

# Why do we need data on sex?

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Forthcoming in: *Alice Sullivan and Selina Todd (eds) 'Sex and Gender: A Contemporary Reader' (Routledge).*

Data on sex has been collected by health scientists, social scientists, and public bodies for centuries. Sex is recognised as a fundamental variable, which affects health and social and economic outcomes. This chapter explains why collecting data on sex is important and documents some examples of public bodies and surveys moving away from data collection on sex. We address the reasons why we are losing data on sex and examine the arguments that have been used to oppose data collection on sex. In conclusion, we argue that accurate data on sex is essential for the human sciences, for policymaking, and to tackle sexism.

## Sex matters

Why do we collect data on sex? The reason is that differences between the sexes are an important factor for analysis in most, if not all, of the areas that social and health scientists address. We outline a few examples below.

*Demography:* Sex, alongside age, is a fundamental demographic variable, vital for projections regarding fertility and life expectancy (Grundy and Murphy 2015). In some parts of the world, sex-selective abortion leads to substantially more male than female births, due to a preference for sons (Chao et al. 2019).

*Physical health:* Sex has systematic effects on physical health (Koblinsky et al. 2018). Some conditions only affect males or females. Only females experience pregnancy, menstrual periods, and menopause. Only males suffer testicular cancer, and only females experience gynaecological

cancers. Other conditions are more prevalent in one sex or the other, for example men are more likely to have heart attacks, women are more likely to suffer osteoporosis. Health behaviours also vary according to sex, with men typically engaging in more 'risky behaviours' such as smoking and excessive alcohol consumption.

*Mental health:* Women report higher rates of depression and anxiety than men, though men are more likely to commit suicide (Ploubidis et al. 2017).

*Crime:* Men commit more crime than women, a pattern that holds over time and internationally (Smith 2014). Violent and sexual crime is particularly rare among females (Phoenix, this volume).

*Education:* Historically, women and girls were excluded from advanced education. In much of the world, such discrimination is still prevalent (Benjamin, this volume). In recent decades, women in advanced industrialised societies have surpassed male attainment on indicators such as the likelihood of gaining a university degree. However, substantial variation in field of study persists, for example males are more likely to study science, technology, engineering and maths, while females are over-represented in languages and humanities subjects (Cassidy et al. 2018).

*Employment:* Women have traditionally been excluded from many occupations, and still face barriers in the workplace, some of which are due to maternity and being the primary carers for children and other family members. Social scientists have analysed the 'gender pay gap', meaning the gap in pay between the sexes, and documented sex differences in entry and progression in different fields of employment (Bryson et al. 2020).

*Religion:* Women are more likely than men to be affiliated to a religion and to express religious belief (Voas et al. 2013).

*Social and Political Attitudes:* Women were traditionally more likely to vote for right wing parties than men, but this pattern has reversed over time (Shorrocks 2018).

In research in all of these areas, sex is not examined in isolation, but in conjunction with other important characteristics such as socio-economic position, ethnic group and age. The ability to understand the intersections between these variables is important.

The biological cannot be neatly parcelled off from the social, since human beings are both biological and social animals. The term *biosocial* describes the interaction between biological and social factors, an important focus in multidisciplinary research across the health and social sciences.

## Losing data on sex: UK Surveys and Administrative Data

Despite its importance as an explanatory variable, many UK public bodies have ceased collecting data on sex, often replacing it with data on self-declared gender identity, or with a fudge between gender identity and sex. This is despite the fact that public bodies are bound by the Public Sector Equality Duty within the Equality Act 2010 (EA2010) to monitor and publish data on the protected characteristic of sex. EA2010 defines sex in binary terms: a 'woman' is a 'female of any age' and a man is a 'male of any age'.

The Office for National Statistics (ONS) sought to redefine sex to encompass gender identity for the purposes of the 2021 England and Wales census, and were only prevented via a legal challenge (Sullivan 2021). In Scotland, the guidance for the 2022 census allowed people to answer the sex question according to their gender identity.

The loss of data on sex is an international phenomenon. Scotland's Chief Statistician has stated that collecting data on biological sex is justifiable only 'in a small number of instances...on an individual basis for a very specific purpose' (Scottish Government 2021, 11). Statistics Canada (2021) and Statistics New Zealand (2021: 8) advise that asking about gender rather than sex should be the default approach.

In this section we provide further examples from the UK.

