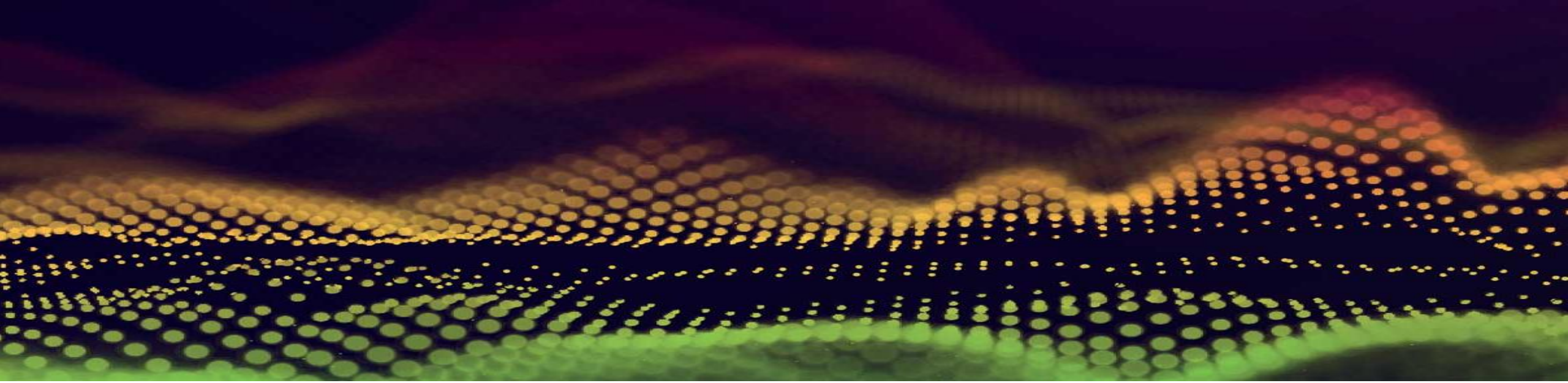

Triangulating Novel Mixed-Method Educational Data for Effective, Evidence-Informed Policy Impact

Prof Catherine M. Lido, Dr Phil Mason & Dr Emma Seddon

Urban Big Data Centre

Urban Big Data Centre

JOINTLY FUNDED BY E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

University of Glasgow

In this session we will discuss

Data Triangulation & Impact for Knowledge exchange & Policy Change through 3 UBDC case studies:

- EX 1 iMCD open data product
  - Novel data linkages & regression
  - GIS mapping &
  - Searchable Twitter dashboards
- EX 2 Gendered Journeys (inequalities in STEM)
  - Secondary data
  - Motivational interviews
  - Digital Footprints & Social network analysis
- EX 3 Social enterprise partnerships (Food Train for older adults)
  - Secondary data
  - Surveys &
  - Lived experience Interviews

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Who am I?

- **Social Psychologist- Prof of Lifelong Learning**
- **Social Identity & Social Capital frames**
- **City Information Modelling approaches &**
- **Mixed-methodologies**
- **To explore Learning Inclusion**

OXFORD REVIEW OF EDUCATION
2019, VOL. 45, NO. 2, 279–295
https://doi.org/10.1080/03054985.2018.1554531

Routledge
Taylor & Francis Group

OPEN ACCESS Check for updates

Lifewide learning in the city: novel big data approaches to exploring learning with large-scale surveys, GPS, and social media

Catherine Lido, Kate Reid and Michael Osborne

KEYWORDS
Lifelong learning; lifewide literacies; informal learning; widening participation; big data; inclusion; Learning Cities

ities agenda, which argues for the
romote education across all sectors
le evaluative research on Learning
h naturalistic and empirically rigor-
adult learning in urban contexts is
provides a case study of informal
amongst Glaswegian adults using
lata collection: a household survey
g attitudes, behaviours, and litera-
ity around the city; and the capture
media. The work operationalises
xplores domains beyond education,
ously been considered in surveys of
ysical mobilities and transportation
ncepts of social identity and capital
anatory frameworks of marginalisa-
of informal learning using multi-
analysis of city-wide participation
emographic picture of groups mar-

Dr. Catherine M. Lido
@CatherineLido
#LifewideLiteracies
@UofGEducation
@urbanbigdata

What is the Urban Big Data Centre?

ubdc.ac.uk

@urbanbigdata

- Promotes use of big/ novel data & innovative research methods to improve social, economic & environmental well-being in cities
- Through:
  - Data Collections & Data Services
  - Data Science Teaching & Capacity Building
  - World-leading & **IMPACTFUL** Urban Research
- Jointly funded Research Centre- ESRC & University of Glasgow

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Educational Disadvantage & Place (UBDC)

PASCAL International Observatory- Learning Cities Network (Rob Mark)
Cultural Literacy & Education (Henrik Zipsane & Maggie McColl)

-Exploring Educational Inequalities Through a *Lifelong Lens*

-Evidencing Associations of **Lifelong** Learning & **Place** with….

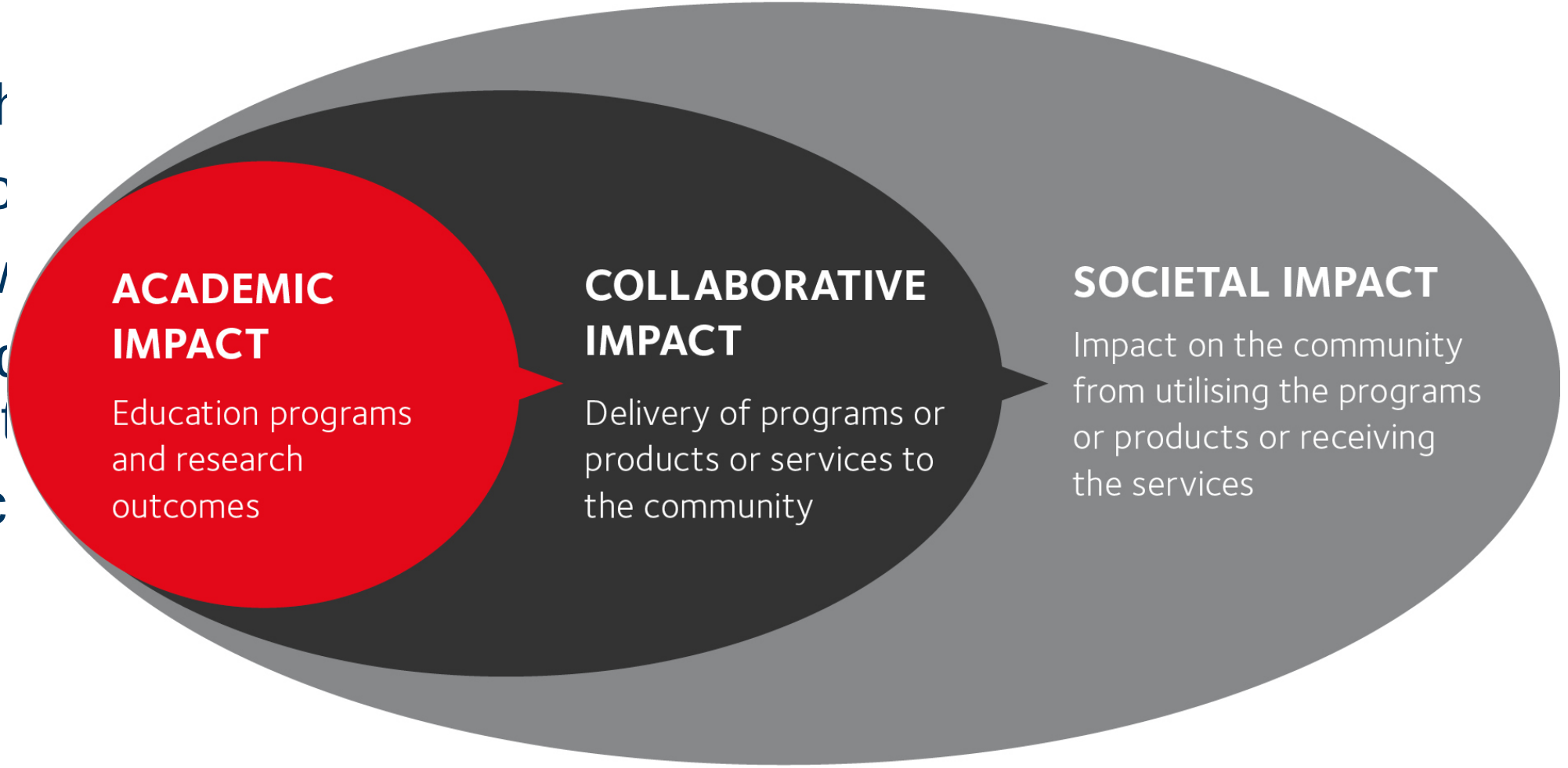
- **Health**
- **Economics**
- **Sustainability**
- **Engaged Citizenship**
- **Cultural Literacy & Education**

