Institution: University of Liverpool

Unit of Assessment: UoA14 – Geography and Environmental Studies

Title of case study: Generating geographic data to inform policy, social welfare and learning for tackling health and social inequalities

Period when the underpinning research was undertaken: Oct 2012-Feb 2020

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Mark Green	Lecturer, Senior Lecturer	2015-Present
Francisco Rowe	Lecturer, Senior Lecturer	2016-Present
Gemma Catney	Lecturer, Senior Lecturer	2012-2018

Period when the claimed impact occurred: Jan 2014-Feb 2020

Is this case study continued from a case study submitted in 2014? No

1. Summary of the impact

Geographic data about people and neighbourhoods are essential for effective local and national policy decision-making. Our research generating novel insights from geographic data about healthy neighbourhoods, ethnic segregation and migration patterns has produced key national and international influence on policy, social welfare and learning that are tackling health and social inequalities. Key beneficiaries include:

- Public Health England, 175 Local and 28 Central Government users using bespoke measures of healthy environments.
- Welfare and health policy reports of the United Nations, Chief Medical Officer and Department for Communities & Local Government.
- School children learning and public debate in updating the Edexcel 'A' Level curriculum.

2. Underpinning research

Research into ethnicity (Catney), health patterns (Green) and migration flows (Rowe) is pivotal for supporting public policy priorities and decision making. Effective policy actions for tackling social and health inequalities depend on the development of a robust and transparent evidence and knowledge base. Our research leads the development of newly openly available data products and methodological frameworks that contribute to this essential evidence and knowledge base. In developing a nuanced understanding of the nature of ethnic segregation, better summarising the characteristics of local areas important for health and understanding the impact of migration on local population structures, the high level of scientific rigour has revealed novel insights in each of these areas which supports our impact activities and public engagement. The collaborative working environment characterising the Geographic Data Science Lab (a group with expertise spanning geography, demography, epidemiology, computer science, statistics and data science) enables this, providing the intellectual space and shared technical expertise to develop novel approaches to identify, better understand and ultimately respond to social issues. Specifically, projects related to the impact generated include:

- The development of the Access to Healthy Assets and Hazards (AHAH) resource, which to our knowledge, is the most comprehensive open database of small area data on health-related features of environments (e.g. distance to nearest fast food outlet, GP, green space) including a novel multi-dimensional summary statistic measuring how healthy neighbourhoods are **[3.1]** (Sept 2018).

- Generating a novel methodology for estimating the impact of internal migration on shaping local population structures in Latin America **[3.2]** (Jan 2018).
- An analysis utilising the longest time series of data (1971-2011) for consistent small areas to understand for the first time how neighbourhoods have changed in their social and demographic populations **[3.3]** (Feb 2020).
- Investigating small area inequalities in ethnic diversity and segregation for Great Britain, including the longest continual time series analysed to demonstrate how ethnic segregation is declining over time **[3.4]** (June 2015).
- Investigating how health outcomes have changed during the period of Austerity in Great Britain (2010-Present) including (i) the first study to quantify changes in food bank usage of children in England **[3.5]** (Sept 2015), and (ii) novel investigation into how trends in delayed discharges of patients in the NHS are correlated to mortality rates **[3.6]** (Oct 2017).

3. References to the research

Papers:

[3.1] Green MA, Daras K, Davies A, Barr B, Singleton A. 2018. Developing an openly accessible multi-dimensional small area index of 'Access to Healthy Assets and Hazards' for Great Britain, 2016. *Health & Place* 54: 11-19. https://doi.org/10.1016/j.healthplace.2018.08.019.

[3.2] Rodríguez-Vignoli J, **Rowe F**. 2018. How is internal migration reshaping metropolitan populations in Latin America? A new method and new evidence. *Population Studies* 72: 253-273. https://doi.org/10.1080/00324728.2017.1416155.

