Working Paper 02/2018

NORTHERN INSTITUTE
People. Policy. Place.

Estimates of Australia's non-heterosexual population

Dr Tom Wilson, Northern Institute, Charles Darwin University

Fiona Shalley, Northern Institute, Charles Darwin University

Email: tom.wilson@cdu.edu.au

Table of Contents

Abstract

Background: Demographers have studied minority populations for many years, but relatively little attention has been paid to sexual minority groups. Population estimates for sexual minorities would be useful as denominators for a range of health and socio-economic indicators, to monitor representation in employment, assist budget planning, and inform the marketing of goods and services.

Aim: The aim of this paper is to present some approximate estimates of the non-heterosexual adult population of Australia in mid-2016 by sex, broad age group and state/territory.

Data and methods: Data on sexual identity were sourced from three nationally representative surveys. Use was also made of 2016 Census data and Estimated Resident Populations. Prevalence rates of the non-heterosexual population aged 18+ were averaged over the three surveys and multiplied by ERPs to obtain national population estimates. Census data on same-sex couples were used to distribute the national estimates by state and territory.

Results: Australia's non-heterosexual population aged 18+ in 2016 is estimated to have been 592,000, representing about 3.2% of the adult population. New South Wales is home the largest non-heterosexual population (about 204,000) and the Northern Territory the smallest (about 4,700), while the highest prevalence is in the ACT (5.1%).

Conclusions: Australia's non-heterosexual population is a relatively small population, but its prevalence varies considerably by age and sex and between states and territories. Estimates of this population should prove useful for monitoring health and wellbeing and for a variety of planning and policy purposes.

Keywords

Population estimates; non-heterosexual; lesbian, gay and bisexual; Australia; states and territories

Acknowledgments

We gratefully acknowledge helpful advice received from Emeritus Professor Gary Gates during the course of this study.

Ethics approval

Approval for this study was received from the Charles Darwin University Human Research Ethics Committee (Approval H17122). Contact: ethics@cdu.edu.au.

1. Introduction

Minority populations have been the subject of demographic research and policy development for many decades, particularly ethnic minority populations (e.g. Coleman and Salt 1996; Jivraj and Simpson 2015) and Indigenous peoples (e.g. Smith 1980; Taylor 2011), but also other groups such as foreign-born populations (e.g. Edmonston 2016) and minority religious populations (e.g. Peach 2006; Pew Research Center 2017). Over the last two decades, and especially in recent years, demographers and statisticians have started to examine sexual and gender minority populations (e.g. Aspinall 2009; Baumle et al. 2009; Baumle 2013; Black et al. 2000; ONS 2010; Meier and Labuski 2013; ONS 2016).

In Australia, the non-heterosexual[1] population was subject to increased attention in the lead-up to the Australian Marriage Law Postal Survey in 2017. Following public debate about same-sex marriage over many years, the Australian Government decided to put the issue to the electorate in late 2017. Effectively a plebiscite, the survey asked "Should the law be changed to allow same-sex couples to marry?" Of those who returned their forms (and excluding unclear responses), 62% voted yes (ABS 2017a). Shortly afterwards Parliament voted overwhelmingly to amend the Marriage Act, and the updated law came into force in December 2017 (Commonwealth Marriage Act 1961).

Yet while progress such as this is made towards equality for the non-heterosexual community in Australia, relatively little is known about the demography of this population. More demographic research could increase knowledge and understanding of this segment of society, leaving less room for stereotypes and myths (Gates 2012). Better demographic evidence could highlight where disadvantage and discrimination remains, and where policy and legislation need revision. Sexual minority population estimates specifically could prove valuable for a variety of health, social justice, and economic purposes. For example, estimates could be used to monitor representation in employment, assist budget planning for specific services for sexual minorities, form denominators for a range of health and socio-economic indicators, and inform the marketing of goods and services (e.g. same-sex weddings). In addition, sexual minority demography can prove useful in broader analyses of demographic trends and theory, such as the influence of gender roles within couples on the labour market consequences of migration (e.g. Cooke 2005).

