



Interim report on case study research into the electoral registers in Great Britain

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Translations and other formats

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1 Introduction

1.1 Electoral registration is the bedrock of the democratic process and so it is vital that electoral registers are as complete and accurate as possible. The Electoral Commission encourages people to register to vote and sets standards for well-run electoral registration services; this is to ensure that all those who are eligible to be on the electoral register are accurately registered, and those who are not eligible to vote are not found on the register.

1.2 This interim report reviews the latest findings from our ongoing research into the electoral registers in Great Britain. The research focuses on eight detailed local authority case studies and has been designed to build directly on our previous research on the registers, which dates back to 2004. The report does not include research on the registers in Northern Ireland. Northern Ireland has a system of individual electoral registration (IER), which differs from the household registration system currently operating in Great Britain.¹

1.3 The key definitions we use are presented in the box below:

Definitions of completeness and accuracy

Completeness: every person who is entitled to have an entry in an electoral register is registered

Accuracy: there are no false entries in an electoral register²

1.4 The research study on local authority registers was divided into two phases and focused on the following areas:

- Derby
- Glasgow City
- Hambleton
- Knowsley
- Lambeth
- South Ayrshire
- Swansea
- West Somerset

1.5 This report summarises the key interim findings, which are drawn from the first phase of the research. The findings from both phases will be presented in a final report in 2010. The main body of this report is divided into three sections:

¹ Reports on the comprehensiveness and accuracy of the registers in Northern Ireland are available on our website at www.electoralcommission.org.uk/publications-and-research. (The term 'comprehensiveness' is used in the place of 'completeness' in Northern Ireland reports.)

² Our definition of accuracy excludes minor errors, such as the misspelling of an elector's name, which would not prevent an elector from being able to vote.

- our approach to the local case studies
- a summary of our interim findings
- an outline of the next steps for research

1.6 The appendix to the report summarises the objectives of our wider programme of research into electoral registers, provides an overview of recent changes in electoral law, and presents a more detailed discussion of the methods used to undertake the case studies.

2 Local case studies: our approach

2.1 Research into the completeness and accuracy of electoral registers in Great Britain is complicated by a variety of factors. These include the lack of statistics relating to the size of the eligible voting population; the use of a system of household registration without personal identifiers; and the localised nature of electoral registration, with no single national electoral register and no straightforward means of searching all of the registers simultaneously. It is also important to note that the registers are something of a 'moving target', since population movement will continually serve to compromise the completeness and accuracy of the registers in the period after an annual canvass.

2.2 To overcome some of these difficulties, our approach to the local case studies has been based on a combination of established methods and the piloting of a range of new techniques. This has involved data-mining of each of the local authority registers plus random house-to-house surveys. The fieldwork for the local case study research was undertaken by Ipsos MORI on our behalf and represents a significant step forward in producing insights into the completeness and accuracy of the registers.

2.3 As noted in section one, the case study research was carried out in two phases. This report reviews phase one, which consisted of two main elements: a data-mining exercise on the registers of eight local authorities and a house-to-house survey in Knowsley (one of the local authority case study areas). We also conducted interviews with electoral administrators in the eight areas and have begun a review of the literature on electoral register research. Phase two of the research consists of house-to-house surveys in the remaining seven local authority areas.

Local authority case studies

2.4 The eight case study areas were selected to ensure a geographic spread across England, Scotland and Wales, containing a mixture of local authority types, including urban and rural areas, and localities with varying levels of social deprivation and contrasts in the proportion of the population drawn from black and minority ethnic groups. Table 1 provides a summary of some of their key demographic and social characteristics.

2.5 Once the eight areas had been selected, data-mining of their registers was carried out. This involved checking the registers for visible, potential anomalies. A number of house-to-house interviews were then undertaken in each local authority in order to check whether apparent anomalies were an indicator of an inaccuracy on the register. Our approach to data-mining was partly experimental, with the primary objective being to evaluate the usefulness of the approach – either as a tool which electoral registration administrators might deploy to improve the accuracy of a local register, or as a technique to be used by researchers to help estimate the accuracy of a local register.

2.6 A house-to-house survey was also undertaken in Knowsley, which was designed to produce estimates of completeness and accuracy of the local register. This entailed drawing a random, preselected sample which was subsequently used to approach interviewees. The Knowsley survey also operated as a pilot for phase two of the research.

Literature review

2.7 The literature review covered both the national and international experience of electoral registration and provides context and support to the findings from the case study research.

