Cardiometabolic risk factor prevalence in a representative population of adults in India

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India is expected to become the country with the largest population in the world by mid-2023.[1] The proportion of India's population that lives in urban areas is estimated to be around one-third at present and to become one-half before 2050.[2] The proportion of people living in extreme poverty has halved between 2011 and 2019, although child malnutrition and inequality in consumption remain high.[3] India has a diverse population in terms of ethnicity, languages, religions, and diet, alongside major socioeconomic inequalities between individuals and the geographically diverse regions.

Previous studies have indicated that there is a growing burden of diabetes and other cardiovascular disease risk factors such as hypertension and dyslipidaemia in south Asia. In higher-income countries, time trends in incidence of type 2 diabetes are either flattening off or have declined in recent years, although diabetes prevalence continues to increase.[4] The different states and union territories of India are working their way from different starting points and at different paces through the epidemiological transition. Earlier studies of metabolic risk factor prevalence have not generally been based on robust, comparable methods applied in representative population samples across the whole of India. Adverse lifestyle changes associated with increasing urbanisation are known to contribute to increasing prevalence of obesity and diabetes.[5] Due to the paucity of data, previous estimates of prevalence of diabetes in rural areas of many countries have been based on a simple fraction of age-and-sex-specific prevalence for urban areas—eg, one-quarter in the global burden of diabetes estimates for India for 2000.[6]

In *The Lancet Diabetes & Endocrinology,* Ranjit Mohan Anjana and colleagues[7] provide prevalence estimates of several metabolic conditions from a representative sample of the Indian population through the Indian Council of Medical Research–India Diabetes (ICMR-INDIAB) study. Just over 100 000 people aged 20 years and older were recruited between 2008 and 2020. Standardisation using weights derived from a national survey conducted in 2019 was used to update data collected long-term trends in risk factor patterns. The research team achieved a 95% response rate with the support of people with local knowledge in the study sites, which included providing study material in 15 languages. Fasting capillary samples were collected from all participants, with a 2-h oral glucose tolerance test (OGTT) performed in people without self-reported diabetes. HbA_{1c} and lipids were also measured in subsets of participants, but HbA_{1c} is not a recommended measure for diagnosing diabetes in India due to the high prevalence of anaemia. Both WHO (based on fasting and 2-h glucose) and American Diabetes Association (HbA_{1c}-based) criteria were used to identify previously undiagnosed diabetes and prediabetes.

Key findings include weighted prevalence of OGTT defined diabetes of 16·4% (95% CI 14·6–18·2) in urban participants and 8·9% (8·1–9·7) in rural participants, with an overall diabetes prevalence range across states of 4·8% (1·5–8·5) in Uttar Pradesh to 26·4% (19·3–33·7) in Goa. Overall national prevalence estimates for dys glycaemia (diabetes and prediabetes combined) were 26·6% (25·0–28·3) based on OGTT criteria, 34·3% (30·3–38·4) based on HbA_{1c} criteria, and 47·7% (43·5–51·8) based on one or both sets of criteria. These estimates translate to an estimated number of people with diabetes and prediabetes based on OGTT criteria in India in 2021 of 101 million and 136 million, respectively. These are considerably higher estimates than previous ones, such as the International Diabetes Federation's estimate of 74 million people aged 20–79 years with diagnosed or undiagnosed diabetes

in India in 2021.[8] The authors conclude that the diabetes epidemic appears to have already reached its peak in more developed states but has yet to reach this point in the majority of other states in India; clearly, further data will be required to validate this conclusion.

Having established estimates of current and potential future burden of diabetes in India, the next challenge will be to identify cost-effective approaches to primary, secondary, and tertiary prevention of diabetes that minimise health inequalities in the face of contradictory pressures. Changing prevalence of obesity and non-communicable diseases (NCDs) appears to be an inevitable consequence of economic development**;** there is a pattern of increasing incidence first observed among more affluent populations followed by the opposite pattern as economic development continues, with differing patterns by age and sex.9 Improvements in life expectancy inevitably increase the incidence and prevalence of age-related conditions such as type 2 diabetes. This is compounded by increasing prevalence of obesity and higher predisposition to diabetes among people of Indian compared with European ancestry.10 Multiple factors at the individual and societal level need to be addressed to reduce the burden of metabolic NCDs across the world and these need to differ within and between countries depending on political will and the human and financial resources available. Identification of effective approaches to primary and secondary prevention in India would make an extremely valuable contribution to reducing the global burden of NCDs.

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