Prof Catherine Lido
Prof Mike Osborne
Prof Keith Kintrea
Dr Muir Houston
Dr Phil Mason
Dr Emma Seddon
Brittney Murphy
Barry Black
Dr Nadiia Gorash (Data Scientist)

What is Research IMPACT?

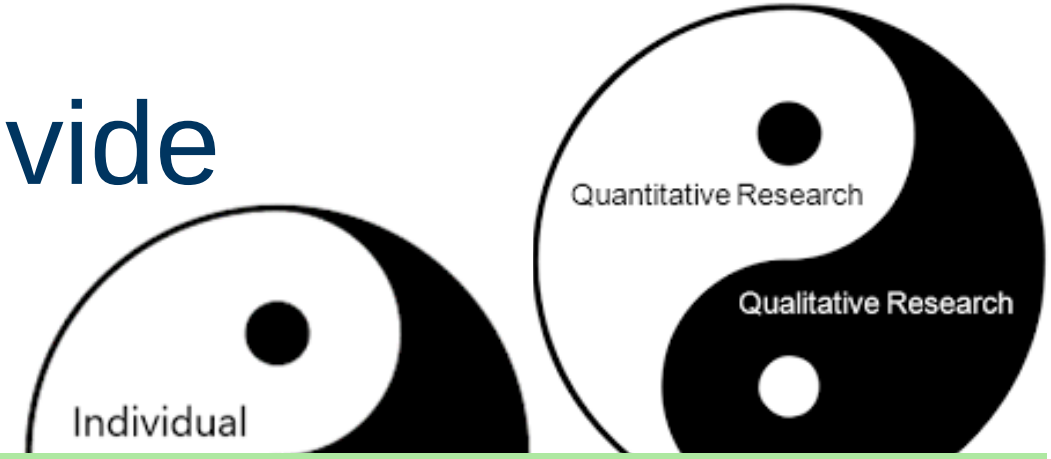
- Please k
- Enter cc

1. Type v
2. Should
   impact
3. How c
   time?



Blurring the Qual/ Quant Divide

Lido & Osborne, 2015; Lido et al. 2018; 2020

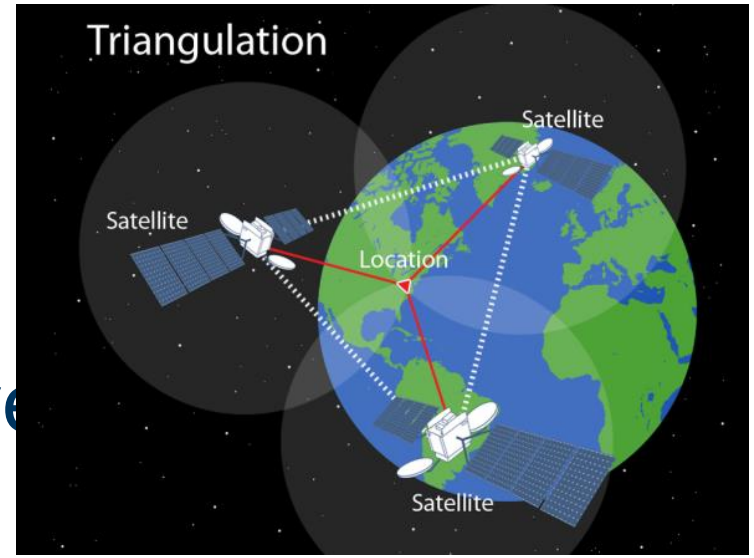


- Big Data- The various 'Vs' (Eynon, 2013)
  - Volume
  - Velocity
  - Variety (Value & Veracity
- Existing/ Naturalistic data- S
- Novel/ Innovative data- Soci
- Qualitative data- Experientia

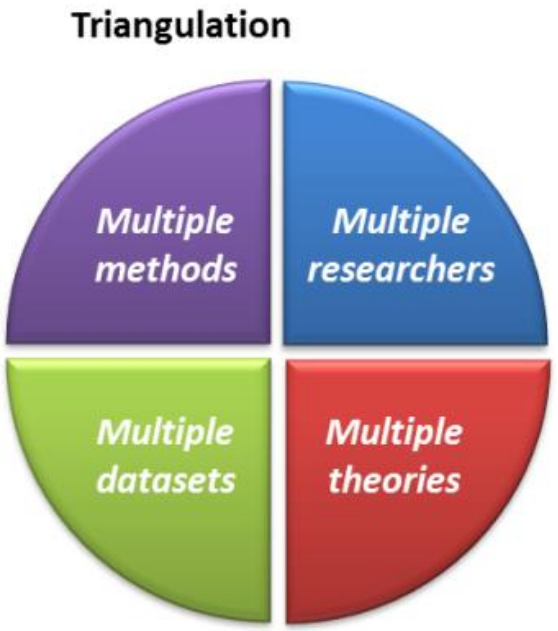
Blurring the Boundaries- Symp

Big Data may be numerically large or beyond the capacity of most relational database systems to manage. More significantly, it may be continuous (in real-time) with ongoing data collection, or it may be 'big' due to the complexity of the data themselves and the need for novel methods to capture, analyse, interpret and visualise. Data-sets are becoming bigger and more open, and it is important to tap into such resources to improve our knowledge of city-wide participation.
(Lido et al. 2015, p. 494)

Triangulation



- ‘Comparing findings from > one perspective
- Multi-methods (within a paradigm)
- **Mixed-methods** (integrating paradigms)
  - Can be part quantitative – part qualitative
  - Experiment and survey (multiple-methods)
  - Survey and interview (mixed-methods)
- Secondary data as contextual
- One researcher with another…



Project Ex 1: Integrated Multimedia City Data (iMCD)

