



Public Health  
England

Protecting and improving the nation's health

# **Producing modelled estimates of the size of the lesbian, gay and bisexual (LGB) population of England**

## **Final Report**

## About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health, and are a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS in a professionally independent manner.

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## Executive summary

Public Health England (PHE) is committed to understanding the health and wellbeing needs of different population groups and reducing health inequalities. In addition, PHE has a duty, as part of the Equality Duty, to consider the needs of all individuals in their day to day work in shaping policy and in delivering services. The Duty requires PHE to have due regard for the need to reduce discrimination, advance equality of opportunity and foster good relations between those who share protected characteristics and those who do not. Sexual orientation is a protected characteristic under the Equality Duty.

There is evidence to suggest that minority sexual orientation groups can experience high prevalence of poor mental health and low wellbeing. In order to assess health outcomes by sexual orientation, there is a need for a widely accepted national estimate of the size of the lesbian, gay and bisexual (LGB) population in England. This is currently unavailable. Data on sexual orientation are collected as part of a number of national general social surveys. However, obtaining robust estimates is problematic. The proportion of people self-identifying as LGB is influenced not only (substantively) by underlying cultural factors and stigma associated with responses and legality, but also methodologically by survey population, sample size and survey methodology. So far, no studies have used a systematic approach to identify and synthesise all relevant existing surveys and measurement tools to produce an aggregated estimate of the LGB population for England.

The objectives of the project were to locate and critically review existing research, surveys and measurement tools that estimated the size of the LGB population of England. A methodology is proposed for accurately and robustly estimating the size of this population, seeking to reduce error inherent in the reviewed surveys. The weighted average of the national survey data results in a synthesized estimate of the LGB population of England, broken down by socio-demographic and geographic variables. This report is intended for all organisations that have an interest in monitoring outcomes for LGB populations and require a population denominator. It is specifically focused on the LGB population and further work is needed to include transgender and intersex people.

Sexual orientation is a combination of a person's sexual attraction, behaviour and self-identity. The ways in which these factors are measured in social surveys differs greatly depending on the purpose of the survey. The three concepts may refer to distinct but overlapping groups about which estimates can be derived separately, but combinations are inherently complex. This project limits its estimates to self-reported sexual identity as this is considered to provide the most robust estimate of

the LGB population, thereby recognising that this may potentially underestimate the size of this particular population. We were guided on both substantive issues and project methodology and outcomes by an Expert advisory group established for this project.

Informed by formal systematic review methods, a search was performed using standardised search terms to trawl relevant databases and grey sources. A total of 22 relevant national surveys were identified which met the inclusion criteria and included a sexual orientation question (no date restriction was applied). Individual survey estimates for people that identified themselves as lesbian, gay, bisexual or 'other' ranged from 0.90% [95%CI 0.40, 1.83] to 5.52% [95%CI 4.63, 6.56]. An exploration of methodological approaches led to the conclusion that surveys with study populations likely to be biased in terms of LGB prevalence could not be included into a general pooled estimate and that weights should be applied in the final synthesis based on sample size, response rate and proportion of missing data.

Thus the final synthesis includes 15 surveys that represent the general adult population of England. The weighted estimate of people identifying as LGB or 'other' is 2.5%. If this were applied to the census-based mid-2014 population estimate, this suggests that there would be 1,358,848 people identifying as LGB or 'other' in England. If people who responded 'prefer not to say', 'don't know' or gave no answer (ranging from 0-10% for individual surveys) are assumed to all be LGB, then the upper limit becomes 5.89%. Stratification by age, gender and ethnicity (based on the distribution of the broadest survey; the GP Patient Survey 2015), indicates that the proportion of self-identified LGB is highest in men, younger age groups, and mixed/multiple or other ethnic groups. The GP Patient Survey provides local authority data for Greater London, Greater Manchester and Brighton and Hove which had an overall LGB prevalence of 5.1%, 3.6% and 9.9% respectively.

This study is the first to systematically review existing sources and synthesize data into a new robust estimate of the size of the LGB population of England. However, these results should be interpreted with caution. Not only is the synthesised result sensitive to error in each survey, but 2.5% is likely to be an underestimate as it is derived from general social surveys that did not have the specific aim of enumerating the LGB population. The upper limit of 5.89%, on the other hand, is almost certainly an overestimate of the included sources as it is unlikely that all non-responders are LGB. This project did not aim to qualitatively assess the propensity to under or misreport sexual identity.

Furthermore, it should be noted that any national estimate is likely to conceal significant sub-national variation. As this study has shown, LGB prevalence in the areas of Greater London, Greater Manchester and Brighton and Hove are higher

than the mean national estimate found in this study. Future studies should explore more local surveys using the methodology proposed in this study to synthesise results. In addition, future research could explore the impact of the mode of administration and context in which the sexual orientation question is posed on LGB responses. Finally, more work could be done to clarify who constitutes the group of 'others'.

## Introduction

Public Health England (PHE) is committed to understanding the health and wellbeing needs of different population groups and reducing health inequalities. In addition, PHE has a duty, as part of the Equality Duty, to consider the needs of all individuals in their day to day work in shaping policy and in delivering services. The Duty requires PHE to have due regard for the need to reduce discrimination, advance equality of opportunity and foster good relations between those who share protected characteristics and those who do not. Sexual orientation is a protected characteristic under the Equality Duty.

Sexual orientation is a complex area and how a person defines their sexual orientation can change throughout their life, depending on their own experiences and the influences and prejudices around them. A critical requirement for assessing health outcomes by sexual orientation is robust estimates of the size of the population in different sexual orientation groups. There is currently no widely accepted national estimate of the size of the lesbian, gay and bisexual (LGB) population within England.

This project was set up to synthesize existing evidence and propose a pooled estimate of the LGB population for England and for different areas within England. This report is intended for all organisations that have an interest in monitoring outcomes for LGB populations and require a population denominator. It is specifically focused on the LGB population and further work is needed to include transgender and intersex people.

Data on sexual orientation are collected as part of a number of national surveys, whose primary purpose varies. Some healthcare services also routinely ask users questions around sexual orientation, such as sexual health services and mental health services. The proportions identifying themselves as LGB can be influenced by the structure of the question, the sample size and the methodology of the survey. The generalisability of the survey and sub-analysis by sexual orientation is dependent on the sampling methodology, eligibility of the participants to answer a question on sexual orientation and the response rate to the question itself. A number of respondents decline to answer the question, prefer not to say, or don't feel that they fit into one of the defined categories used in the question and define themselves as 'other'.

The overall aim of this project is to improve understanding about how best to estimate the size of the LGB population in England and to provide an accurate estimate. There are three key objectives:

1. To critically review existing research, surveys and measurement tools to identify the strengths and weaknesses in using them to estimate the size of the LGB population.

2. To set out and justify the proposed methodology for accurately and robustly estimating the size of the LGB population
3. To produce robust and reliable estimates for the LGB population that can be broken down by socio-demographic and geographic variables.

## The deliverables for this project

### A review examining:

- existing surveys/measurement tools that have a focus on 'measuring sexual minority populations', from the UK and internationally
- the known (unknown) limitations of the existing measurement tools and existing surveys examining sexual orientation
- a recommendation about how existing surveys/measurement tools should and should not be used
- examining published and grey literature to establish a comprehensive understanding

### A document outlining a robust methodology for estimating the size of the LGB population within England.

This methodology was developed through an in-depth understanding of the existing population measurement tools and an in-depth understanding of population modelling methodologies.

This methodology takes into account and adjusts for the impact of respondents who decline to answer the question on sexual orientation and those who 'prefer not to say'.

