Office for
National Statistics

Llywodraeth Cymru
Welsh Government

Life After Census

Belfast - 9 May 2012

Beyond 2011

The future of population statistics

Alistair Calder – Head of Stakeholder Engagement, ONS

Beyond 2011 (England & Wales)

- Context - why change?

- Statistical options – what are the alternatives?

- Research plans & the (long) timescale

- Risks & Issues – what could possibly go wrong?

Beyond 2011

The context and background

Why bother to change ?

Context

- Census – every 10 years
    Population statistics → small areas + multivariate combinations
    Social conditions →
    Housing →

- Uses: Resource allocation
    Service planning
    Policy development, monitoring and review
    Social research

- EU regulations and duty to report to Parliament

The Beyond 2011 Programme

- Why change? – Why look beyond 2011?

    Rapidly changing society

    Evolving user requirements

    New opportunities – data sharing

    Traditional census – costly and infrequent??

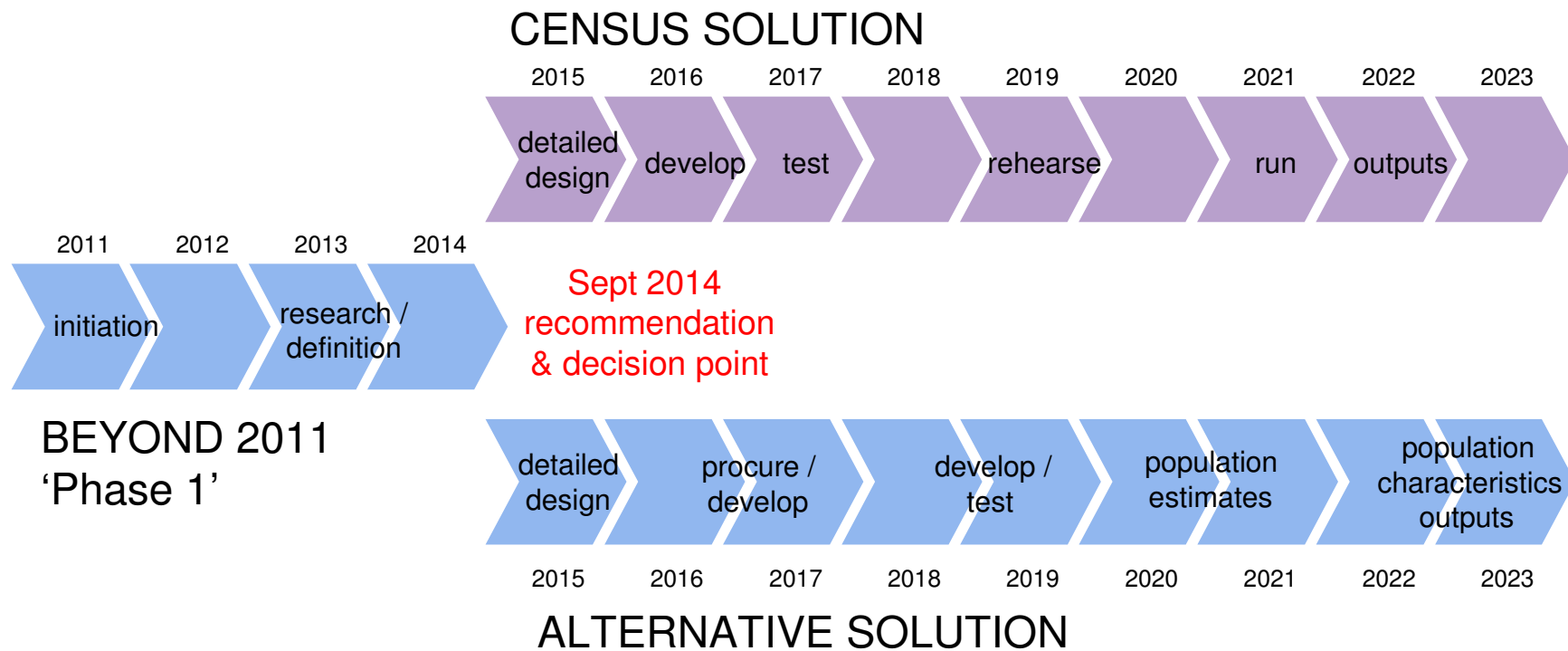- UK Statistics Authority to Minister for Cabinet Office

    "As a Board we have been concerned about the increasing costs and difficulties of traditional Census-taking. We have therefore already instructed the ONS to work urgently on the alternatives, with the intention that the 2011 Census will be the last of its kind."
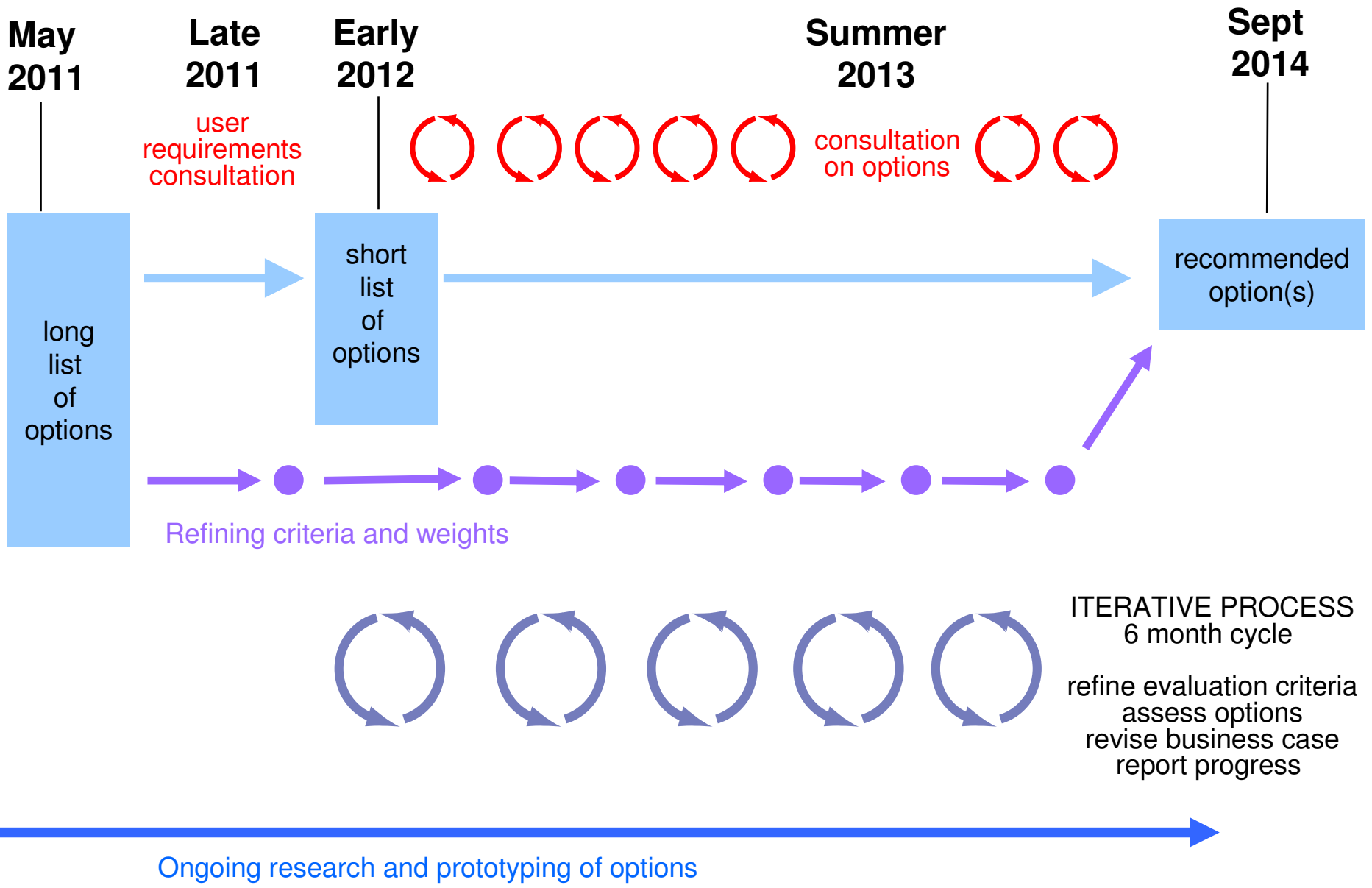
Programme Purpose

