Producing the right evidence

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DECIPHer and CIPHER

• **DECIPHer**: Centre for the Development and Evaluation of Complex Interventions for Public Health Improvement

• **CIPHER**: Centre for the Improvement of Population Health through e-Records Research
  – New MRC funded centre of excellence
  – Farr Institute
  – Contains data & systems
Outline

• Data Linkage (SAIL)
• Linking environment and health data to evaluate natural experiments as interventions
  • The Housing Regeneration and Health Study (Carmarthenshire)
  • Care & Repair evaluation
• Discussion: the evidence... and beyond
SAIL System

• Suite of privacy-protecting technologies:
  – Including multistage encryption in which unique anonymised numbers replace individual, household, and organisational identities
  – Patient and public representatives and an independent panel scrutinise proposals.

• Many different health, educational attainment, environment, and housing datasets

• SAIL supports various research designs including pure population-based electronic cohorts, traditional cohorts, embedded individual and cluster randomised trials, and assessments of natural experiments.
Getting intervention data into SAIL

• Home addresses stored in the Welsh Demographic Service (WDS) dataset at NHS
  – Residency start and end dates
• Use widely available map data (e.g. Ordnance Survey) containing addresses of all homes
  – Attach data specific to that home -house or local area.
• Link these together (residential links)
• Link to demographic data to know which (anonymised) people are resident (individual links)
Anonymised data, linked at *individual, and household levels*

Data Provider Organisation, e.g. GP data, housing data

Incoming Data

File is split

Names & addresses only

Anonymisation process

Validated, anonymised data

Linking fields replace names and addresses

NHS Wales Informatics

Health / environment data

CIPHER

SAIL databank

Records for >3 million people

Data Provider Organisation, e.g. GP data, housing data
• Conditions of SAIL turn into another advantage...
  • Residence-based population data, flexible areas
  • Sub-population as a proxy for facility demand

• Enables exploration of the impact of (high resolution) environment on health of individuals’

• Provide evidence to develop potentially complex environmental interventions
The Housing Regeneration and Health Study: The Intervention

• Investment of £204 million in Carmarthenshire social housing improvements; 9,256 homes (2008 – 2015)

• **internal works:** kitchen units, bathroom suites, downstairs toilets, central heating, rewiring

• **windows and doors:** double-glazed, locks

• **thermal insulation:** walls and loft

• **gardens and estate package:** fencing, security lights, paths in good condition.
Evaluation of Carmarthenshire Housing Regeneration

- Does improving housing benefit the physical and mental health of residents?
- Using a natural experiment to evaluate population health
- Comparisons of **health changes** over time of
  - Intervention group (n=9,256 Carmarthenshire households) with nearby
  - Comparator group (n=13,000 households in a Nearby Region)
  - 2nd Comparator group (n=100,000 households in Rest of Carmarthenshire)
The primary outcome measure is the change in the proportion of residents aged 60+ who have emergency admissions to hospital for selected conditions:

- Cardiovascular
- Respiratory conditions
- Falls
- Burns

Secondary outcome measures:

- Incidence of GP treated anxiety and depression
- All-cause mortality
- Costs associated with using health service
Where will we get this information?

- Secure Anonymised Information Linkage (SAIL) databank
- Carmarthenshire County Council
- **NHS Wales Informatics team** remove addresses and replace with an unidentifiable code
- Allows us to link **new housing data** but home location remains unknown to researchers
- Anonymised links from houses to people and their health conditions
Baseline Cohort Demographics

- Carmarthenshire Cohort
- Regional Comparator Cohort
- Rest of Carmarthenshire

The graph shows the percent of cohort across Townsend Deprivation Quintile, with Quintile 1 representing the least deprived and Quintile 5 the most deprived.
Baseline Data

- Carmarthenshire Social Housing Intervention
- Rest of Carmarthenshire (relatively affluent)
Care and Repair analysis plan
Objectives

1. To evidence whether Care & Repair services reduce or delay frail clients accessing Health & Social Care Services following an intervention.

2. To evidence if the cost of a Care & Repair intervention is cheaper than a client accessing Health & Social Care Services.
Care and Repair Data

Variables include:

• Service type – Care & Repair, Rapid response
• Service request type
• Work type
• Request date
• Start/end date of work
• Service request closed date
• Total value of work
• Property type
• Property Classification
• Approx property age
Study population

- Cohort of frail individuals
- International Classification of Diseases 10th revision - chronic disabling conditions
- Use Patient Episode Database for Wales (PEDW) inpatient data to identify population
Study population

- Link to Welsh Demographic Service (WDS) data and Care and Repair data

PEDW data
Individuals identified as frail

WDS data
Anonymised address field

C&R data
Identify addresses that received C&R

Care and Repair
Study population
Outcomes

- Measure time to event e.g. moving to care home
- Cost of health care utilisation
Benefits/Limitations

Benefits
• Individual level linkage

Limitations
• Individuals who did not receive Care and Repair work could have had work carried out independently of Care and Repair
• Limited time to measure outcomes such as time to move to care home since Care and Repair data is recent data
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Publications

• David Fone, Frank Dunstan, James White, Chris Webster, Sarah Rodgers, Shin Lee, Narushige Shiode, Scott Orford, Alison Weightman, Iain Brennan, Vas Sivarajasingam, Jennifer Morgan, Richard Fry, Ronan Lyons. 2012 Change in alcohol outlet density and alcohol-related harm to population health (CHALICE), BMC Public Health V12, Issue 1
Questions?

- Using C&R data to show the impact of the interventions we have with clients has on health
  - Are we collecting the right evidence?
  - What else can be evaluated?
  - Limitations on what is routinely collected

- Health and housing working together to show the impact that good, appropriate housing has on people’s health

- Assigning costs to the health effects! Implications for budgets (health to housing crossover?)

- Finally: we have collected some good quality data on housing improvements and educational programmes. How do I evaluate the impact?
Thank you for your time

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