The bulk of existing research on sexual minority demography focuses on the US and, to a lesser extent, the UK (e.g. Black et al. 2000; Black et al. 2002; Cooke and Rapino 2007; Flores et al. 2016; Gates 2014; Geary et al. 2018; ONS 2016; van Kampen et al. 2017). Australian work is limited, though a small number of contributions have been made over the last two decades (e.g. Dempsey 2015; Grulich et al. 2003; Maddedu et al. 2006; Perales and Baxter 2017; Prestage et al. 2008; Richters et al. 2014; Smith et al. 2003; Wilson 2004). Many Australian-based papers are primarily concerned with important sexual health

[1] We use the term 'non-heterosexual' here but acknowledge there is no standard terminology for sexual and gender minority groups. We discuss this issue in section 2 of the paper.

issues, and only a few present population estimates. Prestage et al. (2008) estimated the population of gay and bisexual men in Australia and each of the states and territories in 2001, while Maddedu et al. (2006) created estimates of gay and bisexual men across inner Sydney postcodes in 2001. Both multiplied gay and bisexual prevalence rates by census counts to obtain estimates. Several other studies include estimates of the prevalence of the non-heterosexual population or parts of it (primarily gay and bisexual men).

We argue that there is a need for sexual minority population estimates for Australia. Ideally, these would be to be up-to-date, available annually, cover the whole non-heterosexual population but also include separate estimates for lesbian, gay, bisexual and other minority sexual orientations, and contain age, sex and geographic detail. Preferably the estimates would use Estimated Resident Populations in their calculation rather than census counts, which suffer from undercount (particularly in the young adult ages). But creating sexual minority estimates is far from straightforward. There are so few demographic data sources which include sexual orientation (Wooden 2014), and those that do so have several limitations. Defining who should be included in the non-heterosexual population is also complicated because of the complex nature of sexual orientation.

The aim of this paper is to present some approximate estimates of the non-heterosexual adult population of Australia in mid-2016 by sex, broad age group and state/territory. The estimates are approximate in the sense that they are constructed from several imperfect data sources and necessarily involve several assumptions. At this stage we present state/territory and national estimates only, and those for the non-heterosexual population as a whole. Finer geographical detail, annual numbers, and separate estimates for lesbian, gay, bisexual and other minority sub-populations are planned in subsequent work.

Following this introduction we consider how sexual orientation is conceptualised and the issue of appropriate definitions and terminology for sexual minority populations. Section 3 describes the data sources and population estimation methods, while section 4 presents the results. A final section includes a short discussion and conclusion.

2. Definitions and terminology

Sexual orientation can be defined as "an enduring pattern of emotional, romantic, and/or sexual attractions to men, women, or both sexes … [and] a person's sense of identity based on those attractions, related behaviors, and membership in a community of others who share those attractions" (American Psychological Association 2008 p. 1). It is generally considered to comprise three elements (Durso and Gates 2013):

(i) sexual attraction – the feeling of sexual desire towards others, considered by some to be the fundamental basis of sexual orientation,
(ii) sexual behaviour – sexual activity, and
(iii) sexual identity – how a person describes their sexual orientation (e.g. heterosexual, gay, lesbian, bisexual).

The non-heterosexual population referred to in this paper includes all those who identify as gay, homosexual, lesbian, bisexual, or in other ways using non-heterosexual terminology (e.g. queer). We therefore focus on sexual identity rather than behaviour or attraction. The sexual identity, behaviour and attraction of individuals are not necessarily coterminous. The Venn diagram in Figure 1 illustrates the relationship between the three dimensions of sexual orientation for the non-heterosexual population. Several surveys have found that a relatively large group of people have felt some same-sex sexual desire at some point in their adult lives, a smaller but not wholly overlapping group have engaged in same-sex sexual activity, and a smaller group still identifies as being non-heterosexual (e.g. Geary et al. 2018; Richters et al. 2014; Smith et al. 2003). Identity is shown in the diagram as 'current' identity because some people change the way they describe themselves over time.

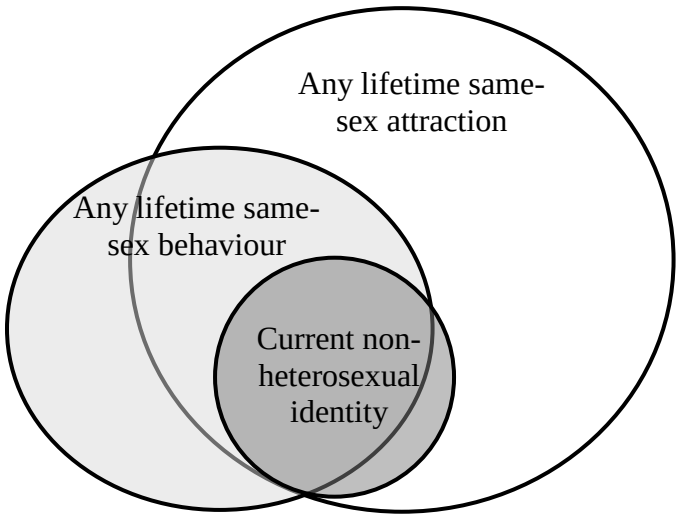

Figure 1: The relationship between the three dimensions of sexual orientation
Source: loosely based on Figure 1 in Richters et al. (2014) and Figure 2 in Geary et al. (2018)