- Identify the best way to provide small area population and socio-demographic statistics in future

- Provide a recommendation in September 2014
  - underpinned by full cost-benefit analysis
  - & high level design for implementation

- (subject to agreement) Implement the recommendation

Beyond 2011 - Timeline - the key decision

CENSUS SOLUTION

| 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |

detailed design · develop · test · rehearse · run · outputs

| 2011 | 2012 | 2013 | 2014 |

initiation · research / definition

Sept 2014 recommendation & decision point

BEYOND 2011 'Phase 1'

detailed design · procure / develop · develop / test · population estimates · population characteristics outputs

| 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |

ALTERNATIVE SOLUTION

Beyond 2011

Statistical Options

Beyond 2011 : Statistical options

Census options

Traditional Census (long form to everyone)

Rolling Census (over 5/10 year period)

Short Form (everyone), Long form (Sample)
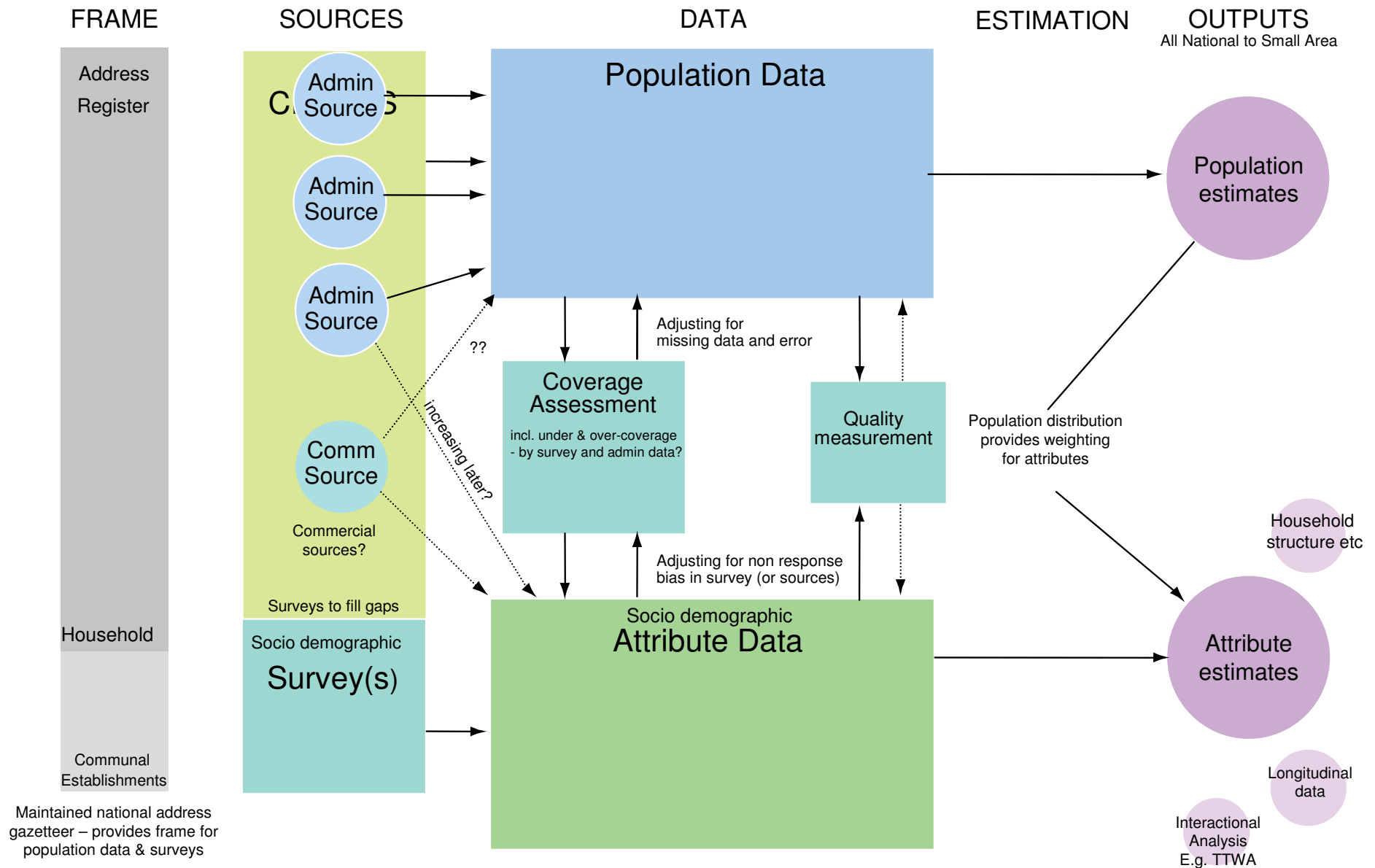
Short Form + Annual Survey (US model)

Administrative data options

Aggregate analysis

(Intermediate) Sample linkage e.g. 1% of postcodes

100% linkage to create 'statistical population spine'

Survey option(s)

Address register + Survey

Beyond 2011 – statistical options

FRAME | SOURCES | DATA | ESTIMATION | OUTPUTS
All National to Small Area

Address Register

Population Data

Admin Source

Admin Source

Admin Source

Comm Source

Commercial sources?

Surveys to fill gaps

??

increasing later?

Adjusting for missing data and error

Coverage Assessment

incl. under & over-coverage - by survey and admin data?

