Demographics and Working from Home

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Context

census 2021

Google

A “new” normal

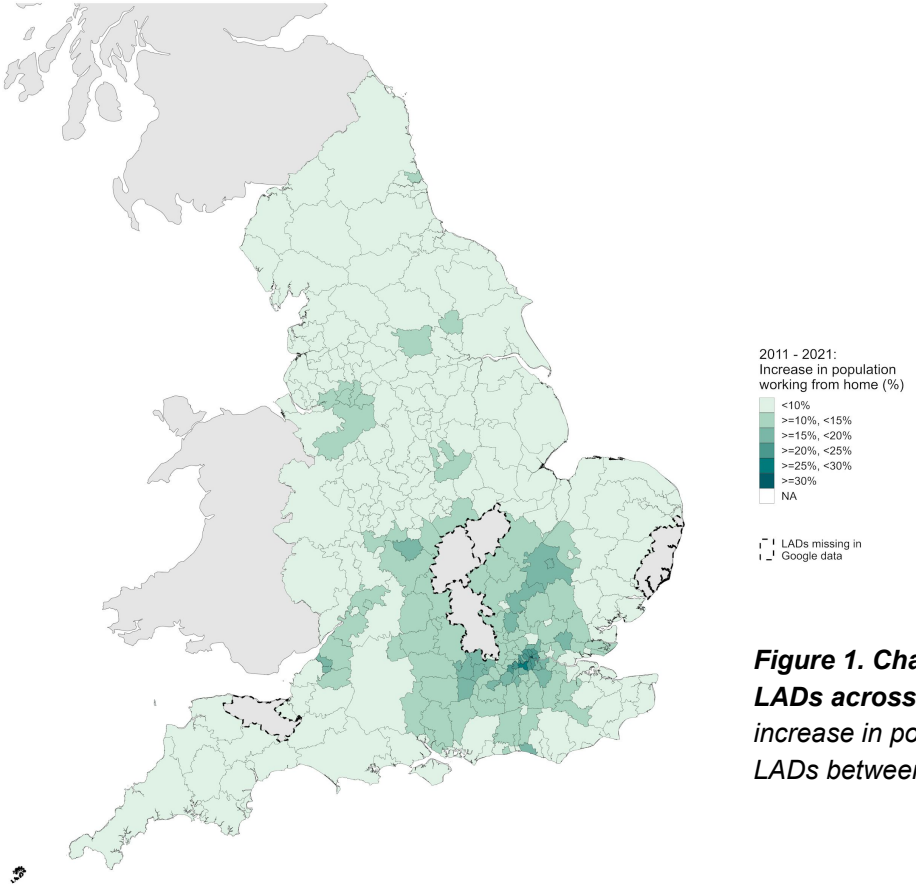


Figure 1. Change in WFH populations for LADs across England. *The percentage increase in population working from home in LADs between the 2011 and 2021 Censuses.*