[3.3] Rowe F, Patias N, Arribas-Bel A. 2020. Neighbourhood change and trajectories of inequality in Britain, 1971-2011. http://uk2070.org.uk/wp-content/uploads/2020/02/07-Neighbourhood-Inequality.pdf

[3.4] Catney G. 2016. The Changing Geographies of Ethnic Diversity in England and Wales, 1991–2011. *Population, Space and Place* 22: 750-765. https://doi.org/10.1002/psp.1954

[3.5] Lambie-Mumford H, **Green MA**. 2017. Austerity, welfare reform and the rising use of food banks by children in England and Wales. *Area* 49: 273-279. https://doi.org/10.1111/area.12233

[3.6] Green MA, Dorling D, Minton J, Pickett K. 2018. Could the rise in mortality rates since 2015 be explained by changes in the number of delayed discharges of NHS patients? *Journal of Epidemiology & Community Health* 71: 1068-1071. http://dx.doi.org/10.1136/jech-2017-209403.

Grants:

[3.7] [3.1] was supported by the Economic and Social Research Council (Feb 2014 to Feb 2020). 'Retail Business Datasafe' (ES/L011840/1).

[3.8] [3.4] was undertaken as part a Leverhulme Trust Early Career Fellowship (2012-2014). 'Geographies of Ethnic and Social Segregation in England and Wales, 1991-2011' (ECF-2011-065).

4. Details of the impact

Effective policy decision making and informed public debate requires access to good quality data and measures which often do not exist. Research at the University of Liverpool has generated novel data products to improve our understanding of health and social inequalities, and has benefitted local (e.g. Local Authorities), national (e.g. Public Health England) and international (e.g. United Nations) policy makers, as well as informed the public and school children. Impact was achieved through our two pillars of research engagement:

Pillar 1: Enabling policy action through generating new data products

To enable effective policy action, governments require relevant data to underpin decision making. We have created new data products to address gaps in availability in two key areas:

(i) Supporting local and national public health intelligence in England

Dr Green's research investigating how neighbourhoods contribute to health inequalities led to the generation of the most comprehensive open source database on healthy environments – Access to Healthy Assets and Hazards (AHAH). AHAH addressed skills and data gaps among local and national governments as detailed spatial data did not exist in a form that was easy to use previously, meaning decisions were being made without suitable data to support them.

The creation of a new indicator summarising how healthy environments are was adopted by Public Health England into their online toolkit 'Public Health Profiles' in November 2017 **[5.1a]**.The system provides health-related data to all Local Authorities in England, helping to inform their policy planning and local decision making. In the 6 months following its release it was ranked as the 11th most popular indicator (out of 75) on their system. Public Health England described our contribution to their activities as "*…essential for addressing the lack of information we had on these indicators and our lack of technical skills for producing them*" and "*AHAH index has improved our product by offering local public health analysts a unique means of understanding which areas have poor environments for health."* **[5.1b]**.

AHAH recorded a total of 7432 unique views and 1071 unique downloads since their online publication including being used by 175 Local and 28 Central Government unique users **[5.2]**. Notable applications of AHAH for informing policy decisions to tackle health inequalities include: Key data for measuring spatial inequalities in air pollution by Gloucestershire Council to underpin their 'Air Quality Action Plan' **[5.3a]**; Integrated into an infographic to demonstrate the extent of poor quality environments in Tower Hamlets and the need for greater policy investment **[5.3b]**.

The dissemination of AHAH has informed public learning and participation on how environments influence health. Dr Green was invited to debate an item on how healthy high streets are on the on the BBC News Channel (12.30pm 2nd Nov 2018; BBC estimated 505k viewers). The AHAH resource has also been downloaded by 88 users from schools **[5.2]** including Shotley Community Primary School who co-designed with Dr Green (Sept to Dec 2019) projects investigating how their local area impacts health (e.g. food produced nearby and healthy eating exercises).

(ii) Informing the United Nations strategy on migration in Latin America

Dr Rowe's novel open source methodology and software for making future data predictions on how internal migration patterns change local age structures have helped planning for future service needs. Dr Rowe's research led to a commissioned report for United Nations' (UN) Population Division in Latin America **[5.4a]**. Research findings were used to inform an expert group meeting at the UN in 2017 **[5.4b]**, and the results from this commission were integrated into the Global Compact for Migration (GCM; 19 Dec 2018). GCM was the first-ever, UN global inter-governmentally negotiated agreement to approach migration in a holistic and comprehensive manner.