Quality measurement

Population estimates

Population distribution provides weighting for attributes

Household

Socio demographic **Survey(s)**

Adjusting for non response bias in survey (or sources)

Socio demographic **Attribute Data**

Attribute estimates

Household structure etc

Communal Establishments

Maintained national address gazetteer – provides frame for population data & surveys

Longitudinal data

Interactional Analysis E.g. TTWA

Potential data sources

- Population data
  - NHS Patient Register
  - DWP/HMRC Customer Information System
  - Electoral roll (> 18 yrs)
  - School Census (5-16 yrs)
  - Higher Education Statistics Agency data (Students)
  - Birth and Death registrations
  - DVLA?

- Socio-demographic sources
  - Surveys
  - DVLA?
  - Commercial sources?
  - Utilities?
  - TV licensing?

Updating Statistical Populations from Administrative Sources

Venn diagram of population sources

DVLA **HESA** **SC**

EBIS **PRD**

Excellent Population

ER

PRD

CIS

Missing includes:
Non-driving-licence holders
Non-registered university students
Some pre-school children
Independent school children
Non-university students
Unregistered patients
Undocumented asylum seekers

Extras includes:
Multiple registrations
Some deceased
Students on short-term courses
Short-term migrants deregistered
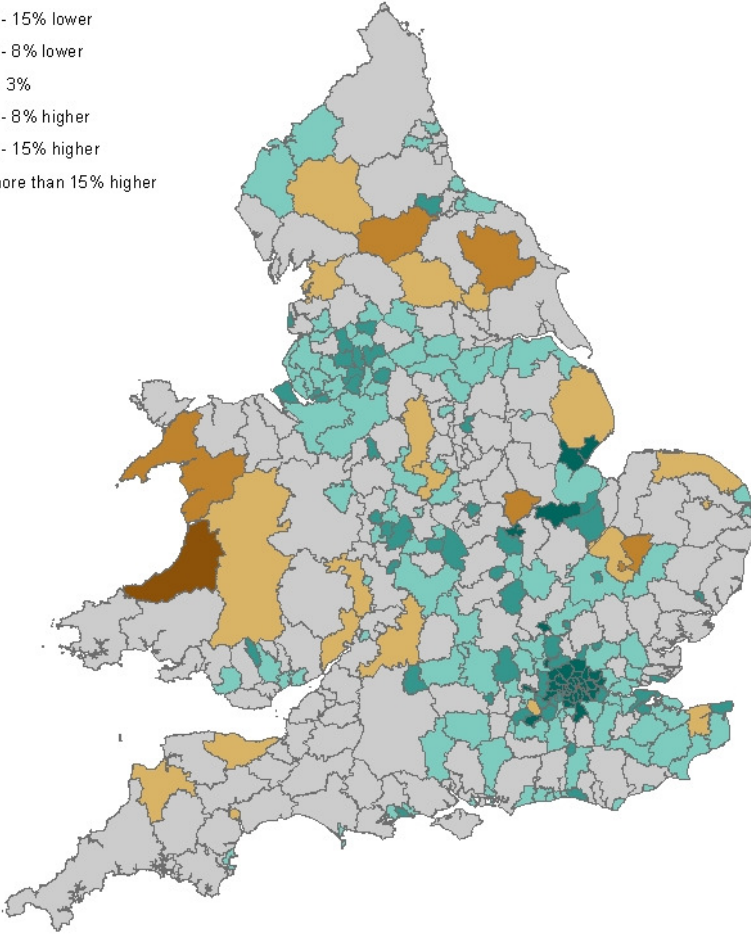
Comparing Administrative Data Sources

Differences between population counts from
the 2010 DWP CIS and ONS Mid Year Estimates 2010

N

Totals for all age groups

**Percentage Difference
(MYE is base)**

- CIS more than 15% lower
- CIS 8 - 15% lower
- CIS 3 - 8% lower
- Within 3%
- CIS 3 - 8% higher
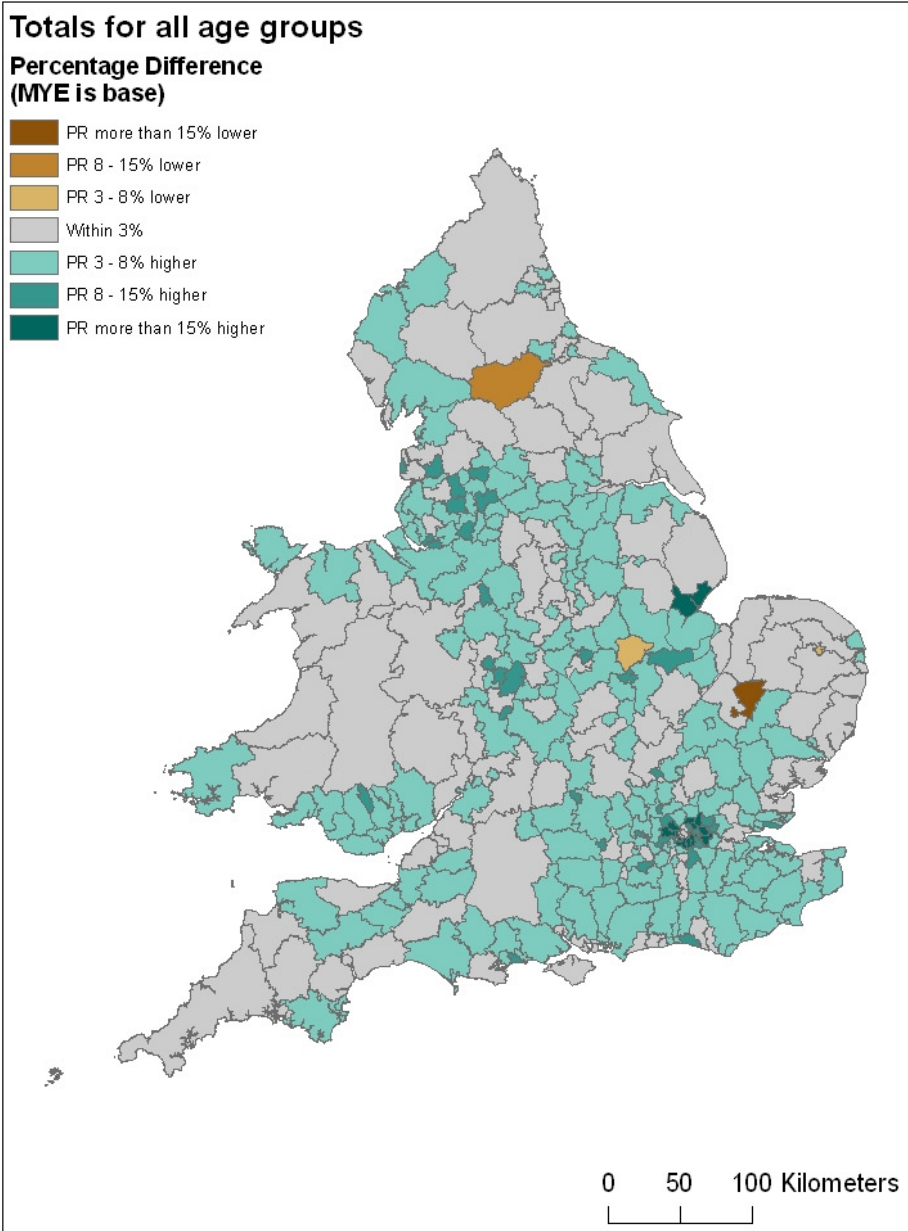- CIS 8 - 15% higher
- CIS more than 15% higher