Table 1: Overview of the case study areas

Local authority	Country/ region	Authority type	Population	Population density*	Black and minority ethnic population **	Worklessness ***
Derby	East Midlands	Unitary	221,708	28.4	15.6	16
Glasgow City	Scotland	City council	584,240	32.9	5.5	20
Hambleton	Yorkshire & the Humber	District council	84,111	0.6	2.0	8
Knowsley	North West	Metropolitan borough	150,459	17.4	2.7	27
Lambeth	London	London borough	266,169	99.2	50.4	16
South Ayrshire	Scotland	Unitary	111,670	0.9	<1	13
Swansea	Wales	Unitary	223,301	5.9	4.3	19
West Somerset	South West	District council	35,075	0.5	2.5	14

Notes:

* Persons per hectare (2001).

** Percentage of population not describing themselves as 'white British' (2001) – this definition of 'ethnic minority' therefore includes 'white Irish' and generally negligible numbers of 'white European', 'white Australasian' and so on.

*** Percentage of working age population receiving a key benefit (2007).

Sources: Neighbourhood Statistics, Scottish Neighbourhood Statistics, General Register Office for Scotland.

3 Summary of interim findings

3.1 Existing research on the quality of electoral registers primarily relates to the completeness of the registers and points to a number of key patterns and trends in under-registration. This section uses existing evidence to present a variety of headline indicators on the state of the registers at a national level. This section also reviews findings derived from the first phase of the local case studies research. These offer important insights into the scope to identify and redress specific inaccuracies in electoral registers, as well as the most effective means of estimating the overall accuracy of the registers.

The state of the registers: headline indicators

3.2 Existing published literature and data sources offer sufficient evidence to identify a number of patterns in relation to the completeness of the electoral registers. In particular:

- Most recent estimates of non-registration point in the same direction: existing approaches suggest an average national rate of under-registration of around 7–10% (there are likely to be local outliers significantly above and below this average).
- Registration rates fluctuate over time, albeit with evidence of gradual overall decline over a period of several decades.
- Non-registration is especially prevalent in metropolitan areas, among specific black and minority ethnic groups and mobile young people living in rented accommodation.
- The largest concentration of under-registered voters is in Greater London. There are also likely to be other areas where under-registration is concentrated.
- The completeness and accuracy of a register will naturally decline between annual canvasses due to demographic change and population movement.

3.3 There is also evidence to suggest that registration levels in Great Britain are broadly in line with the rates achieved in other Organisation for Economic Co-operation and Development (OECD) countries operating similar systems of voter registration. As Table 2 highlights, in the countries for which data are readily available, registration rates typically vary between 90 and 95% (although rates in the USA are significantly lower). Even Australia, which operates a system of compulsory voting, has not managed to achieve universal registration.

Table 2: Estimates of electoral registration rates in six OECD countries (Percentage of eligible electors registered)³

Country	Year	Rate %
England and Wales	2000	91.0
Canada	2000	93.1
New Zealand	2000	91.5
France	2001	90.0
Australia	2002	95.1
USA	2002	66.5

Note: These figures should be taken as being for broad comparison only. Variations in the years for which the estimates apply (especially their timing relative to UK Parliamentary general elections and in the methods used to calculate them) mean that direct comparison is inappropriate. While there are more up-to-date figures for some of the countries listed above, the dates nearest to 2000–2 have been shown for comparative purposes.

3.4 Far less evidence is available about the accuracy of the registers. While previous research has identified a relatively small proportion of register entries containing minor errors, such as misspelled names or slight errors in the recording of addresses, there is no current estimate available of the extent to which the registers contain false entries.

Local case studies: initial findings

3.5 The phase one findings comprise complete results for the data-mining exercise across all eight case study areas, as well as results for the house-to-house survey in Knowsley. The findings relating to the house-to-house surveys in the remaining seven case studies areas will only be available once the analysis of phase two has been completed. It is also important to note that estimates for completeness and accuracy are likely to vary according to the point in a register's lifetime at which a survey is undertaken, owing to electors moving home and not registering between canvass periods (while it is possible for electors to re-register between canvasses through rolling registration, not all electors will do this).⁴

³ J.H. Black, *From Enumeration to a National Register of Electors: An Account and an Evaluation Choices*, 9 (7) (2003), pp. 3–46; Electoral Commission, *Understanding electoral registration: the extent and nature of non-registration in Britain* (2005); Joint Standing Committee on Electoral Matters *Review of ANAO Report No. 42 2001-02, Integrity of the Electoral Roll*. Canberra: Joint Standing Committee on Electoral Matters (2002); J.L.P.K. Schon, Determinants of electoral non-registrations and sensitive neighbourhoods in France, *Population*, 59 (1) (2004), pp. 147–60; www.elections.org.nz; www.census.gov.

