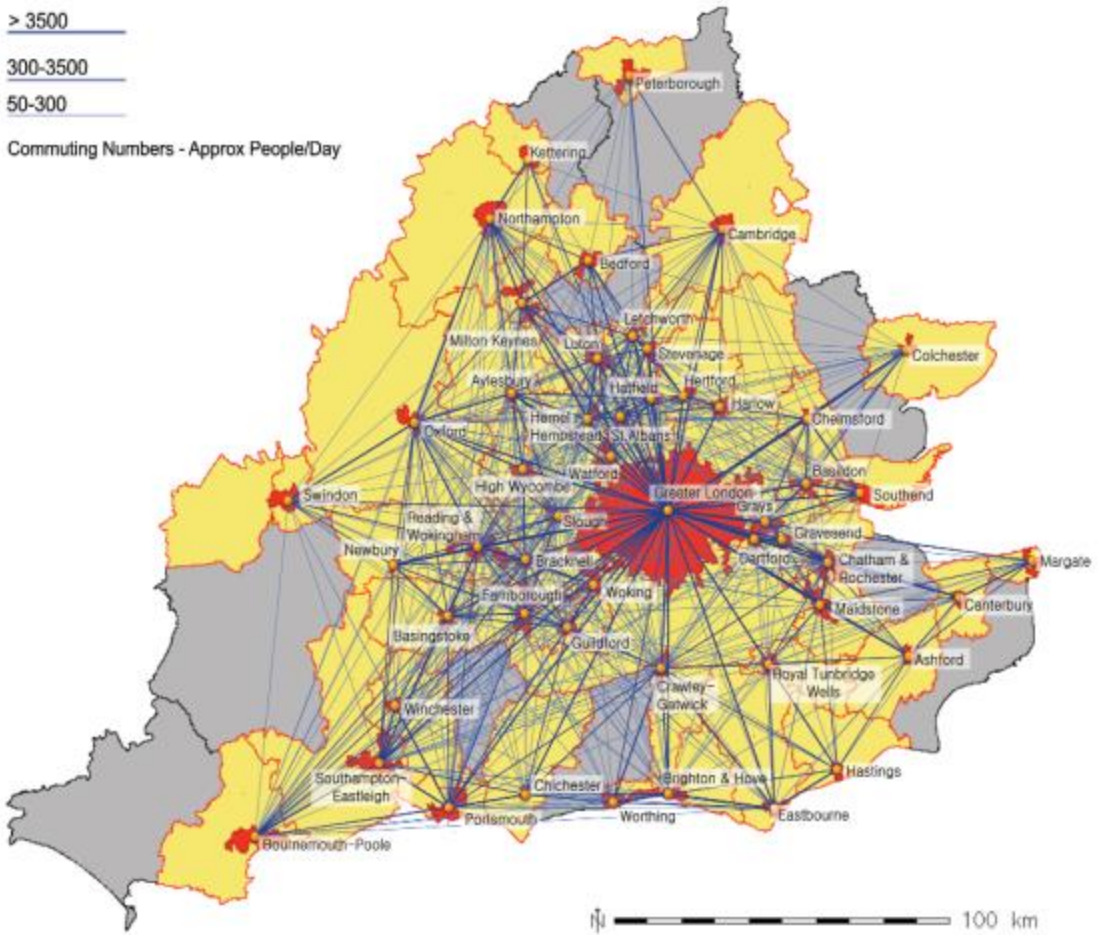
Example:

European North-West Europe Regional Development Fund research - Southern England



- Strong **radial ‘hub and spoke’ flows** on key corridors (rail, motorway) to and from London.
- **Cross flows** – sign of **positive economic** spillovers.
- **BUT uneven development spatially** – densely networked cross flows **NW, W, SW of London**.
- **Negative environmental** spillover effects.
- The Randstad, Netherlands – “If all cities in the region were equally well connected to each other in terms of commuter flows, it would be… ***“a clear recipe for traffic chaos and environmental degradation”*** (van der Werff et al, 2005, p.19).

Pandemic – Negative spillover

- **Wuhan** - The largest, **most economically vibrant city in central China** and the leading agglomeration in a city region with the designated role in China's central government planning system, of promoting inland development (CSC, 2016; NDRC, 2016).

- **State investment in an efficient regional inter-city transportation network** to promote positive spillovers through human travel flows, has been a central plank in policies to develop the city region economically and contribute to coastal-inland levelling up.