2015 project designed to address themes of **urban living**

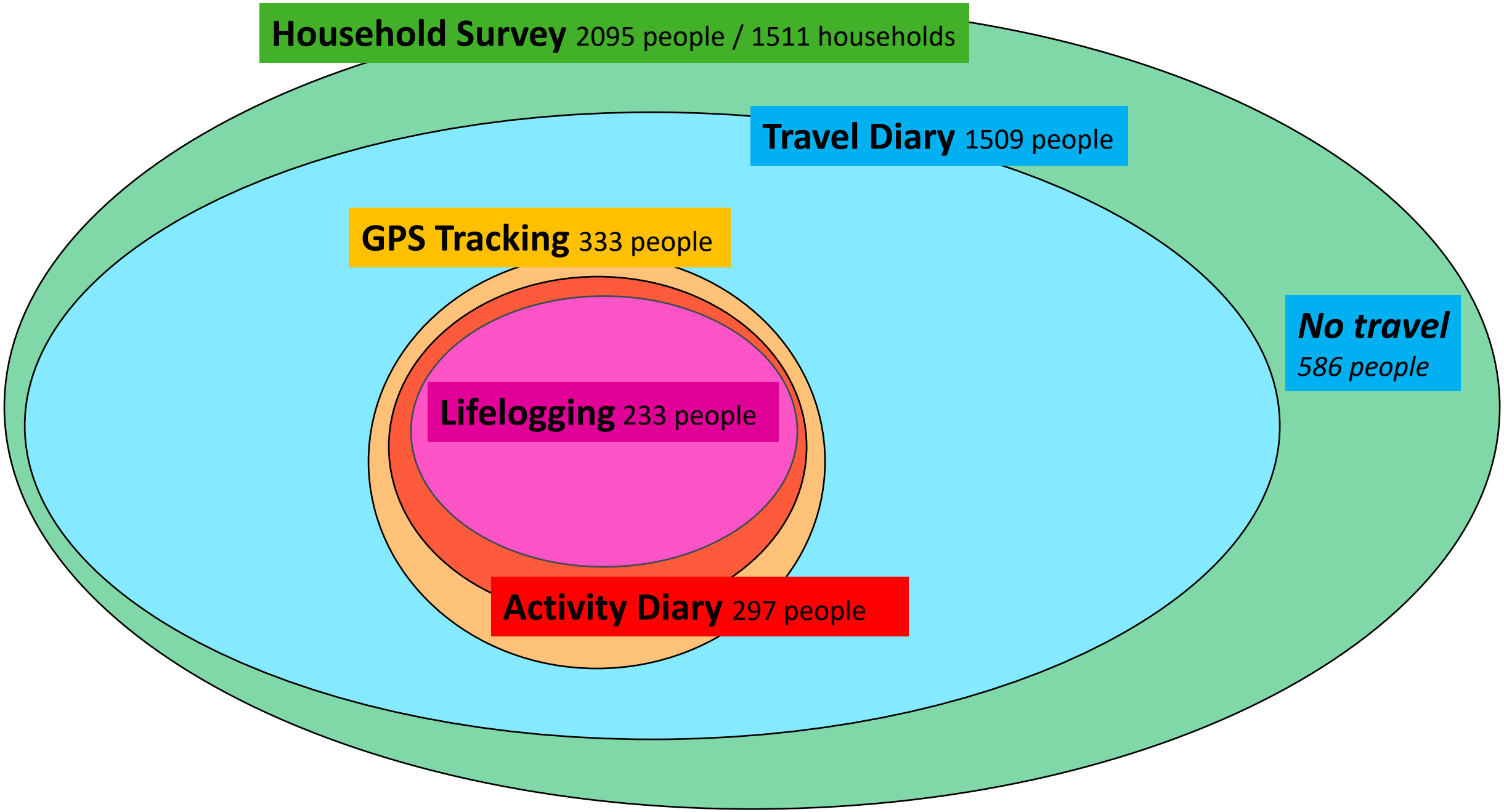
Based in the Greater Glasgow region (1.2m population)

Integrates multi-mode data: person-level self-reported and sensed information, linkable to external data sources

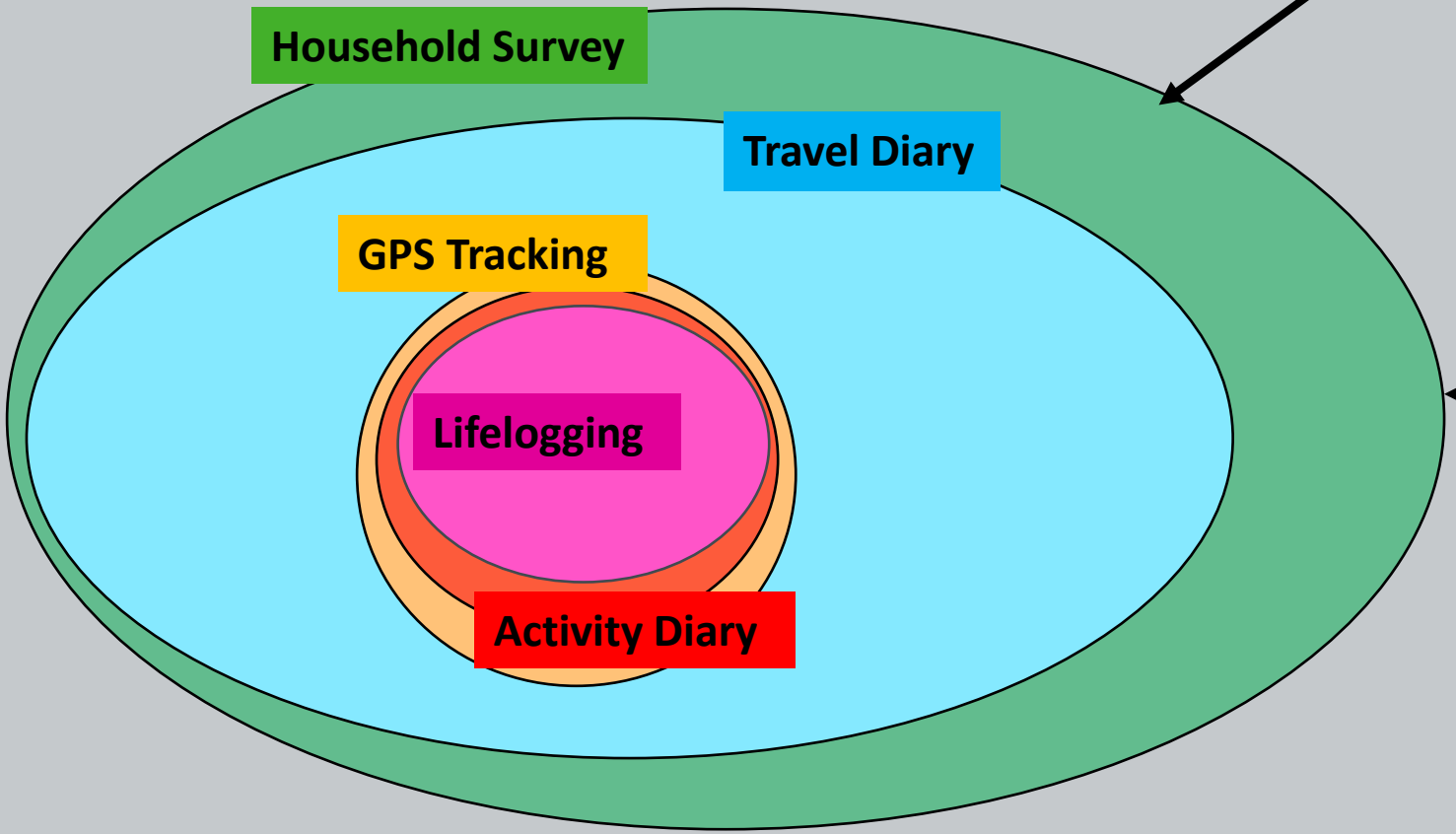
A Big Data project, especially because of the ***variety*** of its data strands

Education research perspective:

- Attitudes, Literacies & Behaviours
  - Education/ skills
  - Sustainability
  - Transport
  - Cultural/ civic activity and engagement
  - ICT/ technology use