### *Gender Pay Gap (UK Government Equalities Office)*

Since 2017, UK public authorities and private sector employers with headcounts of 250 or more have been required by law to report annually on their 'gender pay gap' – the difference between the average earnings of men and women. However, UK government guidance states that employers 'should be sensitive to how an employee identifies in terms of their gender' and that 'where the employee does not self-identify as either gender, an employer may omit the individual from the gender pay gap calculation' (Government Equalities Office 2021). This means that gender identity is recorded rather than sex, and employees who identify as non-binary are excluded from the data, making it impossible to assess whether non-binary males may have different labour market experiences from non-binary females. It is not obvious why employers would be less likely to discriminate against a woman simply because she identifies as non-binary. For example, employers may still discriminate based on the perceived risk of pregnancy and maternity, irrespective of self-defined gender identity.

### *Crime*

Crime statistics rely on reporting by the police. Many police forces record crimes by male suspects as though they were committed by women at the request of the perpetrator. The Criminal Justice Act 1991 requires the Secretary of State for England and Wales to publish relevant information for the purpose of avoiding discrimination, including sex and race discrimination. To meet this requirement, the Ministry of Justice publishes 'Statistics on Women and the Criminal Justice System', which compiles statistics from a range of data sources including the police, courts and prisons (Ministry of Justice 2020a). The accompanying Technical Guide states that the publication is aimed at understanding 'trends in the CJS [Criminal Justice System] in England and Wales, and how these vary between the sexes and over time' (Ministry of Justice 2020b, 4). However, it explains further that 'given the range of recording practices throughout the CJS, it is likely that most recording includes a mixture of physiological and personal identity' (Ibid., 6). These variously include sex as 'self-identified', 'self-reported', 'officer identified', and a mix of the above (Ibid., Table G.01).

In 2021 Police Scotland confirmed that in cases of rape or attempted rape 'if the male who identifies as a woman were to attempt to or penetrate the vagina, anus or mouth of a victim with their penis, Police Scotland would record this as an attempted rape or rape and the male who self-identifies as a woman would be expected to be recorded as a female on relevant police systems' (Hunter Blackburn et al. 2021).

#### *National Health Service (NHS)*

Over the past twenty years, there has been a gradual shift away from recording and analysing sex in NHS datasets. Patient datasets have replaced data fields denoting biological sex with fields denoting self-declared gender identity. In 2002 the NHS introduced a 'Person Sex' data field, with two sub-fields: 'Gender at Registration' (sex registered at birth) and 'Gender Current' (self-identified). Around 2016, the NHS replaced these subfields with 'Person Phenotypic Sex' (observed sex) and 'Person Stated Gender' respectively. However, the former is only used in three NHS national datasets (relating to maternity services and neonatal outcomes) and is missing entirely from the NHS patient demographic database (Fair Play for Women 2021).

The NHS's failure to record biological sex on patient records has led to trans patients not being called in for screening for conditions which may affect them due to their sex (Richards 2018). This has potentially fatal consequences for trans people. Administrative data based on patient records is also a vital resource for health research. Throughout the UK, individuals can change their NHS 'gender' marker on request. In Scotland, NHS National Services Scotland (2014, 1) confirmed that: 'No evidence is required; the patient simply needs to advise either their GP practice or Practitioner Services that they wish to change their gender'.

#### *Higher Education Statistics Authority (HESA)*

HESA's role is to 'collect, assure and disseminate data about UK Higher Education' (HESA2022a). Higher Education Institutions return data to HESA on both their staff and students. Data on sex are collected alongside other characteristics such as age, ethnicity and institution. For students, the

information includes subject of study, and for staff it includes salaries. For staff records, in 2017/8 HESA replaced the binary 'legal sex' variable with a variable labelled 'sexual identification'. The variable description stated 'This field records the sex of the member of staff', and provided three response categories: male, female and 'other'. The 'other' category included 'people who associate with the terms intersex, androgyne, intergender, ambigender, gender fluid, polygender and genderqueer' (HESA 2018). Yet in reality, being androgynous or otherwise gender non-conforming in no way implies that one lacks a sex.

Student records followed the same structure, with an 'other' option. For tax reporting purposes, there are only two sex categories, male and female. HESA guidance stated: 'It is therefore no longer possible to ask staff one question about sex, as staff who select 'Other' cannot be reported to the HMRC (Her Majesty's Revenue and Customs). We would recommend that providers ask staff about sex in two separate surveys at two separate points in time to avoid any confusion' (HESA 2019). Yet the confusion lay entirely with HESA if they imagined that the sex binary only existed for tax purposes.

