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Published by Oxford University Press on behalf of the International Epidemiological Association
International Journal of Epidemiology 2013;**42**:1435–1437
doi:10.1093/ije/dyt080

Commentary: Jumping the gun or asleep at the switch: is there a middle ground?

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Accepted 18 March 2013

Non-communicable diseases (NCD) are now widely recognized as constituting a majority share of global mortality, accounting for 65% of all deaths.[1] An estimated 43% of all deaths in low-income countries and 75% of deaths in lower-middle-income countries can be attributed to non-communicable conditions.[2] In this context, it has been hypothesized that NCD may no longer be confined to only the most affluent populations in low- and middle-income countries (LMIC). Instead, even populations with lower socioeconomic status (SES) within LMIC may be experiencing increasing risk for NCD or NCD risk factors. Support for this hypothesis has been documented in a number of LMIC.[3–7]

In this issue of *IJE*, Subramanian and colleagues challenge the idea that NCD are disproportionately

represented among populations with low SES in India.[8] The authors focus specifically on cardiovascular risk factors, disease and mortality. They provide a summary of the literature and a critical appraisal of the discourse around NCD in India. They conclude that, contrary to what has been hypothesized, cardiovascular risk factors (with the exception of tobacco use/smoking) are less prevalent among the lowest SES populations in India as compared with the highest. Subramanian *et al.* argue that, despite the lack of empirical evidence, previous interpretations of results from India display a strong bias toward portraying results as congruent with the hypothesis that the burden of NCD is shifting toward the socioeconomically disadvantaged. Finally, they conclude that, beyond being problematic to the scientific community, these biased interpretations and the associated advocacy for NCD prevention/treatment might have unintended negative consequences for the most vulnerable populations in India.

Subramanian *et al*. summarize the results of 53 studies reporting 353 associations between SES and cardiovascular risk factors, disease or mortality. They find that in a majority of studies, five of seven cardiovascular risk factors (obesity, diabetes, adverse lipid profile, hypertension and physical inactivity) were clearly more prevalent among populations with high SES compared with low. Only two cardiovascular risk factors (smoking/tobacco use and low fruit and vegetable intake) were clearly more prevalent among populations with low SES compared with high. Results for cardiovascular disease were more equivocal, with 52% of the 21 associations reporting higher disease prevalence among the higher SES groups (vs lower). Only two studies examined cardiovascular mortality.

There are several points that should be noted while interpreting these results. First, a stated goal of the paper is to determine whether NCD have increased among populations with low SES, as a means of judging the legitimacy of claims of such. However, this review only specifically evaluates whether populations with low SES had a relatively higher risk or prevalence for each outcome than populations with high SES. NCD may pose a substantial disease burden for populations with low SES even if the prevalence is still lower than that in high SES populations. For instance, the prevalence of overweight/obesity among women in Mumbai is 25% for those living in slums and 30% for those living in non-slums.[9] This would suggest a substantial burden of overweight/obesity among women who live in slums, even though overweight/obesity is more prevalent among women who do not live in slums.

This review also does not answer the question of whether NCDs have increased over time among lower SES populations in India. The authors pooled data collected over the span of 40 years (1969–2009), the very time period during which changes in the distribution of disease would be expected to occur. The resultant summary does not directly address the current state of associations between SES and cardiovascular risk factors or disease, nor does it address the extent to which cardiovascular risk factors or disease have changed over time. We might be fairly confident that for five out of seven cardiovascular risk factors, the current prevalence is likely to be highest among higher SES groups compared with lower SES groups. However, no evidence is provided to evaluate changes in cardiovascular risk factors, disease or mortality over time within SES strata. A time-series analysis of a one high-quality, national survey would be arguably more relevant for answering this question than the 53 highly diverse studies that were summarized. From the authors' own previous work in India,[10] the combined prevalence of pre-overweight, overweight and obesity (BMI $\geqslant$23) among women increased across all education strata from 1998 to 2005, rising from 15 to 19% for those with <9 years of education, from 34 to 38% for 9–12 years and 49 to 54% for those with 12+ years of education. Similar data for hypertension, diabetes, cardiovascular disease or cardiovascular mortality would be most informative for evaluating the extent to which these risk factors and disease states have increased among populations with low SES in recent years.

A related point for evaluating the data and interpretation provided by Subramanian *et al*. is clarification of what constitutes low SES or vulnerable groups in India. The authors point to a lack of a gradient-shaped relationship as evidence for lack of a robust inverse relationship between SES and cardiovascular mortality. Among men, those with primary, middle or secondary school education had higher cardiovascular mortality rates than either the lowest or the highest education groups. However, in transitional countries, this is precisely the type of relationship that one might expect—that the most disadvantaged populations continue to suffer from malnutrition and communicable diseases due to extreme poverty, whereas those who are slightly better off (but still with low absolute education levels or incomes) are the populations that are facing occupational change, changing food choices and transitions in disease and cause-specific mortality profiles. Some relevant questions for evaluating viewpoints presented in this issue of *IJE* are: how financially secure are the populations with primary school, middle or secondary school education in India? And, how do these populations factor into the argument that incorporating NCD into the national political agenda ignores the evidence base and may have unintended consequences for vulnerable populations?

The most serious concerns raised in this paper are that (i) scientists offer a biased interpretation of their own studies and (ii) advocating for NCD prevention and treatment in the India context is particularly worrisome and may have unintended consequences since free and universal healthcare is being

contemplated there. To demonstrate the bias in the literature, six quotes from different studies are provided that, to a varying degree, demonstrate a conclusion that does not stem from the data presented, or a conclusion that is vague enough to be misinterpreted. However, there is no indication of how frequently, beyond these six instances, a misleading or unsubstantiated claim appeared in the 53 papers included in the review.

Similarly, few details are provided to elucidate the proposed mechanisms by which advocating for NCD prevention and treatment in India may have unintended consequences for low SES populations and why this might be especially relevant since free and universal health care is being contemplated. Many of the country-level recommendations being promoted for prevention/treatment of NCD are policy related. These include increased education and employment opportunities, early childhood development programmes,[11] tobacco control, reduction of dietary salt in the processed food supply and increasing the supply of generic medications for the treatment of cardiovascular disease.[12] Devoting resources in the policy realm certainly may indirectly decrease resources in the health sector. However, it is necessary to evaluate the degree to which this is likely in order to support the argument that NCD advocacy brings with it the risk of decreasing health resources for vulnerable populations. In the meantime, it is worthy of mention that the proposed first action step for preventing NCD (after capacity building) is aimed at decreasing tobacco use,[13] which is in fact overrepresented among low SES populations in India.

The case of India reminds us that, behind general global trends of increasing NCD, there is substantial heterogeneity in the degree to which populations with low SES within LMIC are currently experiencing this increased burden. In some countries, this NCD burden may still be largely constrained to affluent populations. As the authors suggest, complacency with untested notions or simplistic stories to predict what might happen does not benefit the scientific community and has the potential to harm vulnerable populations. However, claims of unintended negative consequences must also be equally rigorously examined.

Funding

This work was supported by a grant from the National Institutes of Health Eunice Kennedy Shriver National Institute of Child Health and Human Development (grant number K99HD073327).

Conflict of interest: None declared.

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