Household Survey 2095 people / 1511 households
Travel Diary 1509 people
GPS Tracking 333 people
Lifelogging 233 people
Activity Diary 297 people
No travel
586 people

iMCD



Social Media

64m tweets

Secondary / Administrative Data

Linked at data zone/postcode unit level

Neighbourhood deprivation
Scottish Index of Multiple Deprivation

Access to urban greenspace
OS Open Greenspace & Open Street Map

Learning engagement, walking and greenspace

Learning: formal (for qualification), non-formal (not for qualification), informal (independent)

Deprivation: SIMD quintile

Greenspace access: within 10 min walk of e.g., parks, sports grounds, children's play areas

Trying to understand complex patterns

1) Household Survey:

   Learning engagement is more likely if you live near greenspace (OR=1.27–2.16)

2) Household Survey + Travel Diary + GPS tracks:

   Learning engaged people generally walk more often (OR=1.68, 5-7 days per week)

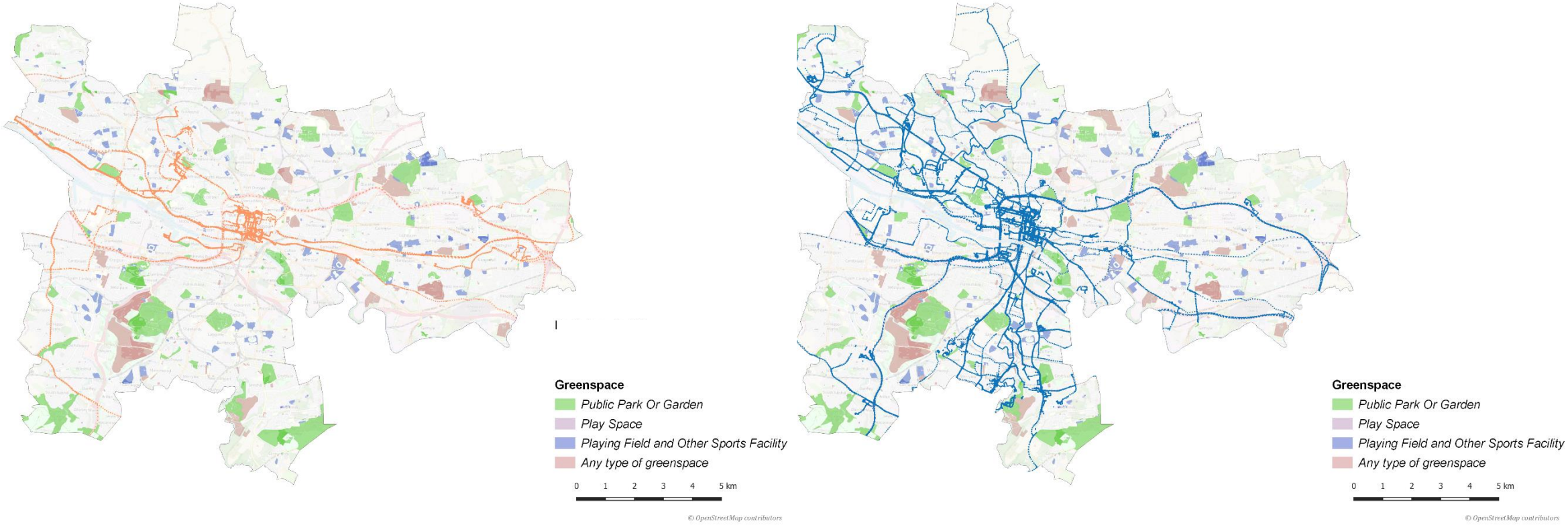
   and for longer (21.4 vs 16.4 min), but not significantly so in greenspace

3) GPS tracks:

   Qualitative illustration. Maybe learning-engaged older women walk less in greenspace (more in the city centre) than the non-learning-engaged?

Lido et al., Integrated multimedia city data: exploring learning engagement and greenspace in Glasgow. 2020. Built Environment 46(4), 574-598

All-mobility patterns of learning-engaged (left) and non-learning-engaged (right) women aged 60+ years

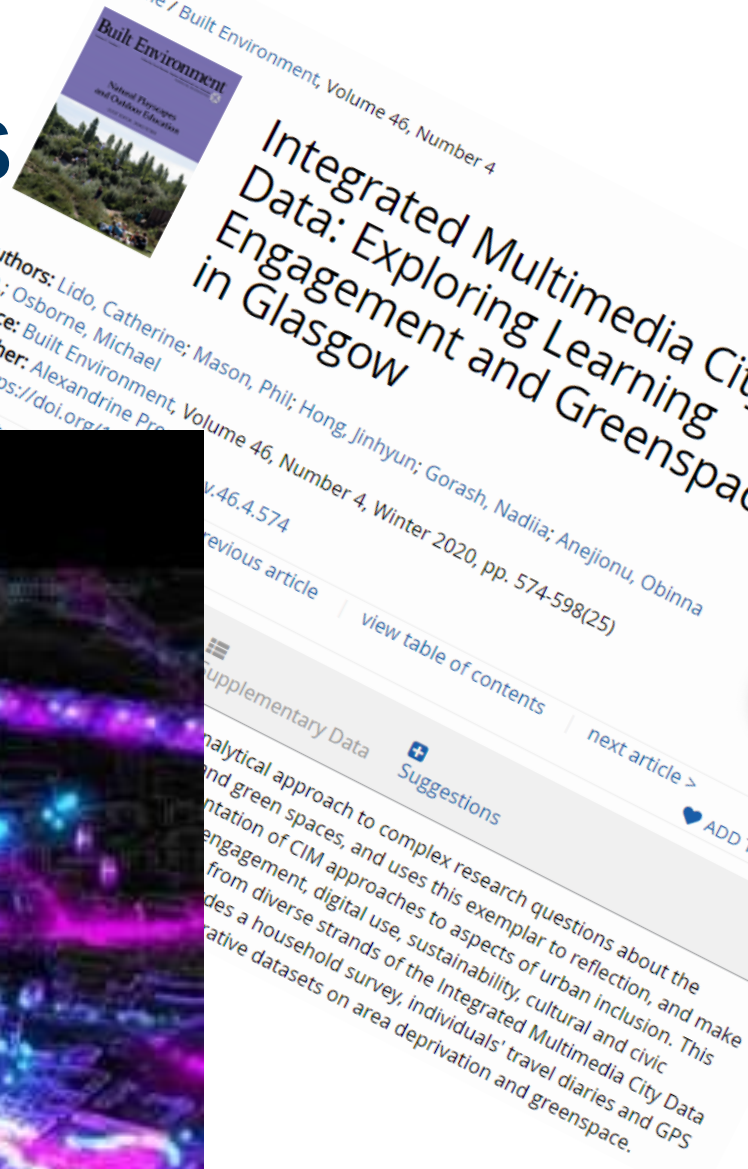


3) GPS tracks:

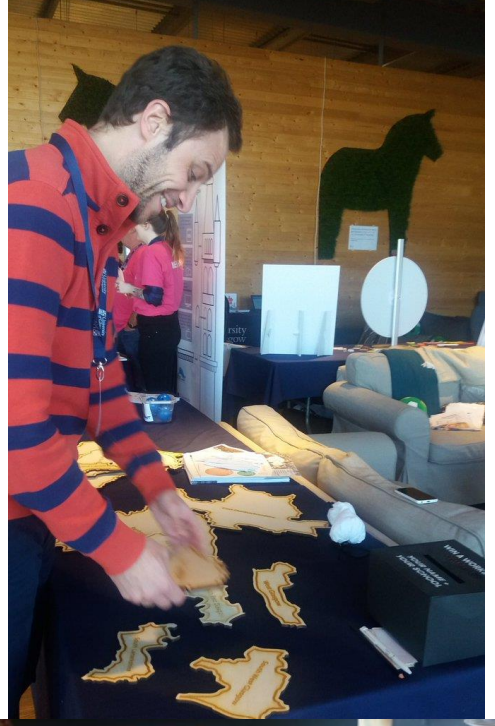
Qualitative illustration. Maybe learning-engaged older women walk less in greenspace (more in the city centre) than the non-learning-engaged?