- **68,135 Covid-19 cases** reported in the Wuhan city-region **to May 2020**.

- Represented **81% of China's total infections** nationally, yet the region has just **4.23% of the national population** and occupies **only 1.94% of the national land mass** (NHC, 2020).

➢ **Looking into mobility in the Covid-19 'eye of the storm'**: Simulating virus spread and urban resilience in the Wuhan city region travel flow network, 2022, *Cities:* https://doi.org/10.1016/j.cities.2022.103675 Shi, S., Pain, K. and Chen, X.

Supported by the Hong Kong Research Grants Research Council.

Focus – Wuhan city region

- Analysis: investigated the **city region spatial spread of human transmitted Covid-19 viral contagion** as a spillover negative externality **transported through the travel flow network.**

- Focus: the '**spontaneous' structural responses** of a city region transport/travel human flow network to a contagious shock **as opposed to individual pathological characteristics** and **excluding Covid-19 state institutional interventions.**

- Time period: **1st January to 23rd January 2020** when Wuhan was locked down and other cities in the region followed suit.

- Data: **Baidu human mobility big data platform daily travel data** (qianxi.baidu.com) included inter-city human flow direction, scale and intra-city human flows (hourly time granularity, full coverage of prefecture cities, origin and destination city, city migration index, intra-city travel intensity proportionate to local population).