A social gradient of WFH

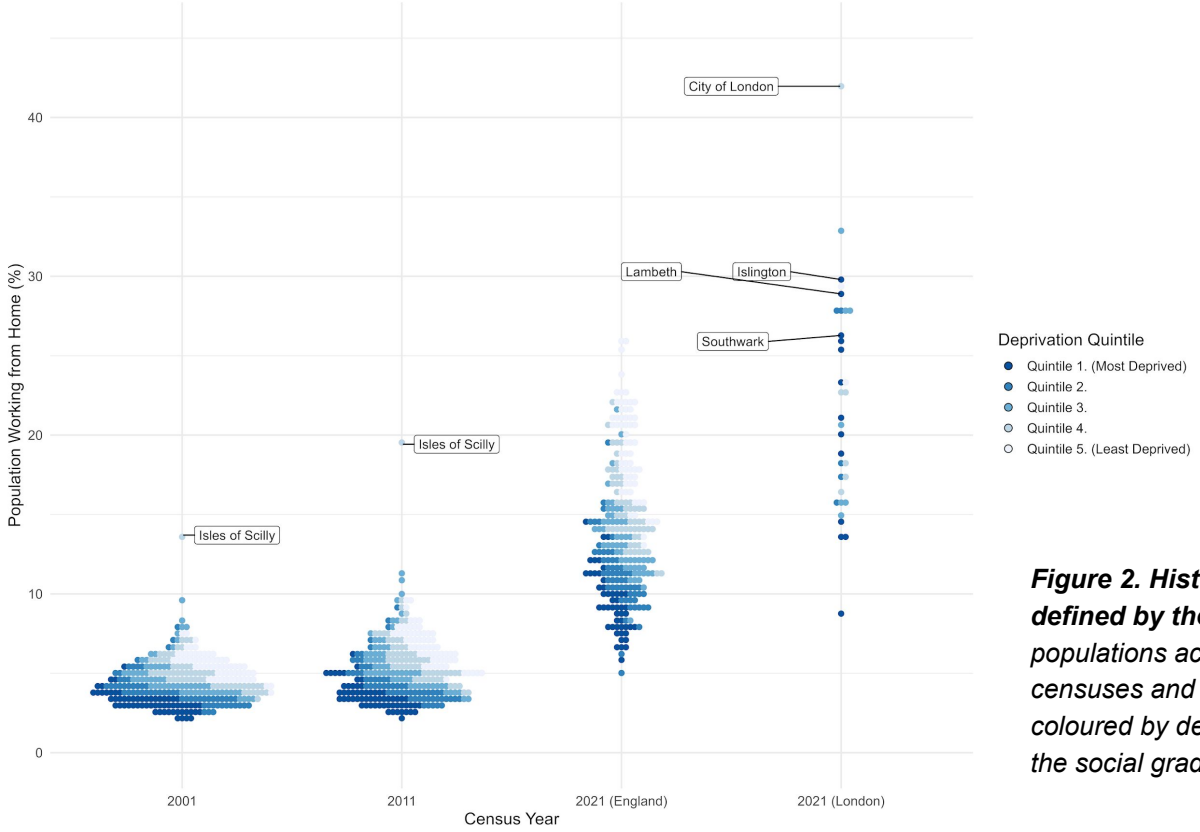


Figure 2. Historical changes in WFH, as defined by the census. *LAD WFH populations across the previous three censuses and specifically in London for 2021, coloured by deprivation quintile to highlight the social gradient of WFH.*