iMCD IMPACT- Movement Patterns

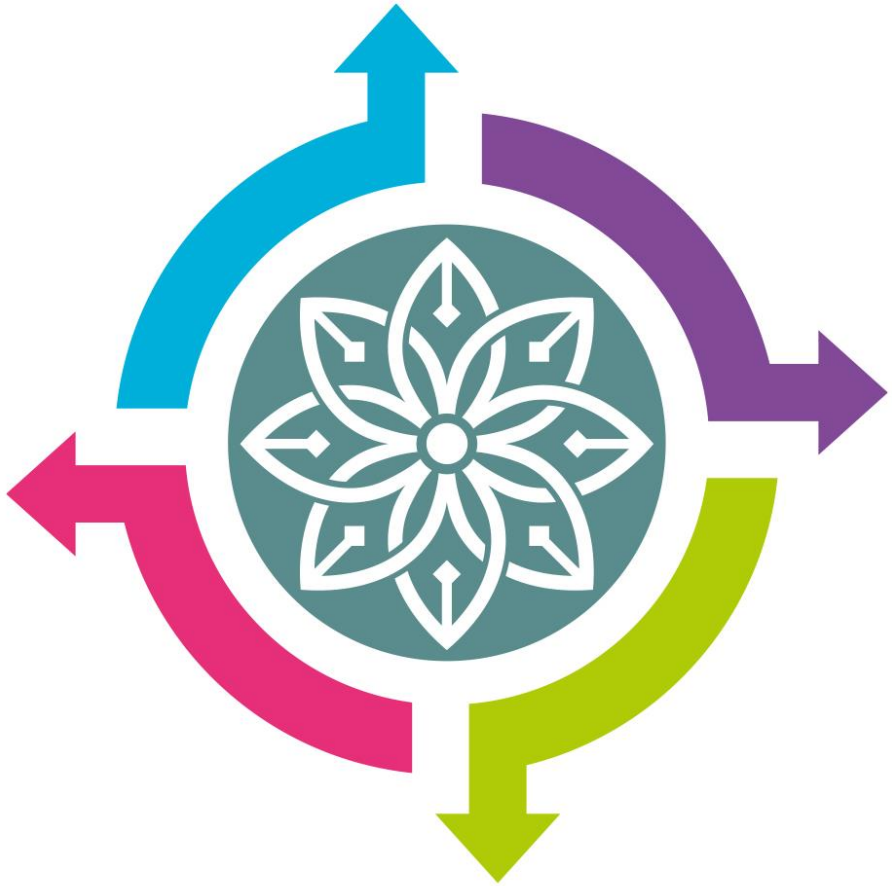
- Understanding Sedentary Patterns of Seniors (Shaw et al 2017)
- Lifelong Learning with Greenspace (Lido et al. 2020)



#LifewideLiteracies @Ikea



Is this 'Impactful' & How can we capture outcomes in communities?

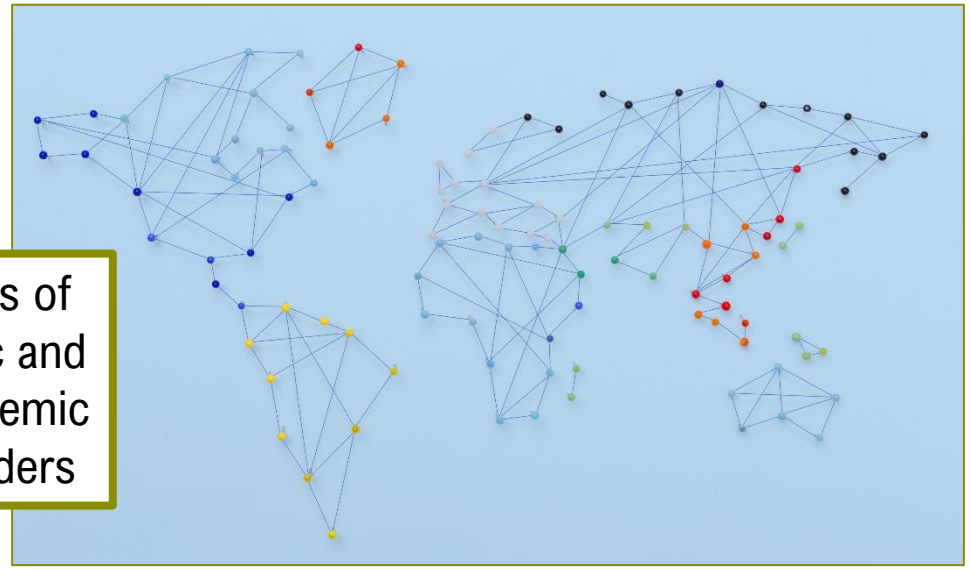


GENDERED JOURNEYS

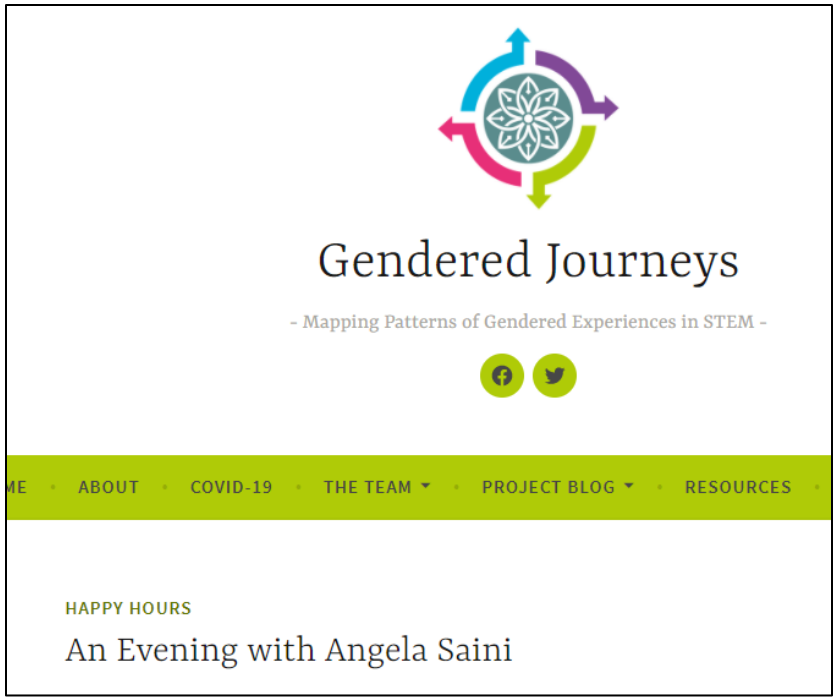
Trajectories of STEM students and graduates through higher education and into employment, in India, Rwanda and the UK

- Mixed methods:
  - large-scale survey
  - secondary data analysis
  - interviews and focus groups
- Stakeholders in different countries and institution types:
  - universities
  - private and public STEM employers
  - state-level organisations
- International research for global impact:
  - national policy change
  - ‘toolkit’ for students, HEIs and employers in all contexts
- Broader impact = contribution to meeting sustainable development goals (SDGs 4, 5, 8, 9)