⁴ Further gaps or inaccuracies on the register can result from other external influences outside the control of the Electoral Registration Officer. These include the absence of new residential addresses from existing local databases, or unintentional errors made by the head of household when completing the registration form (see Appendix A for further discussion). When electors are registered during the annual canvass period, the details on the published register are **legally** accurate (meaning that they are legally permissible for the lifespan of that

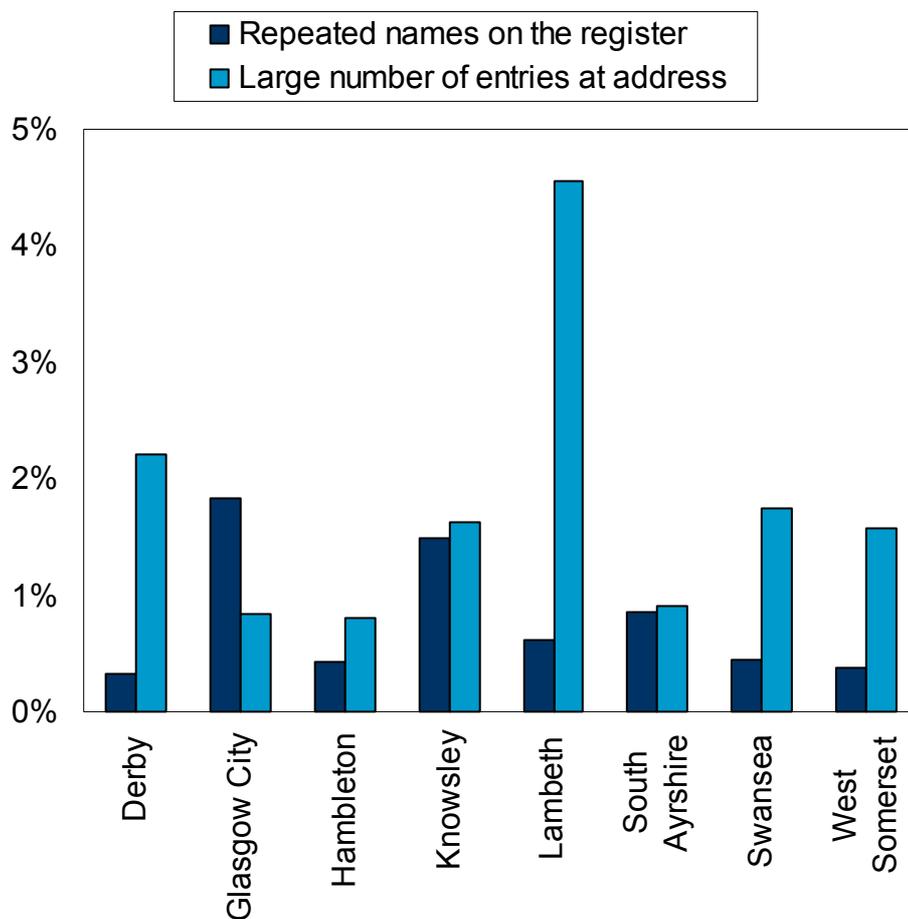
Data-mining and anomalies

3.6 The data-mining exercise was based on using automated techniques to identify anomalies on the registers, with follow-up interviews used to investigate the anomalies and to estimate the proportion of these that represent inaccuracies. In this sense, an anomaly is a register entry that is 'under suspicion' of being inaccurate, but which requires an interview at the property in order to determine whether the anomaly is indeed an inaccurate register entry. It is also crucial to underline that data-mining can only be used to identify particular types of anomaly and inaccuracy, since it is based on the use of automated computer 'look ups'. For instance, if a name appears twice at the same address with a slightly different spelling, it will not be identified as a duplicate, nor will inaccuracies arising from population movement generally be picked up by this approach.