The numbers of students reported as identifying their sex as 'other' has increased more than tenfold over a five-year period, from 510 individuals in 2014/15 to 5,505 in 2020/2021 (HESA 2022b). While many universities have no students at all who claim that their sex is 'other', some have a surprising number of such students. According to HESA, the University for the Creative Arts had 285 other-sexed students in 2019/20, four per cent of their student body.

HESA dropped their guidance on the definition of the 'other' sex category in 2021, and, in 2022, issued amended guidance in line with the England and Wales Census, so that the sex variable reverts to legal sex, and the 'other' category is only intended for use in the case of non-UK nationals where an additional category is legally recognised by their country of citizenship (HESA 2022c). Thus, HESA no longer treats gender non-conformity as a third sex.

The Athena Swan charter was established in 2005, initially to encourage commitment to advancing the careers of women in STEMM (Science, Technology, Engineering, Maths and Medicine) subjects in Higher Education. Monitoring gaps between men and women in recruitment and career progression was an essential feature of the scheme. Yet, in 2016, Athena Swan recommended that data collection should be based exclusively on gender identity, not sex: ‘

Asking questions about gender is more inclusive than asking questions about sex’ (Equality Challenge Unit, 2016).

By 2021, the recommended question on ‘gender’ included non-binary identities (Advance HE2021).

‘How would you describe your gender?’

- Man
- Non-binary
- Woman
- In another way (specify, if you wish)
- Prefer not to say.’

If Higher Education institutions collected data on gender identity in addition to sex, this would provide useful insights into the experiences of trans and non-binary people of each sex. Yet Athena Swan explicitly recommended against asking about both sex and gender identity, as they claimed this could lead to people who identify as trans being outed.

Athena Swan’s embrace of ‘the wider definition of gender beyond male and female’ (Advance HE 2020) meant that sex had been jettisoned.

Following critical commentary which attracted media coverage (Sullivan and Armstrong 2021) Advance HE took down their data collection advice in December 2021. Subsequent guidance

(Advance HE 2022) recommended asking ‘What is your sex?’ with options ‘Male’, ‘Female’ and ‘Prefer not to Say’. A separate question on gender identity was also recommended.

## Why are we losing data on sex?

It is difficult to think of an area of life where sex is not an important dimension for analysis, and few quantitative social scientists today would question the central place of sex as an analytic category. So why are surveys and administrative data collection exercises moving away from asking about or observing sex?

The erasure of sex in data collection has been driven by quiet lobbying, and has often gone under the radar (Sullivan 2020, 2021). Gender-identity lobbyists have campaigned to remove sex as a protected characteristic in law, and to replace sex with gender-identity in data collection (Jones and Mackenzie 2020). Much of this campaigning has occurred without public debate, due process or democratic scrutiny, a process termed ‘policy capture’ (Murray and Hunter Blackburn 2019). The removal of sex-based data collection is part of a wider supranational political project, aimed at replacing sex with self-defined gender identity in law and policy (Murray et al. 2020).

Adding to these dynamics, the gender identity lobby is marked by intolerance of dissent, and has waged a remarkably successful campaign to shut down debate, making it difficult to challenge the loss of data on sex. Academics have faced harassment simply for asserting the reality and social salience of sex (Suissa and Sullivan 2021). This has a chilling effect, meaning that normal open and rigorous discourse is effectively suspended.

## The arguments against collecting data on sex

Arguments against data collection using a conventional binary sex variable typically confuse sex, gender and gender identity, and aim to problematise the concept of sex. Many of the public bodies and organisations influenced by such arguments may be unaware of their intellectual provenance,



rooted in ‘a set of inter-locking fallacies about sex which derive from a strand of postmodernist queer theory’ (Sullivan 2020, 4).

We address the main arguments against collecting data on sex, and related connotations and fallacies, below.

### Conflating sex, gender and gender identity

The gender identity movement uses the term gender to refer to both gender (a social construct) and gender identity (an individual self-perception) (Todd and Sullivan, this volume). Yet, whereas gender is rooted in sex, and how others treat us based on our sex, gender identity derives its meaning in opposition to sex. A male may ‘identify as’ a woman, whereas a female simply is a woman.

Statistics Canada’s definition of ‘gender of person’ illustrates the lack of clarity regarding what gender refers to. This definition includes gender identity, ‘which refers to the gender that a person feels internally and individually’, and gender expression, ‘which refers to the way a person presents their gender, regardless of their gender identity, through body language, aesthetic choices or accessories (e.g., clothes, hairstyle and makeup), which may have traditionally been associated with a specific gender’ (Statistics Canada, 2018b). So, does gender refer to ‘identity’ or is it ‘expression’? And what is the basis of the ‘specific gender’ with which certain gender expressions have traditionally been associated?