Networks of academic and non-academic stakeholders



Online (social) media engagement with stakeholders and beyond



THE CONVERSATION
Academic rigour, journalistic flair

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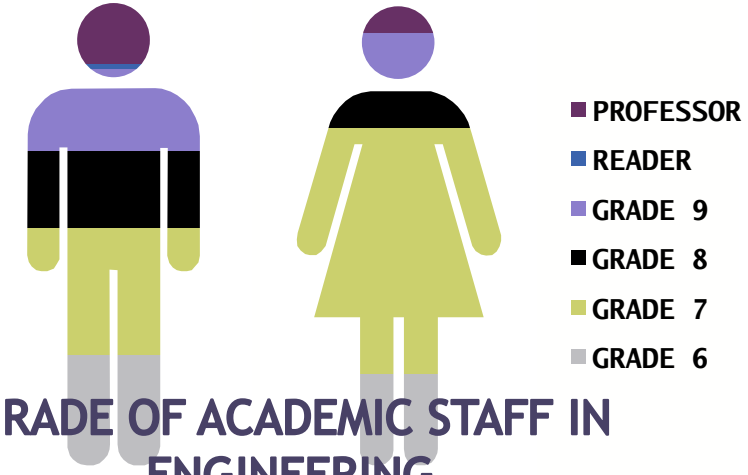
VisNET- Vir

(Gauchotte-Linds

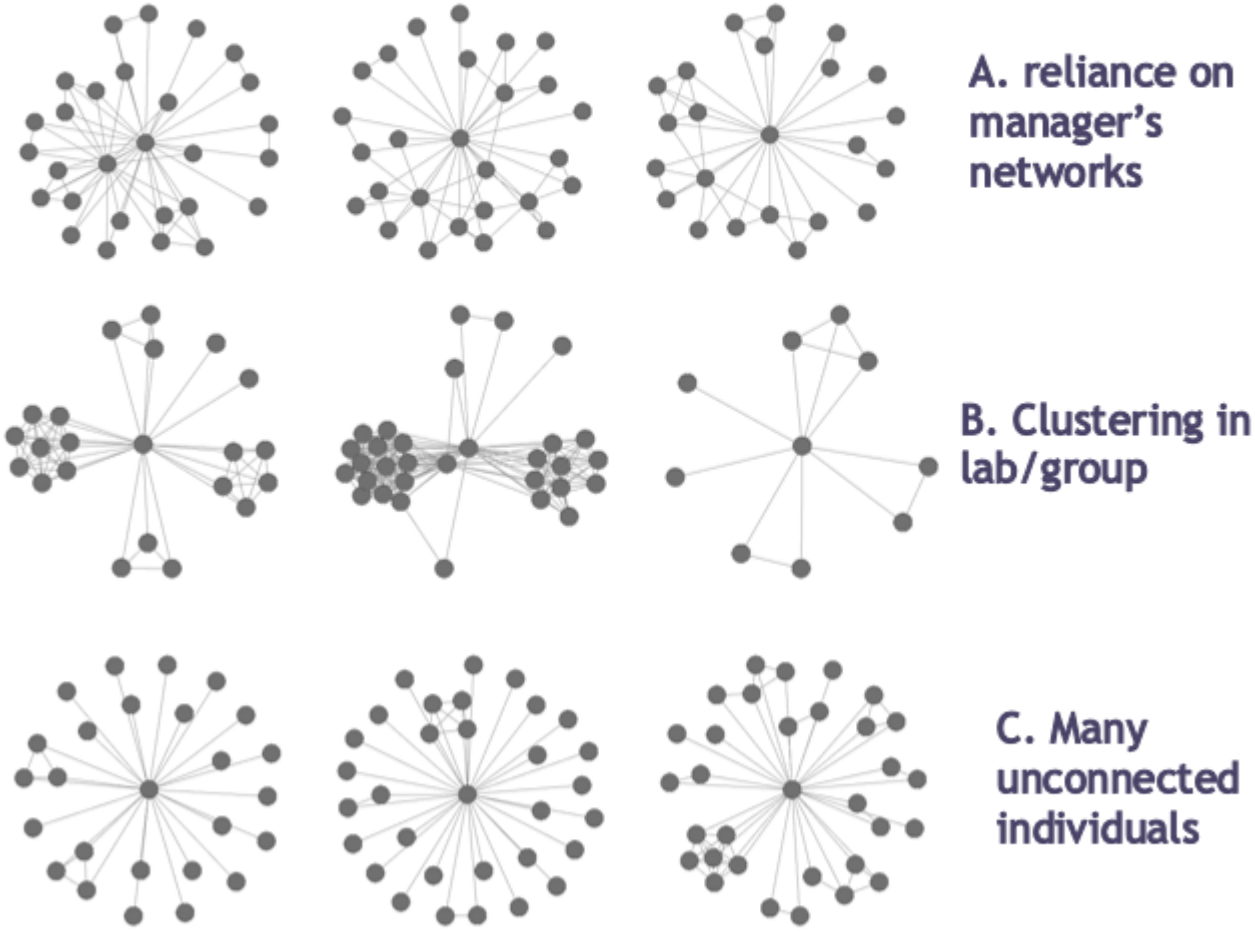
- Addressing Gendered
- 30 women STEM Early
- Longitudinal- Survey, N Professional Networks
- Events, Policy Paper (Ir



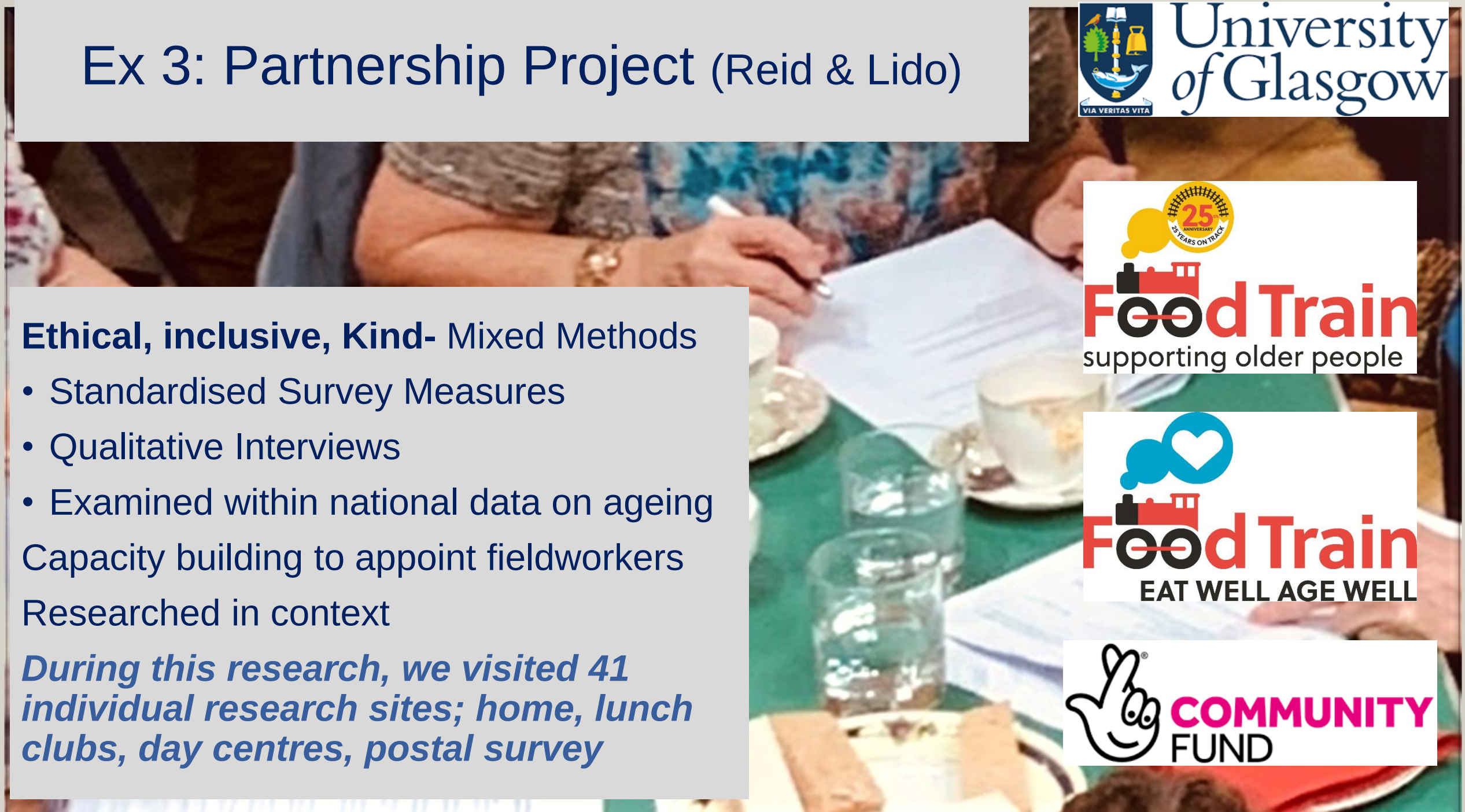
GRADE OF ACADEMIC STAFF IN ENGINEERING
University Of Glasgow (2016)