### An estimate of the number and proportion of the population of England who are LGB:

- broken down by appropriate groups within the LGB population (heterosexual/straight, gay/lesbian, bisexual, other)
- broken down by sub-national geographies within England (geographies to be agreed)
- broken down by, age, gender and ethnicity for England as a whole.
- derived through the methodology developed (see above)
- clear recommendation of how the estimates can be used to provide a suitable denominator for measuring and developing health and wellbeing indicators in addition to indicators for sexual health

## Background

### Why do we need an estimate of the LGB population?

In recent years, the implementation of new legislation (Civil Partnership Act 2004; Equality Act 2010; The Marriage (Same Sex Couples) Act 2013) has provided the LGB community with visibility and offered this potentially vulnerable population protection from inequality and discrimination.<sup>[1-3]</sup> Despite research on health, inequality and discrimination among lesbians, gays, and bisexuals, there is an absence of reliable statistical data on sexual identity and sexual orientation in England and the UK. There is a need for a widely accepted national estimate of the size of the LGB population in England, which can serve as a suitable denominator for measuring and developing health and wellbeing indicators. In recent years progress has been made in the development of a general approach to quantify the size of the LGB population and an increasing number of national surveys now include this measure.

### How do we define the LGB population (in the UK)?

In the UK, the Equality Act (2010) considers sexual orientation a protected characteristic. This legislation classifies the population in terms of 'sexual and emotional orientation towards':

- persons of the same sex (lesbians or gay men)
- persons of the opposite sex (heterosexual people)
- persons of the same or opposite sex (bisexual people)

This classification does not provide a clear-cut way of measuring sexual orientation. For example, the report 'Measuring sexual identity: an evaluation report' (ONS, 2010) demonstrates that sexual orientation is a combination of a person's sexual attraction, behaviour and self-identity.<sup>[4]</sup> The multitude of ways in which to measure each of these factors and the resulting survey question can change broadly depending on the purpose of the survey. If, for instance, the focus of the survey is on sexual health risks, then sexual behaviour is the most useful measure.<sup>[5]</sup> On the other hand, if the goal of the survey is to gauge experiences of discrimination, then sexual identity is a more suitable measure.<sup>[6]</sup>

Including behaviour, attraction, and identity, definitions of sexual orientation pinpoint the complexity and social implications of self-identification. The three concepts may refer to distinct but overlapping groups about which estimates can be derived separately, but combinations are inherently complex. Some people may engage in same-sex practices or feel sexually attracted to people of the same sex,

but do not identify themselves as lesbian, gay or bisexual.<sup>[7]</sup> For this reason, surveys that focus on sexual behaviour often introduce the notion of gender as a measurement of sexual experiences, thereby avoiding non-heterosexual terminology. These surveys use phrases like ‘men who have sex with men’ (MSM) and ‘women who have sex with women’ (WSW), and are informed by the epidemiology of HIV.<sup>[8]</sup> Limiting a survey to self-reported sexual identity potentially underestimates the size of the LGB population (Expert advisory group discussions), though, however, does produce a robust estimate of that particular population. It is also important to note that there is an element of uncertainty even about identity itself, where people are undecided about their sexual orientation. This introduces a degree of valid fluidity in terms of sexual identity, but certainly complicates measurement, something further compounded when socio-cultural aspects like ‘being out’ or closeted as a LGB person are taken into account.

In addition to reviewing the literature on the topic we posed this distinction to our Expert advisory group and concluded that, for the purposes of this report, the focus would be solely on identity; that is, whether an individual would be willing to self-identify as LGB. In this way we can effectively estimate that population with the caveat that it represents a clearly defined (though potentially smaller) group of individuals.

However defined, since the introduction of the new legislation in the UK, efforts have been made to monitor and measure sexual orientation more closely. Though as discussed, the complexity of the concept of sexual orientation means that no single question in a general survey would accurately capture all relevant information. Following extensive examination, the Office for National Statistics (ONS) developed a single measure of sexual identity to be adopted on social surveys.<sup>[9]</sup> ONS suggested that self-reported sexual identity, when included as a measure, provides robust estimates to capture experiences of disadvantage and discrimination.<sup>[10]</sup> Similarly, the Equality and Human Rights Committee (EHRC) suggests that a sexual identity question may be sufficient in a national government survey, when the focus is on quantifying minority groups to ensure inclusion or avoid disadvantage with regards to different type of services and workforce recruitment.<sup>[11]</sup>

## Which surveys have looked at sexual orientation?

There has historically been little consistency in the way sexual orientation is measured and thus figures reported.<sup>[12]</sup> The figure most regularly quoted in the media comes from the UK Department of Trade and Industry, which estimated the size of the LGB population to be between 5-7% of the total adult population in 2003.<sup>[13]</sup> This figure was based on a general review of surveys from Europe and the US that looked at sexual preferences, including behaviour and attraction. However, recent UK national surveys that asked specifically about self-reported sexual

identity have reported lower figures, among which the ONS Integrated Household Survey of 2014 is probably the most comprehensive; with a reported 1.9% of the population self-identifying as LGB or 'other'.<sup>[14]</sup> The National Survey of Sexual Attitudes and Lifestyles (NATSAL) Wave 3 of 2010-2012 reported 2.7-2.8% of the population self-identifying as LGB or 'other', and this is the only national survey that included questions on sexual behaviour and attraction in addition to identity.<sup>[15]</sup>

Some national surveys have instead asked questions focused on same-sex civil partnerships, relationships and/or marriage, eg the Community Life Survey, 2013-2014 and the General Lifestyle Survey, 2011. However, clearly not all LGB individuals will be in a relationship and therefore these surveys will significantly underestimate the population (Expert advisory group discussions). The Census of England and Wales, of which the most recent was conducted in 2011, has, to date, not included a question on sexual orientation.<sup>[16]</sup> The latest user consultation about the 2021 Census showed a clear need for local data on the LGB population to aid service provision and monitor equality objectives. ONS will first investigate the feasibility of collecting sexual identity data in a census, to assess concerns related to quality, acceptability and respondent burden.<sup>[17]</sup>

Besides national-level surveys, some sexual and mental healthcare services routinely ask users questions around sexual orientation and practices, eg HIV and STI clinics.<sup>[18,19]</sup> Also, a wide variety of organisations have started to monitor their staff in terms of sexual orientation as a way to protect them from discrimination, including the Home Office, county councils, police authorities, Barclays, IBM and JPMorgan.<sup>[20]</sup>

## What guidance is provided on measuring sexual orientation?

The ways in which questions on sexual orientation are posed, and the ways in which such questions are administered, contribute to the ways in which they are answered. Non-response and misreporting are considered to be the central issues regarding the quality of responses.<sup>[11]</sup> The way in which a question on sexual orientation should best be asked in general social surveys has been the subject of extensive work by both ONS and EHRC. The main outcome of the ONS Sexual identity project (running from 2006 to 2009) was the development of a single question on sexual identity.<sup>[21]</sup>

The following question, using a standardised neutral question stem and four discrete response categories on a show card, proved to be the most understandable and acceptable and was subsequently introduced in components of the Integrated Household Survey:

Which of the options on this card best describes how you think of yourself?

Please just read out the number next to the description:

- heterosexual/straight
  - gay/lesbian
  - bisexual
  - other
- (spontaneous don't know/refusal)

Pre-testing the question by ONS in the Omnibus trials 1-4 found that question non-response rates decreased from 2.4% to 1.0% after the option 'prefer not to say' was dropped and respondents could only refuse or answer 'don't know' spontaneously. This was only recommended for interviewer administered surveys however whereas the option 'prefer not to say' remains on self-completion surveys.

Importantly, ONS found that rates of missing responses were highest in self-administered questionnaires and less so in face-to-face and telephone interviews.<sup>[22]</sup> In face-to-face interviews, the use of concealed response show cards rather than self-administration using a laptop further reduced non-response, as the latter method highlights the sensitivity of the question. In terms of misreporting, EHRC suggests that interviewing methods may result in inaccurate disclosure of sexual identity, especially when another person is present; while the most truthful responses about sexual orientation are elicited when self-completion online surveys are used.<sup>[23]</sup> In order to avoid privacy concerns and associated inaccuracy of responses, the question ought not be asked where translators are being used or reported to proxy respondents. Despite all of this, certain proportions of the LGB group may choose to misreport their sexual orientation in survey and monitoring settings or may not answer the question.<sup>[24]</sup> Consequently, all surveys including these measures are likely to underestimate the true size of the LGB population.

