## NOTE #3

An analysis of gender equity in scientific authorships: a case study of the National Institute for Health Research Oxford Biomedical Research Centre

**By Rinita Dam, Syed Ghulam Sarwar Shah, Pavel Ovseiko, Lorna Henderson, Vasiliki Kiparoglou and Alastair Buchan**

# RRI IMPLEMENTATION
# IN BIOSCIENCE ORGANISATIONS

GUIDELINES FROM THE  STARBIOS2 PROJECT

Andrea Declich with the STARBIOS2 partners

# NOTE #3

## An analysis of gender equity in scientific authorships: a case study of the National Institute for Health Research Oxford Biomedical Research Centre

**By Rinita Dam, Syed Ghulam Sarwar Shah, Pavel Ovseiko, Lorna Henderson, Vasiliki Kiparoglou and Alastair Buchan**

Women are under-represented in academic medicine [1-2] including the authorship of scientific publications [3-5]. Funding requirements for the National Institute for Health Research (NIHR) Biomedical Research Centres (BRCs) have resulted in many improvements for women via the Athena SWAN Charter on gender equality [6]. However, there are still areas which need addressing. The number of women and their achievements are not tracked routinely by the NIHR BRCs and little is known about how much women contribute to research and innovation in the BRCs. It is therefore imperative to inform the acceleration of women's advancement and leadership in translational research not only in line with the stated objectives of the NIHR within the UK but also from the Responsible Research and Innovation (RRI) perspective within the wider European Research Area through the collection of gender-disaggregated bibliometric data and gender analysis of scientific authorships.

**Aim:** To undertake retrospective bibliometric analyses of authorship by gender using the NIHR Oxford BRC publications for the period from April 2012 to March 2017.

**Methods:** The authorship of NIHR Oxford BRC's research publications (n=2409) was analysed for gender of the first author, joint first authors, first corresponding author, joint corresponding authors, the last author and joint last authors. The gender of author(s) was used as a binomial variable: male and female. The gender of the authors was identified from the names of authors through a rigorous methodology. When the authors' names were difficult to associate

with the appropriate gender, further information was sought, such as their institutional affiliations, or social networks e.g. LinkedIn and ResearchGate. Gender API (gender-api.com) was also used when it was not possible to ascertain the gender of the authors via their institutional affiliations or via the social networks. In addition, some authors were contacted directly to ascertain their gender.

**Data analysis:** Data were analysed using frequencies and descriptive statistics in the SPSS (version 25 for windows). Publications with 'missing data', 'unable to determine gender of authors' and authors reported as 'trial groups' were not included in the analysis. In terms of calculating the proportion of female and male authorships, only authors with defined gender were included in the analysis. Chi-Square tests and $p$ value less than 0.05 were used for identifying statistically significant differences in various types of authorship between male and female authors.

**Results:** The gender of the first author was mostly male (59%, n=1430) compared to female (41%, n= 994). 458 publications included joint first authors (authors that were named as equal contributors in publications), which included both male and female (57%, n=262), male (28%, n=127) and female (15%, n=69). The first corresponding authors were mostly male (65%; n=1565) compared to female (33.5%, n=806). 169 publications reported joint corresponding authorship which involved mostly male (63%, n=107) than female (29%, n=49) and both male and female (8%, n=13). Senior authors were mostly male (77%, n=1853) compared to female (23%, n=553). Joint senior authors reported in 229 publications were mostly male (47%, n=108) followed by both male and female (43%, n=98) and only 10% were female (n=23). Chi-square goodness-of-fit tests showed that the proportion of female authors was statistically significantly lower than the proportion of male authors in all categories of authorships in our sample.

**Impact:** STARBIOS2 has acted as a catalyst of structural change as these findings prompted the NIHR Oxford BRC to routinely record gender in scientific authorships and measure gender equity in research reporting.

# ABOUT THE ✶ STARBIOS2 GUIDELINES

This guideline aims to help readers formalize and trigger structural change aimed at introducing appropriate RRI-related practices to their own organisations. This is not a series of prescriptions, but an itinerary of reflection and self-interpretation addressed to different actors within the biosciences. To support this itinerary of reflection and self-interpretation, the document provides...

· a description of a general RRI Model for research organisations within the biosciences, that is a set of ideas, premises and "principles of action" that define the practice of RRI in bioscience research organisations,

· some practical guidance for designing interventions to promote RRI in research organisations in the Biosciences, putting into practice the RRI Model,

· a set of useful practices in implementing the structural change process,

· and information on particular STARBIOS2 cases and experiences, as well as materials, tools and sources, are also provided in the Appendix and in the Annex.