Data: ONS & Ministry of Housing, Communities and Local Government

An urban-rural gradient of WFH

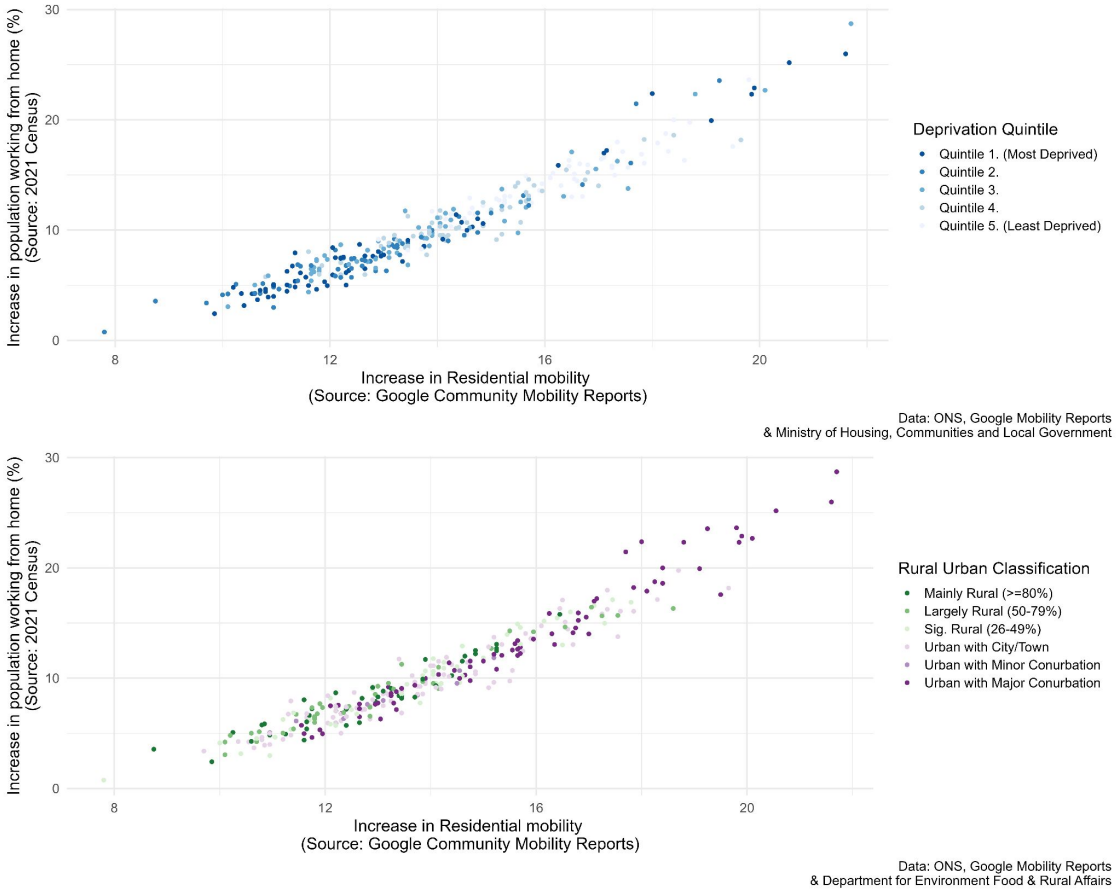


Figure 3. ***Comparing WFH changes between the 2021 Census and Google Community Mobility Reports.*** *Change in WFH is calculated for each LAD, with change from 2011-2021 used for census estimates (top), and change from census date and same date in 2020 used for Google mobility (bottom). LADs are coloured by deprivation decile and rural urban classification to highlight area characteristics associated with greater increases.*