As a result of this national guidance on monitoring sexual orientation, other practical guides have been published by organisations including Stonewall and LGBT Foundation, explaining how organisations can best monitor sexual orientation among their staff and service users.<sup>[25,26]</sup> Both documents recognize that the introduction of a question on sexual orientation into routine monitoring systems should be preceded by desensitisation around the topic, including communication about legislation and benefits of recording this equality characteristic. Accordingly, those introducing a question of sexual orientation in their surveys ought to prepare the ground through consultation, explanation and communication with their users before successful monitoring can take place.<sup>[27]</sup>

## Why do we need to (re-)estimate the size of the LGB population in England?

There is currently no widely agreed national estimate available of the size of the LGB population in England. First of all, ONS national guidance on standardized ways to monitor sexual identity was released relatively recently and data collected earlier may not adequately represent this group. Hesitance to collect national standardized sexual identity data may in fact have hampered actions to improve data quality.<sup>[28,29]</sup> Further, recent estimates of the LGB population (such as the 1.9% provided by the Integrated Household Survey (ONS 2015)) are lower than anticipated by stakeholders like LGBT Foundation (Expert advisory group discussions) who believe that issues of non-response and non-disclosure are still having a major impact on estimates. As noted by EHRC, response rate to the sexual identity question can change over time as public recognition increases and people are more willing to answer the question, as demonstrated in the NATSAL I and II surveys from 1989-1990 and 1999-2001.<sup>[30]</sup>

However, even after standardisation of question wording and mode of administration, variety in the estimates is to be expected. The proportion of people identifying themselves as LGB is influenced not only substantively by underlying cultural factors, stigma associated with responses, and legality, but also methodologically by the selected survey population (eg gender, age, geographical coverage), sampling methodology, sample size, and eligibility of the participants to answer the question. We are aware of two recent reviews evaluating health inequalities among sexual orientation groups using national general surveys.<sup>[31, 32]</sup> They suggest that minority sexual orientation groups can experience higher prevalence of poor mental health and low wellbeing. However, so far, no studies have used a systematic approach to synthesise all relevant existing surveys and measurement tools and generate a robust estimate of the size of these groups in England.

## Methods

### Expert advisory group

An integral part of this project was the establishment of an Expert advisory group. This virtual, email-based group served as a sounding board throughout the project and provided feedback on both substantive issues and project methodology and outcomes. It comprised members from the UK Office of National Statistics (Timothy Vizard, Helena Rosiecka), Government Equalities Office (Kevin Mantle, Kaite Emmerson), Public Health England (Natasha Roberts, Hugh Mallinson), Stonewall (April Guasp), LGBT Foundation (Heather Williams), NatCen (Martin Mitchell), University of Kent (Peter Aspinall) and University of Manchester (Kingsley Purdam).

The group provided guidance on a number of topics which are incorporated into the report and can be summarized as follows:

- consensus was reached on limiting the project to surveys that measure sexual identity rather than the broader concept of sexual orientation

Although data on sexual attraction and behaviour would be important for measuring health care needs, sexual identity was considered most relevant for measuring diversity and discrimination.

- consensus was reached on inclusion of the group of 'others' into the numerator of the LGB estimate.

Although it may not be exactly clear who constitutes this group, it is important to enumerate them because they form a sexual minority group.

- the group agreed to include surveys of all time periods, thus no date restrictions were applied to the search
- the group were asked for assistance in completing the list of retrieved surveys and obtaining raw survey data if not available otherwise
- the group reviewed and agreed on the overall methodological approach and final results of the project

### Review of LGB estimates

A review was undertaken to locate and examine existing surveys and measurement tools that estimate the size of the lesbian, gay, and bisexual (LGB) population in England. A search was conducted using systematic review methods and key surveys identified. Second, data were extracted from these key surveys and limitations were discussed. Third, recommendations were made about how existing surveys and LGB measures should be used.

Search terms were derived from reading key documents in the field of sexual orientation, LGB measurements and national surveys as well as discussion with stakeholders and the Expert advisory group. Relevant databases were searched using appropriate combinations of terms. Also, grey sources were explored including reports from key organisations (NHS, ONS, Stonewall, LGBT Foundation), hand-searching of known recent publications, author contacts and through our convened Expert advisory group. Surveys were only included if they targeted the general population, included the whole of England, included a direct question on sexual identity and produced a measure of the size of the LGB population.

Standard methodological data were extracted into Excel, including principle investigators, survey coverage, data collection period, study population, study design, sampling method, sample size, response rate, question format, question mode of administration, response categories and estimates. Response categories included both substantive answers (heterosexual/straight, lesbian/gay, bisexual and other) and non-substantive answers (don't know, prefer not to say, refused, no answer).

Methodological similarities and differences were assessed in order to draw conclusions about the limitations of each survey, and such limitations informed: 1) which survey estimates could reasonably be pooled in a synthesis, and, 2) how surveys differed in quality and, as a result, how weights should be applied to better estimate the population.

The following survey characteristics were used to:

- select estimates to pool into a synthesized estimate:
  - a. study population
- derive weights for pooled estimates:
  - b. sample size (logarithmic transformation)
  - c. survey response rate
  - d. rate of missing data

The full methodology of the review is detailed in Technical Report 1.

## Synthesis of LGB measures

The estimates from the surveys obtained in the first stage of the project were combined into an aggregated and weighted estimate of the LGB population of England. The methodology for synthesis is based on a previously developed method to enumerate minority ethnic groups weighted to the 2001 Census for England and Wales (see Technical Report 2).

First, survey estimates of the percentage of LGB were extracted; being the sum of the proportions of 'gay/lesbian', 'bisexual' and 'other' among all those that were eligible to respond to the question on sexual orientation. The denominator included people who gave non-substantive answers (don't know, prefer not to say, refused, no answer). These percentages were limited to the population of England only and individual survey weighting methods were followed in line with original survey instructions. Simplistically, we collated each survey's best possible estimate.

Second, aggregated means of survey estimates were calculated using different weights based on quality criteria determined in the first stage of the project, and were sensitive to (ie prioritised better surveys according to) sample size, survey response rate, and proportion of missing data. For the weight of missing data, 'prefer not to say' and 'refused' were grouped together into 'prefer not to say', as they both indicate a respondent not willing to answer the question. This resulted in six different aggregated means:

1. simple aggregated mean
- 2a. aggregated mean weighted by sample size
- 2b. aggregated mean weighted by sample size and survey response rate
- 3a. aggregated mean weighted by inverse proportion of missing data ('no answer')
- 3b. aggregated mean weighted by inverse proportion of missing data ('prefer not to say' and 'no answer')
4. aggregated mean weighted by sample size, response rate and missing data ('prefer not to say' and 'no answer')

The underlying formulas are: (where e=estimate (%), k=number of surveys; s=logarithmic transformation of sample size (log(n)), r=response rate (%), wa=weight for missing data (a) (100%-% no answers), and wb=weight for missing data (b) (100%-% no answer + prefer not to say))

$$\text{Method 1: } \frac{(e1+e2+ek)}{k}$$

$$\text{Method 2a: } \frac{(e1 \times s1) + (e2 \times s2) + (ek \times sk)}{s1 + s2 + sk}$$

$$\text{Method 2b: } \frac{(e1 \times s1 \times r1) + (e2 \times s2 \times r2) + (ek \times sk \times rk)}{(s1 \times r1) + (s2 \times r2) + (sk \times rk)}$$

$$\text{Method 3a: } \frac{(e1 \times wa1) + (e2 \times wa2) + (ek \times wak)}{wa1 + wa2 + wak}$$

$$\text{Method 3b: } \frac{(e1 \times wb1) + (e2 \times wb2) + (ek \times wbk)}{wb1 + wb2 + wbk}$$

$$\text{Method 4: } \frac{(e1 \times s1 \times r1 \times wb1) + (e2 \times s2 \times r2 \times wb2) + (ek \times sk \times rk \times wbk)}{(s1 \times r1 \times wb1) + (s2 \times r2 \times wb2) + (sk \times rk \times wbk)}$$

Method 4 incorporates all weights and is therefore considered to be the most robust method. The synthesized mean estimate from Method 4 is presented with ranges, ie a (very much theoretical) upper and (more accurate) lower bound, by making assumptions about missing data. 'Prefer not to say', 'don't know' and 'no answers' were grouped and reclassified as either being all heterosexual (lower bound) or all lesbian/gay/bisexual (upper bound).