3.7 The most common anomalies identified through data-mining were the duplication of names and the inclusion of an unusually large number of people in a household, compared to the average for that postcode (as set out in the appendix). By far the most frequent anomaly identified was an above average number of entries at an address, with this type of anomaly being almost twice as common as duplicate names. Other types of anomaly identified by the data-mining process, such as those relating to dates of birth or nationality, were minimal and could effectively be disregarded. The approach also identified variations in the extent to which local registers contain anomalies. Figure 1 illustrates the incidence of repeated names and above average number of entries per household in each local authority area as a proportion of their register.

register). However, the actual accuracy of the register tends to diminish between canvass periods due to population movement, deaths, name changes, etc.

Figure 1: Repeated names on the electoral registers and large number of entries at one address as a proportion of the registers



Base: 1,301,893 entries across the eight local authority registers.

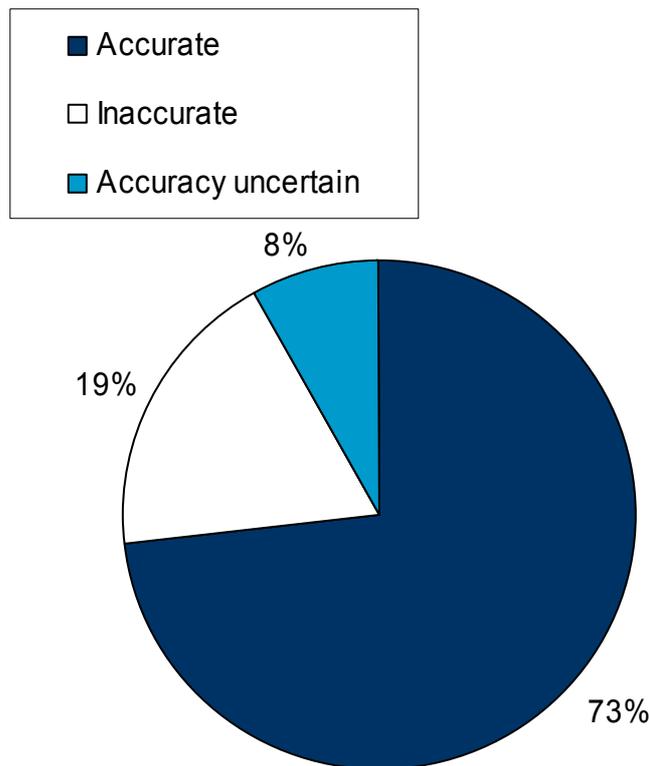
Note: There may be crossover between the two types of anomalies identified. This means that in some instances the same entry may be included in both repeated name anomalies and large number of entries at address anomalies.

3.8 As Figure 1 shows, Lambeth's register had the highest rate of an above average number of entries (compared to the postcode average) per household: at 4.6%, over twice the rate in Derby, Swansea and Knowsley and three to six times the rate in the remaining four areas. It is not surprising that Lambeth should exhibit this pattern. As an inner-London borough, Lambeth has a significantly higher proportion of single-person households (40%, compared to an average in England of 30%), as well as a slightly higher proportion of very large households (three per cent of Lambeth households have six people or more, compared to two per cent nationally). There are also clear variations in repeated names as an anomaly on the local registers. Repeated names are more frequent in Glasgow and Knowsley (1.8% and 1.5% of the register respectively) than in the other case study areas.

3.9 Since these anomalies represent only **potential** inaccuracies these outputs from the data-mining exercise are best interpreted as offering an

indication of which parts of the register may contain inaccuracies. This was then tested through follow-up interviews, using a small sample drawn from the anomalous cases identified. In total, 610 interviews were conducted across the eight case study areas, comprising 266 cases of duplicate or triplicate names (requiring more than one interview to be conducted where repeated names were in different households) and 237 cases where the number of entries per household was three or more above the average for the postcode area.⁵ Figures 2 and 3 illustrate the findings from our follow-up interviews.

Figure 2: Proportion of repeated name anomalies on the registers that were found to be accurate or inaccurate