0   50   100 Kilometers

DWP CIS population counts
compared with ONS Mid Year
population estimates

Comparing Administrative Data Sources

Differences between population counts from
the 2010 Patient Register and ONS Mid Year Estimates 2010

Totals for all age groups

**Percentage Difference
(MYE is base)**

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- PR 3 - 8% lower
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- PR 8 - 15% higher
- PR more than 15% higher

0   50   100 Kilometers

Patient Register population
counts compared with ONS Mid
Year population estimates

Comparing Administrative Data Sources

Differences between population counts from
the 2010 Electoral Roll and the Mid Year Estimates 2010

N

Totals for age groups 18 and over
**Percentage Difference
(MYE is base)**

- Electoral roll more than 15% lower
- Electoral roll 8 - 15% lower
- Electoral roll 3 - 8% lower
- Within 3%
- Electoral roll 3 - 8% higher
- Electoral roll 8 - 15% higher
- Electoral roll more than 15% higher

0   50   100 Kilometers
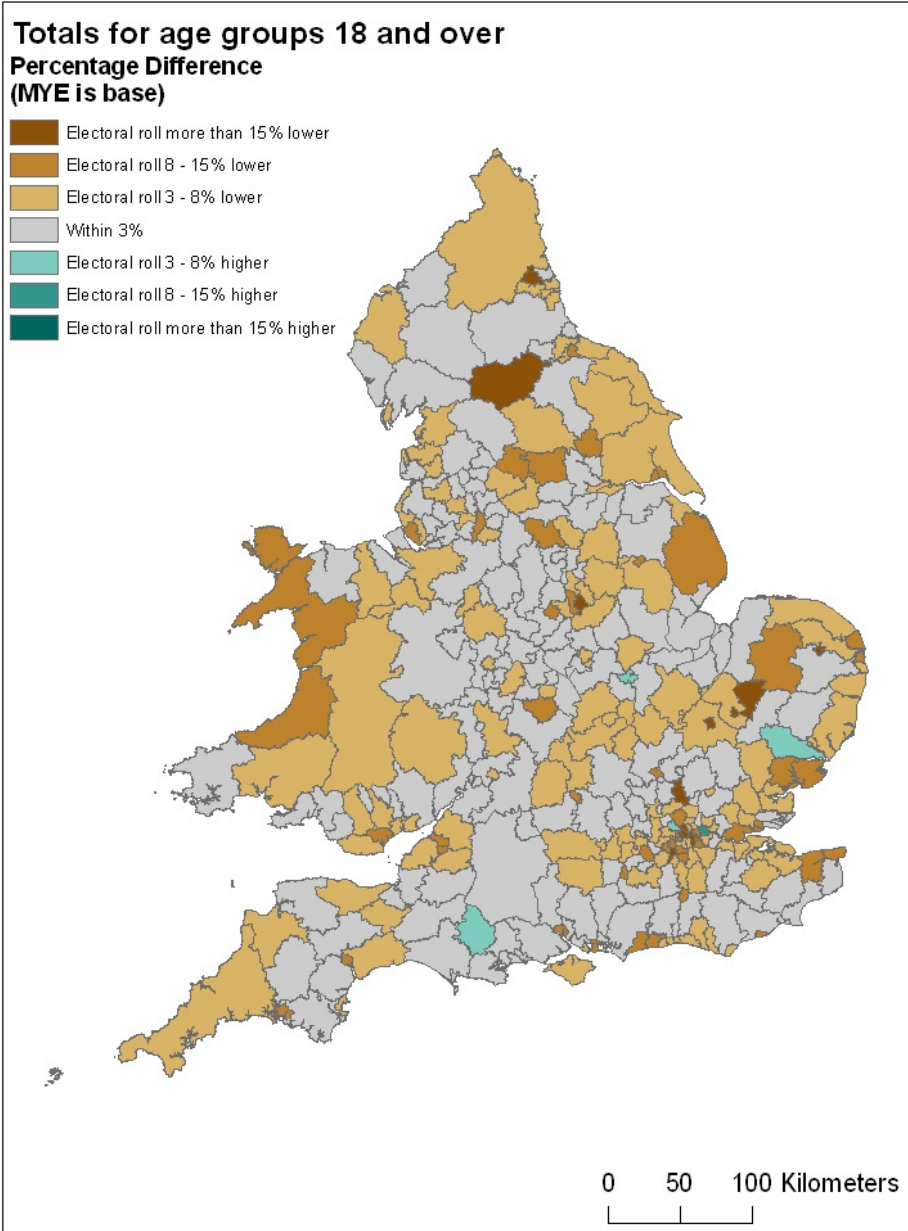
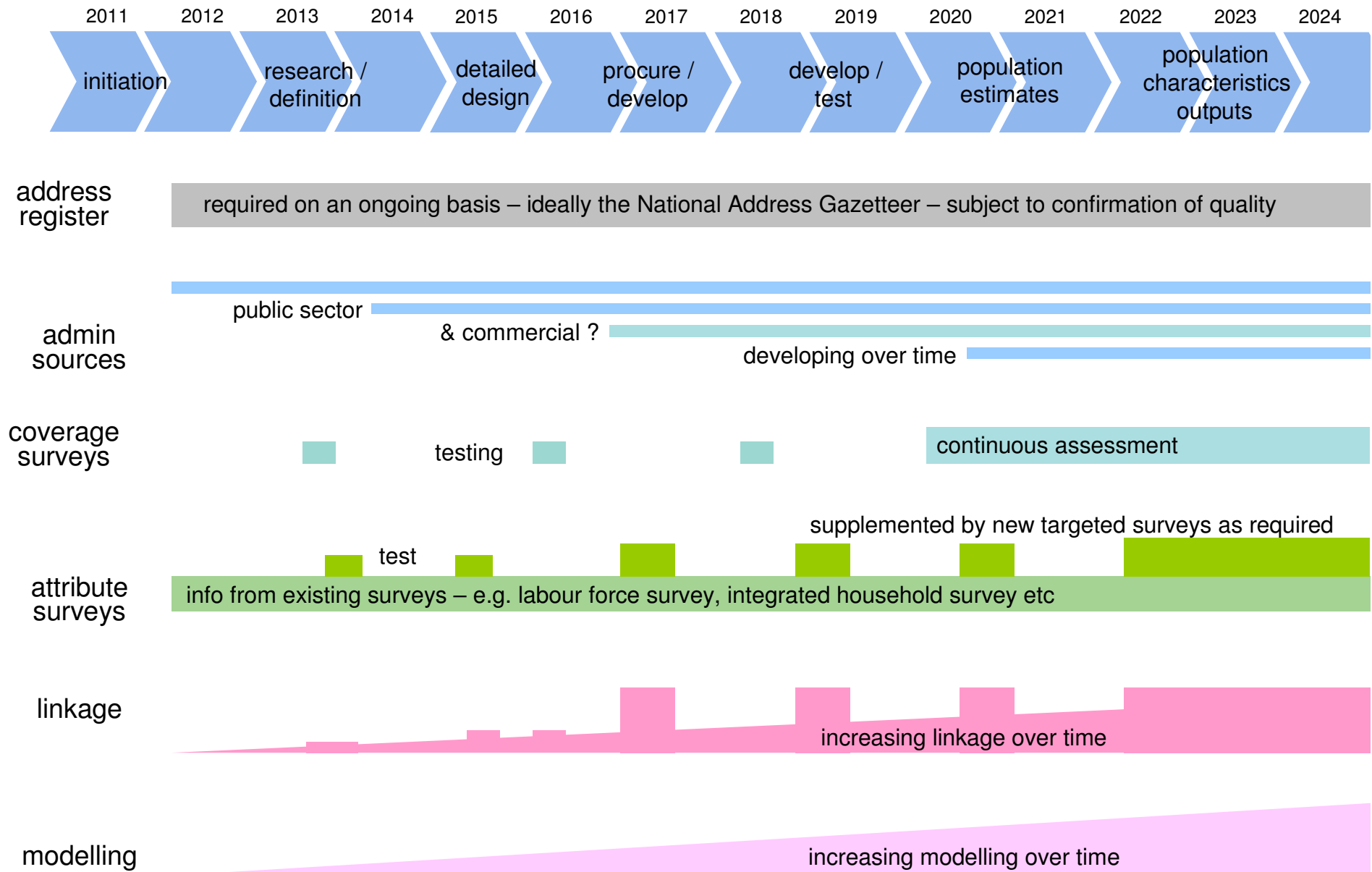Electoral Roll population counts
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Beyond 2011