As a next step, the aggregated weighted mean percentage of Method 4 was applied to the national total population number from ONS's latest estimates. This provided the estimated total number of people self-reporting as LGB or 'other' in England in mid-2014. This number was then stratified by age, gender and ethnicity by applying the distribution of LGB individuals across age, gender and ethnicity from the broadest and most representative survey included in the synthesis.<sup>1</sup>

Finally, we aimed to break down the proportion of LGB and 'others' by geographical area using the GP Patient Survey. Geographical stratification was conducted at local authority level for Greater London, Greater Manchester and Brighton and Hove.

The full methodology of synthesis is detailed in Technical Report 2.

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<sup>1</sup> The broadest survey was selected based on sample size, response rate, data collection period and representativeness of the population, i.e. the extent to which the survey population resembles the 2011 census population distribution of age, gender and ethnicity.

# Results

## Review of LGB estimates

The search resulted in a total of 664 records; 617 from databases and 47 from other sources. Of these, 636 were excluded because they did not meet the inclusion criteria. A total of 28 unique surveys were obtained: 22 through the UK Data Archive; one through EMBASE; one through the HSCIC database; two through the ONS Sexual Identity project documents; two through the Expert Advisory Group. These surveys were read in full after which six were excluded: four were previous versions of more recent surveys already included; and two surveys formed part of an umbrella survey (Integrated Household Survey) that was already included.

The final list of 22 surveys is shown in Table 1. Additional survey characteristics including geography, study population, sampling method, sample size, response rate and mode of administration can be found in Annex Table 1.

**Table 1: Final list of key surveys**

Survey name	Most recent data <sup>1</sup>
1970 British Cohort Study: Forty-Two-Year Follow-Up	2012
Active People Survey	2013-2014
Adult Psychiatric Morbidity Survey	2007
British Social Attitudes Survey	2013
Citizenship Survey	2010-2011
Count Me In	2010
Crime Survey for England and Wales	2014-2015
Employees' Awareness, Knowledge and Exercise of Employment Rights Survey	2005
EU Agency for Fundamental Rights: Violence Against Women Survey	2012
Family Resources Survey	2014-2015
Fair Treatment at Work Survey	2008
First Longitudinal Study of Young People in England: Waves 1-7	2004-2010
GP Patient Survey	2015
Health and Wellbeing of 15 year olds in England – What About YOUth? Survey	2014
Health Survey for England	2013
Integrated Household Survey	2014
National Survey of Sexual Attitudes and Lifestyles	2010-2012
National Cancer Patient Experience Survey	2013-2014
Place Survey	2008

Taking Part: the National Survey of Culture, Leisure and Sport	2014-2015
Understanding Society: Waves 1-5 ('UK Household Longitudinal Study')	2009-2014
Workplace Employee Relations Survey	2011

<sup>1</sup> Most recent data collection period for which a question on sexual orientation was included

Data extraction revealed significant similarities and differences in survey methodologies. Similarities largely related to study population, study design, sampling method, question format and substantive response categories. The majority of studies used a cross-sectional survey and targeted adults (>16 years) in private households, who were sampled using a standardized sampling frame (small user postcode address file) and complex stratification methods ensuring representativeness of the general population of England (or Great Britain or UK). However, some studies used limited study populations or sampling methods (sampling frames and/or stratification methods). Differences were related to sample sizes, survey response rates, modes of question administration, non-substantive response categories and proportion of non-substantive answers across surveys. Sample sizes ranged from 996 to 854,032 and response rates from 27.8% to 87.3%. A wide variety of modes of administration were used, including postal surveys, online questionnaires, telephone interviews and face-to-face interviews. Non-substantive categories included various combinations of 'don't know', 'prefer not to say', 'refused' and 'no answer'.

The full review of survey characteristics and methodologies can be found in Technical Report 1.

## Synthesis of LGB measures

The proportion of gay/lesbian, bisexual and 'others' among all those that were eligible to respond to the question on sexual orientation was extracted from each of the 22 included surveys. Where required, these proportions were adjusted using original data so that they were limited to the population of England and were weighted to represent the population of England (using weights applied by the original survey). Proportions of LGB and 'others' ranged from 0.90% [95%CI 0.40, 1.83] to 5.52% [95%CI 4.63, 6.56]. The results can be seen in Table 2. The figures broken down by all response categories (heterosexual, lesbian/gay, bisexual, other, don't know, prefer not to say, refused, no answer) can be found in Annex Table 2.

**Table 2: Proportion of people self-identifying as LGB in 22 key surveys**

Survey Name	LGB (%)	95% confidence interval
1970 British Cohort Study: Forty-Two-Year Follow-Up <sup>1</sup>	2.99%	2.63, 3.37
Active People Survey	2.65%	2.53, 2.78
Adult Psychiatric Morbidity Survey	3.42%	3.01, 3.86
British Social Attitudes Survey <sup>2</sup>	3.84%	2.67, 5.43
Citizenship Survey	1.66%	1.42, 1.94
Count Me In <sup>1,3</sup>	3.24%	3.05, 3.43
Crime Survey for England and Wales	3.48%	3.23, 3.76
Employees' Awareness, Knowledge and Exercise of Employment Rights Survey	0.90%	0.40, 1.83
EU Agency for Fundamental Rights: Violence Against Women Survey <sup>4</sup>	2.27%	1.56, 3.13
Fair Treatment at Work Survey	2.04%	1.61, 2.58
Family Resources Survey <sup>5</sup>	2.09%	1.90, 2.31
First Longitudinal Study of Young People in England: Waves 1-7 <sup>6</sup>		
GP Patient Survey	2.92%	2.89, 2.96
Health and Wellbeing of 15 year olds in England – What About YOUth? Survey	5.30%	5.24, 5.36
Health Survey for England	2.62%	2.27, 2.99
Integrated Household Survey	1.94%	1.86, 2.02
National Cancer Patient Experience Survey <sup>1</sup>	1.19%	1.12, 1.28
National Survey of Sexual Attitudes and Lifestyles	2.79%	2.52, 3.09
Place Survey	3.23%	3.06, 3.39
Taking Part: the National Survey of Culture, Leisure and Sport	1.62%	1.38, 1.89
Understanding Society: Waves 1-5 ('UK Household Longitudinal Study')	5.52%	4.63, 6.56
Workplace Employee Relations Survey	2.48%	2.26, 2.71

**Legend: LGB: lesbian, gay, bisexual and 'others'**

<sup>1</sup> The estimate of these surveys are unweighted, because the surveys sampled the entire target population: Count Me In Survey; National Cancer Patient Experience Survey; 1970 British Cohort Study: Forty-Two-Year Follow-Up.

<sup>2</sup> The estimate is for the response categories 'gay', 'bisexual' and 'can't choose'. This survey had no category for 'other'.

<sup>3</sup> Count Me In survey had a survey response rate of 100%, but a very high rate of 'no answers' to the sexual orientation question. It is therefore likely that at least a proportion of people with no answer were in fact not eligible to respond or never asked the question.

<sup>4</sup> The estimate is for the response category of 'non-heterosexual'. This survey made no differentiation between lesbian/gay, bisexual and other. The data is for the UK and could not be specified for England.

<sup>5</sup> The estimate of the Family Resources Survey is unweighted, because the weighted proportions were less precise than the unweighted proportions.

<sup>6</sup> We were not able to obtain raw data for the First Longitudinal Study of Young People in England survey: Wave 1-7.

There is evidence that sexual orientation prevalence varies with gender and age. Thus, surveys with limited age or gender groups were not pooled into a synthesized estimate. Also, surveys focusing on specific patient populations were excluded from the pooled estimate as they did not aim to extrapolate their findings to the general population of England. Thus, reported separately but not included in the synthesis are results of the following seven surveys:

Limited to specific age:

- 1970 British Cohort Study: Forty-Two-Year Follow-Up
- Health & Wellbeing of 15 year olds in England (What About YOUTH? Survey)
- First Longitudinal Study of Young People in England: Waves 1-7
- Understanding Society: Waves 1-5 (UK Household Longitudinal Study)

Limited to specific gender:

- EU Agency for Fundamental Rights: Violence Against Women Survey

Limited to specific patient group:

- National Cancer Patient Experience Survey
- Count Me In Survey (patients of mental health services)

The results of the remaining 15 surveys, representative of the population of England, were pooled and synthesised using the four different weighting methods described. These estimates are broken down by lesbian/gay, bisexual and ‘other’ group separately. The results are presented in Table 3. Individual survey data that was used in this synthesis (proportion of LGB and ‘others’, sample size (log transformed), response rate, percentage of missing data) can be found in Annex Table 3.

