

Correspondence

Edited by Kiriakos Xenitidis and
Colin Campbell

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Confounders in studies of suicide by occupation

Milner *et al*¹ make a commendable analysis of the effect of occupation on suicide risk, drawing on an imperfect field of research. Their work does not, however, allow for the effects of the differential demographic profiles (particularly gender) of those employed in each occupational category. This is particularly important when, in the UK in 2011, there was an 18.2 per 100 000 suicide rate among males compared with a 5.6 per 100 000 rate among females.²

If an occupation were almost entirely filled with men aged 30 to 44, with their suicide rate of 22.2 per 100 000,² it would not be surprising that its rate of suicides was significantly higher against all reference groups.

The United Nations Statistics Division figures show a striking difference in the gender balance of the ISCO categories in the UK from 2009 census data. In ISCO-9, with its high suicide rate ratio of 1.8 (95% CI 1.5–2.3) in Milner *et al*, 60.4% were male.³ In ISCO-4, with its rate ratio of 0.8 (95% CI 0.6–0.9), only 22.5% are male.³ This relationship does not correlate across the ISCO categories, but it is enough of a confounder to be of interest. Despite the advantages of the rate ratio, it does not correct for gender, whereas the proportionate mortality ratio does. It may be premature to dismiss its utility, until we have better data-sets that are more amenable to correction for demographic factors.

- 1 Milner A, Spittal MJ, Pirkis J, LaMontagne AD. Suicide by occupation: systematic review and meta-analysis. *Br J Psychiatry* 2013; **203**: 409–16.
- 2 Office for National Statistics. *Suicides in the United Kingdom, 2011*. ONS, 2011.
- 3 United Nations Statistics Division. *UNdata 2013*. UN Statistics Division, 2013 (<http://data.un.org/Default.aspx>). Accessed 26 Dec 2013.

Alasdair D. Forrest, CT1 in Psychiatry, Argyll & Bute Hospital, Argyll PA31 8LD, UK.
Email alasdair.forrest@nhs.net

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The paper by Milner *et al*¹ is an excellent meta-analysis, but there are a few lacunae in the interpretation of results. First, suicide rates differ from country to country. Second, causes differ in age groups and in different countries. For example, in India a 2012 analysis² revealed that the self-employed category accounted for 38.7% of victims, of whom 11.4% worked in farming/agriculture, 4.7% in business and 2.9% in professional occupations. Students and unemployed victims accounted for 5.5% and 7.4% respectively; 18% of those who died were housewives. Third, educational status also affects suicide rates. In India, the majority of suicides (46%) are by people with a middle- or primary-level education. These

categories have been relatively constant for a long time.^{2,3} Fourth, the causes differ from culture to culture: in India, family problems constitute the majority (26%), followed by illness (21%). So, drawing and applying conclusions from meta-analysis to different cultures and countries is difficult.

- 1 Milner A, Spittal MJ, Pirkis J, LaMontagne AD. Suicide by occupation: systematic review and meta-analysis. *Br J Psychiatry* 2013; **203**: 409–16.
- 2 National Crime Records Bureau. *Suicides in India*. NCRB, 2011 (<http://ncrb.nic.in/CD-ADSI2011/suicides-11.pdf>).
- 3 Bhatia MS, Aggarwal NK, Aggarwal BB. Psychosocial profile of suicide ideators, attempters and completers in India. *Int J Soc Psychiatry* 2000; **46**: 155–63.

Manjeet S. Bhatia, Professor and Head, University College of Medical Sciences & Guru Teg Bahadur Hospital, Dilshad Garden, Delhi-110095, India. Email: manbhatia1@rediffmail.com; **Anubhav Rathi**, **Nirmaljit Kaur**, UCMS & GTB Hospital, Delhi

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Author's reply: We welcome the responses to our meta-analysis on occupational gradients in suicide mortality,¹ and would like to reply first to the comments raised by Forrest. He suggests that gender is an unmeasured factor that may be driving the higher rate ratios in the lowest-skilled occupational groups (ISCO-9, elementary and unskilled occupations such as labouring). Certainly, gender has the potential to be a confounder in this circumstance – being associated with employment in high-risk, low-skilled occupations in the ISCO-9 category and suicide. However, it is inaccurate to suggest that our paper does not allow for the differential effects of gender. In fact, we conducted sensitivity tests and found similarities in patterns. Both women and men had higher rates of suicide in the lowest skilled occupational group. There were some differences in the highest skilled group, in which women had elevated rates. The argument by Forrest would suggest that there should also be an elevated rate ratio for males in the highest skilled group, which is largely comprised of a male workforce. Instead, rates for males are significantly lower than those for the working-age population.

Gender is only one of the myriad component causes that contribute to a set of sufficient conditions for suicide. As acknowledged in our paper, suicide in high-risk occupational groups is likely to be due to a number of factors related to socioeconomic disadvantage, low access to services, access to means, and detrimental working conditions. It has been shown in numerous studies that those working in lower skilled jobs are exposed to the worst psychosocial working conditions, including for example high job strain (high demands and low control at work)¹ and job insecurity.² Adverse work-related psychosocial stressors have been shown to be associated with common mental disorders³ and suicide^{4,5} across studies. Considering that both males and females have elevated suicide rates in the lowest skilled occupational group in our meta-analysis, we would suggest that factors connected to the social and working environments have the potential to be contributing risks. In short, to assume that the higher suicide rates among the lowest skilled occupational groups is due to a larger proportion of males oversimplifies what is a complex set of causes.

Bhatia and colleagues raise the issue of cultural differences in the epidemiology of suicide. Unfortunately, eligible studies on suicide by occupation were not available from India and because of this we agree that the results of the meta-analysis may not generalisable to this country. They go on to comment about suicide in groups out of the labour force. These were not the topic of our review and therefore have limited bearing on our