Attempts to capture some combination of sex, gender and gender identity in a single survey item fall foul of basic principles of questionnaire design, including that multiple-choice response options requiring a single answer must be *mutually exclusive*. The 2021 NHS Staff Survey provides an example of a set of response categories which breaks this principle, asking ‘What of the following best describes you?: Female; Male; Non-Binary; Prefer to Self-describe; Prefer not to say’ (NHS 2021, 7). The question wording leaves it unclear what the target of the question is, that is, what

information is actually sought. The categories are not mutually exclusive, because non-binary people have a sex – they are either male or female. If the question is intended to record sex, the ‘prefer to self-describe’ category is both redundant and mysterious. A person’s identity may be non-binary or any other preferred description, but this should be captured in a separate question on gender identity, not confused with sex. Confusing the two concepts leads to poor quality data on both.

The sex question in the Australian 2021 census includes a ‘non-binary sex response category’, for ‘people who wish to report their sex as other than male or female’ (Australian Bureau of Statistics 2021a). Statistical standards from the Australian Bureau of Statistics (Australian Bureau of Statistics 2021b) state that ‘a person's reported sex can change over the course of their lifetime and may differ from their sex recorded at birth’. The same claim is made by Statistics New Zealand (2021, 17). At a Scottish High Court Appeal hearing on the definition of sex in Scotland’s 2022 census, counsel for the Scottish Government claimed ‘It may once have been thought that sex at birth is immutable. It is no longer so’ (MurrayBlackburnMackenzie 2022). Yet sex is immutable – what may actually change is gender identity.

### [Are sex categories oppressive?](#)

Judith Butler is the most influential theorist behind the denial of the material reality of sex (Butler 1990, 2007). Butler understands gender as a performance rather than a social structure (Jones, this volume). Butler asserts that sex and gender cannot be distinguished, and argues that sex is socially constructed, in the radical sense that sexed bodies do not exist prior to the categories that people use to describe them in language and law. In other words, sex categories do not describe the sexes, but rather create them. This claim seems incredible. Lacking both linguistic and legal categories, can a dog not recognise a bitch when he meets one, or vice versa?

For Butler, the categories themselves are responsible for social hierarchy and oppression. ‘The “naming” of sex is an act of domination and compulsion, an institutionalized performative that both creates and legislates social reality by requiring the discursive/ perceptual construction of bodies in

accord with principles of sexual difference' (Butler 1990, 2007, 157). Sex categories are described as 'violent'. This idea that categories are violent is taken quite literally by Butlerians. For example, Lloyd (2013, 828) claims that the 'constant and unrelenting violent (re-)production of bodies as sexed operates to uphold the norm of compulsory heterosexuality that requires this binary designation of the sexes in the first place', and draws an analogy between such categorisation and a brutal murder. This view underpins the vitriolic response of gender identity activists to sex-based data collection.

But if categories are responsible for oppression, rather than helping us to describe it, why not apply this logic to other categories? For example, we could abolish poverty simply by ceasing to categorise people as poor. The belief that categories are violent implies that empirical social science is an inherently thuggish pursuit.

A further claim is that sex categories 'deny the existence' of trans people. The claim that asking people their sex denies their existence appears odd, given that the concept of being transgender does not make sense without the existence of a disparity between sex and identity, which in turn implies that sex is real. Yet the assertion that 'Trans Women Are Women' is taken to imply that any acknowledgement of biological sex is a denial of trans people's identities. Whereas, if we distinguish between identity and material factors, it is clear that we can acknowledge everyone's identities without denying their sex.

### Are there more than two sexes?

Data Standards produced by Statistics New Zealand (2021, 21) suggest that it is incorrect to view sex as a fixed binary variable. These reference 'Gender Minorities Aotearoa' who define the 'sex binary' as follows:

'An incorrect system of viewing sex as consisting solely of two categories, termed male and female... This system is oppressive, and is a cause of marginalisation for people who do not fit within the sex binary, including many trans and intersex people' (Gender Minorities Aotearoa, 2020, 6).

The claim that sex is 'assigned' rather than observed at birth appears regularly in official documents, for example, Statistics Canada's (2018a) guidance refers to 'sex at birth typically assigned based on a person's reproductive system and other physical characteristics'.