Longitudinal Mixed Methods

Incl. Ego Nets @ 3 time points



Ex 3: Partnership Project (Reid & Lido)



Ethical, inclusive, Kind- Mixed Methods

- Standardised Survey Measures
- Qualitative Interviews
- Examined within national data on ageing

Capacity building to appoint fieldworkers

Researched in context

During this research, we visited 41 individual research sites; home, lunch clubs, day centres, postal survey

Demographic Summary
Average Age: 79.51 (8.15 SD), Ranging 58-98 Years

169 total surveys

17 interviews

Variable	Response	n	%
Gender	Female	130	77%
	Male	39	23%
Living status	Live Alone	120	71%
	Partner	28	17%
	Child	15	9%
	Other	5	3%
Disability Status	Yes	118	70%
	No	46	27%
Food Train delivery	Yes	55	33%
	No	106	63%
Meal Prep	Prepare Hot Meals Myself	116	69%
	Friend or Family	19	11%
	A Carer	21	12%
	No Hot Meals	3	2%
SIMD Quintile	Least Deprived	22	13%
Deprivation of Area	Most Deprived	31	18%
Ethnicity	Asian	10	6%
	White	153	91%
	Mixed/other	4	3%

Nationally Avg BMI- 28 (6.24 SD)*

4.7% Under weight
8.9% Severely Obese

Findings: Relationship of Malnutrition Risk to Psycho-Social Wellbeing

Risks for Lower **Wellbeing** related to:

- Greater **Loneliness** reported ($p<0.001$)
- Less reported **Social Support** (both variables $p<0.001$)
- Higher levels of **Food Insecurity & Malnutrition Risk** (both moderately strong, & negative in direction $p<0.05$)

Malnutrition Risk was related to:

- Greater **Food Insecurity**
- Greater **Loneliness**,
- Less reported **Social Support** (both measures),
- More **external locus of control** (all $p<0.05$)

Themes

1) If food was st ners (isolation and loss)

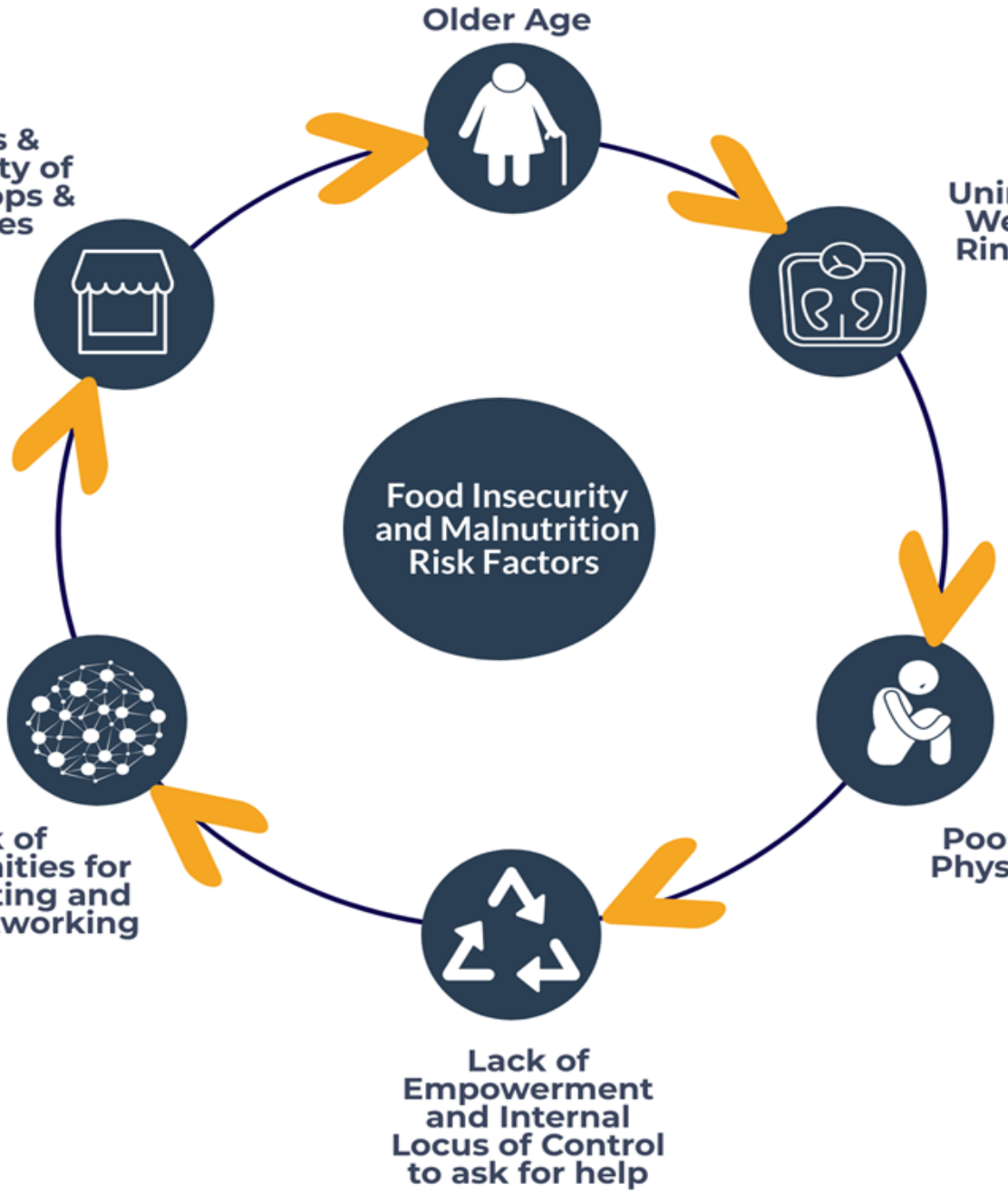
it was hat" ….you know, if you
cooke

this sp ody comin' round", so a don't
need t

2) Financial barr and societal barriers far more prominent (mob

Now w

peopl mes you know uh, I've not got
the er)



e Exchange Tips

rd sector support (in Pandemic)

events, multi-stak

- Video for onwa
- Policy papers*
- Webinars**

Data Lessons?