**Table 3: Mean size of the LGB population of England synthesised from 15 surveys**

Method	Weighting approach	LGB	L/G	B	O
1	Unweighted	2.51%	1.25%	0.60%	0.65%
2a	Weighted by log sample size	2.52%	1.27%	0.63%	0.62%
2b	Weighted by log sample size and response rate	2.51%	1.26%	0.63%	0.61%
3a	Weighted by inverse proportion of missing data ('no answer')	2.50%	1.25%	0.60%	0.65%
3b	Weighted by inverse proportion of missing data ('prefer not to say' + 'no answer')	2.50%	1.25%	0.60%	0.66%
4	Weighted by log sample size, response rate and inverse proportion of missing data ('prefer not to say' + 'no answer')	2.50%	1.25%	0.63%	0.61%

**Legend: LGB: lesbian, gay, bisexual and ‘others’; L/G: lesbian and gay; B: bisexual; O: ‘other’ sexual identity**

Ranges were calculated around the mean LGB estimate of 2.5% (Method 4), with the assumption that missing answers could represent either all heterosexual or all LGB'. This resulted in a minimum of 2.5% and maximum of 5.89%, when all people with 'prefer not to say', 'don't know' or 'no answer' were assumed to be either heterosexual or LGB. The inherent assumption is that missing answers represent heterosexual answers and so have no effect on the lower limit of the LGB estimate, thus our synthesis provides the lowest possible estimate of LGB in the given sources. While 2.5% is likely to be an underestimate, the upper limit of 5.89% should also be interpreted with caution. It reflects the theoretical maximum if all people who did not answer the sexual orientation question would have been LGB, something which is highly unlikely.

### LGB measures broken down by socio-demographic variables

The aggregated mean of 2.5% was then applied to the national population number based on the latest population estimates. In mid-2014, ONS estimated the total population of England to be 54,316,618. Multiplying this by the aggregated mean LGB estimate produced, we estimate that (in mid-2014) a total of 1,358,848 people would identify as being lesbian, gay, bisexual or 'other', with an upper range of 3,198,517 people (or 5.89%) if all with missing responses would identify as LGB.

In order to stratify the total number of LGB and 'others' by age, gender and ethnicity, we use the distribution of LGB for each of these characteristics from the broadest survey. The selection of the broadest survey was between the Integrated Household Survey 2014 and the GP Patient Survey 2015; both were conducted recently and had large study populations of 189,212 and 854,032 individuals, respectively. Both populations were originally weighted to represent the 2011 census population, so the distribution of age, gender and ethnicity of the weighted data closely resembles that of the 2011 census population. Since the GP Patient Survey had the largest sample size, it was selected as our broadest survey and served as our standard.

### Stratification was performed as in the following example of gender:

In the GP Patient Survey (2015), 811,172 participants responded to both the question on sexual identity and gender. Of 23,615 people who self-identified as LGB or 'other', 14,434 (61.1%) were male and 9,181 (38.9%) were female.<sup>2</sup>

We apply this proportion to the estimated total number of LGB of the national population of England in mid-2014:

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<sup>2</sup> The gender distribution is similar in other surveys: Integrated Household Survey (54.9%, 45.1%); NATSAL (49.8%, 50.2%), Health Survey for England (53.8%, 46.2%); British Social Attitudes Survey (69.1%, 31.0%); Taking Part Survey (57.5%, 42.5%); Active People Survey (58.5%, 41.5%); average (57.8%, 42.2%).

- 1,358,848 times 61.1% is 830,558 male LGB and ‘others’
- 1,358,848 times 38.9% is 528,291 female LGB and ‘others’

In the latest population estimates, 49.3% (26,773,196) were male and 50.7% (27,543,422) were female. The estimated proportion of LGB stratified by gender therefore is:

- 830,558 divided by the population of 26,773,196 is 3.10% male LGB and ‘others’
- 528,291 divided by the population of 27,543,422 is 1.92% female LGB and ‘others’.

The final results of estimated stratified proportions of LGB and ‘others’ for the mid-2014 population of England are shown in Table 4. Additional information used in these calculations, including the number and proportion of LGB by age, gender and ethnicity from the GP Patient Survey 2015 and the projected national population numbers for each strata, can be found in Annex Table 4.

**Table 4: LGB estimates of the mid-2014 population of England stratified by age, gender and ethnicity**

Age (years)	LGB
0-17	0.00%
18 to 24	4.73%
25 to 34	4.74%
35 to 44	4.18%
45 to 54	3.21%
55 to 64	1.98%
65 to 74	1.20%
75 to 84	1.08%
85 or over	1.28%
<b>Overall</b>	<b>2.50%</b>

Ethnicity	LGB
White	2.38%
Mixed/multiple ethnic groups	4.25%
Asian/Asian British	2.73%
Black/African/Caribbean/Black British	2.58%
Other ethnic groups	5.05%
<b>Overall</b>	<b>2.50%</b>

**Legend: LGB: lesbian, gay, bisexual and ‘others’**

Gender	LGB
Male	3.10%
Female	1.92%
<b>Overall</b>	<b>2.50%</b>

## LGB measures broken down by geographic variables

Using the same method as above for socio-demographic breakdown, the aggregated estimate of 2.50% was also stratified by region of England (previously government office region). In order to stratify by region, we applied the distribution of LGB by region from the GP Patient Survey to the total number of LGB and ‘others’ estimated for

England in mid-2014. Table 5 shows the results of stratification and Annex Table 4 provides additional information used for calculations. As expected, the proportion of LGB and 'others' was highest in the London region with 4.26%, while it was around 2.0-2.5% in the other regions of England.

**Table 5: LGB estimates of the mid-2014 population of England stratified by region**

<b>Region</b>	<b>LGB</b>
London	4.26%
North West	2.51%
North East	2.27%
South East	2.23%
West Midlands	2.15%
South West	2.08%
Yorkshire and the Humber	2.07%
East of England	2.00%
East Midlands	1.98%
<b>Overall</b>	<b>2.50%</b>

**Legend: LGB: lesbian, gay, bisexual and 'other's**

In addition, the project aimed to extract and synthesize data from our key surveys of three key geographic areas which were of particular interest to our Expert advisory group: Greater London, Greater Manchester and Brighton and Hove. Unfortunately, the surveys only reported sexual orientation at regional level and not at local authority level, except for the Active People Survey and GP Patient Survey. The Active People Survey sample sizes for the sexual identity variable at this level are too small to generate reliable proportions and are not presented. The GP Patient Survey provides results by clinical commissioning group (CCG) which are sometimes coterminous with local authority, and are presented because they overlap for the three key geographical areas. We also contacted individuals in these areas to request recent surveys measuring sexual orientation. For Brighton and Hove, we were able to use additional data from two recent surveys: the Health Counts Survey and the City Tracker.

The results of the case studies of Greater London, Greater Manchester and Brighton and Hove are presented in Box 1, 2 and 3. In each of these areas, the estimated mean self-identified LGB prevalence is comparatively higher than that of our synthesised England total of 2.5%. The GP Patient Survey's estimate for Greater London is slightly different from the stratified aggregated estimate of the region of London in Table 5, which is a result of applying our weighting methodology.