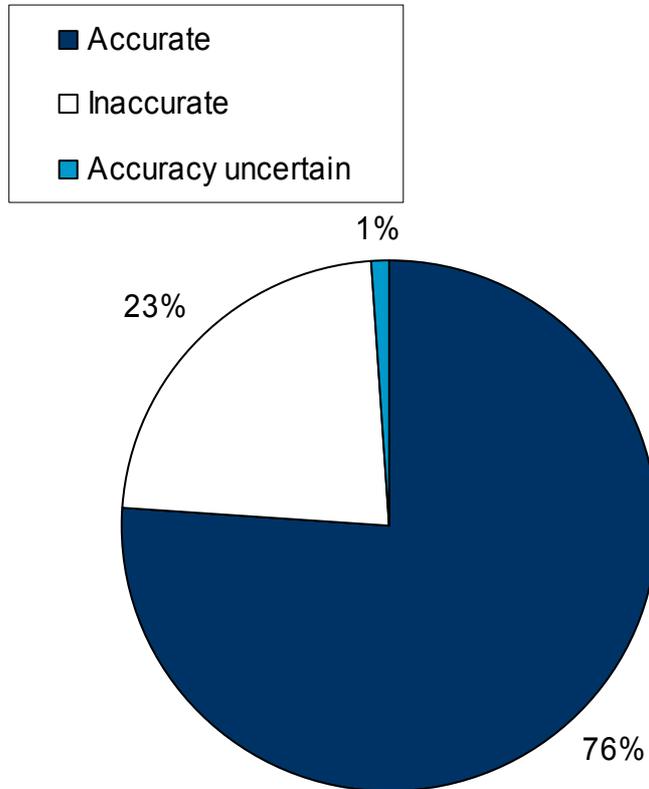


Base: 1,020 anomalous repeated name entries.

Note: This chart does not represent the accuracy rate for the registers as a whole. It sets out the proportion of repeated name anomalies that were found to be accurate or inaccurate entries.

⁵ For the most part, a 'case' is a single address, however please note that where the 'case' is a duplicate covering two or more separate addresses, a 'case' will encompass more than one household or address.

Figure 3: Proportion of register entries at those households with an above average number of names that were found to be accurate or inaccurate



Base: 1,399 anomalous entries at those households with an above average number of names.

Note: This chart does not represent the accuracy rate for the registers as a whole. It sets out the proportion of entries in those households with an above average number of names that were found to be accurate or inaccurate.

3.10 The results of the follow-up interviews indicate that a clear majority of the anomalous register entries are, in fact, valid. Based on these interviews, it can be estimated that 19% of repeated names found on the registers are inaccurate, while the rate of inaccuracy was 23% among register entries in households with an above average number of names (see Figures 2 and 3). However, it is also significant that the results of the data-mining exercise indicate that close to 50% of the cases examined (i.e. a duplicate or triplicate name or a household with more names than average) are likely to contain at least one inaccuracy.

3.11 However, data-mining cannot be used to estimate levels of inaccuracy in the registers as a whole as it would seriously underestimate the proportion of entries which are inaccurate. Table 3 underlines that data-mining techniques are typically likely to identify inaccuracies in just 0.2–0.6% of register entries, although the figure rises to two per cent in the case of Lambeth, an inner-London borough.

Table 3: Estimated inaccuracies on the registers identified via data-mining, by case study area

	Total entries on the electoral register	Estimated inaccurate entries identified (number)*	Estimated inaccurate entries identified (%)*
Derby	176,334	1,130	0.6
Glasgow City	433,710	2,093	0.5
Hambleton	70,165	129	0.2
Knowsley	111,772	455	0.4
Lambeth	207,326	4,214	2.0
South Ayrshire	90,634	522	0.6
Swansea	183,926	1,015	0.6
West Somerset	28,026	148	0.5
Total/average	1,301,893	9,706	0.7

Note:* These are estimates of the extent to which false entries would be identified on the register if all anomalies were followed up. The consistency of the results across the case study areas (with the exception of the London Borough of Lambeth) is striking.

3.12 The data-mining process may have a potentially useful role to play in maintaining the accuracy of the electoral registers. The technique could provide electoral registration administrators with an effective tool for identifying specific problems with the registers, including duplicate entries arising from administrative errors, or deliberate attempts to register large numbers of false electors at individual addresses. In the latter scenario, **the potential for data-mining techniques to be used as a tool for identifying whether false entries are an attempt to perpetrate electoral fraud is worthy of further examination.**

Knowsley house-to-house survey

3.13 The Knowsley house-to-house survey achieved a response rate of over 67.4%, with the result that the target of 350 interviews from a sample of 700 was easily exceeded. In total, interviews were carried out at 449 addresses, resulting in data being collected for a total of 963 registered electors (with a further 40 register entries recorded at properties reported to be vacant or derelict). Using this base of approximately 1,000 Knowsley electors, the following headline figures were derived for completeness and accuracy among those found to be eligible to vote:

- **Completeness:** among the eligible population, the survey found that 93.6% of those surveyed appeared on the electoral register – a figure broadly in line with available national estimates. **Registration levels were found to be significantly higher among those aged 20 and over, and among interviewees who had lived at an address for at least two years and who live in properties which are owner-occupied.**
- **Accuracy:** 91.4% of register entries were confirmed as being accurate. **The great majority of inaccurate entries represented cases where electors are registered at addresses at which they are no longer living, or less commonly, have never been resident.** Inaccuracies arising from incorrect information being entered in relation to nationality or date of birth are negligible.

