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**On behalf of the RSS Medical Section.**

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## "Medical Statistics – always on tap but never on top" … ?

"Get out of Medical Statistics – you will always be second fiddle to medically qualified staff".

"Persevere – be true to yourself and the profession, don't be steamrollered by clinicians".

"Need to proactively support local medical statistics groupings and carve out time for interaction. Too easy to be swamped with requests for 'support' from clinical researchers with pressing needs."

"I was seen by clinical colleagues as 'someone who can do computers' and in general they had little idea about statistical issues or how qualified I was".

These (and the title) are selected responses by medical statisticians to the question "Have you found a way to pursue the career path that you wished to follow despite obstacles" – a qualitative, open-ended question included in a survey conducted by the Royal Statistical Society (RSS) Medical Section in 2019. The survey ran for 5 weeks with email invites sent to 317 RSS members who included the terms medical and or health in their professional interest. The invitation was extended to wider networks through the National Institute for Health and Care Research (NIHR) Statistics Group and twitter accounts of the RSS Medical Section committee. The survey was open both to members and non-members of the RSS who were working as statisticians across the medical/health and social care sectors including academia, the National Health Service (NHS), commercial bodies and other research organisations.

This anonymous survey was conducted to help the RSS consider if it should provide professional support for statisticians working within health and social care to allow individuals to achieve their full potential. It addressed the question "is there a need for greater professional recognition and development opportunities" and aimed to provide quantitative evidence to the RSS Executive Committee following submission of a report entitled "Improving professional recognition and development opportunities for statisticians working in medicine and health" by the RSS Medical Section. This report was initiated in part by a session on career development that had taken place at the 2017 Burwalls meeting. Burwalls is an annual meeting that takes place in the UK which began in 1980 and is open to those responsible for teaching statistics to medical, dental and other healthcare students within the UK[1]. Here it had emerged that there was evidence of dissatisfaction amongst individuals working in the UK as medical statisticians and confusion about any concept of a

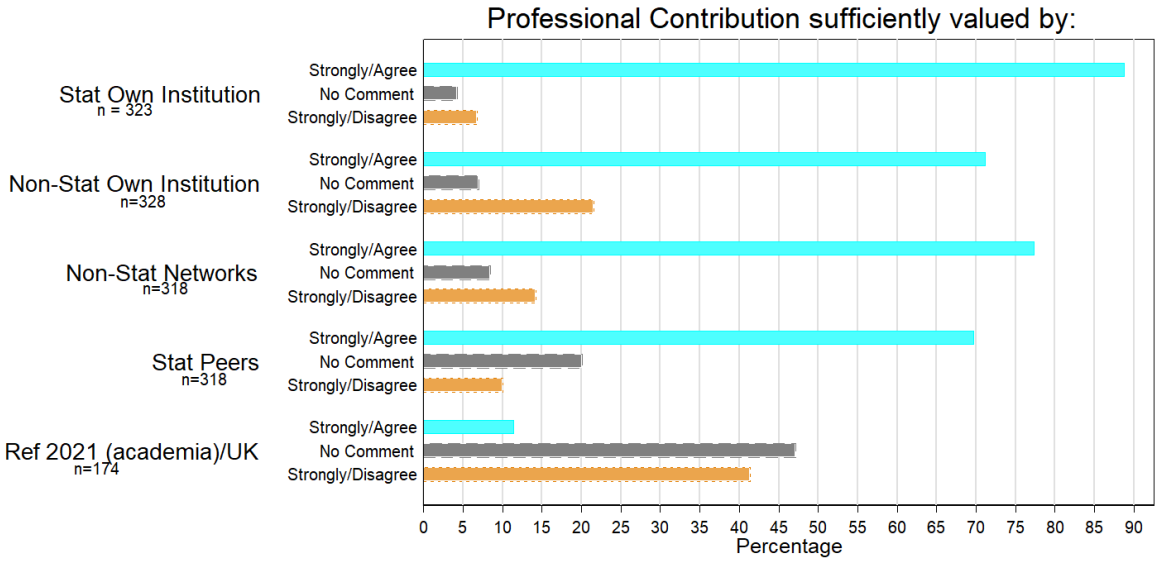
career path. Issues discussed included lack of recognition in research, in teaching, and in consultation by colleagues in medical or related fields by both employers and funders, and professional isolation. Although these issues appeared to be felt commonly amongst statisticians in early stages of their careers, they were reported by those at later stages including at professorial level.

Access to the data set can be requested from mona.kanaan@york.ac.uk. Of note is that it contained open-ended survey questions – or "qualitative data". The value of the qualitative data being that "it gives a voice to the lived experience, offering researchers a deeper insight into a topic or individuals' experiences. Qualitative data can be combined with quantitative to enhance understanding around a policy or topic in a way that quantitative data by itself often cannot"[2].

We received responses from 335 respondents, 253 were employed full-time, 57 part time, 13 were self-employed and 8 were retired. The most commonly selected employment sector was academia with 239 respondents, followed by the NHS with 49. The majority of respondents were from the UK, 278 (83 %) and 220 (66 %) were RSS members. The median time working in healthcare was 10 years with an interquartile range of 5 to 22 years. A considerable proportion of those who responded did not have PhDs. For those with over 10 years of experience in health care, 40% did not have PhDs.

Figure 1 provides quantitative information in relation to how respondents judged that their professional contribution as a statistician in the healthcare sector is generally valued by different members of staff within and outside their institution. Some good news is that the majority 286 (85%) felt valued by fellow statisticians but unfortunately 71 (21 %) felt undervalued by non-statistical colleagues within their own institution. Perhaps it is this that is captured by our selected quotes. Another key finding was that 72 (41 %) of UK academic respondents reported feeling undervalued by the Research Exercise Framework (REF) 2021 process –a UK system that assesses the quality of research in higher education institutions (HEIs).