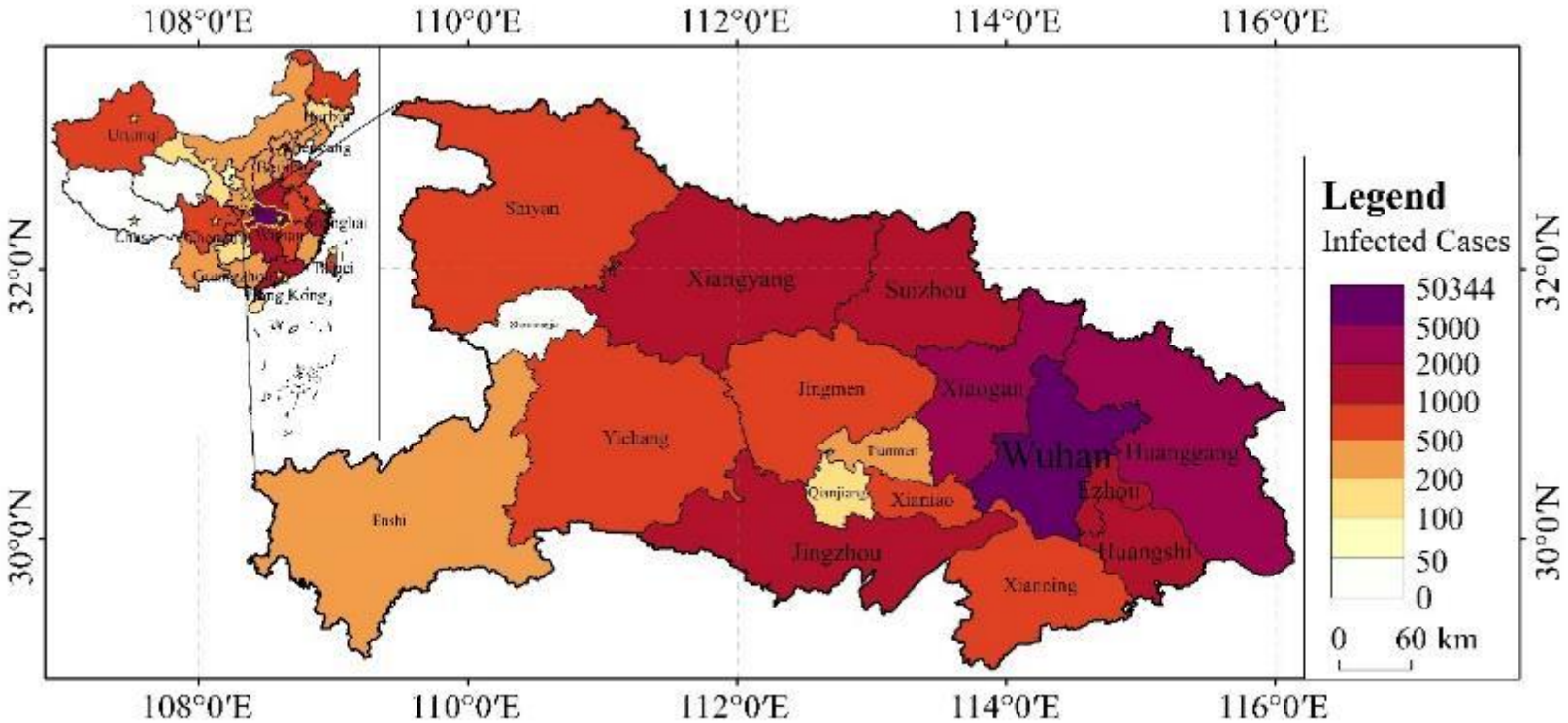
Wuhan Covid-19 learning – 1

- In conventional city region network spillover studies, **major cities** are prioritised as the source of positive spatial spillovers which **allow other regional cities to 'borrow size'** and technological advantages (Meijers et al., 2016).

- The case of Covid-19 demonstrates that the primacy of Wuhan in the human travel flow network gives it **region-wide influence in viral spatial spread and risk exposure**.

- If the source of contagion were external to the region in a future pandemic, as the **most internationally connected city in the region**, Wuhan would be the agglomeration **most exposed to infection** which it would then rapidly spread to other regional cities.

- And the city region **spatial spread of health services capacity and specialisms** is **heterogeneous**.



The Spatial Distribution of Covid-19 Infected Cases in the Wuhan City Region (source: NHC).

Wuhan in Covid-19 learning – 2

- **Regional cities** are **exposed to variable, spatially uneven contagion risk** in the event of an unregulated sudden viral infection outbreak.

- Spatially unequal exposure to viral contagion is **a counter dynamic** to travel flow **positive regional spillovers and levelling-up.**

- **Travel network intermediary 'second order' cities play a dominant role in viral spatial expansion** negative spillover effects.

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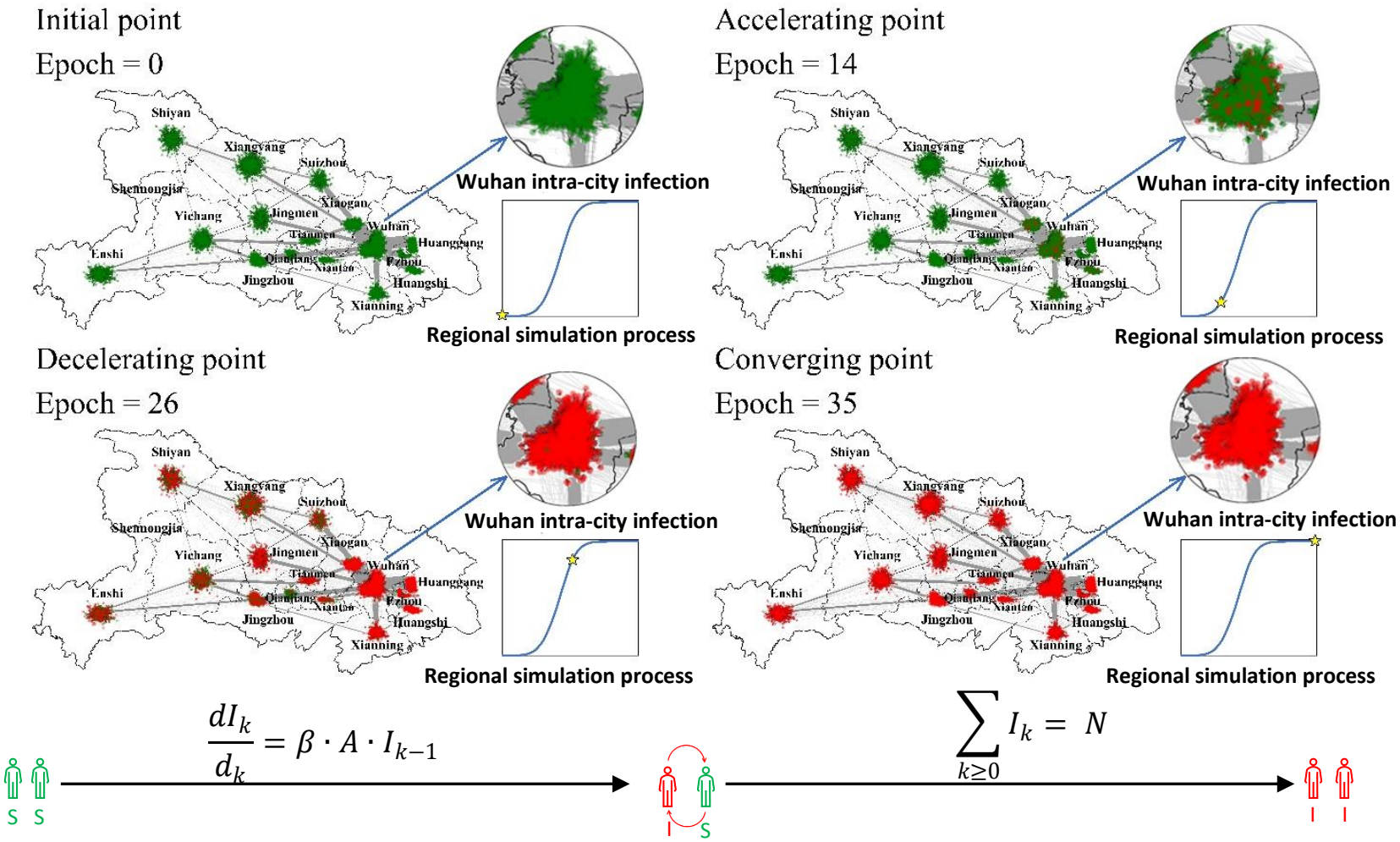
- **Interlock the regional travel flow network** and **can speed up inter-urban contagion** exponentially once a virus reaches every city in the network.



