

Path-Finding and Prospective Work in the REAL Demand Unit

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Plan for Today

A very small number of slides only, lets focus on three things:

1. A quick 'Open Science' plea!
2. Three 'Pathfinding' projects for discussion/consideration.
3. Three 'Prototype' projects for the medium term.

‘Open Science’ Disclaimer

- I am Oxford’s LNL Coordinator for the UKRN.
- I co-convene an Autumn School: Open/Responsible Research.
- All research conducted with free, and ‘Open’ tools:
 - Linux (operating system)
 - Python (general purpose / statistical programming)
 - $\text{\LaTeX}$ (typesetting)
- Are there plans to set up an organisation GitHub account for the Unit? Or an ‘Open Science’ policy (or otherwise)?

"If I have seen further, it is by standing on the shoulders of giants."

Source: Isaac Newton to Robert Hooke, in February 1676.

The Scientometrics of (Health and) Social Care

- Computational variant of systematic reviews. Two approaches:
 1. Curate list of ISSNs with relevant Health and Social Care focus.
 2. Identify all relevant Level 4 FoRs within ANZSRC
- Under a broad/pre-existing agreement with Digital Science, obtain all scientometric data at the paper level.
- This builds upon multiple existent work:
 - Invited/peer-reviewed work on Population Studies
 - Analysis of REF 2021 ICS.
 - Earlier scientometric work on GWAS.

The Scientometrics of Health and Social Care

- This allows us to do things like assess:
 - The descriptive trends in the fields (data visualization).
 - Trends in Topics that have been studied (with LLMs).
 - Inter-sectional characteristics of authors themselves.
 - Clusters of highly cited work and trends in citations.
 - Characteristics of co-authorship dynamics (network science).
 - Multi-/Interdisciplinarity within/across health and social care.

The Demographic Drivers of Care Demand

Another core pathfinding project:

1. Obtain recent care prevalence rates across M/F.
 - Sources: UKHLS, UKBiobank, etc.
 2. Obtain most recent UK demographic data.
 - Mortality, Fertility, Population Sizes.
 - Primary source: ONS.
- Use Cohort Component Method to project populations.
 - Use projected populations to calculate future prevalence rates.
 - Writeup: A renewed case for urgent social care review?

Political Discourse and Care over Time

How is Care dynamically discussed in Hansard?

1. Build a scraper which captures all debates in Hansard.
2. Write a classifier: do discussions relate to care?
3. Build a LLM based dynamic topic modeler.
 - BERTopic is our current tool of choice for other projects.
4. Rich visualisations: which topics have risen and fallen?
5. Named Entity Recognition: Frequencies changing over time?

An Agent Based Model of Care Demand

- We are currently thinking about/scoping an ABM of Care.
- Agents would:
 - Supply and Demand care across the life course.
 - Contribute to labour market (inc. formal care sector).
 - Pay tax, and respond to government incentives.
 - Have children (or not) at differential rates.
 - Have differential healthcare demands.
- **Objective:** Public facing dashboard with policy levers.

Is Demand for Care Predictable in Realtime?

Also exploring the potential for real-time prediction of demand.

- Current discussions ongoing with SCC/HCC
- These two councils have pioneering TEC offerings.
- High dimensional sensor data.
 - For example: sleep/wake times.
 - For example: repeatedly boiling the kettle.
- Can this data help predict urgent demand for care?

Mapping Inequalities [Mapineq]

- Melinda has asked me to highlight some of her relevant work.
- **Mapineq**: trends and drivers of intergenerational, educational, labour market and **health** inequalities.
- Link geospatial social/economic policy databases.
- Generates rich open-access database with API/dashboard.
- Harmonizes and blends multiple sources.
- Dedicated to FAIR principles.
- Integration/supplier of data to REAL Units?