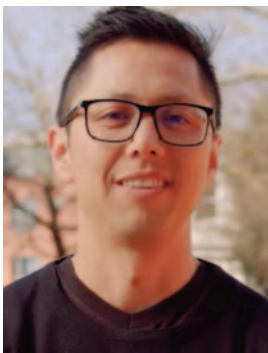


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# HARNESSING THE POWER OF GEOGRAPHIC DATA SCIENCE TO IMPROVE POLICYMAKING



Prof. Francisco Rowe is Professor in Population Data Science and the Lead of the Geographic Data Science Lab at the University of Liverpool.

*We are all living through a global data revolution where digital information is constantly and continually published at unprecedented scale across a vast array of different sources – transforming the way that*



Prof. Mark A Green is Professor of Health Geography at the University of Liverpool.

*decisions are made in a range of areas, from business to sport. What makes this data revolution even more significant for policymakers in the UK and beyond is that a vast majority of this digital information carries a*



Dr Kawtar Najib is Lecturer in Human Geography at the University of Liverpool.

*key attribute – geographical location.*

*The University of Liverpool is home to the Geographic Data Science Lab (GDSL), a world-leading research centre dedicated to supporting data-*

*based policy making through harnessing the power of geographic data science. Collectively, we span the disciplines of econometrics, spatial analysis, spatial statistics, demography, population geography and computer science.*

*In the GDSL, we are interested in making sense of how our world works, turning geographic data into actionable insights to enable policymakers at local, national, and international scales to tackle social science challenges through the application of data science and artificial intelligence. In addition to traditional data sources such as censuses and surveys, our research in the GDSL exploits and ethically repurposes digital*

footprint data from technological platforms, such as mobile phones, satellites, social media and sensors.

Here, three of our pioneering researchers from the GDSL outline how they are applying geographic data science approaches to tackle real world challenges across human mobility, health inequalities and Islamophobia.

## MONITORING HUMAN MOBILITY TO SUPPORT EFFECTIVE EMERGENCY RESPONSES:

### Professor Francisco Rowe

In the GDSL at the University of Liverpool we harness geographic data to monitor human mobility (the migration, displacement or planned relocation of people) to support emergency responses to natural disasters and humanitarian crises – estimating service demand, improving population forecasting, and informing spatial planning.

Established evidence on human mobility predominantly relies on traditional data sources but they can only offer static geographic representations of human mobility at single points in time. As such, their ability to provide timely insights into sudden or short-term changes in human mobility, including in health emergencies such as the COVID-19 pandemic, or in natural disaster events caused by flooding or wildfires, is limited and hence, their capacity to enable appropriately rapid policy responses is also limited. By using location data from digital technology, we have been able to measure and monitor human mobility flows in near real-time at small area levels over short, hourly time intervals. We have worked with national government agencies and transitional organisations to support their plans and operations.

We are currently collaborating with the Liverpool City Region Combined Authority to create a composite index of transport demand and supply to identify potential areas in need of suitable infrastructure to promote active travel. We have also generated evidence for Ajuntament de Barcelona (the City Council of Barcelona) to inform the design of 15-minute neighbourhoods.

We have assisted the UN International Organisation for Migration (IOM) to respond to the ongoing humanitarian crisis triggered by the war in Ukraine by identifying potential settlement areas of refugees across Europe, estimating the extent and key destinations of population displacement within Ukraine. We have also partnered with the United Nations in Latin America to assess the impact of the COVID-19 pandemic on population movements from large cities, directly contributing to their flagship “Inclusive and Sustainable Smart Cities” project.

## IMPROVING POPULATION HEALTH AND TACKLING HEALTH INEQUALITIES:

### Professor Mark A Green

In the GDSL, we also use geographic data to improve the design of urban green and blue spaces to maximise population health and tackle health inequalities. While there is established evidence demonstrating how urban green (parks, woodland, gardens) and blue (lakes, rivers, canals) spaces support health and wellbeing, we have less understanding of what works best and for whom. This is because while local authorities and third sector organisations often modify places such as by creating new parks or improving their quality, they often fail to evaluate what the impacts on health and wellbeing are.

As part of our ongoing £7.1m UKRI funded GroundsWell project, we are addressing this gap by embedding greater routine evaluation into urban green and blue space interventions. This includes working with NHS England to link data on access to green and blue spaces to electronic health records for 2.7m people across Cheshire and Merseyside so that any policy can be evaluated, as well as developing the infrastructure to extend this to all records across England.

We are also helping Wirral Council to plan and evaluate their new Dock Branch park in Birkenhead so that it benefits local communities within a highly deprived area. Finally, we are conducting the longer-term evaluation of the Connswater Community Greenway through a collaboration with Belfast City Council, demonstrating how it has had a positive impact on mental health and improved social cohesion. Each of these projects demonstrates the power of utilising geographic data to contextualise health records about people who live and interact with these spaces.

## UNDERSTANDING AND COMBATING ISLAMOPHOBIA:

### Dr Kawtar Najib

In the GDSL, we are also utilising geographic data science approaches to better understand and help policymakers combat forms of racism and discrimination in society. Islamophobia is a global issue that has clear local impacts on people and communities. It is therefore important to study Islamophobia at different spatial scales. Our research aims to provide expert-advice for policymakers to reduce Islamophobia as part of a push toward creating a society that strives for more anti-discrimination and recognition

for equal human dignity.

Geographers are well placed to conduct analysis of Islamophobia from the global scale to the micro-local scale. My book on ‘Spatialized Islamophobia’ details these spatial scales (global, national, urban, neighbourhood, body and mind) and, in particular, shows how a rise in the global fear of Islam and Muslims has a direct impact on the way Muslim bodies feel constrained in their everyday lives and spaces, negatively impacting on their sense of security, mobility, and daily behaviours.

Working on Islamophobia and its spatialization allows us to quantify and map Islamophobia across cities, providing rare insights for academics and policymakers. Indeed, to be able to study Islamophobia from the largest to the finest scales, we have used both quantitative statistics collected from community associations and the Metropolitan Police in London, as well as qualitative testimonials directly from victims of Islamophobia present in the databases of NGOs fighting against Islamophobia.

We have provided expert advice to the All-Party Parliamentary Group (APPG) on British Muslims, which has been included in their special report proposing a working definition of Islamophobia. Through the APPG, I was invited to the House of Commons to present my book in a panel discussion on ‘Spatialized Islamophobia’ which included a number of MPs. Our research also contributes to and supports the work of a variety of organisations including NGOs, such as Islamophobia Awareness Month (IAM), and European institutions, such as the European Network on Religion and Belief (ENORB). To learn more, visit: [www.liverpool.ac.uk/geographic-data-science](http://www.liverpool.ac.uk/geographic-data-science) ■