The Dynamic Process of the Covid-19 Infection in the Wuhan Regional Travel Flow Network (note: the epoch reflects the number of iterative steps needed to reach the infection status in the Wuhan city region; transmission is occurring within and across cities; the initial infected node is located in Wuhan; accelerating and decelerating points are determined by the width of the fitted Gaussian function).

Wuhan learning – Conclusion

- **Mobility policy vigilance** is required to mitigate future viral contagion risks in city-regions characterized by balanced, well-connected human flow network structures.
- Pandemic intervention measures should be **tailored to the specific functional network positions of cities** to limit negative viral spillover effects while maintaining essential social, productivity and virtual positive city region spillovers.
- **Advanced planning for collective inter-city interventions** is required for coordinated agile time-sensitive strategic interventions to contain city region network diseconomies.
- Further research is needed to inform the construction of **interactive human flow data platforms** facilitating **in-time city region information sharing** and **coordinated rapid intervention responses** to future contagious viral outbreaks.

BUT holistic health matters…

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- **Life expectancy is not the same as *healthy* life expectancy** – increasing global urban population suffering from chronic (non-communicable) diseases (NCDs) associated with socio-economic inequality and co-morbidities with longevity.

- The focus of a 5 (extended to 6) years **TRUUD**: ***T****ackling* ***R****oot causes upstream of* ***U****nhealthy* ***U****rban* ***D****evelopment* **consortium project** funded by UKPRP Prevention Partnership, led by University of Bristol Medical School.

- Why is this important? **'Hidden' human suffering,** a **cost to productivity,** a **cost to government purses** in health services provision and treatment costs.

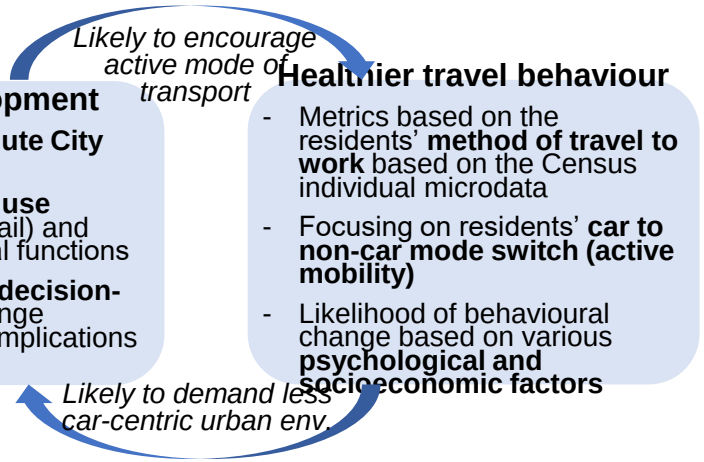
- Significantly, the ***causes* of NCDs are associated with the urban environment** and are outside the remit of health services.