Timeline — Plans and the Future
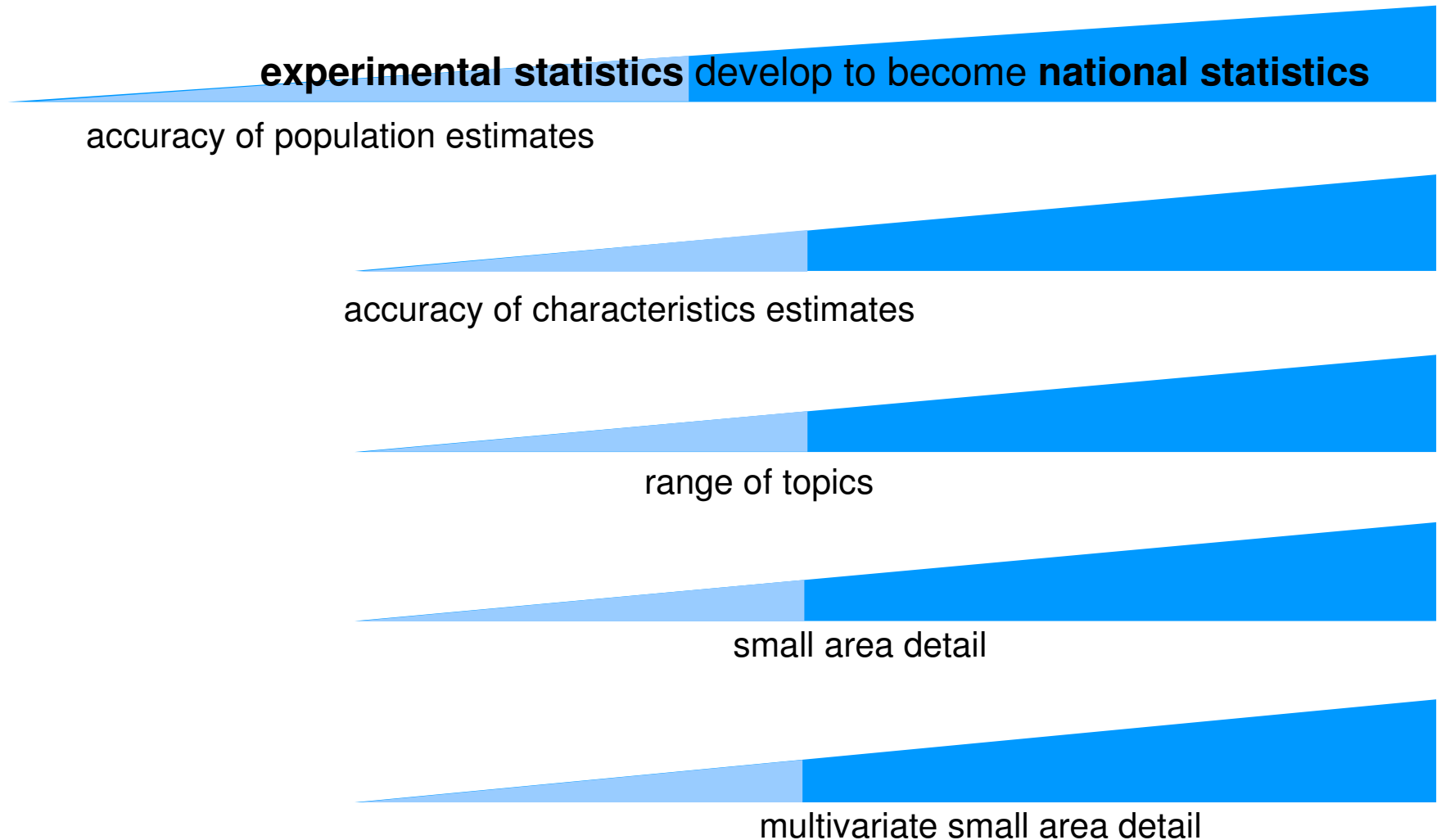
Beyond 2011 - Timeline (non census solution)

2011　2012　2013　2014　2015　2016　2017　2018　2019　2020　2021　2022　2023　2024

initiation

research / definition

detailed design

procure / develop

develop / test

population estimates

population characteristics outputs

address register

required on an ongoing basis – ideally the National Address Gazetteer – subject to confirmation of quality

admin sources

public sector

& commercial ?