Pillar 2: Influencing policy and welfare decisions with novel data insights

Insights generated from geographic data research have directly benefitted UK Government health and welfare policy in three core areas:

(i) Revealing the health impacts of austerity

Dr Green's research on austerity effects have become a key evidence in policy documents due to the timeliness of the work where there is a lack of alternative data available to assess the impacts of austerity on population health. The work has been used (citations and quotes) in major reviews by Public Health England, the Chief Medical Officer and Food Standards Agency **[5.5]**, which have informed debates about changing policies about austerity due to the negative impacts on health being observed. The significance of the research has seen it covered in multiple national newspapers helping to maximise the reach to the public **[5.6]**.

(ii) Leading policy debates about ethnic segregation

BAME groups are considerably disadvantaged in the labour market partly due to their experiences of segregation in society. Dr Catney's research on inequalities in ethnic residential segregation informed the Department for Communities & Local Government's Casey Review into Opportunity & Integration (citations, quotes and reproduced figures) **[5.7a]**. The review is one of the main sources informing national policy interventions for local communities and welfare relating to segregation and integration. The same research was extensively cited as evidence on ethnic inequalities in employment within the McGregor-Smith Review of Race in the Workplace **[5.7b]**. The report was used to inform the Department for Work and Pensions response to Prime Minister David Cameron's pledge to increase ethnic minority participation in the labour market by 20% by 2020. The dissemination of Dr Catney's research has also led to invitations to submit written evidence to All-Party Parliamentary Groups **[5.7c].** These major reports and evidence committees have set out how to improve the social and economic circumstances and opportunities for some of the most vulnerable ethnic and migrant groups in the UK.

Racial prejudices, often misinformed about ethnic segregation or integration narratives, remain prevalent in the UK. Dr Catney's segregation research has also informed the development of the Edexcel A-Level Geography curriculum (influencing 12,407 students in 2019; 39% of all Geography A-level students) to help ensure future generations continue to be well informed. Reproduced figures from Catney's research provided a case study influencing how school children understand ethnic diversity and segregation **[5.8]**.

(iii) Future planning for narrowing regional economic inequalities

Dr Rowe's research on regional differences in economic performance and poverty identified long-term struggling neighbourhoods in Scotland and North England. Dr Rowe was invited in 2019 to supply evidence to the UK 2070 Commission on tackling inequalities about their work **[5.9]**. Dr Rowe's research formed a key piece of evidence for setting out neighbourhood focused economic policies in the UK2070 Ten Point Action Plan which directly feeds into UK Government strategies for achieving UN Sustainable Development Goal 10 (reduce inequalities).

5. Sources to corroborate the impact

Pillar 1: Enabling policy action through generating new data products

[5.1] Sources verifying the role of AHAH in supporting data and skills gaps within Public Health England: [a] Public Health England. 2019. Public Health Profiles: Access to Healthy Assets and Hazards [website] https://fingertips.phe.org.uk/profile/wider-determinants/data#page/3/gid/1938133043/pat/6/par/E12000002/ati/102/are/E08000012/iid/93074/age/1/sex/4/cid/4/page-options/cin-ci-4_map-ao-4_ovw-do-0_car-do-0. Verifies inclusion of AHAH metrics into fingertips tool, see footnote at bottom of table. **[b]** Letter of support from Public Health England verifying contribution of AHAH for supporting skills gaps in PHE.

[5.2] Letter of support from Consumer Data Research Centre verifying download and engagement statistics for AHAH.

[5.3] Sources corroborating applications of AHAH: [a] Gloucestershire Council. 2018. Review of Air Quality and Health in Gloucestershire.

https://glostext.gloucestershire.gov.uk/documents/s49496/ Appendix%20A%20-%20Air%20Quality%20and%20Health%20in%20Gloucestershire%20Report.pdf (see pp.19-20). **[b]** Tower Hamlets Council. 2018. Annual Public Health Report of the Director of Public Health. Website no longer available, pdf provided (see p.20 on pdf report).