It is important to recognise that people counted as non-heterosexual in data sources are only those willing to identify as such in statistical collections. Strictly, this is the revealed non-heterosexual population. Others may consider themselves to be gay, lesbian, bisexual or other in private but choose not to disclose that. This is the hidden (or closeted) population, and is not included our population estimates (see Gates 2012 for a discussion of the issue).

In addition, it is important to note that sexual orientation is distinct from gender identity and intersex issues, although they are often considered together (e.g. in the term LGBTQI – Lesbian, Gay, Bisexual, Transgender, Queer and Intersex). Gender identity refers to "a person's innate, deeply-felt psychological identification as a man, woman, or something else" (Fenway Health 2010 p.3). The transgender population consists of those whose gender identity or expression differs from their birth sex while intersex refers to "a spectrum of conditions involving anomalies of the sex chromosomes, gonads, reproductive ducts, and/or genitalia" (Fenway Health 2010 p.9). Transgender and intersex populations may be of any sexual orientation.

Finally, on the issue of terminology, we acknowledge that many different terms are used in the literature covering different population sub-groups, with no single term being standard (Dempsey 2015). These include LGB (lesbian, gay and bisexual), LGBT (lesbian, gay, bisexual, and transgender), LGBTIQ (lesbian, gay, bisexual, transgender, intersex and queer), and LGBTQQIP2SAA (lesbian, gay, bisexual, transgender, queer, questioning, intersex, pansexual, 2-spirited, asexual, and allies). We choose the shorthand term 'non-heterosexual' to refer to gay, lesbian, bisexual, and related sexual minorities. Gender minorities such as the transgender population, and sex minorities such as intersex people, are included in our population estimates only if they have identified as non-heterosexual.

3. Data and methods

3.1. Data sources

The proportions (or prevalence) of people identifying as non-heterosexual were acquired from three representative national surveys: the Household Income and Labour Dynamics in Australia (HILDA) survey, the second Australian Study of Health and Relationships (ASHR2), and the ABS General Social Survey (GSS). Data on the proportions of the population identifying as non-heterosexual by sex and broad age group (18-24, 25-34, 35-44, 45-54, 55-64, and 65+) were obtained or calculated from each survey.

The Household Income and Labour Dynamics in Australia (HILDA) survey is a nationally representative household-based longitudinal survey on the lives of Australians (Wilkins 2017). It covers a wide range of topics including family relationships, employment, education, income, health and wellbeing, life events, and personal attitudes. It is conducted annually by interview and self-completion questionnaire with all those aged 15 years and over in the participating household. A question on sexual identity was included in Wave 12, conducted in 2012, as part of the self-completion questionnaire (Wilkins 2015, Wooden 2014). In this wave interviews were conducted with 17,476 respondents and self-completion questionnaires were received from 88% of the interviewed sample. The sexual identity question asked was "Which of the following categories best describes how you think of yourself? Heterosexual or Straight; Gay or Lesbian; Bisexual; Other; Unsure/Don't know; and Prefer not to say" (Melbourne Institute 2012).

The second Australian Study of Health and Relationships (ASHR2) was undertaken in 2012 and 2013 to study the sexual and reproductive health, sexual practices, and wellbeing of the Australian population (Richters et al. 2014a). The survey was conducted via telephone interview using random digit dialling of landline and mobile phones. The survey covered Australian residents aged 16-69 and obtained responses from 20,094 participants, achieving a response rate of 66% of eligible people contacted. The sexual identity question asked was "Do you think of yourself as: 1. Heterosexual or straight; 2. Homosexual (gay); 3. Bisexual; 4. Queer; 5. Not sure; undecided; 6. Something else/other" (Richters et al. 2014b).

