Measurement, meaning and moving on: reporting sex and gender matters in health research

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What is "normal"? In the study of medicine, from the laboratory to the bedside to the art and craft of public health, we seek and apply standards and measures of "normality" – designed to show that there is a 'baseline' from which 'variation' or 'deviation' may be observed and possibly corrected for.

Over several centuries of medical and health research, 'normal' has, generally, been male. From the earliest days of anatomical research, for example, the bodies subject to dissection and drawing were overwhelmingly male[1] and textbook depictions of female bodies tended towards Aristotle's observation that "the female is, as it were, a mutilated male"[2], or Galen's description of women as "imperfect" representing essentially a "turned in" version of men[3].

The 'norm' of the male body persists in much of medical education – a study of 31 anatomy textbooks used over the period 1890-1989 found little difference in the proportions of anatomical drawings that were male (generally around 70%) compared to female (less than

10%, with the remainder classed as 'non-gendered')[1], and a more recent survey of 15 general medical and surgical textbooks found that 78% of depicted faces were male[4].

This level of 'sex-blindness' in educational materials and medical research carries consequences for individuals and groups who do not 'conform to the norm' - and who may receive erroneous diagnoses, missed opportunities for intervention, or simply the wrong dose of the wrong drug. The genetics, anatomy, physiology, biochemistry and health-care experience of women and girls has historically been under-researched and under-addressed in the health sciences, but the question of whether it continues today has not been extensively and rigorously analysed till now.

In their analysis, Sugimoto and colleagues investigated the extent to which sex-related research and reporting occurs in contemporary (1980-2016) scientific publications[5]. With over 2 million papers included in their analysis, and recognising potential biases and limitations, their findings highlight that in 2016 the field of public health saw just over half of studies report both female and male populations, but fewer than half do in clinical medicine. Laboratory and biomedical research still lags far behind with not even a third of papers reporting on sex. There has been progress in sex-reporting over time, but significant improvements are still required – particularly in academic disciplines that are more closely allied with studying bench science than society.

Additionally, the paper confirms findings and trends seen in other studies[6], and provides the strongest evidence to date that the gender of the authors has a direct influence on sex-reporting. Studies with a female first- or last-author were statistically more likely to report on sex, and when both first and last were women, the effect size was strongest. In other words, female authors are more likely to consider sex as a key variable in research and analysis.

Might the impact of author-gender explain both the relative absence of sex-reporting in the past and the increase over the 35+ years of the papers included in the study? Has the increase in women in clinical medicine contributed to the rise in sex-reporting in the field?

In the UK, for example, there have been more women than men entering medical school since 1996[7], and in Tunisia approximately 70% of medical graduates in 2016 were female[8]. In contrast, bench science globally is still dominated by men with fewer than 30% of researcher positions occupied by women[9]. It seems likely that the relative dearth of women in laboratory science reinforces the institutional culture that promotes sex-blind research.

In our experience of working in scientific research, clinical medicine and public health research across various geographical settings, the relative sex-blindness of research outputs is not a surprise and is mirrored by pervasive levels of gender-blindness in health research and practice. Gender - representing socially constructed roles and power distribution shaping behaviours, activities, expectations and opportunities considered appropriate for all people[10] - drives many of the major differences in health outcomes, but analysis of global health organisations has found that not only are 60% of them gender-blind in their policies and programmes, but two-thirds fail to disaggregate their performance data by sex[11].

These findings of sex- and gender-blindness represent the continuation of centuries-old archetypes that see male sex as the norm – resulting in a unidimensional view of humanity. Sugimoto and colleagues have provided strong empirical evidence that change to a splendid 2-dimensional vision is possible -– and have shown that change happens when the people conducting the research also change.

There may be some truth in the trope that people measure what they treasure. A shift to a more diverse and inclusive research community is likely to result in research outputs that carry greater meaning and potential benefit for more people in more parts of the world. Such a shift would be transformative – from 2-D to 3-D vision and more – but the extent to which it is able to do so depends on the measurement being treasured more widely. For that we need to move beyond a measurement revolution to an accountability revolution – one that is based on respect and realisation of universal human rights[12] to ensure that our research is universally beneficial and not limited by sex, gender, ethnicity, nationality, income, or any other intersecting index of inequality. Such a revolution towards accountability in research seems more likely to occur when the research community itself

becomes more inclusive, diverse and representative, and works to ensure that everyone counts.

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