Proxy measurement of WFH

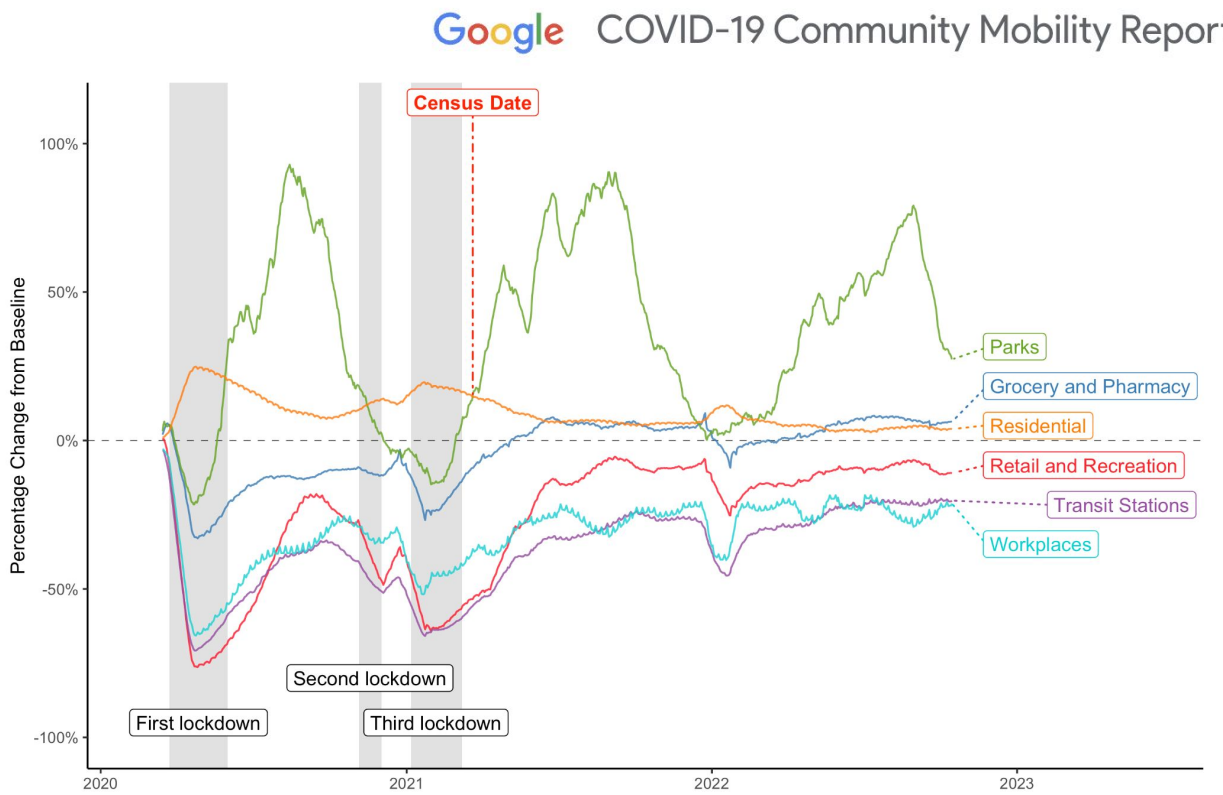


Figure 4. Mobility indicators in different settings. *Change in mobility indicators in different settings relative to the census data. Mobility indicators have been smoothed with a 30 day moving average for display.*

Key questions

- Can mobility measure WFH on census day?
- Can mobility 'fill-in' data between censuses?
- Can mobility predict WFH beyond the census?
- Validation data for mobile phone mobility indices is sparse

How does mobility capture WFH?

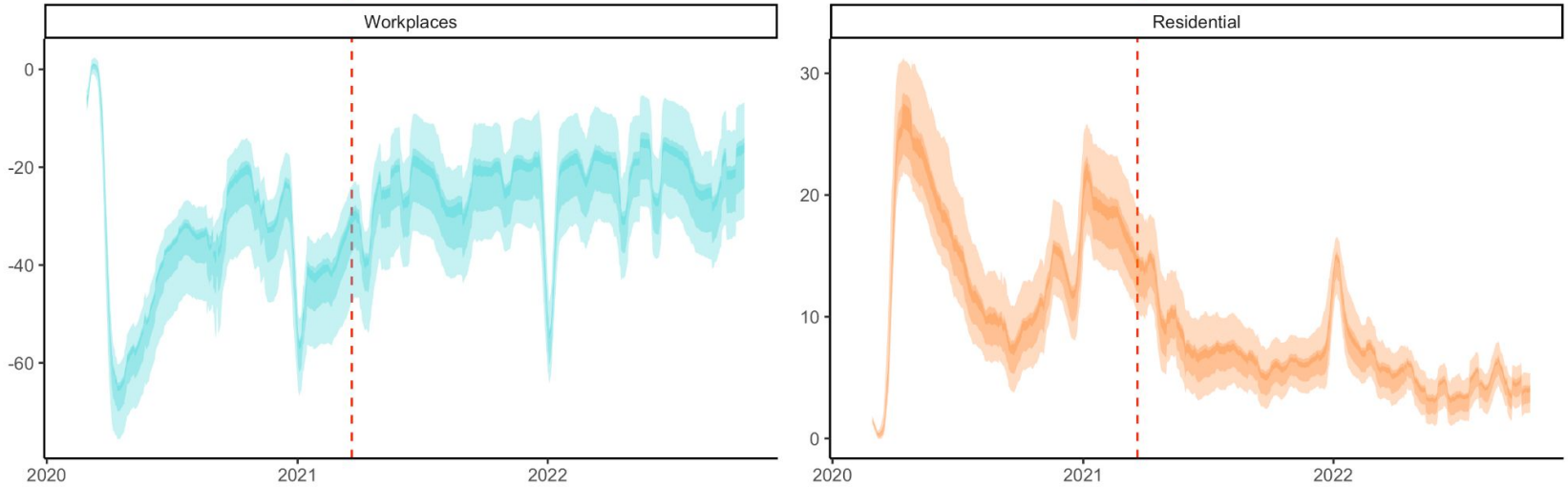


Figure 5. Google mobility in Local Authority Districts. *The distribution of the Google mobility indicator collected in individual Local Authority Districts. Shaded areas indicate 90%, 50%, and 20% density intervals. Dashed red line indicates the date of the UK census.*