developing over time

coverage surveys

testing

continuous assessment

attribute surveys

supplemented by new targeted surveys as required

test

info from existing surveys – e.g. labour force survey, integrated household survey etc

linkage

increasing linkage over time

modelling

increasing modelling over time

Beyond 2011 - and into the future

2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038

regular production of **population and attribute estimates**
ongoing methodology refinement

address register required on an ongoing basis

and be added & develop over time

administrative sources will change and disappear

continuous **coverage survey**

need for **attribute surveys** declines over time ?

existing surveys

increasing **linkage** over time

increasing **modelling** over time

Improving quality & quantity

2013 ⟶ 2021 ⟶ 2031

experimental statistics develop to become **national statistics**

accuracy of population estimates

accuracy of characteristics estimates

range of topics

small area detail

multivariate small area detail

Statistical benefit profile

Cost profile (real terms)

Census

???
Alternative
method

2011   2021   2031   2041
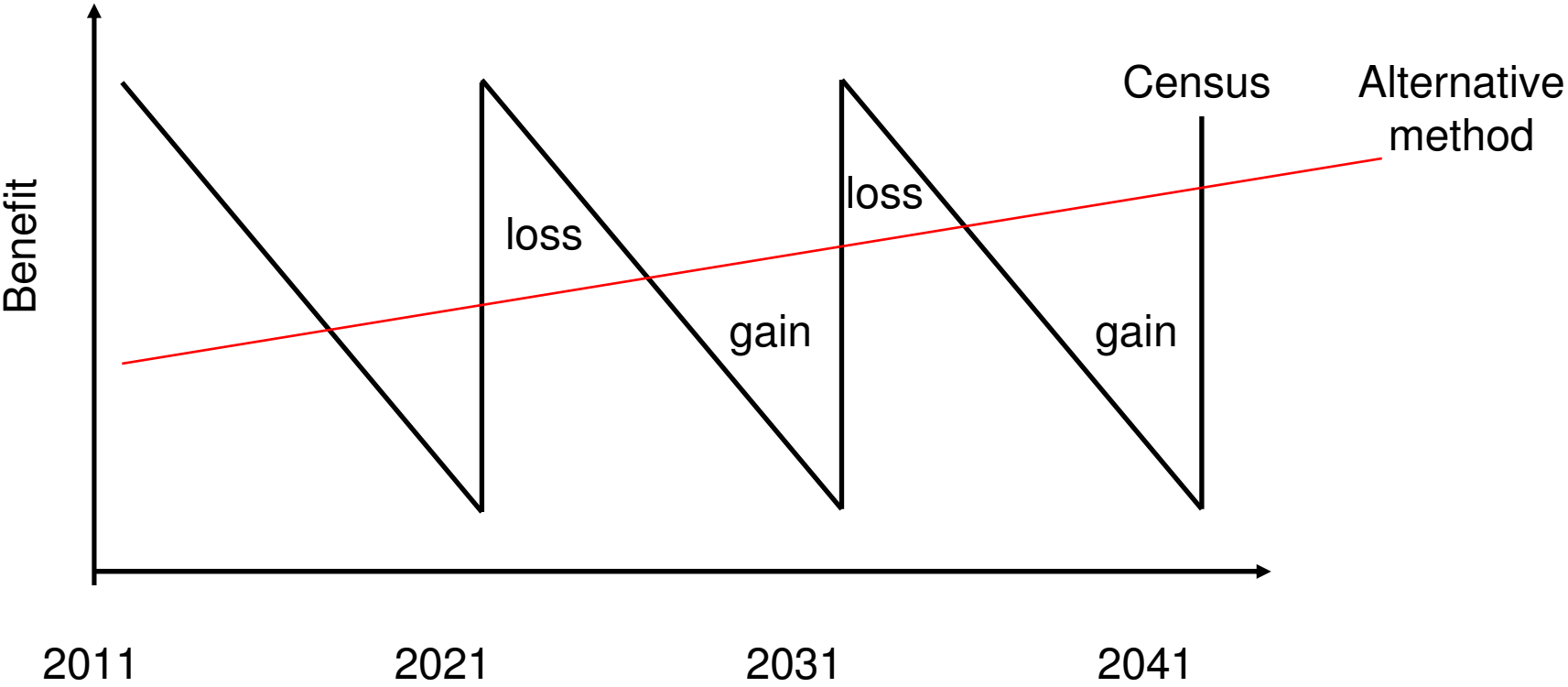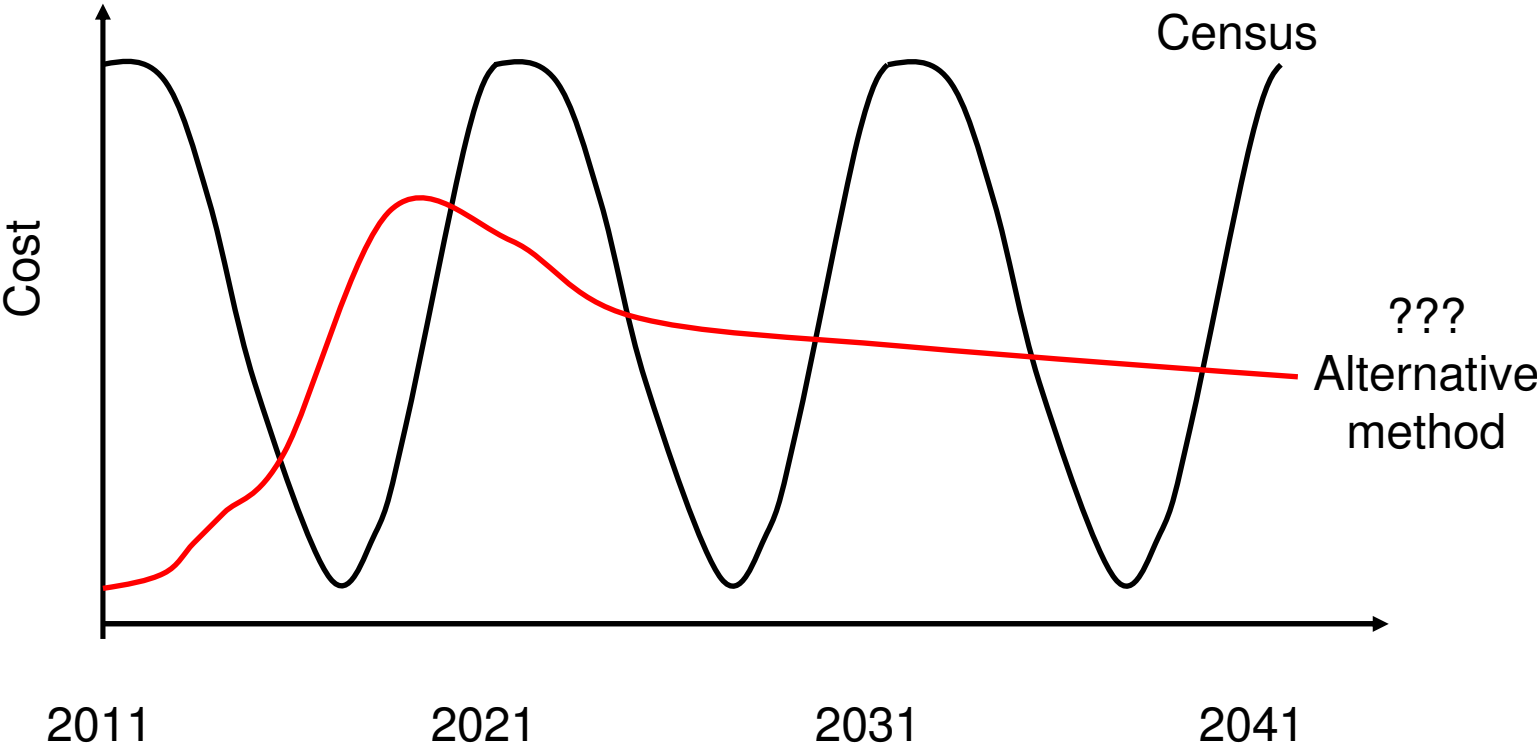
Beyond 2011