3.14 It is important to note that **the Knowsley results cannot be regarded as an indicator, or even a proxy, of the completeness or the accuracy of electoral registers nationally.** While there are initial grounds for regarding the findings of the Knowsley survey as a reasonable estimate of completeness in a local authority of this type, it is only once the full set of results are available that further commentary may be made in relation to the results of the house-to-house surveys.

4 Next steps

4.1 The state of the electoral registers had, until recently, been neglected as an area of research. However, much is known, or can be established, about the completeness of Great Britain's electoral registers and about the groups most likely to be absent from the registers. There is, by contrast, little or no existing evidence about the overall accuracy of the registers and relatively little understanding of what could be done to identify and eliminate inaccuracies.

4.2 The results of phase one of the case study research are encouraging in that they may provide a basis for the development of techniques that could be implemented locally by electoral registration administrators to tackle some forms of false entries on the electoral register. Meanwhile, phase two of the case study research will provide a clearer indication of the extent to which the registers contain inaccuracies. Looking beyond the case studies, our wider programme of research should also offer significant scope to derive more robust national estimates of completeness. It is anticipated that these estimates will be derived initially from the British Election Survey of 2010 and, subsequently, via the 2011 Census of Population.

4.3 Our final report on the current programme of research into the registers will be published in 2010. It will review in more detail existing evidence about the state of the registers, as well as presenting a more detailed account of the completeness and accuracy of the registers in all eight case study areas, including the views and activities of electoral registration administrators in these local authorities.

Appendix A – Background on research project and approach

Overview of current research into the electoral registers

1. Our current research into the electoral registers of Great Britain is being undertaken by a team of researchers from the Electoral Commission, Ipsos MORI and the University of Liverpool. We are also seeking to build strong relationships with a range of external stakeholders with an interest in electoral registration. The principal aims of the research programme are to:

- provide an overview of the completeness and accuracy of Great Britain's electoral registers
- inform our guidance for Electoral Registration Officers, based on an assessment of good practice across the country
- assist with the identification of types of authorities whose registers need to be improved, in order to complement our performance standards work
- provide up-to-date information on those groups that are more likely to be under-registered and thereby inform our approach to campaigns and public awareness material
- provide ongoing tracking of how electoral registers change in response to legislative developments, administrative change or population change

2. We have reviewed these aims in light of the likely research requirements arising from the Political Parties and Elections Act 2009 (PPEA). Our view is that these aims largely encompass the individual electoral registration (IER) reporting requirements, but that the research programme will also need to:

- review methods that are appropriate for measuring the impact of the introduction of IER, in line with the reporting requirements defined in the legislation
- establish an approach to assessing the take up of identifiers and how the public respond to IER
- review which groups may be more likely to be missing from the register following a permanent move to IER

3. The current work plan, which covers the period from early 2009 to early 2010, consists of three principal strands of research activity:

- A comprehensive review of existing published research on the electoral registers, summarising what is and what is not known about the state of Great Britain's electoral registers. The review considers historical developments and trends in electoral registration, examines what lessons can be drawn from international comparisons, highlights neglected areas of research, and summarises the methodological issues involved in researching the electoral registers. It also makes recommendations for future research.

- A review of existing data sources, which considers the full range of options for making use of these data sources to derive measures of completeness and accuracy, as well as wider baseline indicators appropriate for assessing the voluntary roll-out of IER. The options for future research into the registers will largely be derived from this analysis, as well as the recommendations contained in the literature review.
- Eight local case studies of completeness and accuracy across a mix of urban and rural areas in England, Wales and Scotland, using data-mining techniques, door-to-door surveys and interviews with electoral registration administrators.

4. The local case studies form a particularly significant element of the current research programme. In particular, the combined use of data-mining and survey techniques represents a potentially important methodological innovation for identifying types and levels of inaccuracy in the electoral registers. At the same time, the current programme of work will also have a strong bearing on the scope to produce robust national estimates of completeness of the registers from 2010 onwards. In particular, we are working closely with the Office for National Statistics to ensure that the 2011 Census can be used to provide the best possible national estimates of the completeness of the registers.