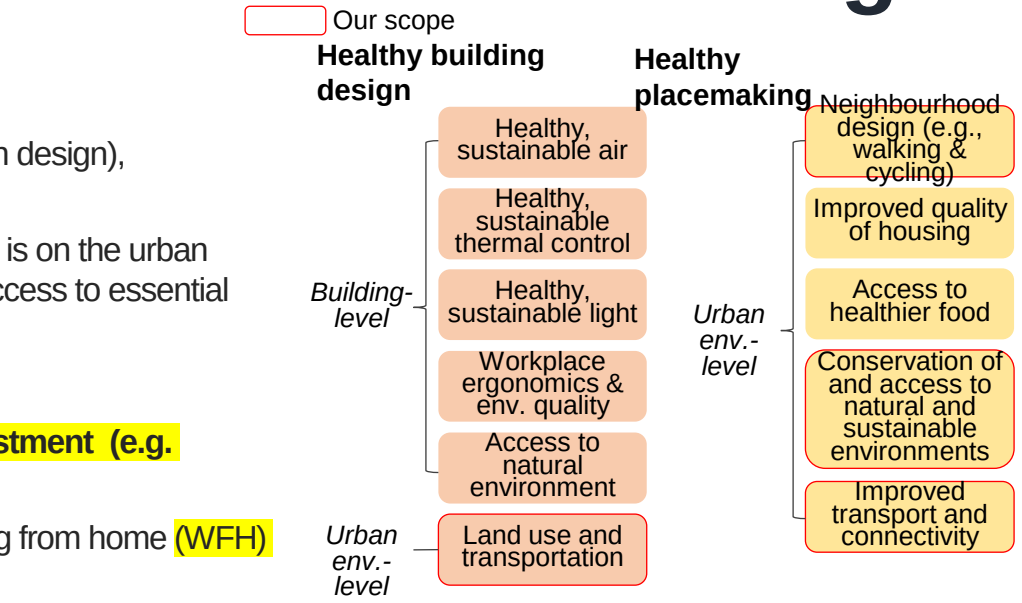
- **NCDs are unevenly distributed spatially,** therefore health relevant data are needed to inform strategic planning and development decision-making.

UKPRP PHASE UoReading agent-based modelling

Heeseo Rain Kwon

- **Healthier urban development/planning can include many topics:**
  - Various disciplinary approaches: often public health + design-oriented (e.g., architecture, urban design), engineering-oriented, policy-oriented (e.g. urban planning, real estate…) perspectives
  - Among the many topics related to healthy building design and healthy placemaking, our focus is on the urban environment, in particular, land use and transport (with a focus on walking and cycling), and access to essential functions including green space.
- **What we focus on for GMCA (scope):**
  - **Discipline**: **Real estate** sector practice insights into **healthier urban development and investment (e.g. around hubs) viability**
  - **Topic**: Potential **urban land use change scenarios** and the implications of increased working from home (WFH) for residents' **active mobility** (walking & cycling + bus considering multimodal transport)
  - **Health outcomes** focus: primarily obesity (measured in **BMI**), **air quality** and related outcomes (e.g., reduced risk of cardiovascular disease, cancer, diabetes; improved mental wellbeing), and **spatial analysis of active mobility-related health inequality** connected to the **socioeconomic divide of ability to WFH**
  - **Agent-based model**: test and experiment with the **feedback loop** (i.e., virtuous/vicious cycle) between **healthier urban development and healthier travel behaviour**

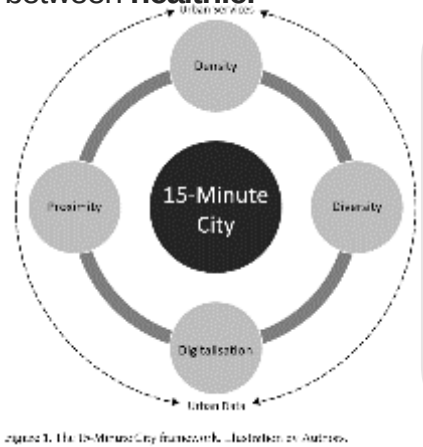




Source: Loftness et al., 2007

Source: PHE, 2017

Building on the 15min neighbourhood concept outlined in the GMCA's July 2021 report regarding Streets for All



Source: Moreno et al., 2021

- **Density:** Optimal resident population that a given area can accommodate sustainably in terms of health/well-being, urban delivery and resource consumption. Can refer to research evidence on the associations between 'good density' and improved risk adjusted returns on commercial RE investment (Pain, 2020)
- **Proximity:** Between home, work, commercial area, educational centres, health facilities, public spaces and green spaces, etc.
- **Diversity**: mixed-use especially resi, comm and entertainment; people - socio-economic, age, ethnicity etc.
- **Digitalisation**: digital tools and solutions for enhancing inclusivity, resident participation, urban service delivery, bike sharing…

UoReading TRUUD intervention

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Builds on previous city region *research*: Focus urban real estate.