The General Social Survey (GSS) is a household-based survey run by the Australian Bureau of Statistics (ABS) every four years. The aim of the survey is to provide a broad range of information on an individual's social circumstances and their relative levels of advantage and disadvantage (ABS 2015a). The survey covers all people aged 15 years and over who are usual residents of private dwellings and is conducted by face to face interview. In the 2014 survey 12,932 out of 16,145 eligible persons responded to the survey, representing a response rate of 80%. A question on sexual identity was introduced for the first time in 2014 and was asked of all participants aged 18 years or over. It was: "Which of the following options best describes how you think of yourself? 1. Straight (Heterosexual); 2. Gay or Lesbian; 3. Bisexual; 4. Other; 5. Don't Know" (ABS 2015b).

In addition, our study made use of some ABS census data. 2016 Census counts of persons in same-sex couples by broad age group, sex and state and territory were extracted from the ABS TableBuilder Pro online data service (ABS 2017b). A direct question on sexual orientation is not asked in the Australian

census. Instead, a same-sex couple variable is created by combining information from two census questions: the question on the relationship of an individual in the household to person 1 on the census form, and the question 'Is this person male or female?'. If the relationship of someone to person 1 is recorded as husband or wife, or de facto partner, and both individuals record the same answer to the question on gender then a same-sex couple is identified (ABS 2018). Nationally, 2016 Census counts of individuals aged 18 and over living together as part of a same-sex couple totalled about 90,000 (only 0.5% of adults counted in the census). This is only a sub-set of all non-heterosexual people, of course. Aside from census undercount, non-heterosexual people who are single or in living-apart-together relationships are excluded from the census count of individuals in same-sex couples. HILDA survey findings from 2012 show that amongst those aged 25-59 only 55% of non-heterosexual men and 59% of women are partnered, compared to 74% for heterosexual men and women in that age range (Wilkins 2015). In addition, people in cohabiting same-sex couples are not always identified as being in a same-sex relationship, such as when neither is person 1 on the census form or if they do not wish to reveal their relationship. Furthermore, there is probably some error in the same-sex couple counts due to errors in responses to the question on gender. Research in the US has revealed this to be a problem with same-sex couple census data there (e.g. Gates 2010; DiBennardo and Gates 2014) but there is no information on whether this has affected Australian census data.

Finally, mid-2016 Estimated Resident Populations (ERPs) by broad age group, sex and state and territory were obtained from the ABS.Stat online data extraction tool (ABS 2017b).

3.2. Methods

Estimates of the adult non-heterosexual population of Australia in 2016 were created by multiplying non-heterosexual proportions averaged across the three surveys by ERPs published by the ABS for 30th June 2016. The estimates were prepared by sex and broad age group (18-24, 25-34, 35-44, 45-54, 55-64, and 65+) for Australia and each of the states and territories. The decision to use proportions averaged across the three surveys was taken because of the non-trivial variations in proportions between surveys and no clear evidence that one survey was superior to another.

National estimates were calculated by multiplying averaged proportions by ERPs:

$$P^{NH}_{Aus,s,A} = prop^{NH}_{Aus,s,A}\ ERP_{Aus,s,A} \quad (1)$$

where P denotes population estimate, Aus Australia, $prop$ the proportion of the population, NH non-heterosexual, ERP Estimated Resident Population, s sex and A broad age group. State and territory estimates were created by distributing national estimates according to the numbers of individuals in same-sex relationships identified in the 2016 Census:

$$P^{NH}_{i,s,A} = P^{NH}_{Aus,s,A}\ \frac{C^{SSR}_{i,s,A}}{C^{SSR}_{Aus,s,A}} \quad (2)$$

where i denotes state or territory, C census counts, and SSR the population in same-sex relationships. While the census same-sex couple data provide an imperfect geographical distribution proxy, they do not suffer from small sample size. Estimates of state and territory non-heterosexual populations from the

three surveys were based on samples too small to be of use (e.g. there were zero non-heterosexual males in the Northern Territory in the HILDA data).

Clearly, the above methods incorporate a number of assumptions which are unlikely to hold precisely. No adjustments have been made for net undercount in the census. It is assumed that the average proportions across the three surveys provide an accurate measure of the identified non-heterosexual population of Australia. It is also presumed that the proportions of the population identifying with non-heterosexual identities remain unchanged between the time of the surveys in 2012 to 2014 and mid-2016. For the state and territory population estimates, the distribution of people in same-sex relationships recorded by the 2016 Census is assumed to match the distribution of the wider non-heterosexual population.