The claim that there are more than two sexes, and the related idea that sex is 'assigned at birth', is associated with the influential queer theorist Anne Fausto-Sterling. Fausto-Sterling initially posited the existence of five sexes, later sliding into the claim that sex is a continuous variable: 'Indeed, I would argue further that sex is a vast, infinitely malleable continuum that defies the constraints of even five categories' (Fausto-Sterling 1993, 21). She then dialled back from such bold claims, in favour of the more nebulous notion that '...sex and gender are best conceptualized as points in a multidimensional space' (Fausto-Sterling 2000, 22). No one has yet attempted to operationalise such a view of sex empirically.

In an attempt to problematise the concept of binary sex, Fausto-Sterling grossly exaggerated the number of people with 'intersex' conditions, now known as Differences of Sex Development (DSDs). DSDs are a group of rare conditions which lead to sex development which differs from the norm (Hilton and Wright, this volume). Fausto-Sterling (2000, 20) claimed that 1.7 per cent of the population has an intersex condition. Going further, Judith Butler has claimed that 'a good ten percent' of people have chromosomal variations outside of the XX/XY norm (Butler 1990, 146). Butler attributes this statement to a scientific paper in the journal 'Cell' which in fact contains no such claim (Page et. al. 1987). In reality, conditions in which chromosomal sex is inconsistent with phenotypic sex, or in which the phenotype is not classifiable as either male or female account for only 0.018 per cent of births (Sax 2002).

It is clearly a fallacy to suggest that the existence of a small minority of anomalous cases invalidates the existence or usefulness of a categorical variable. As an ethical principle, general data collection exercises should not request information on rare conditions, because this would be intrusive and may potentially identify individuals. Nor can it be justified, since there will not be enough cases for

any useful analysis. The appropriation of DSD conditions in the service of a distinct ideological cause is deemed insensitive by many individuals and families affected by DSDs (DSD Families 2021).

### Does gender identity always trump sex?

Is it possible that it is really gender identity, and not sex, which affects people's lives? This argument suggests that sex is a mere proxy for gender identity, as the true underlying explanatory variable.

The claim that gender identity should replace sex is very different from the claim that gender identity matters in addition to sex.

For some outcomes, such as the risk of becoming pregnant or contracting testicular cancer, the evidence against the assertion that gender identity is always the salient variable, is overwhelming. In others, such as patterns of criminality, empirical evidence also suggests that sex trumps identity (Dhejne et al. 2011; Fair Play for Women 2020). The hypothesis that sex is never a relevant variable is an extraordinary one, and would require extraordinary evidence to support it. No such evidence has yet been put forward.

The hypothesis that gender identity is a more powerful predictor than sex for any particular outcome cannot be tested without data on both sex and gender identity. Those who use the claim that gender identity trumps sex as a justification for not collecting data on sex seek to make it impossible to test their assumptions. This demonstrates a radically anti-scientific approach to evidence.

### Has sex changed over time?

The Office for National Statistics stated in 2017 that '[w]ithin today's society the traditional view of gender as a binary classification, male or female, is changing' (Office for National Statistics, 2017).

No-one would deny that gendered roles have changed over time. But does that really imply that humans no longer have just two sexes, male and female? Or that sex is no longer relevant to our lives?

It is certainly the case that demographic variables can change over time. For example, the ethnic group categories used in a society at any given time will tend to reflect the groups that are numerous enough to capture meaningfully, and so will change in line with migration flows and fertility. Occupational categories and social-class schemas are revised due to changing labour markets. New questions are added, for example the addition of questions on sexuality and gender identity as these categories have become politically visible. No-one has argued against collecting data on gender identity, however. The contested issue is the attempt to remove sex via redefinition in terms of gender identity.

Categories like race and social class are socially constructed. These categories change as society changes. But sex is different. The social implications of being male or female have certainly changed over time and differ between cultures. But the biological categories remain constant, and have been recognised in all societies throughout history, for the simple reason that they are the basis for human reproduction.

### Is asking people's sex a violation of their privacy?

The view that collecting data on sex may constitute an unlawful violation of privacy has gained wide traction. The Government Equalities Office (2021) advice to employers on reporting the gender pay gap suggests that collecting data on sex would be unduly intrusive. Public Health England told sexual health and HIV clinics to stop collecting data on the sex of service users after advice from the LGBT Foundation that it may be unlawful to do so (Newman and Bindel 2021). A similar position has been put forward by the Equality and Human Rights Commission, although it has subsequently changed its view (MurrayBlackburnMackenzie 2021).