- The world's most valuable international financial asset – impacts **economic growth** positively, **climate change** negatively AND **societal health/wellbeing.**
- Institutional and private investor concern for sustainable development makes real estate **evidence and reporting** on environmental and social impact **a commercial imperative**.
- BUT **very little quantitative / qualitative evidence of health considerations**.

Post-Covid-19 context opportunity: The human behavioural shift from in-person to more online interaction has created a **need for urban land repurposing**.

Real estate intervention aim: Address the gap in health evidence to inform commercial real estate investment and spatial planning.

Approach: Informed by an actor network systems mapping approach.

Objective: Test the value of TRUUD health evidence for filling the gap in two investment decision-making scenarios in selected UK city regions:

1. **Brownfield site development**
2. **Investment appraisal**

Question: How can fund managers incorporate health considerations in portfolios to align with **societal and investor demand for healthier urban space** and **willingness to pay?**

Why does this matter for China?

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Business

China picks up as stimulus measures boost services

Jack Barnett Economics Correspondent

China's economy is gathering momentum after officials drastically stepped up stimulus measures to offset a deep-seated property crisis that has constrained growth, a closely watched survey has revealed.

The Caixin services sector purchasing managers' index (PMI) for May jumped to 54, the highest reading since July last year, from 52.5 the previous month. The figure topped analysts' expectations and the 50-point threshold separating growth from contraction.

The sharp increase in services sector activity signals that a series of supportive policies incrementally launched by Beijing over the last year has started to help economic output. Last month government officials said they would allow local authorities to buy homes at a "reasonable" price in an attempt to inject demand into a property market that has been rocked by a string of de-

policy support, matching Beijing's 5 per cent annual target. The IMF urged the CCP to focus future policy on stimulating domestic demand rather than prioritising strategic industries.

Seasonal effects boosted demand for services in May, with the Labour Day holiday lifting spending on travel and recreation. The official PMI, published by the National Bureau of Statistics, also indicated that the services industry is fuelling economic activity.

China's economy expanded by 5.2 per cent last year having been hit hard by restrictions on social activity to curb the spread of coronavirus, which were eventually dropped in late 2022. Downbeat international export demand has also weighed on the Chinese economy.

Kelvin Lam, senior China economist at the consultancy Pantheon Macroeconomics, said: "We expect the rebound in the sector will eventually broaden from tourism-related consum-

- A deep-seated post-Covid-19 real estate crisis in China.
- A series of supporting policies launched by Beijing in the past year has begun to help economic output.
- The International Monetary Fund has raised China GDP growth from 4.6% to 5%.

- **Real estate and economic growth are linked.**
- **NCDs and real estate development are linked.**
- **Future NCDs, productivity and economic costs to governments are linked.**

The Times 06th June 2024

System mapping

- In depth interviews and high-level meetings with experienced real estate actors informed **schematic mapping of the system of market behaviours**.
- An operational ring depicts the interaction and relations between actors within and between **investment, user, property and development markets**.
- Facilitates understanding of dynamic actor behaviours to inform a TRUUD real estate intervention ‘Theory of Change’ (ToC) to **encourage sustainable output with health considerations contributing to NCD reduction** and aligning with health and social value, while creating sustainable returns to investors.
- TRUUD health evidence in the property market (HAUS model - next slide bottom right quadrant) **monetarises benefits of health considerations in new stock** (bottom left) quadrant.
- The intervention aims to establish the endogenous and exogenous actor networks that contribute to **shared actor perceptions of norms shaping healthier resource deployment as a strategic outcome**.