[5.4] Sources corroborating use of Rowe's work within United Nations strategy on migration in Latin America: [a] Rodríguez Vignoli J, Rowe F, 2018. Efectos cambiantes de la migración sobre el crecimiento, la estructura demográfica y la segregación residencial en ciudades grandes: el caso de Santiago, Chile, 1977-2017. Report commissioned by the United Nations 'Population and Development Division of the Latin American and Caribbean Demographic Centre'. https://repositorio.cepal.org/handle/11362/44367. **[b]** Rodríguez Vignoli J. 2017. Cities and migration in Latin America and the Caribbean. Report delivered for the United Nations Expert Group Meeting on Sustainable Cities, Human Mobility and International Migration. https://www.un.org/en/development/desa/population/events/pdf/expert/27/papers/III/paper-Rodriguez-final.pdf (see p.3)

Pillar 2: Influencing policy and welfare decisions with novel data insights

[5.5] Corroborating evidence verifying how Green's research on austerity informed policy responses: [a] Public Health England (on behalf of Department of Health and Social Care). 2018. A review of recent trends in mortality in England. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/827518/Recent_trends_in_mortality_in_England.pdf (see pp.67-68, ref 73). **[b]** Davies S, Pearson-Stuttard J, Murphy O (Eds). 2018. Chief Medical Officer annual report 2018: better health within reach. https://www.gov.uk/government/publications/chief-medical-officer-annual-report-2018-better-health-within-reach (see Chapter 6 p.14, ref 33). **[c]** NatCen (for Food Standards Agency). 2018. Food security in Wales. https://www.food.gov.uk/sites/default/files/media/document/foodsecurityinwales_0.pdf (see p4).

[5.6] Corroborating the reach of Green's austerity research through reporting in the following national newspaper online websites (also in print newspapers for the Daily Mail and Times): [a] Guardian https://www.theguardian.com/society/2017/oct/02/england-and-wales-death-rate-rise-linked-to-longer-stays-in-hospital. **[b]** Telegraph https://www.telegraph.co.uk/news/2017/10/02/8000-deaths-year-may-caused-rising-bed-blocking/. **[c]** Times https://www.thetimes.co.uk/article/bed-blocking-in-hospitals-linked-to-rising-death-rate-nrm9582vb. **[d]** Daily Mail https://www.dailymail.co.uk/health/article-4942600/Bed-blocking-causing-8-000-deaths-year.html.

[5.7] Corroborating how Catney's work informed policy debates on ethnic segregation: [a] Ministry of Housing, Communities & Local Government. 2016. The Casey Review: a review into opportunity and integration. https://www.gov.uk/government/publications/the-casey-review-a-review-into-opportunity-and-integration (see p.43). **[b]** Department for Business, Energy & Industrial Strategy. 2017. Race in the workplace: The McGregor-Smith Review. https://www.gov.uk/government/publications/race-in-the-workplace-the-mcgregor-smith-review (see pp.9, 45, 46, 47; refs 10, 31, 43, 45). **[c]** All Party Parliamentary Group on Social Integration. 2018. Integration not demonstration https://socialintegrationappg.org.uk/wp-content/uploads/sites/2/2018/09/Final-Report-into-the-integration-of-migrants.pdf (see p.83)

[5.8] Evidence for Catney's segregation work influencing the School curriculum: Dunn C, Adams K, Holmes D, Oakes S, Witherick M, Warn S. 2016. *Edexcel A level Geography Book 1 Third Edition*. Hodder Education, London. (see Figure 21.13).

[5.9] Verifying how Rowe's research has informed policy responses: UK 2070 Commission. 2020. Make No Little Plans: Acting at scale for a fairer and stronger future. http://uk2070.org.uk/wp-content/uploads/2020/02/UK2070-FINAL-REPORT.pdf, (see p.13).