Why are we carrying out this research?

5. The importance of our objective of complete and accurate electoral registers has been underlined by a number of recent developments in this area. Since 2000, a series of changes in electoral law have impacted on long-established registration practices. These changes have served to increase the importance of electoral registration as a policy issue and have highlighted the need for new research. Of particular significance are the following Acts of Parliament:

- The Representation of the People Act (RPA 2000) introduced provisions for rolling registration to supplement the annual canvass of electors, thus enabling eligible electors to register outside of the canvass period.
- The Electoral Fraud (Northern Ireland) Act 2002 replaced the system of household registration with individual electoral registration in Northern Ireland, in response to concerns about potential fraud.
- The Electoral Administration Act 2006 (EAA) established a duty on Electoral Registration Officers to take specific steps to ensure all eligible electors are registered.
- PPEA introduced provisions for IER to be introduced in Great Britain.

6. Much of this legislative change is a direct response to concerns about both completeness and accuracy. The specific provisions in the RPA 2000 and EAA highlighted above reflect long-standing evidence of under-registration. Available estimates suggest that several million eligible voters may be unregistered, with young people, specific black and minority ethnic

groups and those on low incomes being disproportionately affected.⁶ Since the electoral registers are compiled and maintained locally, the socio-demographic factors influencing registration levels are also recognised to result in significant local variations in the completeness of registers. These patterns may be partially reinforced, or counteracted, by the different practices adopted by local authorities and the level of resource they devote to the task.

7. At the same time, the provisions introduced by the EAA reflect more recent concerns about over-registration, whereby some local registers may be inflated through the inclusion of entries that represent redundant names or, more worryingly, ineligible, duplicate or even fictitious voters. The latter has become a high-profile issue as a result of proven, albeit isolated, cases of 'roll stuffing', whereby illegitimate names, such as bogus or deceased persons, have been added to registers in order to commit electoral fraud.⁷ Again, the extent to which over-registration is a serious concern will vary significantly across local authorities.

8. The replacement of the current system of household registration with a system of IER introduces an additional need for research. With IER, each individual elector will become responsible for registering to vote, rather than this task being entrusted to the head of household. The introduction of IER will also involve Electoral Registration Officers obtaining personal identifiers (signature, date of birth and National Insurance number) from voters, although initially on a voluntary basis. Under the provisions in the PPEA, the introduction of IER on a compulsory basis after 2015 will be dependent upon both a positive recommendation in favour of the proposed system from the Electoral Commission and subsequent approval by Parliament.

9. In particular, the reporting requirements placed on us by the PPEA make clear that measures of completeness and accuracy will be crucial to the assessment of whether there should be a full roll-out of IER. We will also be expected to reach evidence-based conclusions about the effectiveness of electoral registration and whether a move to require personal identifiers from all electors would compromise the quality of the registers.

Issues to consider when conducting research

10. As mentioned in the main report, there is no straightforward means of obtaining estimates for the percentage of eligible voters absent from the registers or the proportion of register entries that are inaccurate. Techniques based on matching Census records against the electoral registers are recognised to provide an effective means of estimating completeness and, potentially, accuracy at the national level. However, the options for producing estimates for periods between each Census are more limited.

⁶ The Electoral Commission (2005) *Understanding Electoral Registration*. London: Electoral Commission.

⁷ Stuart Wilks-Heeg (2008) *The Purity of Elections in the UK: Causes for Concern*. York: Joseph Rowntree Reform Trust.

11. Almost all previous research has concentrated on assessing the extent to which the electoral registers are complete. In part, this reflects the fact that concerns about potential levels of electoral disenfranchisement have taken precedence over concerns about potential levels of electoral fraud. At the same time, however, research into the accuracy of the registers must also be recognised as a significantly more complex task. There are many reasons why entries on an electoral register may be inaccurate. It is often difficult to identify the source of inaccuracies, to establish whether they are intentional or unintentional and, in some cases, whether they are even inaccuracies.