**Box 1: LGB estimates of Greater London**

GP Patient Survey 2015

Local authority	Sample	LGB
Barking and Dagenham	2619	3.9%
Barnet	5408	3.7%
Bexley	3252	1.8%
Brent	4890	4.7%
Bromley	4794	2.9%
Camden	3639	8.1%
City of London and Hackney	3815	8.5%
Croydon	5379	3.8%
Ealing	5587	4.7%
Enfield	4252	4.5%
Greenwich	3695	5.6%
Hammersmith and Fulham	2984	6.4%
Haringey	4067	6.0%
Harrow	3468	2.9%
Havering	3714	1.4%
Hillingdon	4040	3.2%
Hounslow	4119	4.5%
Islington	3342	7.2%
Kensington and Chelsea	3425	6.7%
Kingston	2830	3.4%
Lambeth	5333	10.0%
Lewisham	4150	6.6%
Merton	2975	4.2%
Newham	4663	5.5%
Redbridge	3948	2.2%
Richmond	2935	2.9%
Southwark	4246	7.7%
Sutton	2664	3.3%
Tower Hamlets	3878	8.7%
Waltham Forest	3962	4.0%
Wandsworth	5215	5.3%
Westminster	2955	9.0%
<b>Total</b>	<b>126243</b>	<b>5.1%</b>

**Box 2: LGB estimates of Greater Manchester**

GP Patient Survey 2015

Local authority	Sample	LGB
Bolton	4197	1.8%
Bury	2810	3.1%
Central Manchester	2946	8.0%
North Manchester	2688	6.2%
South Manchester	2378	5.4%
Oldham	3346	2.7%
Rochdale	3164	3.2%
Salford	3614	4.6%
Stockport	4433	3.0%
Tameside	3517	2.7%
Trafford	3370	2.8%
Wigan	4647	2.3%
<b>Total</b>	<b>41110</b>	<b>3.6%</b>

### Box 3: LGB estimates of Brighton & Hove

The clinical commissioning group used in the GP Patient Survey is coterminous with the local authority of Brighton and Hove, thus results can be compared with those from two recent local authority surveys. Key characteristics of these three surveys as well as the results of the sexual orientation questionnaire are shown here.

Survey Name	Period	Study population		Sampling method		Mode of admin.	Response rate	LGB
		Age	Group	Sampling frame	Sample size			
Health Counts Survey	2012	18+	registered with GP	GP registration database	2,035	postal	37.0%	10.1%
City Tracker	2015	18+	residents with landline	Random digit dialling	1,003	telephone	-	7.3%
GP Patient Survey *	2015	18+	registered with GP	HSCIC patient registration records	4,512	online, postal, telephone	35.7%	9.9%

\* GP Patient Survey data are weighted, others are not.

# Discussion

## Summary of findings

This project used a systematic search strategy to identify 22 key surveys providing an estimate of the lesbian, gay and bisexual (LGB) population of England including people with 'other' sexual identity. The 22 included surveys were assessed in terms of their methodology, and their limitations were used to inform if and how sources were pooled and the different weights applied to derive a synthesised mean estimate. Homogeneity of study populations allowed aggregation of 15 of the 22 surveys, while sample size (logarithmic transformation), survey response rate, and the rate of missing data (prefer not to say/refused, don't know and no answers) were used as weights in a synthesis calculation.

The synthesis resulted in an aggregated weighted estimate of the size of the LGB and 'other' population of England of 2.5% with a range of 2.5% to 5.89% based on missing data interpretation. The upper bound should be treated with caution as it merely represents the theoretical maximum if 'all people who did not respond to a question on sexual orientation would report as LGB'. This range represents the most robust estimate based on currently available data. However, it may still underestimate the LGB population as individuals may choose to misreport their sexual identity in survey and monitoring settings.

Applied to the mid-2014 population estimates by ONS, this projects to 1.36 million to a maximum 3.2 million out of 54.3 million people that would self-identity as belonging to a sexual minority in England. The proportion of LGB and 'other' is highest (4.74%) among young adults up to 34 years and decreases with every older age group. The proportion is also higher in men (3.10%) than women (1.92%); and highest in mixed/multiple (4.25%) and other (ie other than White, Black, Asian or mixed/multiple) (5.05%) ethnic groups. The difference between men and women is consistent with findings from other surveys, including the Integrated Household Survey, Health Survey for England, British Social Attitudes Survey, Taking Part Survey and the Active People Survey. The variation in ethnicity is potentially linked to age differences, ie the population of mixed and other ethnicity is likely to be composed of young people due to relatively recent trends of inter-race couples and immigration.

The mean national LGB estimate of 2.5% is lower than the figure of 5-7% quoted by the UK Department of Trade and Industry in 2003, but higher than the 1.89% of LGB estimated by the latest Integrated Household Survey in 2014. The estimate is also lower than figures from the areas of Greater London, Greater Manchester and Brighton and Hove, though this is to be expected as there is evidence that rates are higher in cities.

## Strengths of the project

This is the first study to use a systematic approach to locating and synthesising existing surveys to derive an estimate of the size of the LGB population of England. In addition, it is one of few studies to apply a justified weighted approach in synthesising survey estimates.

The search strategy used was intentionally very broad in terms of time period (no limit), databases and terms. Inclusion criteria for surveys were also intentionally broad. The methodology to synthesise estimates was based on an approach used previously in estimating small minority groups and adjusted to incorporate characteristics of measures on sexual orientation. Furthermore, both the search strategy and synthesis methodology were discussed with an Expert advisory group which included experts in the field of sexual orientation surveys in England. As a result, we are confident that the results presented include all relevant surveys and that the methodology to synthesise the LGB estimates is robust. However, the estimate is clearly sensitive to reliability, validity and other linked biases from the original data (see below).

## Limitations of the project

### The use of general population surveys

Firstly, the included general population surveys were conducted for several reasons but their primary aim was usually not to measure sexual orientation. These surveys did not boost their samples to include sexual minority populations. Thus there are likely to be pockets of sexual minority groups in England that are not being captured by general surveys.

Secondly, since estimates of the LGB population from national surveys in England are small, the proportion of missing data has an important impact on the final estimate. This project has sought to account for this by incorporating missing data into the aggregated weighted mean estimates. However, it is still likely that the aggregated estimates do not reflect the actual proportion of the LGB population in England, since some people may choose to inaccurately report their sexual identity in survey settings, especially in personal interviews.

Thirdly, the focus on survey estimates of self-reported sexual identity necessarily limits our findings. The concept of sexual orientation also includes sexual behaviour and attraction, meaning that the estimates generated by this project apply to a limited group of people that want to identify themselves as LGB, while the actual proportion of people that have same-sex sexual experience or feelings may be higher. This limitation extends to all national surveys that measure sexual identity, including the 2021 Census if it includes such a question. It is important to

acknowledge that sexual identity is not coterminous with sexual orientation, which is the term used in the Equality Act (2010) to legally protect LGB people from discrimination

### Obtaining original survey data

It was very difficult to locate and obtain raw data from the UK Data Archive, primary investigators or dedicated survey websites, due to the protected nature of sexual orientation data. Where surveys were conducted and included a sexual orientation variable, but that variable was not made available, the indexing appeared as though it was absent making locating surveys problematic. We were not able to obtain raw data for one of the 22 surveys (First Longitudinal Study of Young People in England survey). Further, the data from the Count Me In survey was retrieved from the National Archives website, rather than the UK Data Archive or directly from investigators, which meant that the data could not be verified or completed (missing information on response rate and mode of administration).

The fact that survey questionnaires include non-substantive response categories (don't know, prefer not to say, refused, no answer) in various ways, made comparison across surveys challenging. Especially the fact that missing data was sometimes reported as 'no answer' and sometimes left out of the figures, necessitated additional verification with survey investigators. For example, data reported on the GP Patient Survey website leaves out the number of people who were asked but did not respond to the sexual orientation question.

Some surveys reported LGB data unweighted and others weighted to the national population of England. Also, the methods used by surveys to arrive at their weighted data was different and, often, poorly reported. Some surveys kept unweighted and weighted base sizes the same and others increased or decreased the base sizes. The survey estimates presented in this report are, wherever possible, weighted to the national population of England according to the methods used in the original survey, and calculated back to unweighted base sizes. This was not possible for the Family Resources Survey as the survey percentages were rounded to the nearest one per cent and using weighted data would introduce more inaccuracy than keeping the unweighted data.

