Commentary: Shielding against a future inferno: the not-so-problematic discourse on socioeconomic status and cardiovascular health in India

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We applaud Subramanian et al. for seeking to hold authors accountable for their enthusiastic interpretations of the published data in their article 'Jumping the gun: the problematic discourse on socioeconomic status and cardiovascular health in India'. The article includes several important arguments that data from India are being reported in a way that supports the case that cardiovascular diseases (CVD) are no longer confined to affluent people, but are an increasing threat even for poorer sections of India.

Ironically, in our opinion, Subramanian et al.'s commentary-style comprehensive review also falls prey to over-stretching interpretations of available data to make their point. For example, in arguing the pitfalls of the socioeconomic status-CVD gradient reversal, the authors attribute the lowering of mean serum low-density lipoprotein (LDL) levels in affluent groups in the USA to the diffusion of statins, disregarding a volume of literature that shows higher prevalence of dyslipidaemias among lower...
socioeconomic status (SES) groups even when defined based on self-report, measured lipid levels and/or cholesterol-lowering medication.\textsuperscript{2,3} Another example we ‘cherry-picked’ from Subramanian et al.’s article concerns the average dietary consumption reported for India’s different SES groups. These dietary data were collected in 2004–05 and in the 8–9 years that have passed since these data were collected, India’s population, both rural and urban, have experienced major changes. Notwithstanding that we acknowledge Subramanian et al.’s concerns regarding the noncommunicable diseases (NCD) community’s use of data for enthusiastic advocacy, we are just providing examples of the pot calling the kettle black. Further, we wish to challenge Subramanian et al. on a number of their positions and provide perspective on NCDs, and particularly CVD burdens, in India.

First, Subramanian et al.’s methods fall very considerably short of a formal systematic review. Whereas we credit the authors for applying a systematic process towards assessing the published findings regarding SES and CVD risks, events and mortality in India, they would be the first to agree that the search was not exhaustive as it used only one database and limited search terms. As such, although these data are useful, they may not reflect the totality of evidence on this issue, and nor are they free of interpretational biases.

Second, the challenge with any review is in interpreting the findings across studies. Though we recognize that the authors may justify that each study is internally valid and therefore comparable, heterogeneous definitions or measures of the exposure—in this case, SES—make it challenging to assert consistency across the different studies’ findings. Also, the authors themselves are well versed enough in this field to know the challenges of fully characterizing SES,\textsuperscript{4} of gathering accurate data regarding income and wealth\textsuperscript{5} and the hazards of interpreting some SES indicators like occupational status (e.g. do housewives of millionaires get assigned to high or low SES groups?) in different settings.

Third, the authors examine mortality as well as prevalence of a number of CVD risk factors and this mixing of outcome measures blurs the interpretation. CVD mortality is really a reflection of access to care and therapies to improve risk factor control, whereas CVD risk appears to be more behavioural and/or genetic. Whereas non-income measures of SES (e.g. education and occupation) may influence behaviours leading to and the prevalence of CVD risk factors, it is not clear that there is a similar mechanistic relationship with mortality.

Fourth, the authors focus heavily on the prevalence of disease in different socioeconomic groups and assert, conditionally, that only if CVD risks and disease are concentrated among the poor, is there a compelling case to include CVDs into the core agenda of Indian health policy. By focusing on relative indicators like prevalence and odds ratios, the authors are overlooking the importance of the absolute numbers affected which is a key concern in policy and decision making. Even if the prevalence is lower in the lower SES groups, the absolute number of people that belong to lower SES groups is far larger than the advantaged SES groups in India, and so the absolute numbers affected by CVD in low SES strata may still be extremely high. This is especially true in the context of India’s large population, with a majority living on two dollars or less per day as Subramanian et al. remind us. Additionally, it is not clear why diseases have to predominantly affect the poor to be important policy concerns. Most data from India suggest that 12–20\% and 20–40\% of all adults in India are affected by diabetes and hypertension, respectively. Shouldn’t these data, or those from the INTERHEART study showing a younger age of first myocardial infarction and higher prevalence of CVD risk factors in South Asian countries than in others,\textsuperscript{6} be enough to stimulate action?

Fifth, by choosing extreme ends of the SES distributions to argue their position, the authors ignore the fact that a large majority of people in the middle of the distribution have significant NCD risk burdens, and thus, from a population perspective, the majority of the burden probably does not affect the most educated or even the most privileged. For example, in Figure 2 in their paper, although the proportion of all deaths from CVD is lower in the illiterate compared with the college-educated, the majority of CVD deaths in the population occur not in the college-educated, but across the rest of the educational groups. In addition, the proportion of deaths from stroke is, if anything, as high or higher in the illiterate group compared with the college-educated. Furthermore, there are some other data to support the idea that NCDs such as diabetes may be growing at a rapid rate in lower SES\textsuperscript{7} and rural groups,\textsuperscript{8} thus narrowing the gap across the current SES gradient. Lastly, this whole discourse ignores the considerable heterogeneity in disease risk within each of these SES groups.