For instance:

- Inaccuracies can occur at the registration stage, resulting from the provision of incorrect details by the head of household either about themselves or other electors at that address (this may be intentional or unintentional).
- It is possible that the electoral registration administrators may have incorrectly recorded the electors' details, either by mis-entering or misreading the information provided to them.
- An elector may be registered more than once. For example, they may be registered at two different addresses because of their residential situation or movement within the local authority, or they may be registered (in error) more than once with slight variations in address, for example John Smith, Flat A, Rose Lane, SE1 2FG or John Smith, Ground Floor Apartment, Rose Road, SE1 2FG. In addition, a person may change their name (for a number of different reasons) and be registered twice under two separate names.
- Electors who move house may not be deleted from the register and may subsequently register elsewhere.

How did we do the research?

12. The research for the local case studies has been based on a combination of established methods, as well as the piloting of a range of new techniques aimed to overcome at least some of the difficulties outlined above. The details of the methods used are as follows.

Identifying inaccuracies via data-mining (eight local authority areas)

13. Data-mining involved the application of new techniques to the registers to identify inaccuracies. The data-mining work was carried out in three distinct stages, as follows:

1. An automated computer look up was carried out for each of the unedited local authority registers. These automated checks were used to identify potential anomalies in the information held on the register, including cases where:

- there were more register entries for a household than the average for that postcode
 - names were repeated within the same postcode area
 - the date of birth for attainers (16 and 17 year olds) was 'out of range' in relation to the qualifying date of the register
 - non European Union (EU) or Commonwealth citizens were registered whose nationality would not give them automatic registration rights
 - no marks were made against EU citizens from outside the UK/Ireland/Commonwealth to indicate their right to vote in either only local ('G flag') or local and European elections ('K flag')
 - UK/Ireland/Commonwealth citizens were incorrectly marked with a 'G flag' or 'K flag', thereby potentially disenfranchising them from a UK Parliamentary general election
2. An 'eyeball check' was then carried out on all anomalies identified during the computer check up. This check was undertaken to ensure that apparently legitimate entries were removed from the list of anomalies. For instance, residential addresses such as student halls of residence, residential nursing homes, and army barracks, which inevitably contain an above average number of register entries, were removed from the list of anomalies. Relatively common names such as 'John Smith' were also removed from the anomalies list except where they were very close in the same street. Similarly, where unique identifiers appeared in apparently duplicated names, such as middle initials or titles such as 'Snr' and 'Jnr' clarified that entries related to separate individuals, these cases were also removed from the list of anomalies. Where any doubt remained, the entry was recorded for further investigation at the interview stage.
 3. House-to-house follow-up interviews were then carried out using a small sample of the anomalies identified. These interviews entailed checking the details of those who were resident at the addresses against those held on the electoral registers, with the sample selected according to the type of anomalies identified on each register. A target number of 50 interviews per case study area was defined, and easily surpassed in each case (the actual number of interviews ranged from 60–89).

House-to-house survey (Knowsley)

14. As set out in the main report, the approach taken to the house-to-house survey was to draw a random, preselected sample, which was subsequently used to approach interviewees. Two important principles were applied in selecting the sample. First, in order to render house-to-house interviewing more efficient, this sample was 'clustered' – in this instance addresses were drawn from every fourth ward, with wards having first been stratified and ranked by a range of socio-demographic criteria. Second, a decision was made to depart from the approach taken in previous surveys, which have tended to derive their sample entirely from the Postcode Address File (PAF), widely acknowledged as the most complete record of residential addresses in the UK. Instead, 50% of the sample was drawn randomly from the electoral

register, with the remaining 50% from the PAF. The primary rationale for deriving the sample in this way was to mitigate the risk of PAF being an incomplete record of eligible residential addresses. The validity of this approach was underlined by the fact that the sample of 700 addresses included 14 (two per cent of the total) that were found on the electoral register but not on the PAF. This means that mixing the sample from the PAF and the register did not statistically compromise the reliability of the findings in this case.

15. Advance letters were sent out to all addresses in the sample informing them that an Ipsos MORI interviewer would call at their door. Interviews were carried out between 23 March and 27 May 2009. Up to six visits were made to each address in the sample, with the aim of ensuring that the head of household or their partner be approached to participate in the research where possible. The interviewee was asked about all adults (and 16–17 year olds) in the household, using a questionnaire designed to ascertain the completeness and accuracy of all entries on the electoral register at that address. Where consent could not be obtained to complete an interview or it proved impossible to make contact with anyone in a household, attempts were made to record the state and status of the property (e.g. derelict, vacant, in better/worse condition than the average for the area). This additional information was then used to assess whether account should be taken for non-response by weighting the data.

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