Strategic overview

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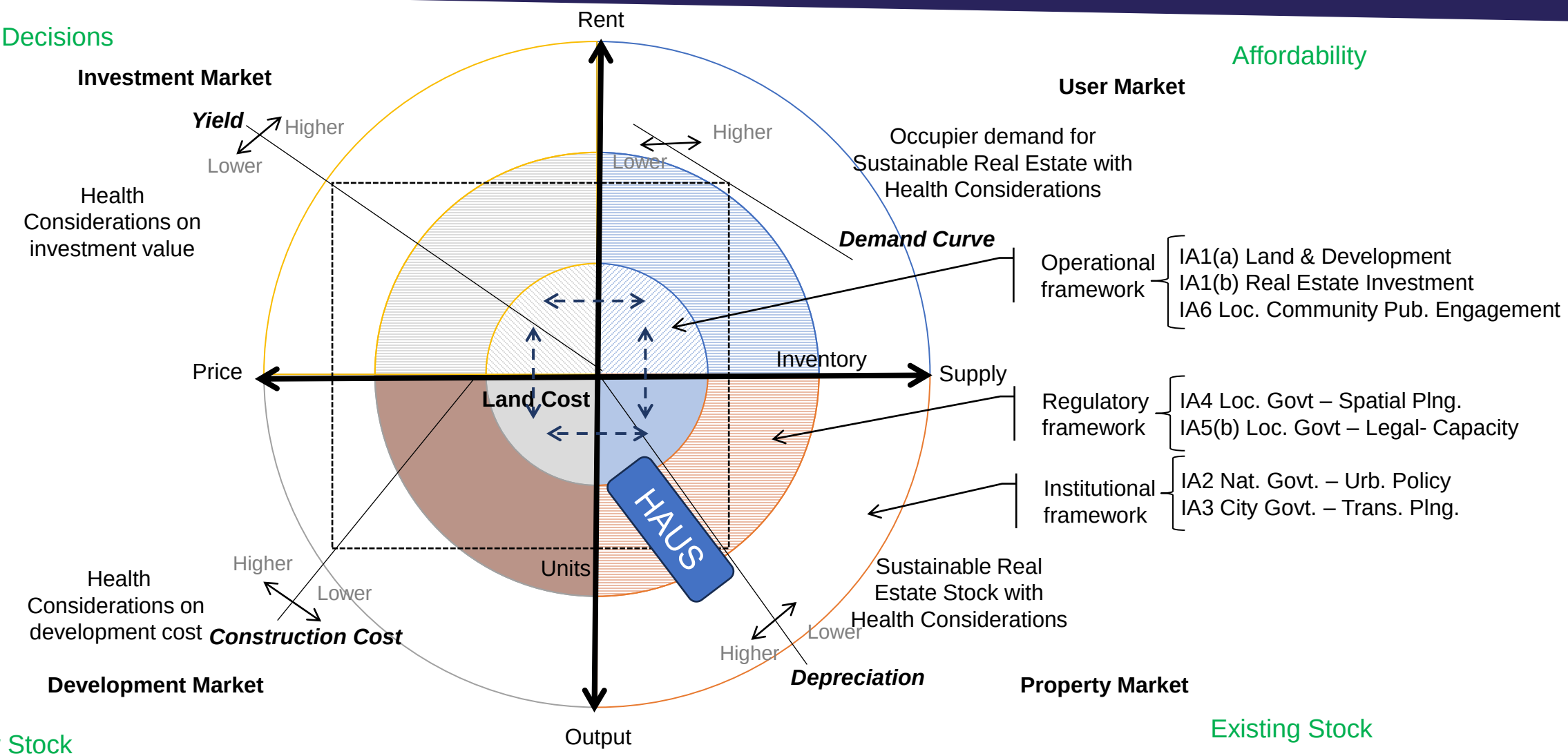

Workshop discussion questions

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1. **Data availability** to inform state and commercial investment in post-Covid-19 city region development on health and social wellbeing value?

2. **Digital data technologies** and **online platform developments** for scraping and mapping communicable and non-communicable diseases?

3. **Feasibility of intra-city** and **city region level mapping** of granular linked socio-economic and spatial health inequalities?

4. **Place-relevant potential missing variables**?

5. **Availability of disaggregated and aggregated data** to establish causal relations?

6. **Challenges for promoting smarter coordinated strategy** for government regulation, health services, spatial and real estate development planning?

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Acknowledgements

This work was supported by the UK Prevention Research Partnership, an initiative funded by UK Research and Innovation Councils, the Department of Health and Social Care (England) and the UK devolved administrations, and leading health research charities.