Research Plan

- Overview / Some early observations
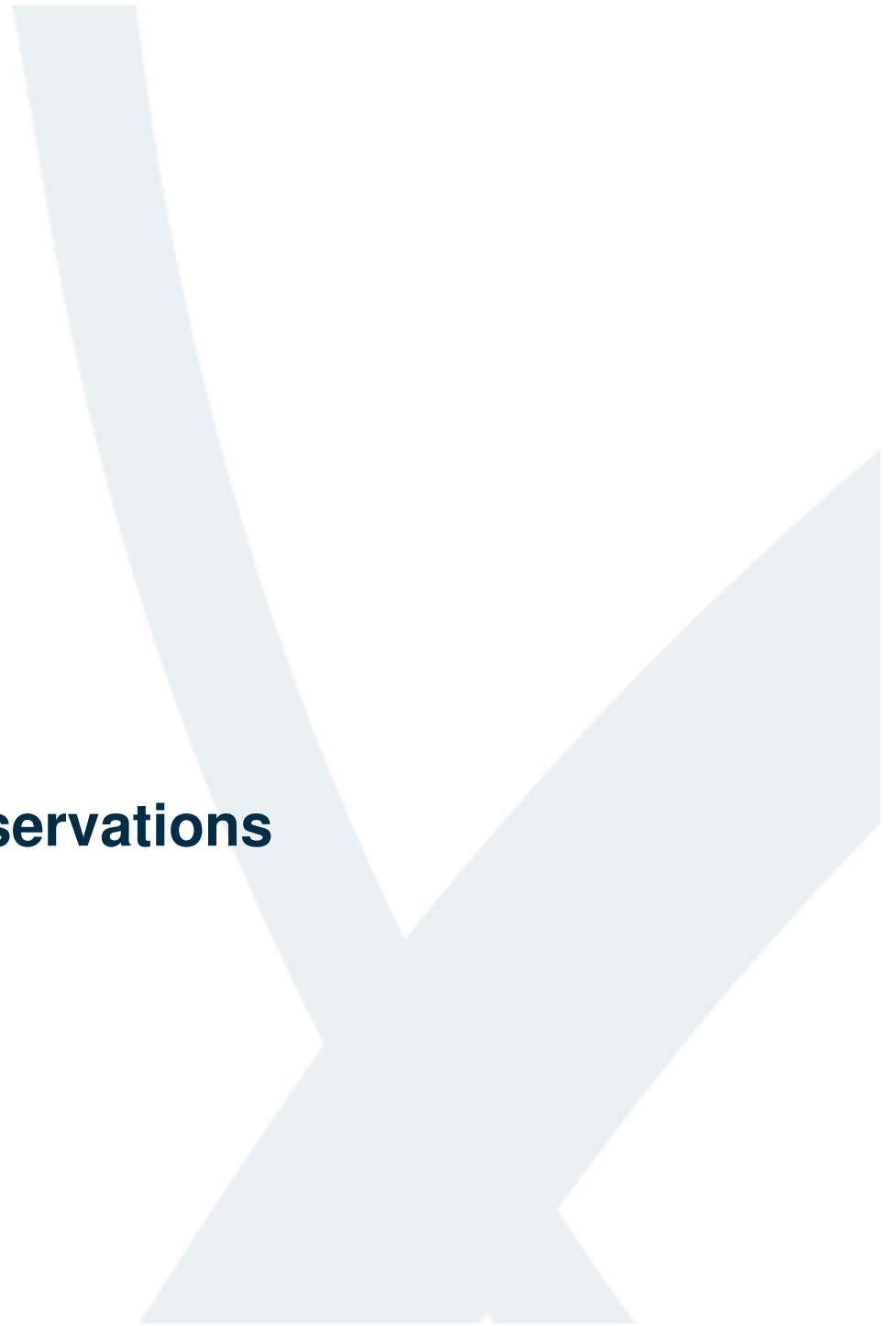
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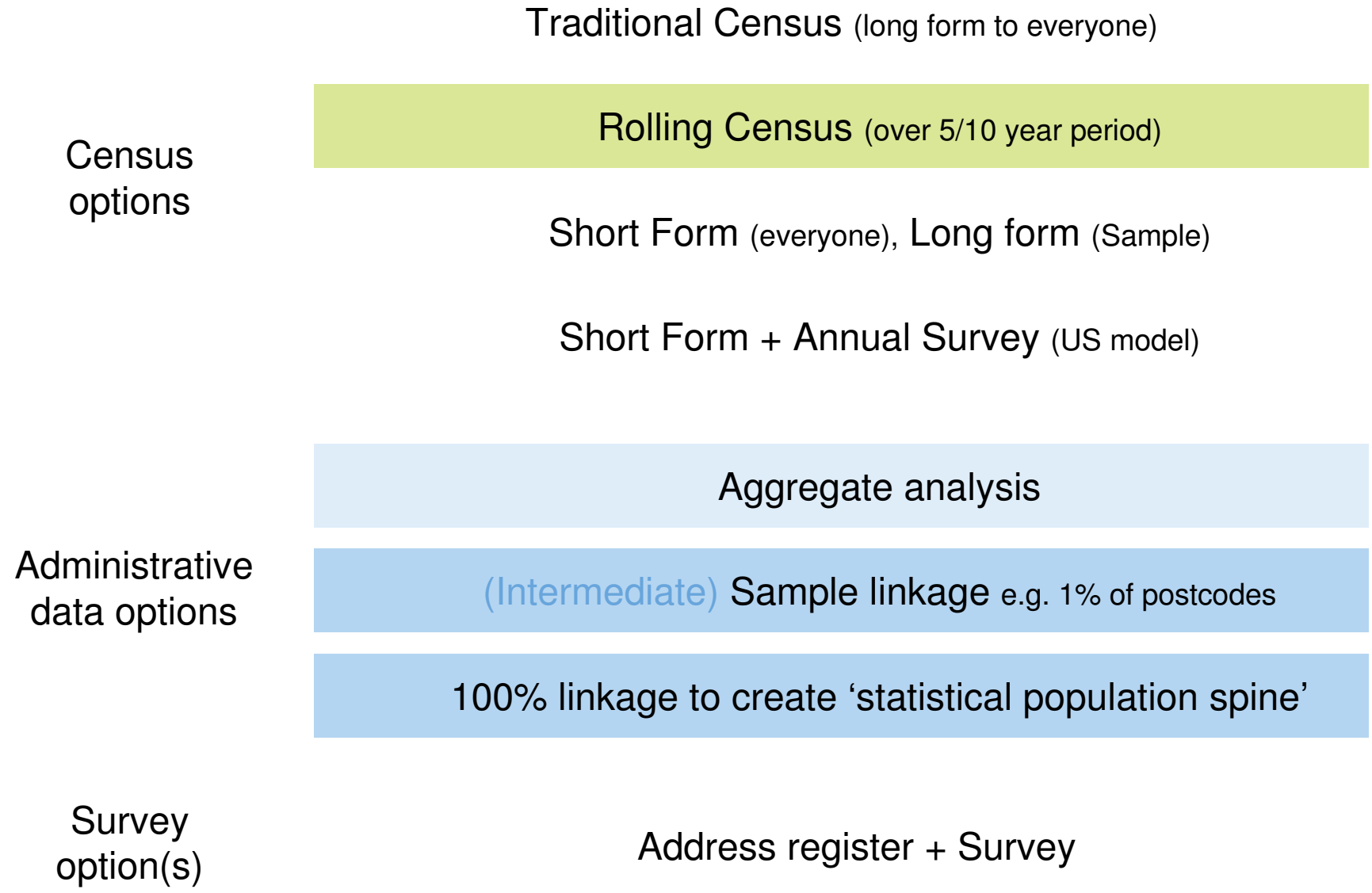
# Research and Testing Strategy - overview