This last assumption is probably the most approximate. It effectively assumes that, for each age-sex group, the proportion of the non-heterosexual population in a same-sex relationship as identified by the census is the same in each state and territory. This is unlikely to be the case. Using survey data from California, Carpenter and Gates (2008) found that highly educated gay men and lesbian women are more likely to be partnered than those who are single; and the educational composition of the population clearly varies spatially.

4. Non-heterosexual population estimates

4.1. New estimates

The extent to which the Australian population identifies as non-heterosexual, using the averaged findings from three surveys, is shown in Table 1 below. Amongst the adult population of Australia 3.1% of males and 3.4% of females describe themselves as non-heterosexual. These percentages exclude survey participants who refused to answer the sexual identity question or who replied 'don't know'. The percentages are higher at younger ages and lower at older ages, with the age gradient being more pronounced for females.

Table 1: Percentage of the Australian adult population identifying as non-heterosexual averaged across three surveys, 2012-14

Age group	Males	Females
18-24	4.0	6.4
25-34	4.0	4.8
35-44	3.0	3.8
45-54	2.6	2.6
55-64	2.4	2.0
65+	2.3	1.1
18+	3.1	3.4

Sources: GSS 2014, ASHR2, HILDA Wave 12

Estimates of Australia's non-heterosexual population by age group and sex are presented in Table 2. They suggest that the national non-heterosexual population aged 18+ in mid-2016 was a little under 600,000, representing 3.2% of the total adult population. The figures indicate there were more non-heterosexual females than males in the younger adult ages, with the situation reversed in the older age groups. Overall, at ages 18 and above the non-heterosexual population is younger than the Australian population as a whole.

Table 2: Estimates of the Australian adult population identifying as non-heterosexual, 2016

Age group	Males	Females	Persons
18-24	47,098	71,839	118,937
25-34	71,804	86,551	158,355
35-44	48,874	61,770	110,644
45-54	40,848	41,009	81,857
55-64	32,579	28,684	61,263
65+	39,848	21,011	60,859
18+	281,052	310,863	591,915

Population estimates for the states and territories are shown in Table 3. Not surprisingly the most populous states, New South Wales, Victoria and Queensland, are home to the largest non-heterosexual populations, while the ACT, Tasmania and the Northern Territory have the smallest populations. All jurisdictions have more females than males in their non-heterosexual populations with the one exception of New South Wales. As a fraction of the total population, South Australia, Western Australia and the Northern Territory have the smallest percentages identifying as non-heterosexual. The ACT has a relatively large non-heterosexual population at 5.1% of its total adult population, a function to some extent of its comparatively young population (Wilson 2016).

Table 3: Estimates of the adult population identifying as non-heterosexual by state/territory, 2016

State/territory	Population aged 18+			% of ERP
	Males	Females	Persons	Persons
NSW	106,400	98,023	204,423	3.4
Vic	76,267	80,790	157,057	3.3
Qld	48,996	63,596	112,592	3.0
SA	14,265	20,818	35,083	2.6
WA	21,280	29,828	51,108	2.6
Tas	4,992	5,953	10,945	2.7
NT	2,147	2,596	4,743	2.6
ACT	6,705	9,258	15,964	5.1
Australia	281,052	310,863	591,915	3.2

4.2. Comparisons with other studies

Comparing our non-heterosexual population estimates with estimates produced by others is not straightforward because of variations in population coverage, reference dates, age ranges, data sources, and social and cultural contexts. Nonetheless it is instructive to compare our figures with the few earlier estimates prepared for Australia. The gay and bisexual male population aged 16+ was estimated by Prestage et al. (2008) to be 182,624 in 2001, representing 2.5% of the population. The prevalence estimates across states and territories varied from 0.8% for Tasmania and 0.9% for the Northern Territory to 2.9% for the ACT and 3.0% for Sydney. Those numbers were based on the first Australian Survey of Health and Relationships. Our non-heterosexual population prevalence rates for just the male population aged 18+ varied from a low of 2.2% in South Australia and WA and 2.3% in the Northern Territory up to 3.6% in NSW and 4.4% in the ACT; it was 3.1% for Australia as a whole.