### The inclusion of 'others'

All surveys included the option to respond 'other' to the sexual identity question, but it is to a large extent unknown who is enumerated under this group. The inclusion of 'others' into the synthesized estimate inflates the proportion of the population presented in this report. There is an argument that 'other' is a left-over group that may include people that are asexual or do not want to be categorised into groups at all. Conversely, 'others' may include people who do not subscribe to one of the listed sexual identity groups and are therefore, by definition, a sexual

minority group. It is for the latter reason that we include this group in the synthesized estimates.

### Methodology to synthesise survey estimates

In order to synthesise survey estimates into an aggregated mean proportion of LGB, we included weights based on survey sample size, response rate, and rate of missing data. Yet clearly other factors also influence the proportion of LGB which were not included. We discussed the likely possibility that mode of administration and the context of the survey impacts on the willingness and reporting of sexual orientation. Given the lack of robust knowledge about the direction and magnitude of this effect the current methodology could not include quantitative weights for these factors. Qualitative work is needed first to investigate the role of these factors in influencing LGB estimates.

Further, the current methodology does not include a weight for variance as is usual in meta-analysis. The reason is that we wanted to use weights that are conceptually linked to the intrinsic problems of survey design, rather than weights that reflect precision (as in regular meta-analysis, which seeks, amongst other things, to increase sample power), because there is uncertainty about what constitutes a reliable survey method to capture sexual identity.

### Stratification

We sought to stratify by socio-demographics and geographic variables and were able to do so for age, gender, ethnicity and region. Stratifying by lower levels of geography proved difficult as these data were simply not available from the key surveys. Only the GP Patient Survey provides sexual orientation data by local CCG. After contacting local authorities, we were able to present very limited figures for three localities. As a result, we are not currently able to discuss local differences in LGB population proportions. Future work should focus on conducting either more surveys at local level, or present LGB data from national level broken down into sub-regional geographies.

This project aimed to extrapolate the aggregated LGB estimate to the national population of England. Since the census did not include a sexual orientation question, stratification into various age groups, gender, ethnicity and region was based on the broadest survey, which was the GP Patient Survey. There is likely to have been a slight variation in stratified proportions if the actual census was used. However, the GP Patient Survey is, at the moment, presumed to be the most representative survey of the population of England in terms of measuring sexual orientation due to its scale and population coverage.

## Next steps

Future research in this area should, based on current findings, focus on:

- further exploration of the impact of mode of administration and survey context on LGB responses through qualitative research
- undertaking research to understand why respondents do not answer sexual identity questions and who constitutes the group of 'others'
- ensuring that survey data on sexual orientation is publicly available through the UK Data Archive, well indexed, and that it can be broken down by local authority level (where possible)
- undertaking further research to capture local differences in LGB population proportions in England, either through repeated sub-regional reviews of existing surveys or (more likely) through inclusion of sexual identity question on more local surveys
- standardising non-substantive categories across surveys and the way missing data are reported
- standardising the way unweighted and weighted data are presented across surveys

# Annexes

Table 1: Characteristics of 22 key surveys

Survey Name	Collection period	Geography	Study population		Sampling method				Mode of administration	Response rate
			Age	Group	Sampling frame	Stratification level	Sample size	Sample of England		
1970 British Cohort Study: Forty-Two-Year Follow-Up	2012	GB	42	all children born in 1 week	none	N/A	9,764	8,437	CASI	74.6%
Active People Survey	2013 2014	ENG	16+	private households with landline	Random Digit Dialling	simple	60,658	60,658	TEL	27.8%
Adult Psychiatric Morbidity Survey	2007	ENG	16+	private households	small user PAF	complex	7,377	7,377	CASI	57.0%
British Social Attitudes Survey	2013	GB	18+	private households	small user PAF	complex	966	825	PAP	53.8%
Citizenship Survey	2010 2011	ENG & WAL	16+	private households	small user PAF	complex	16,966	9,680	SHOW	58.0%
Count Me In	2010	ENG & WAL	all	patients mental health services	none	N/A	36,091	33,473	-	-
Crime Survey for England and Wales	2014 2015	ENG & WAL	16-59	private households	small user PAF	complex	20,908	18,767	CASI	69.8%
Employees' Awareness, Knowledge and Exercise of Employment Rights Survey	2005	GB	16-64 (M) 16-59 (F)	in employment	small user PAF	complex	1,038	859	SHOW	58.0%
EU Agency for Fundamental Rights: Violence Against Women Survey	2012	UK & EU	18-74	women	small user PAF	complex	1,510	-	SHOW	36.9%
Fair Treatment at Work Survey	2008	GB	16+	in employment	small user PAF	complex	4,010	3,509	CASI	57.0%
Family Resources Survey	2014 2015	UK	16+	private households	small user PAF	complex	27,120	19,479	SHOW	58.0%
First Longitudinal Study of Young People in England: Waves 1-7	2009; 2010	ENG	18-19	in school	Pupil Level Annual Schools Census (PLASC)	less complex	9,799	9,799	CASI; TEL; WEB	87.3%
GP Patient Survey	2015	ENG	18+	registered w/GP	HSCIC patient registration records	less complex	854,032	854,032	PAP; WEB; TEL	35.7%

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Health and Wellbeing of 15 year olds in England – What About YOUth? Survey	2014	ENG	15	in school	National Pupil Database	less complex	116,963	116,963	PAP; WEB	41.0%
Health Survey for England	2013	ENG	16+	private households	small user PAF	complex	7,997	7,997	PAP	64.0%
Integrated Household Survey	2014	UK	16+	private households & student halls	small user PAF	simple	258,661	189,212	SHOW; TEL	63.0%
National Cancer Patient Experience Survey	2013; 2014	ENG	16+	patients treated for cancer	none	N/A	70,141	70,141	PAP	63.9%
National Survey of Sexual Attitudes and Lifestyles	2010 2011 2012	GB	16-74	private households	small user PAF	complex	15,162	13,068	SHOW	57.7%
Place Survey	2008	ENG	18+	private households	small user PAF	complex	43,934	43,934	PAP	39.2%
Taking Part: the National Survey of Culture, Leisure and Sport	2014 2015	ENG	16+	private households	small user PAF	complex	9,816	9,816	SHOW	56.5%
Understanding Society: Waves 1-5 ('UK Household Longitudinal Study')	2013; 2014	UK	16-21	private households	small user PAF	complex	3,354	2,549	CASI; TEL; WEB	65.0%
Workplace Employee Relations Survey	2011	GB	all	in employment	Inter Departmental Business Register	less complex	21,981	19,034	PAP; WEB	50.0%

**Legend: UK: United Kingdom, GB: Great Britain, ENG: England, ENG & WAL: England and Wales, SHOW: face-to-face interview using show cards, TEL: telephone interview, PAP: paper-based self-completion questionnaire, CASI: face-to-face interview using computer-assisted self-completion module, WEB: online self-completion questionnaire.**