Surveys ask about many aspects of people's lives which may be deemed sensitive, from a person's salary to their sexuality. So it is odd that asking about something which is, in the vast majority of cases, readily observable, should be deemed a privacy violation. Moreover, both survey and administrative datasets are typically anonymised, so that analysts cannot identify individuals.

In the case of surveys, participation is voluntary, and participants also have the option of not responding to particular questions which they do not want to answer. A 'prefer not to say' option is often explicitly provided.

One data collection exercise which compels respondents to provide data on sex is the census. There is a legal obligation to respond to the census and its required particulars, including sex. However, even in this case, it is clear that requiring data on sex is lawful. Justice Swift, addressing this point in the Judicial Review of the sex question in the England and Wales Census, ruled that it was unlikely that there was any privacy breach in requiring information on a person's sex, but that if it were, it would be justified, as the question would be posed in pursuit of a legitimate objective. He further noted the careful and confidential way in which census information is used (Sullivan 2021).

We recognise that there are sensitivities here because some respondents may prefer not to acknowledge their natal sex. Nevertheless, the purpose of data collection is to provide accurate data which can be used to identify and address social problems. Data collection must always treat respondents with respect, but should not lose sight of its function.

### Has sex always been self-identified?

Items in surveys are typically self-reported, which means that people are asked to report various facts about themselves and their lives, such as their sex, age, who they live with, how much they earn, etc.

The argument is sometimes made that, since sex has typically been self-reported, it has therefore always been a self-identified measure, implying that it has always referred to gender identity rather than sex. For instance, in relation to the sex question in Scotland's census, the National Records of Scotland stated: 'the self-completion nature of the survey, combined with there being no previous guidance can be seen as having enabled respondents to reach their own conclusions on how to complete the sex question i.e. self-identification' (National Records of Scotland 2021 [online]).

Similarly, following changes to the Scottish Household Survey in 2018, which saw the longstanding

binary sex question replaced with a gender identity question, the Scottish Government claimed that the survey had never collected data on sex:

‘As the questions have always reported gender based on what respondents tell interviewers, there has been little change to the concept behind the question being asked. Biological sex is not collected and has never been asked in the SHS.’ (Scottish Government 2019, 300).

This conflation of self-reported sex and gender self-identification is misleading. Self-reported data and self-identification are different things. Self-report means that an individual provides their own information, whereas self-identification implies that the information is about the individual’s subjective identity rather than their material reality. Social scientists ask people to provide information about both their subjective identities, attitudes and opinions, and their objective conditions, and sometimes the interest lies precisely in comparing the two. For example, the British Social Attitudes survey asks people whether they identify with a particular social class, and if so which one (Evans and Mellon 2016). It also asks people to report what job they do, and an occupational class variable is derived from this information. As Evans and Mellon (2016) show, many people in professional and managerial jobs identify as working-class.

Competing social class schemas exist, and the concept of social class is clearly socially constructed. Yet it is reasonable to make a distinction between an individual’s social-class identity and their material conditions, such as the earnings and labour market conditions associated with the kind of job they actually do. Both these variables, social-class identity and occupation, are self-reported - but only the former concerns identity. ‘Self-report’ simply refers to the fact that the respondent provides the information. So, if sex is determined via a survey item asking ‘what is your sex’, it is self-reported. This is distinct from a survey item on self-defined gender identity, where respondents are asked to report their subjective identity, rather than their sex.



## Are the numbers too small to make a difference?

It is sometimes assumed that the proportion of the population who may not identify with their biological sex is so small that the effects on data quality of asking for gender identity in place of sex must be negligible. However, we await reliable data on the size of the trans, non-binary and 'gender diverse' population, and international estimates of gender diversity among youth vary widely (MurrayBlackburnMackenzie 2020). Crucially, it is impossible to predict how the prevalence of diverse gender identities may change in the future.

The trans population is unlikely to be evenly distributed, for example by age, sex and geography. This means that the effects on data reliability are likely to be greater at the sub-group level. This can have extreme consequences for particular subgroups. For example, in 2019/2020 a survey by HM Chief Inspector of Prisons (2020, 43) reported that one in 50 prisoners in the men's prison estate described themselves as trans..