How do our estimates compare to those produced for other countries? Gates (2011) estimated that about 8 million adults identify as lesbian, gay or bisexual in the US, representing about 3.5% of the adult population. Geary et al. (2018) estimated 1.2 million people aged 16-74 in Britain identified as lesbian, gay, bisexual or other in 2011, or 2.7% of the population. A recent estimate by the Office for National Statistics put the UK population describing themselves as lesbian, gay, bisexual or other aged 16 and over in 2016 to be 1.3 million, representing 2.5% of the population (ONS 2017). In Canada, the Canadian

Community Health Survey found that 3.0% of adults aged 18-59 reported themselves to be lesbian, gay or bisexual in 2014 (Statistics Canada 2017).

In terms of age distributions, our data are consistent with most other studies which have found a higher prevalence of non-heterosexual identities at younger ages (e.g. Gates 2014; ONS 2017). However, this is not a universal finding, with the prevalence estimates presented by Geary et al. (2018) for Britain showing little difference for ages between 16 and 64. Overall, our non-heterosexual population estimates appear reasonably consistent with other respectable studies, and consist of plausible and sensible numbers.

5. Conclusions

This paper has presented a novel set of population estimates for Australia's non-heterosexual population, with disaggregation by sex, broad age group, and state and territory. The estimates should be regarded as approximate given the limitations of the data sources and the assumptions inherent in our methods. Nonetheless, they provide a useful overview of the current non-heterosexual population of Australia which was not previously available. It is emphasised that, conceptually, these estimates refer to the population identifying as gay, lesbian, bisexual and in other non-heterosexual ways, and not those who engage in same-sex sexual behaviour or who have ever experienced same-sex sexual attraction (Figure 1).

Ideally, state and territory, and sub-state, non-heterosexual population estimates would be based on census or large-scale survey data. The UK Office for National Statistics asks a sexual identity question in its Annual Population Survey (covering 41,000 households each quarter) which is sufficiently large to enable sexual identity population estimates to be produced for local authorities (ONS 2017). Perhaps at some point the ABS will follow suit and include a direct sexual identity question in a large-scale survey (or even the census). In the meantime it would be useful to investigate alternative data sources for estimating the state and territory distributions because the use of same-sex couple data from the census is imperfect. It is possible that our ACT prevalence is marginally over-estimated due to its highly educated population. There is likely to be a higher proportion of non-heterosexual people in the ACT in same-sex cohabiting relationships (Carpenter and Gates 2008) which violates the assumption of a fixed ratio between the number of people in same-sex couples in the census and the non-heterosexual population across jurisdictions. Data on the proportion of non-heterosexual adults in same-sex relationships would be ideal, and enable the census counts of persons in same-sex couples to be more accurately scaled up to the total non-heterosexual population.

It would also be useful to investigate the potential of new web-based data sources, such as google search data and social media profiles. For example, some facebook users reveal sexual orientation on their profiles, but even when they do not, facebook 'likes' can be used to accurately predict sexual orientation in 88% of cases (Kosinski et al. 2013). In a more controversial paper, Wang and Kosinski (in press) applied neural networks to detect sexual orientation indirectly from photographs of faces on facebook profiles. Clearly, approaches such as these raise some challenging ethical questions, and also questions about data reliability and representativeness. Future research should explore these new data sources while also continuing to rely on the strengths of existing survey and census data.

References

ABS (2015a) General Social Survey, 2014. Catalogue No. 4159.0. Canberra: ABS.

ABS (2015b) General Social Survey Household Questionnaire. Catalogue No. 4159.0. Canberra: ABS. Available at: http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4159.02014?OpenDocument (accessed 8 February 2018).

ABS (2017a) Australian Marriage Law Postal Survey, 2017. Catalogue No. 1800.0. Canberra: ABS.

ABS (2017b) TableBuilder Pro. Canberra: ABS. Available at: http://www.abs.gov.au/websitedbs/censushome.nsf/home/tablebuilder

ABS (2017c) ABS.Stat. Canberra: ABS. Available at: http://stat.data.abs.gov.au/

ABS (2018) Census of Population and Housing: Reflecting Australia – Stories from the Census, 2016. Catalogue No. 2071.0. Canberra: ABS. Available at: http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/2071.0Main+Features852016?OpenDocument (accessed 8 February 2018).

American Psychological Association (2008) Answers to your questions: For a better understanding of sexual orientation and homosexuality. Washington DC: American Psychological Association. Available at: http://www.apa.org/topics/lgbt/orientation.aspx (accessed 8 February 2018).