- Regular trial estimates

- Key evaluation against 2011 Census results

- Use 2011 Census Coverage Survey (CCS) and administrative sources to test models

- Link 2001/2011 CCS to admin sources to produce trial population estimates

  Similar methodology to Census coverage adjustment

  Trial with a single administrative source – and add other sources incrementally to model to assess quality gains

- Assessing options for coverage survey and socio-demographic survey – field trials later

- Looking at all available sources – including commercial sources

- Discussion with stakeholders – incl debate on criteria

Criteria?

- **Cost** (both total cost and cost profile over time) & **benefit**

- Fitness for purpose i.e. ability to meet user requirements
  - Accuracy of the statistics produced
  - Frequency of the outputs e.g. updated annually, or every 5 or 10 years
  - Geographic level at which outputs can be produced e.g. local authorities, output areas
  - Consistency and comparability of the outputs across geographic areas

- Technical & legal feasibility

- Risk

- Public burden and public acceptability.

(eg. census accuracy)
ACCURACY

?
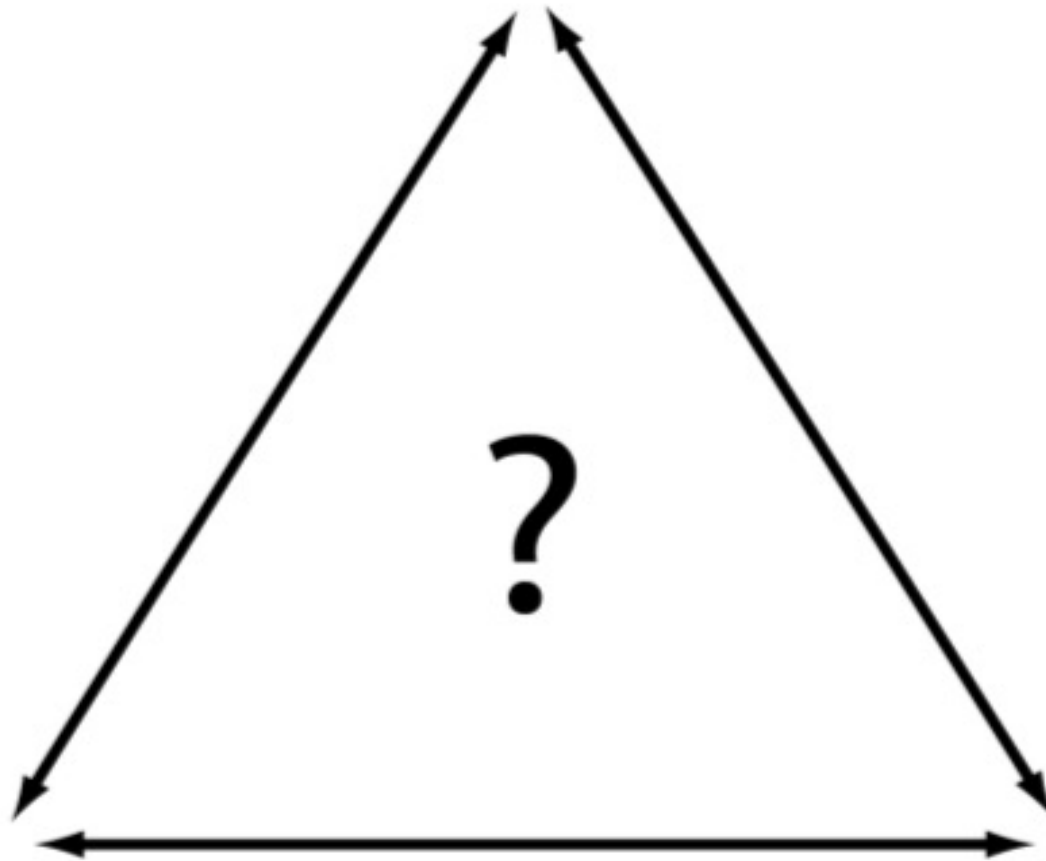
FREQUENCY
(eg. annually)

GEOGRAPHY
(eg. output areas)

Beyond 2011

Key risks and issues

What could possibly go wrong?

Key risks of non census alternatives

- ## Public opinion
  Public acceptability research, open consultation & transparency of approach

- ## Technical challenge – cutting edge & a big change
  Building high quality team, talking to experts and strong external assurance

- ## Changes in administrative datasets
  Building resilient solutions – but may need legislation

- ## Ensuring decision making – getting political buy-in
  This is a big decision – needs real commitment

- ## Devolved issues / harmonisation of UK outputs
  Establishment of UK Beyond 2011 Committee + NS / RGs agreement

Programme Principles

- Open, innovative, high quality research

- Ongoing dialogue with users and other stakeholders

- Clear, published criteria – refined over time

- Iterative assessment of options and business case

- Extensive independent assurance

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