Furthermore, and importantly, past or current burdens are only part of the picture. For prevention, future burdens are equally important, and they offer the possibility of ‘not jumping the gun’, but taking effective action now to prevent a ‘future inferno’. Isn’t prevention about using a time window of opportunity to avert a problem before it becomes unmanageable or too costly to control? India is experiencing major economic, infrastructural, and technological, urbanization and lifestyle transitions within a much shorter period of time than occurred in Western Europe and high-income North America. Recognizing that these changes are occurring and are affecting sizeable portions of the population, in both absolute and relative terms, be they rich or poor, demands action.
With regard to financial protections, although the authors argue that it sounds melodramatic to say that NCDs are a threat to human, social and economic development, one cannot argue with the proposition that NCDs and their risk factors impose high opportunity costs on households (allocation of resources to care and therapies that could have otherwise been spent on other developmental priorities), and these are felt more harshly by lower SES groups. As such, NCDs may make it harder to achieve the Millennium Development Goals of reducing poverty.\(^9\) Universal health coverage or some form of financial protection are therefore imperative for every SES group in India, but particularly those in lower and middle SES groups that are and will increasingly be affected by CVD.

The authors contend, rightly, that any non-zero prevalence of underweight and overweight in the population is a poor justification for the existence of a double burden of disease. We would add that body mass index (BMI) is a poor indicator of CVD risk for Asian Indians, in general, as BMI-focused weight categories don’t adequately reflect the proportion or distribution of adiposity. As such, Subramanian et al. are unjustifiably focused on weight distributions as an indicator for double burden. A very real double burden may in fact exist, and may be better reflected by the increases in proportions of deaths and Disability-adjusted Life Years that are attributable to chronic NCDs despite persistently high undernutrition and water/sanitation burdens in the country.\(^10\)

We agree with Subramanian et al. that intergenerational chronic growth failure is an important issue for the Indian context, and is probably related to a combination of intrauterine exposures, family SES and paternal BMI, not just maternal adiposity alone. Data from the Delhi Birth cohort indicate that children born with low birthweight are at higher risk of impaired glucose metabolism as adults.\(^11\) Furthermore, excess weight gain after the age of 2 years was powerfully associated with impaired glucose metabolism in adulthood, pointing to the importance of addressing intergenerational undernutrition and early childhood overnutrition simultaneously in the same individuals and population.

In conclusion, the picture of NCDs in heterogeneous and transitioning populations like in India is still unraveling, and the true degree of reversal of SES gradient in NCDs is hard to assess. NCDs are more palpable burdens—for example, CVD has become a leading cause of death, even in rural Bangladesh.\(^12\) We posit that it is not important to argue about whether or not NCDs affect the lower rungs of society, but more to acknowledge that the prevention of NCD burdens requires attention now, without at the same time ignoring the unfinished agenda of infectious diseases and undernutrition. In fact, without attending to NCDs, there may be a danger that we might set back progress on the unfinished agenda of poverty elimination, childhood mortality and undernutrition.\(^9\) Furthermore, several highly prevalent infections (e.g. tuberculosis, HIV, invasive group B streptococcus) which disproportionately affect lower SES groups, are commonly predisposed to by underlying NCDs.\(^13-15\) Therefore, the real policy challenge for all countries, rich and poor, will be to simultaneously tackle the unfinished agenda of infectious diseases and undernutrition alongside strategies to effectively deal with the rising threat of NCDs. Innovation in such integration is the need of the hour.

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**References**


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Commentary: The social transition of cardiovascular disease in low- and middle-income countries: wait and see is not an option

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A critical question for public health is whether, in low- and middle-income countries (LMIC), the increasing burden of cardiovascular disease (CVD) concentrates more on the advantaged or on the disadvantaged sections of society, and how this social patterning of CVD changes over time. Subramanian and colleagues argue that CVD concentrates on the rich in India, with limited evidence for the occurrence of a shift towards the poor.1

Operationally, the social patterning of CVD in LMICs can be usefully framed along two different perspectives: (i) what is the current social patterning of CVD based on reliable population-based epidemiological data, acknowledging that few data are available in LMICs; and (ii) what is the potential relevance of different scenarios of social patterning of CVD on policy development, considering that definite data are not yet available in many LMICs but some tools can help anticipate future trends (i.e. findings in high-income countries, theory of the health transition, social theory about adoption of lifestyles, etc.). Subramanian and colleagues mainly adopt the first perspective (i.e. current factual evidence in India), although they also attempt to draw some conclusions on policy. They reviewed mainly cross-sectional studies covering a fairly large time lapse (1969 to 2008), but there is little attempt to examine changes in the social patterning of CVD/CVD risk factors during this period. A clearer view on the social transition of CVD and related risk factors could have perhaps emerged if they had restricted their review to those studies using longitudinal data or repeated cross-sectional surveys on the same population; or by attempting to compare studies from different time periods.

It seems to us that substantial evidence supports the view that the socioeconomic gradient in CVD and CVD risk factors is reversing from the rich to the poor in those LMICs which are at an intermediate stage of the health transition, and that such a shift is likely to occur in those LMICs at an early stage of the health transition (in which the burden of CVD still concentrates among the rich). This frame is important as it provides a rationale for tackling CVD among the poor at an early stage of the non-communicable disease (NCD) epidemics. Here a crucial question arises: who are the poor? Referring to a study of Pednekar et al., Subramanian and colleagues report that age-adjusted CVD mortality in Mumbai was 654, 618, 518 and 450 (per 100 000) among men...