Aspinall P (2009) Estimating the size and composition of the lesbian, gay, and bisexual population in Britain. Equality and Human Rights Commission Research Report 37. Manchester: Equality and Human Rights Commission.

Baumle A K (2013) (ed) *International Handbook on the Demography of Sexuality*. Dordrecht: Springer.

Baumle A K, Compton D, Poston D L (eds) (2009) *Same-Sex Partners: The Social Demography of Sexual Orientation*. Albany NY: SUNY Press.

Black D, Gates G J, Sanders S, Taylor L (2000) Demographics of the gay and lesbian population in the United States: evidence from available systematic data sources. *Demography* 37(2): 139-154.

Black D, Gates G J, Sanders S, Taylor L (2002) Why do gay men live in San Francisco? *Journal of Urban Economics* 51(1): 54-76.

Carpenter C and Gates G J (2008) Gay and lesbian partnership: evidence from California. *Demography* 45(3): 573-590.

Coleman D A and Salt J (1996) *Ethnicity in the 1991 Census. Vol. 1. Demographic Characteristics of the Ethnic Minority Population*. London: HMSO.

Commonwealth Marriage Act 1961. Compilation prepared on 9 December 2017 taking into account alterations up to Act No. 129 of 2017, viewed 28 January 2017 https://www.legislation.gov.au/Details/C2017C00382.

Cooke T (2005) Migration of same-sex couples. *Population, Space and Place* 11(5): 401-409.

Cooke T and Rapino M (2007) The migration of partnered gays and lesbians between 1995 and 2000. *The Professional Geographer* 59(3): 285-297.

Dempsey D (2015) Familiarly queer? Same-sex relationships and family formation. In Heard G, Arunachalam D (eds.) *Family Formation in 21st Century Australia*. Dordrecht: Springer; 225-240.

DiBennardo R and Gates G J (2014) US Census same-sex couple data: adjustments to reduce measurement error and empirical implications. *Population Research and Policy Review* 33(4): 603-614.

Durso L E and Gates G J (2013) Best practices: collecting and analyzing data on sexual minorities. In Baumle A K (ed) *International Handbook on the Demography of Sexuality*. Dordrecht: Springer; 21-42.

Edmonston B (2016) Canada's immigration trends and patterns. *Canadian Studies in Population* 43(1-2): 78-116.

Fenway Health (2010) Glossary of Gender and Transgender Terms. Boston, MA: Fenway Health. http://fenwayhealth.org/documents/the-fenway-institute/handouts/Handout_7-C_Glossary_of_Gender_and_Transgender_Terms__fi.pdf (accessed 8 February 2018).

Flores A R, Herman J L, Gates G J, Brown T N T (2016) How many adults identify as transgender in the United States? The Williams Institute, UCLA School of Law, Los Angeles. Available at: https://williamsinstitute.law.ucla.edu/research/how-many-adults-identify-as-transgender-in-the-united-states/ (accessed 8 February 2018).

Gates G J (2012) LGBT identity: a demographer's perspective. *Loyola Law Review Los Angeles* 42(3): 693-714.

Gates G J (2014) LGBT demographics: comparisons among population-based surveys. The Williams Institute, UCLA School of Law, Los Angeles. Available at: https://williamsinstitute.law.ucla.edu/research/census-lgbt-demographics-studies/lgbt-demogs-sep-2014/ (accessed 8 February 2018).

Geary R S, Tanta C, Erens B, Clifton S, Frah P, Wellings K, Mitchell K R, Datta J, Gravningen K, Fuller E, Johnson A M, Sonnenberg P, Mercer C H (2018) Sexual identity, attraction and behaviour in Britain: the implications of using difference dimensions of sexual orientation to estimate the size of sexual minority populations and inform public health interventions. *PLoS ONE* 13(1): e0189607.

Grulich A E, de Visser R O, Smith M A, Rissel C E, and Richters J (2003) Sex in Australia: Sexually transmissible infection and blook-borne virus history in a representative sample of adults. *Australian and New Zealand Journal of Public Health* 27(2): 234-241.

Jivraj S and Simpson L (2015) (eds) *Ethnic Identity and Inequalities in Britain: The dynamics of Diversity*. Bristol: Policy Press.

Kosinski M, Stillwell D and Graepel T (2013) Private traits and attributes are predictable from digital records of human behaviour. *PNAS* 110(15): 5802-5805.