- Consider Novel/ Innovative Data (e.g. Social Media, Creative Methods)
- Blur Qual/ Quant Boundaries
- Close the Loop- from # & Lived Experiences to **Holistic Stories**
  - **Triangulation**
  - **Interdisciplinarity &**
  - **DIVERSE Impact/ KE**
- Note- Privacy tensions with open data (GDPR)
- ***Need citizens to WANT to engage, feel heard, be included in decisions***
- ***Need evidence to inform policy, but needs to 'speak' to diverse stakeholder needs***

Can your research change the world?

Impact Motivations?

- Social Justice?
- Policy Change?
- Including hard to reach populations?
- Is it being debated in policy?
- Is it topical in the press?
- Are there organisations who might benefit from your work?
- How can you reach out/ connect?

Policy-Maker Needs?

- Lacking in present evidence base- numbers? experiences?
- How has the issue progressed-in in discussions? In law?
- What are the most recent changes being considered?
- Have you contacted SPICE team? MPs? MSPs?
- What types of events might appeal to political and non-stakeholders?
- Executive summaries, policy briefs & briefing papers vs. Research summaries & articles?
- Tell the story with data

Dissemination for Public?

- What are competing discourses & do they need challenged?
- What are main outlets for this topic? Twitter? News print?
- Can you reach out to contacts, journalists, organisations prolific on the topic?
- User-friendly language?
- Simple story (3 key messages)
- Get media savvy/ training
- Get social media savvy

- Question 1. What would make an impactful policy brief for your research? What would that look like?
- What would the goal of this document be?
- Where would you disseminate it?
- What images might accompany it?
- How would you know it was effective?

Question 2. What would constitute impactful social media coverage of your research?

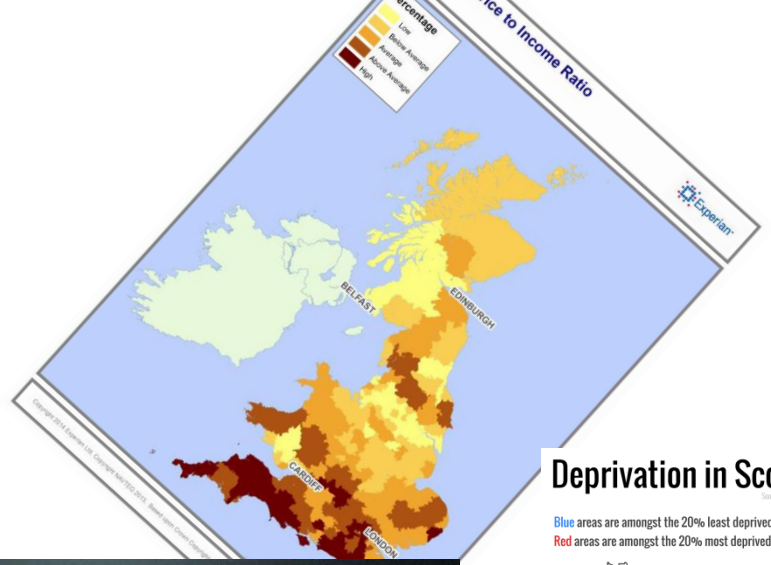
- What form would this output take? Content and target audience?
- Where would you disseminate it?
- How would you know it was effective?

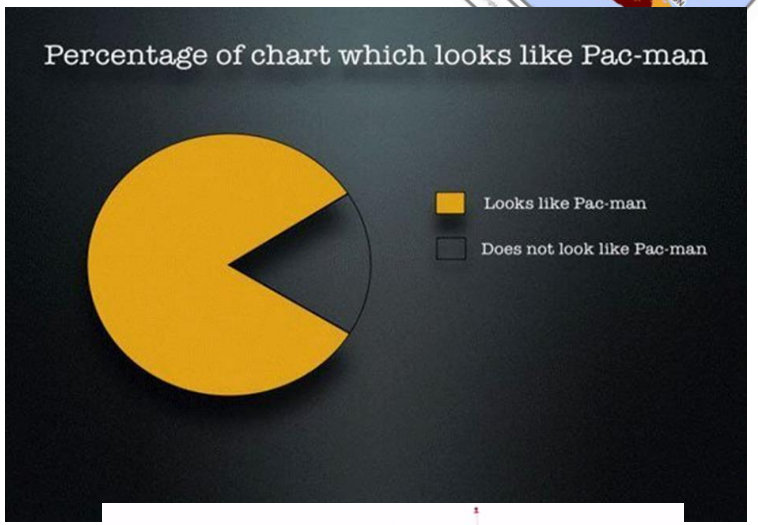
Visualisations are powerful

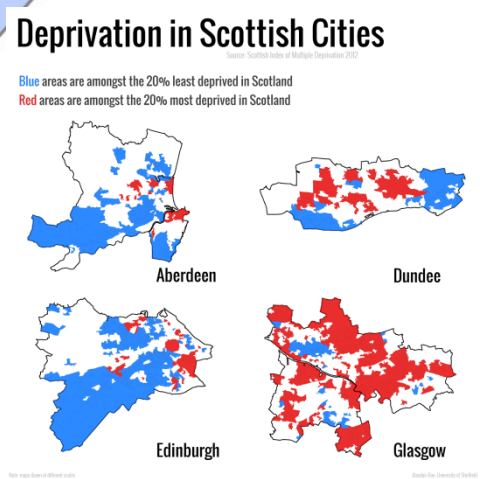
- Visualisations key to communicating:
  - Pie charts?
  - Bar Graphs?
  - Scatterplots?
  - Violin plots
  - 3-D models
  - ‘Heat maps’
  - Social Networks…

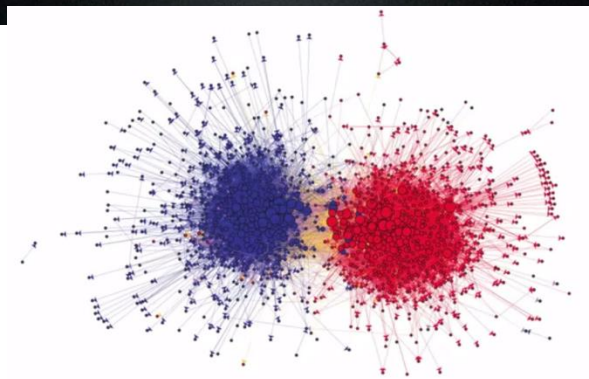
Undertheraedar.com

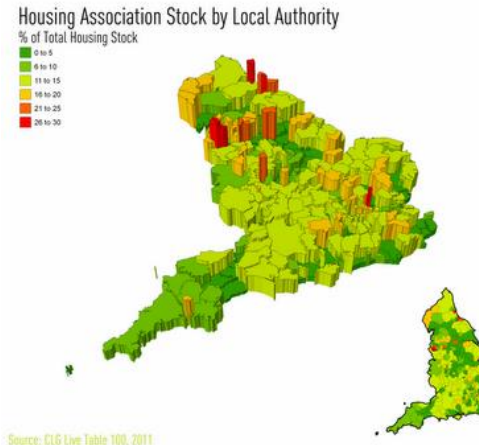
Gonnaemapit.com





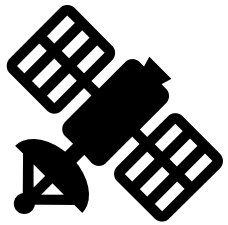






Other UBDC UK Data

- Strava cycling app
- Mobile
- Lidar
- Satellite
- Transport



- **More UK Education….**
  - ScotXed Pupil Data
  - Higher Education (HESA)
  - Further Education (SFC)
  - Universities Colleges (UCAS)
  - Skills Development/ Employment (SDS)

University of Glasgow

Working with UBDC?

- Glasgow as comparison?
- Use our DATA or measures?
- Access training or expertise…

INSPIRING PEOPLE

#UofGWorldChangers

@UofGlasgow