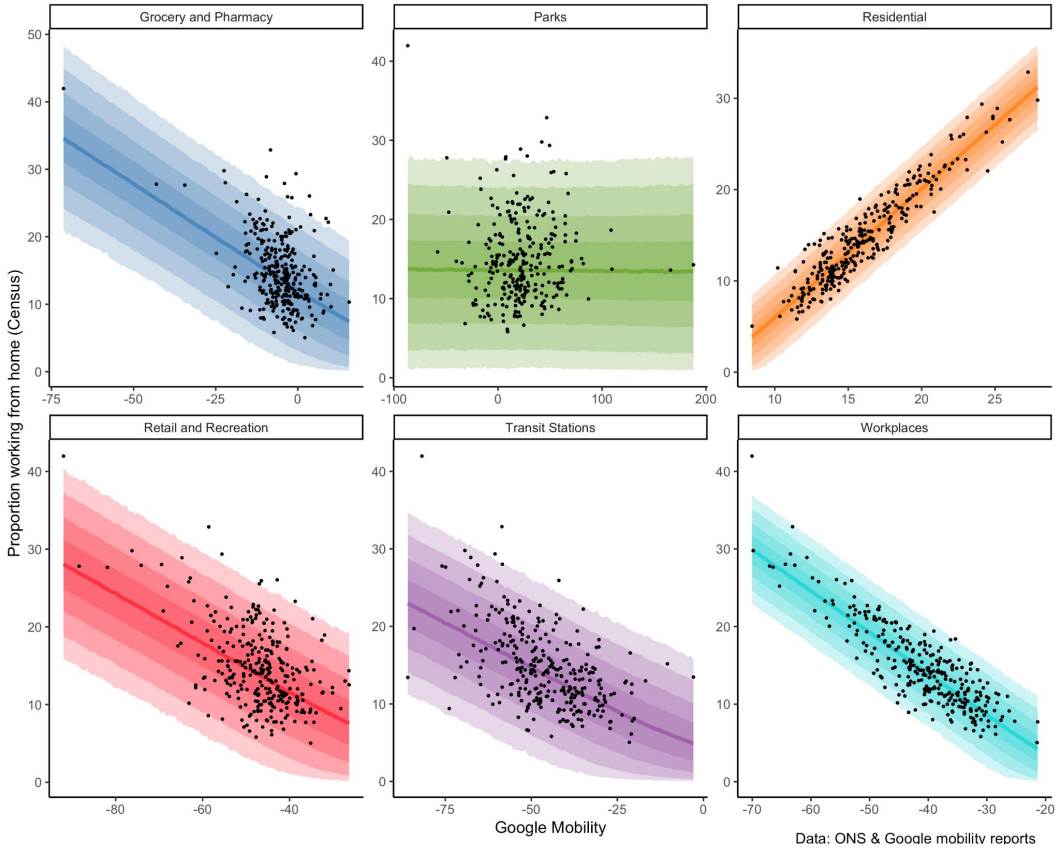
Uncertainties:

User population? (Users with Google Location History activated)

What categories of locations?

What type of activities? ("time in a residential area" vs. "activity (visits) in a category")

Comparison of Census WFH & Mobility



Results

- Strongest association in Residential, then workplaces.
- Similar association in transit stations, high uncertainty.
- Lowest uncertainty in residential setting.
- Importance of measuring time spent rather than “visits”?