Madeddu D, Grulich A, Richters J, Ferris J, Grierson J, Smith A, Allan B, and Prestage G (2006) Estimating population distribution and HIV prevalence among homosexual and bisexual men. *Sexual Health* 3(1): 37-43.

Meier S C and Labuski C M (2013) The demographics of the transgender population. In Baumle A K (ed) *International Handbook on the Demography of Sexuality*. Dordrecht: Springer; 289-327.

Melbourne Institute (2012) HILDA self-completion questionnaire. Available at: http://melbourneinstitute.unimelb.edu.au/assets/documents/hilda-questionnaires/SelfCompletionQuestionnaireW12M.pdf (accessed 8 February 2018).

ONS (2010) Measuring Sexual Identity: Evaluation Report. London: ONS. Available at: http://webarchive.nationalarchives.gov.uk/20160128164700/http://www.ons.gov.uk/ons/rel/ethnicity/measuring-sexual-identity---evaluation-report/index.html (accessed 8 February 2018).

ONS (2017) Subnational sexual identity estimates, UK: 2013 to 2015. Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/sexuality/articles/subnationalsexualidentityestimates/uk2013to2015 (accessed 8 February 2018).

Peach C (2006) Islam, ethnicity and South Asian religions in the London 2001 census. *Transactions of the Institute of British Geographers* 31(3): 353-370.

Pew Research Center (2017) Europe's growing Muslim population. Washington DC: Pew Research Center. Available at: http://www.pewforum.org/2017/11/29/europes-growing-muslim-population/ (accessed 8 February 2018).

Prestage G, Ferris J, Grierson J, Thorpe R, Zablotska I, Imrie J, Smith A, and Grulich A E (2008) Homosexual men in Australia: population, distribution and HIV prevalence. *Sexual Health* 5(2): 97-102.

Richters J, Badcock P B, Simpson J M, Shellard D, Rissel C, de Visser R O, Grulich A E and Smith A M A (2014a) Design and methods of the Second Australian Study of Health and Relationships. *Sexual Health* 11(5): 383-396.

Richters J, Altman D, Badcock P B, Smith A M A, de Visser R O, Grulich A E, Rissel C and Simpson J M (2014b) Sexual identity, sexual attraction and sexual experience: the Second Australian Study of Health and Relationships. *Sexual Health* 11(5): 451-460.

Smith A M A, Rissel C R, Richters J, Grulich A E and de Visser R O (2003) Sex in Australia: sexual identity, sexual attraction and sexual experience among a representative sample of adults. *Australian and New Zealand Journal of Public Health* 27(2): 138-145.

Smith L R (1980) *The Aboriginal Population of Australia*. Canberra: ANU Press.

Statistics Canada (2017) Sexual orientation. Available at: http://www.statcan.gc.ca/eng/dai/smr08/2015/smr08_203_2015#a3 (accessed 8 February 2018)

Taylor J (2011) Postcolonial transformation of the Australian Indigenous population. *Geographical Research* 49(3): 286-300.

Van Kampen S, Fornasiero M, Lee W, Husk K (2017) Producing modelled estimates of the size of the lesbian, gay and bisexual (LGB) population of England. London: Public Health England.

Wang Y and Kosinski M (in press) Deep neural networks are more accurate than humans at detecting sexual orientation from facial images. *Journal of Personality and Social Psychology*. Pre-print available from https://osf.io/zn79k/ (accessed 8 September 2017)

Wilkins R (2015) *The Household, Income and Labour Dynamics in Australia Survey: selected Findings from Waves 1 to 14*. 10th Annual Statistical Report of the HILDA Survey. Melbourne Institute: The University of Melbourne.

Wilkins R (2017) *The Household, Income and Labour Dynamics in Australia Survey: Selected Findings from Waves 1 to 15*. 12th Annual Statistical Report of the HILDA Survey. Melbourne Institute: The University of Melbourne.

Wilson T (2016) Visualising the demographic components of change shaping the age structures of Australian State and Territory populations. Poster presented at the Australian Population Conference, Sydney, December 2016. Available at: https://tinyurl.com/y7622g4z (accessed 8 February 2018).

Wooden M (2014) The Measurement of Sexual Identity in Wave 12 of the HILDA Survey (and associations with mental health and earnings). HILDA Project Discussion Paper Series No. 1/14, Faculty of Business and Economics, The University of Melbourne.