***Figure 1*** Professional contribution sufficiently valued by different professional groups. Valid percentages of those agreeing or otherwise are presented; those who replied 'not applicable' were not included in the analysis[a]. For the Ref 2021 item, only those who responded as working in UK academia are shown. In the figure labels, "Stat" stands for Statisticians.




Does it matter that a sizable proportion of medical statisticians feel undervalued by non-statistical colleagues within their own institutions or that some voice concerns such as those captured by our quotes? We believe that it does because it indicates a lack of collaboration within medical research that might result in statisticians not being included where they perhaps should be. Statistics within medical research matters greatly: errors can – and do – impact on patients and society as evidenced by the Measles, Mumps, and Rubella (MMR) controversy originating with a flawed publication within the Lancet which was subsequently retracted.[3, 4] In 2014, the Lancet ran a series of five papers on "increasing value and reducing waste" in research which highlighted that despite evidence of increasing statistical complexity within medical research, "statisticians and methodologists were only sporadically involved". This lack of involvement often led to flawed designs and analyses.[5] Statistical errors were not only found with more complex methods: one study investigated the use of Fisher's exact test in 71 articles from 6 major medical journals; this study found that the test was correctly specified when a statistician was part of the team in 11 out of 17 articles compared to 10 out of 36 articles when one was not involved[6]. Statistical collaboration between qualified statistician and experienced clinician or experienced scientist is encouraged to fully reap the benefits of team science. Is it correct that the statistician plays second fiddle to the clinician? Perhaps this view stems from the tendency for the clinician to take first or final authorship position resulting in the statistician believing that they are less important as might be inferred from the REF 21 system. Similarly, it is common for medical research to have a chief investigator, and this would tend to be a clinician. Does chief investigator mean lead on statistical issues however, and if a statistician tries to exert their authority in this area, does conflict ensue?

[a] *The number of respondents that chose 'not applicable' were 11, 6, 16, 14, and 27, for the variables presented in Figure 1 from top to bottom, namely, Statisticians in own institution, Non-statisticians in own institution, Non-statisticians in wider networks, Statistical Peers, and REF 2021.*

Qualitative data can, of course, be highly subjective. Other responses were very different to those quoted thus far. One respondent expressed the following:

"Just accept that people will be lost to other professions that are better paid and less stressful. Harping on about continuing professional development gives ideas that this should be a compulsory part of progression, which is unhelpful when work is more about continuing professional stagnation."

Another asserted:

"Work hard and stop moaning. I value the RSS as a Professional organization. I would ask them to tell statisticians to network, be their own man, work hard, don't turn down work opportunities, and learn to respect clinical colleagues."

Here we have just captured comments relating to "professional recognition". We are reporting this to Significance simply because we feel that we owe it to respondents to share their "lived experience" and perhaps encourage discussion about these subjects. We would hope to see greater use of qualitative information because it adds a different dimension to work.

Other key findings from, and our comments on, the survey were as follows:

i. When asked if they had a reasonably clear idea of a likely career development path, 148 (44%) of respondents said they did not. Two hundred and eleven (63 %) felt that there are obstacles in the way of professional development – examples including a lack of suitable career/promotion structure in their institution.
ii. 154 individuals (46%) felt that they would benefit from a mentor.
iii. The NIHR has established an Incubator for Methodology – to increase research capacity in methodology applied to health and care research – including medical statistics.
iv. It is worth highlighting that the survey had a limited number of respondents from industry. The survey might not have reached those working in industry as they might prefer membership of other organisations, such as statisticians in the pharmaceutical industry, to an RSS membership.
v. The results of our survey are in line with those identified in the 2014 qualitative survey of thirty professional statisticians in New Zealand[7].
vi. 220 respondents were RSS members at the time of the survey, the current membership has also 220 members that identify as having careers in 'Medical and Health' out of a total of 2,245 fellows who shared their employment sector with the RSS[b].

The results presented are those of the respondents and do not necessarily reflect the views or experiences of the authors of this article or the organisations to which they are associated.

[b] Source RSS membership manager.

References


1) Altman, D. “Invited talk: 20 years of Burwalls.” Statistics in Medicine vol. 21,7 (2002): 959-67. doi:10.1002/sim.1125.

2) UK Data Service-Learning Hub, Qualitative Data, “Giving a voice to the lived experience” [Online]. Available at: https://ukdataservice.ac.uk/learning-hub/qualitative-data/#:~:text=Qualitative%20data%20is%20non%2Dnumeric,audio%2Dvisual%20recordings%20and%20images [Accessed on 6 December 2023].

3) Wakefield, A. J. et al. “Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children.” Lancet vol. 351,9103 (1998): 637-41. doi:10.1016/s0140-6736(97)11096-0

4) Godlee, F. et al. “Wakefield's article linking MMR vaccine and autism was fraudulent.” *BMJ* vol. 342 c7452. 5 Jan. 2011, doi:10.1136/bmj.c7452

5) Ioannidis, John P A et al. “Increasing value and reducing waste in research design, conduct, and analysis.” *Lancet* vol. 383,9912 (2014): 166-75. doi:10.1016/S0140-6736(13)62227-8

6) McKinney, W P et al. “The inexact use of Fisher's Exact Test in six major medical journals.” *JAMA* vol. 261,23 (1989): 3430-3

7) Cameron, C., et. al. “More than just numbers: challenges for professional statisticians”. *Statistics Education Research Journal,* vol. 16, 2 (2017): 362-375. Available at: https://iase-web.org/documents/SERJ/SERJ16(2)_Cameron.pdf.