**Table 2: Survey results on sexual orientation** (weighted where possible, cells of <10 disclosure controlled)

Survey	H	%	G/L	%	B	%	O	%	DK	%	PNTS	%	R	%	NA	%	Total
1970 British Cohort Study: Forty-Two-Year Follow-Up	8144	96.5%	157	1.9%	76	0.9%	19	0.2%	-	-	41	0.5%	-	-	-	-	<b>8,437</b>
Active People Survey	58,051	95.7%	814	1.3%	402	0.7%	393	0.6%	393	0.6%	-	-	605	1.0%	-	-	<b>60,658</b>
Adult Psychiatric Morbidity Survey	7,071	95.9%	75	1.0%	51	0.7%	126	1.7%	23	0.3%	-	-	-	-	31	0.4%	<b>7,377</b>
British Social Attitudes Survey	784	95.0%	-	-	-	-	21	2.6%	-	-	-	-	-	-	10	1.2%	<b>825</b>
Citizenship Survey	9,345	96.5%	103	1.1%	38	0.4%	20	0.2%	24	0.2%	96	1.0%	54	0.6%	-	-	<b>9,680</b>
Count Me In	24334	72.7%	449	1.3%	446	1.3%	189	0.6%	-	-	-	-	-	-	8055	24.1%	<b>33,473</b>
Crime Survey for England and Wales	17,512	93.3%	323	1.7%	210	1.1%	121	0.6%	13	0.1%	587	3.1%	-	-	-	-	<b>18,767</b>
Employees' Awareness, Knowledge & Exercise of Employment Rights Survey	17,146	90.1%	290	1.5%	120	0.6%	79	0.4%	-	-	654	3.4%	730	3.8%	15	0.1%	<b>19,034</b>
EU Agency for Fundamental Rights: Violence Against Women Survey	1,473	97.6%	34	2.3%	-	-	-	-	-	-	-	-	-	-	-	-	<b>1,510</b>
Fair Treatment at Work Survey	3,386	96.5%	52	1.5%	16	0.4%	-	-	-	-	-	-	51	1.5%	-	-	<b>3,509</b>
Family Resources Survey	18,598	95.5%	208	1.1%	103	0.5%	97	0.5%	174	0.9%	-	-	-	-	299	1.5%	<b>19,479</b>
First Longitudinal Study of Young People in England: Waves 1-7																	
GP Patient Survey	750,322	87.9%	12,621	1.5%	5,923	0.7%	5,148	0.6%	-	-	36,945	4.3%	-	-	43,073	5.0%	<b>854,032</b>
Health & Wellbeing of 15 year olds in England ( What About YOUth? Survey)	107,255	91.7%	1,170	1.0%	3,860	3.3%	1,170	1.0%	-	-	3,509	3.0%	-	-	-	-	<b>116,963</b>
Health Survey for England	7,488	93.6%	108	1.4%	56	0.7%	45	0.6%	-	-	154	1.9%	-	-	146	1.8%	<b>7,997</b>

Producing modelled estimates of the size of the lesbian, gay and bisexual (LGB) population of England

Integrated Household Survey	175,094	92.5%	2,082	1.1%	965	0.5%	617	0.3%	-	-	-	-	7,706	4.1%	2,747	1.5%	<b>189,212</b>
National Cancer Patient Experience Survey	62,621	89.3%	442	0.6%	128	0.2%	268	0.4%	-	-	2,205	3.1%	-	-	4,477	6.4%	<b>70,141</b>
National Survey of Sexual Attitudes and Lifestyles	12,649	96.8%	163	1.3%	153	1.2%	48	0.4%	-	-	-	-	-	-	55	0.4%	<b>13,068</b>
Place Survey	38,474	87.6%	708	1.6%	347	0.8%	362	0.8%	-	-	1,885	4.3%	-	-	2,157	4.9%	<b>43,934</b>
Taking Part: the National Survey of Culture, Leisure and Sport	9,640	98.2%	90	0.9%	49	0.5%	21	0.2%	-	-	-	-	10	0.1%	-	-	<b>9,816</b>
Understanding Society: Waves 1-5 ('UK Household Longitudinal Study')	2,325	91.2%	47	1.8%	75	2.9%	19	0.7%	-	-	78	3.1%	-	-	-	-	<b>2,549</b>
Workplace Employee Relations Survey	849	98.9%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<b>859</b>

**Table 3: Values to calculate aggregated LGB estimates**

Survey	LGB estimate	Sample size	Log. Transf. sample size	Response rate	100%-missing data (NA)	100%-missing data (NA+ PNTS)
Active People Survey	2.65%	60658	4.78	27.8%	100.0%	99.0%
Adult Psychiatric Morbidity Survey	3.42%	7377	3.87	57.0%	99.6%	99.6%
British Social Attitudes Survey	3.84%	825	2.92	53.8%	98.8%	98.8%
Citizenship Survey	1.66%	9680	3.99	58.0%	100.0%	98.5%
Crime Survey for England and Wales	3.48%	18767	4.27	69.8%	100.0%	96.9%
Employees' Awareness, Knowledge and Exercise of Employment Rights Survey	2.57%	19034	4.28	58.0%	99.9%	92.6%
Family Resources Survey	2.09%	19479	4.29	60.0%	98.5%	98.5%
Fair Treatment at Work Survey	2.04%	3509	3.55	57.0%	100.0%	98.5%
GP Patient Survey	2.77%	854032	5.93	35.7%	95.0%	90.6%
Health Survey for England	2.62%	7997	3.90	64.0%	98.2%	96.2%
Integrated Household Survey	1.94%	189212	5.28	63.0%	98.5%	94.5%
National Survey of Sexual Attitudes and Lifestyles	2.79%	13068	4.12	57.7%	99.6%	99.6%
Place Survey	3.23%	43934	4.64	39.2%	95.1%	90.8%
Taking Part: the National Survey of Culture, Leisure and Sport	1.62%	9816	3.99	56.5%	100.0%	99.9%
Workplace Employee Relations Survey	0.90%	859	2.93	50.0%	100.0%	99.8%

**Legend: LGB: lesbian, gay, bisexual and 'other's; NA: no answer; PNTS: prefer not to say**

Table 4: LGB estimates stratified by age, gender, ethnicity and region

Age (years)	GP Patient Survey 2015		Estimated population	Projections mid-2014	
	Number of LGB	Distribution of LGB		Number of LGB	Distribution of LGB
0-17 <sup>1</sup>	-	-	11614949	-	-
18 to 24	4030	17.1%	4898798	231874	4.73%
25 to 34	6122	25.9%	7425591	352241	4.74%
35 to 44	5161	21.9%	7103408	296948	4.18%
45 to 54	4266	18.1%	7635651	245452	3.21%
55 to 64	2099	8.9%	6100512	120770	1.98%
65 to 74	1075	4.6%	5162873	61852	1.20%
75 to 84	581	2.5%	3099319	33429	1.08%
85 or over	283	1.2%	1275516	16283	1.28%
<b>Total</b>	<b>23617</b>	<b>100.0%</b>	<b>54316617</b>	<b>1358848</b>	<b>2.50%</b>

Legend: LGB: lesbian, gay, bisexual and 'others'

<sup>1</sup>The estimation of LGB among people below 18 could not be estimated as the GP Patient Survey only asked about sexual orientation among adults (18+).

Gender	GP Patient Survey 2015		Estimated population	Projections mid-2014	
	Number of LGB	Distribution of LGB		Number of LGB	Distribution of LGB
Male	14434	61.1%	26773196	830558	3.10%
Female	9181	38.9%	27543422	528291	1.92%
<b>Total</b>	<b>23615</b>	<b>100.0%</b>	<b>54316618</b>	<b>1358848</b>	<b>2.50%</b>

Legend: LGB: lesbian, gay, bisexual and 'others'

Ethnicity	GP Patient Survey 2015		Estimated population	Projections mid-2014 <sup>1</sup>	
	Number of LGB	Distribution of LGB		Number of LGB	Distribution of LGB
White	19456	82.5%	47071182	1121574	2.38%
Mixed/multiple ethnic groups	419	1.8%	568807	24154	4.25%
Asian/Asian British	1785	7.6%	3771638	102899	2.73%
Black/African/Caribbean/Black British	661	2.8%	1475768	38104	2.58%
Other ethnic group	1251	5.3%	1429222	72116	5.05%
<b>Total</b>	<b>23572</b>	<b>100.0%</b>	<b>54316618</b>	<b>1358848</b>	<b>2.50%</b>

Legend: LGB: lesbian, gay, bisexual and 'others'

<sup>1</sup>We were not able to obtain the ethnicity breakdown of the mid-2014 population estimations, so the breakdown of the GP Patient Survey population was used.

Region	GP Patient Survey 2015		Estimated population	Projections mid-2014	
	Number of LGB	Distributio n of LGB		Number of LGB	Distribution of LGB
London	6482	26.8%	8538689	363549	4.26%
North West	3197	13.2%	7132991	179306	2.51%
North East	1060	4.4%	2618710	59451	2.27%
South East	3524	14.5%	8873818	197647	2.23%
West Midlands	2187	9.0%	5713284	122660	2.15%
South West	2012	8.3%	5423303	112845	2.08%
Yorkshire and the Humber	1981	8.2%	5360027	111106	2.07%
East of England	2148	8.9%	6018383	120472	2.00%
East Midlands	1637	6.8%	4637413	91813	1.98%
<b>Total</b>	<b>24228</b>	<b>100.0%</b>	<b>54316617</b>	<b>1358848</b>	<b>2.50%</b>

Legend: LGB: lesbian, gay, bisexual and 'others'

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