Figure 6. Predictions of Working From Home (WFH) using mobility in different settings. *The predicted relationship between the proportion of individuals working from home in LADs and mobility in different settings.*

Forward projection of WFH

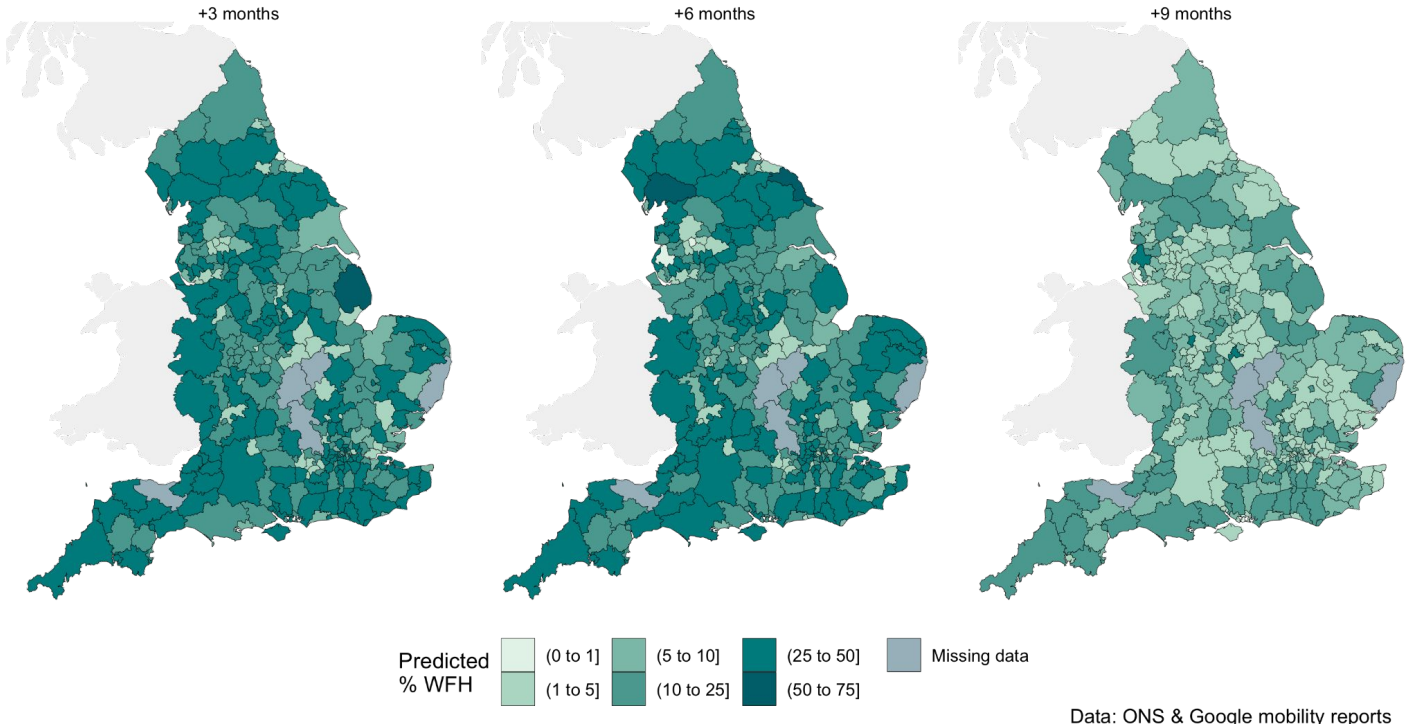


Figure 7. Prediction of WFH proportion beyond the census. *Predicted WFH proportion in individual LADs 3, 6, and 9 months after the 2021 Census.*

Conclusions: Mobility provides good measurement on census date but is not ready for projection.

Conclusions

2021 Census is really unique!

Working from home exploded nationally… (but not equally)

Demographics and Working from Home

Different opportunities, circumstances and locations driving inequalities

Mobility provides surprisingly accurate measurement of WFH

Modes of behaviour must align well with data processing

Forecasting: other factors must be taken into account

Opportunities to account for uncertainties & benchmark predictions

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