The trans population is growing rapidly, particularly among young females (Littman 2018, Cass 2022). Education data may be particularly affected by relatively high numbers of youth, especially girls, identifying outside of their natal sex. The Tavistock and Portman NHS Trust states that between 1.2 per cent and 2.7 per cent of children and young people are 'gender-diverse' (National Institute for Health and Care Research 2019). A representative population study in Sweden found that, among people aged 22-29, 6.3 per cent would like to 'live as or be treated as someone of a different sex' (Åhs et al. 2018). A 2018 survey of an urban school district in Pennsylvania found that nearly ten percent of high school students surveyed reported a gender-diverse identity (Kidd et. al. 2021). The American College Health Association (2021, 2) have reported that in 2008, one in 2,000 female undergraduates in the US identified as transgender, but by 2021, this had risen to one-in-twenty (5%). Non-standard gender identities are most prevalent among highly educated, relatively affluent youth (Whyte et al. 2018).

In the context of understanding outcomes for 'gender diverse' populations, research suggests that questions on both sex and self-defined gender identity are needed (Reisner et al. 2014). In order to improve both demographic survey data and the health care provided to trans people, clinicians have recommended that information on both natal sex and gender identity should be collected (Mays et al. 2018; Wylie et al. 2016). The experiences of people who identify as trans or non-binary are likely to vary substantially according to their sex. We certainly cannot assume that natal males and females who identify as trans, or non-binary, or otherwise 'gender diverse' will have the same or similar experiences in any social domain where sex is a factor, such as education, the labour market or experiences of domestic violence or sexual assault. Thus, without accurate data on sex, we cannot adequately monitor the differing experiences of males and females who identify as gender diverse, including those who have the protected characteristic of gender reassignment.

Many people find the idea that small numbers of misclassified cases can be substantively important in statistical analysis counter intuitive. However, small numbers of people identifying into the opposite sex can in fact have substantive implications for research findings and for assessing policy interventions.

Small errors can make a big difference when the baseline category is also small. One instance where this is likely to make a difference is data on gay, lesbian and bisexual people. The removal of sex as a category risks erasing lesbians and gay men as meaningful categories for analysis. For example, in data from over 40,000 people responding to the UK Household Longitudinal Study 'Understanding Society', two per cent said that they were gay, lesbian or bisexual. Of the 482 people who stated they were gay/lesbian, 183 were recorded as female (Booker et al. 2017). Given the small size of the gay and lesbian categories, it only takes a small number of people to switch sex-category to skew the data. Heterosexuals are by far the dominant category, and when opposite-sex-attracted people identify as the opposite sex, they are also likely to reclassify as same-sex-attracted. If one per cent of male Understanding Society respondents identified as lesbians, they would slightly outnumber the

current lesbian category. If just 40 males were classified as lesbians, they would represent 18 per cent of the lesbian category, which would clearly represent a major skew in the sex composition of the lesbian category. Such a skew in the data would risk significant distortion of research findings on gay and lesbian people. Both sex and sexuality may be associated with outcomes of interest. For example, economists have established that women cohabiting in same-sex couples earn more than women in heterosexual couples, whereas men in co-habiting same-sex couples earn less than men who cohabit with a female partner (Aksoy et al. 2018).

Education researchers often assess phenomena with large sex differentials, to help inform policy. For example, there have been various educational initiatives aimed at increasing the proportion of women among higher education students who take degrees in physical science or engineering, although the growth is slow. Table 1 shows HESA figures of first year students in these subject areas in 2016 and 2018.

Table 1: First year undergraduates in Physical Science and Engineering

### Physical science

	Female	Male	% Female
2016	10,075	13,215	43.3
2018	10,265	12,475	45.1

### Engineering

	Female	Male	% Female
2016	6,855	36,555	15.8
2018	7,280	36,555	17.0

Source: Higher Education Statistics Agency: <https://www.hesa.ac.uk/data-and-analysis/students/table-40>

Analysis from Professor Lindsay Paterson's contribution to the 2020 Census Judicial Review.

Plausible numbers of men self-identifying as women could swamp these trends. In the above tables, if there were, in 2018, in reality the same number of women and men as in 2016, but 6.3 per cent of men were mis-classified as women (based on Åhs et al. 2018), then the number of students ostensibly classified as women would be 10,908 in physical science and 9,158 in engineering, that is, greater than the number of women actually recorded in 2018. In other words, it is quite possible that plausible rates of mis-classification based on gender self-identification could account for the entire growth in female participation in these subjects of study. Even a rate of self-identification of males as female as low as 1.5 per cent (instead of the 6.3 per cent postulated here) would be enough to account for the whole natural growth between 2016 and 2018. Replacing biological sex with gender identity makes it impossible to reliably assess the impact of policies aimed at increasing female participation in these subjects

The potential for substantial errors due to small levels of mis-classification according to sex increases as the baseline sex-ratio increases. Given the very small numbers of women committing violent and sexual crimes, misclassifying even small numbers of males as women leads to a substantive increase in the proportion of these crimes attributed to women. Arrest data for England and Wales show that women typically account for around 15 per cent of arrests annually, compared to 85 per cent of men (Home Office 2022: Table A.01a). This difference is most marked in relation to sexual offences, where women accounted for just two per cent of arrests annually between 2017/18 and 2020/21 (Ibid.). These low figures mean that a small number of males recorded as women can skew the figures substantively. For example, there were 733 female arrests for sexual offences in 2020/21, compared to 28,307 males arrested for sexual offences in the same year. If just one per cent (283) of these male offenders were classified as female, this would imply a 39 per cent increase in reported sexual offences attributed to female perpetrators.

We know that the possibility of male perpetrators identifying into the female category is not hypothetical, but the prevalence of this phenomenon is impossible to establish, precisely because of

the lack of data. For example, Crown Prosecution Service (CPS) data for England and Wales shows that, between 2012 and 2018, the proportion of rape defendants classified as women varied between 1.2 per cent and 1.8 per cent (Crown Prosecution Service 2018, Table 1). During this seven-year period, 436 individuals prosecuted for rape were recorded as women. Rape is classified as a male crime in England and Wales, requiring non-consensual penetration with a penis, and females can only be charged with rape as an accomplice. A Freedom of Information request established that it is not possible to state how many of those 436 individuals who faced prosecution were biological females, due to police policies that allow for gender self-identification in crime recording.

## Conclusions

This chapter has explained that sex matters in social statistics. Sex has a powerful influence on a wide range of outcomes at every stage of life, from the risk of selective abortion to life expectancy.

We have documented the rapid loss of data on sex in recent years. This has not been driven by scientific concerns, but by highly effective lobbying by groups advocating for the removal of sex as a category in data, policy, and law.

Sex and gender identity are distinct concepts. Arguments against collecting data on sex typically depend on muddling the two, and attempting to problematise the concept of sex. The intellectual underpinnings of these beliefs are incompatible with scientific approaches to understanding the world.

We have addressed the arguments against data collection on sex. These include: that sex categories are oppressive; there are more than two sexes; that gender identity is always more important than sex; that sex categories are socially constructed and have changed over time; that asking people's sex is a violation of privacy; that data on sex has always been self-reported, and is therefore really data on gender identity; and that the number of people with identities incongruent with their sex is too small to make any difference to data analysis.

The arguments against collecting data on sex are unconvincing. In order to fully understand outcomes for people of either sex and any self-defined gender identity, we need data on both variables. As we have argued, concerns about the loss of sex-based data are often brushed aside, as it is assumed that the numbers of people whose gender identities are incongruent with their sex are so low that they will not make a difference to statistical results. While this seems intuitive, we have shown that statistical results may be distorted for at least two reasons. First, the prevalence of trans and non-binary identities is higher in some population sub-groups, for example young people, than in the general population. Second, small levels of misclassification can have a large effect where the baseline category is also small. Where both considerations apply, the issue will be compounded. A lack of data on sex will therefore have particularly negative effects on research addressing outcomes for trans people. It also risks erasing lesbians and gay men as meaningful categories for analysis.

We need data on sex in order to understand differences in the lives of women and men, girls and boys, and to monitor and tackle sexism. Striving to collect accurate data on sex is therefore both a scientific and an ethical imperative. Rather than removing data on sex, we should collect data on both sex and gender identity, in order to develop a better understanding of the influence of both of these factors, and the intersection between them, on people's lives.

In the UK, there are signs that we are starting to reverse the trend away from sex-based data collection. The Office for National Statistics were obliged by a Judicial Review verdict to define the sex question in the England and Wales 2021 Census in terms of legal sex rather than gender identity (Sullivan 2021), though a Scottish court reached a different decision regarding Scotland's 2022 Census. As described above, higher education data collected by both HESA and Advance HE has reverted to including sex. The UK Statistics Authority has recently published guidance that recommends that 'sex, age and ethnic group should be routinely collected and reported in all administrative data and in-service process data, including statistics collected within health and care settings and by police, courts and prisons' (UK Statistics Authority 2021). These gains reflect the

combination of quantitative data experts expressing a clearly evidenced view that sex matters; activism and legal cases brought by feminist campaigners, notably Fair Play for Women; and guidance from the Equality and Human Rights Commission (EHRC) reasserting the status of sex as a protected characteristic in law. While much remains to be done, it seems the tide is turning.

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