

Higher, sweeter, heavier: Not necessarily healthier

NATIONAL FAMILY HEALTH SURVEY-4

The recently released results of India's National Family Health Survey-4 (NFHS4)^[1] provide an overview of the health of the nation. A comprehensive exercise conducted across all states and union territories; its well-planned methodology and well-executed implementation ensure accuracy of data. In recent years, NFHS has begun assessing indicators of metabolic and vascular health so as to determine the burden of noncommunicable disease (NCD) and their risk factors.

NFHS4 has reported, among other parameters, the prevalence of underweight, obesity, hypertension, and "high blood sugar" in all states and districts. Although the cutoffs chosen for some indices (such as body mass index [BMI] and plasma glucose) may differ from the ones generally accepted in modern endocrinology, the results provide an estimate of the burden of metabolic dysfunction. Similarly, though NFHS4 uses descriptors which are not entirely accurate (for example, "sugar" instead of "glucose"), this should not distract the reader from interpreting the data properly. NFHS4 also describes the prevalence of certain risk factors for NCD such as alcohol and tobacco use as well.

THE HIGH-PRESSURE STATES

Hypertension, defined by NFHS4 as a blood pressure systolic >140 mmHg and/or diastolic >90 mmHg, is noted in 8.8% of adult Indian women and 13.6% of adult Indian men. The highest prevalence of high blood pressure is noted in women from Sikkim (16.5%), Assam (16.0%), Nagaland (16.0%), Punjab (13.2%), and Tripura (12.6%). In men, the highest risk of hypertension is found in Andaman and Nicobar Islands (AN) (27.9%), Sikkim (27.3%), Himachal Pradesh (21.9%), Punjab (21.8%), and Arunachal Pradesh (21.6%) [Tables 1 and 2].

The lowest prevalence of hypertension is noted among women of Bihar (5.9%), Kerala (6.8%), Rajasthan (6.9%), Dadra and Nagar Haveli (7.4%), and Daman and Diu (7.4%). The healthiest states for men, with regard to blood pressure, are Delhi (4.2%), Daman and Diu (7.6%), Bihar (9.4%), Kerala (9.5%), and Lakshadweep (9.9%).

THE SWEET STATES

Diabetes has become endemic to India^[2] and contributes to the huge burden of cardiovascular disease. NFHS4 takes "high sugar" to be above 140 mg%, and its data can be considered to reflect the combined prevalence of prediabetes and diabetes. "High sugar" levels are found in 8.6% of women and 11.9% of men across India. The "sweetest" states for women are Lakshadweep (17.2%), AN (14.5%), Goa (14.1%), Kerala (13.5%), and Mizoram (12.5%). In men, the highest prevalence of high blood sugar is in AN (26.0%), Goa (19.6%), Kerala (19.4%), Lakshadweep (19.0%), West Bengal (17.3%), and Odisha (16.5%).

The least prevalence of high sugars is seen in the women of Rajasthan (4.7%), Maharashtra (5.3%), Bihar (6.1%), Meghalaya (6.1%), Haryana (6.6%), and Arunachal Pradesh (6.6%). Similar rankings for men are Rajasthan (8.1%), Haryana (8.2%), Maharashtra (8.4%), Jammu and Kashmir (9.1%), and Meghalaya (9.3%).

THE HEAVY STATES

Obesity is said to be the mother of all metabolic dysfunction.^[3] Overall, 20.7% of Indian women and 18.6% of men are obese. Another 22.9% women and 20.2% men are underweight. This implies that 43.6% women and 38.8% men have abnormal BMI in India. The prevalence of women with a BMI >25 kg⁻² is highest in Chandigarh (41.5%), Lakshadweep (41.4%), NCT Delhi (34.9%), Andhra Pradesh (33.2%), and Punjab (31.3%). In men, the heaviest states are AN (38.2%), Puducherry (37.1%), Sikkim (34.8%), Andhra Pradesh (33.5%), and Goa (32.6%).

States with lowest prevalence of obesity are Jharkhand (10.3%), Bihar (11.7%), Chhattisgarh (11.9%), Meghalaya (12.2%), and Assam (13.2%) for women and Meghalaya (10.1%), Chhattisgarh (10.2%), Madhya Pradesh (10.9%), Jharkhand (11.1%), and Bihar (12.6%) for men.

When analyzed for the prevalence of underweight (BMI <18.5 kg⁻²), concordant results are noted. The highest prevalence of underweight women is seen

Table 1: Top five states for metabolic health

Rank	High blood pressure		High blood sugar		Obesity		Underweight	
	Women (%)	Men (%)	Women (%)	Men (%)	Women (%)	Men (%)	Women (%)	Men (%)
1	Bihar (5.9)	Delhi (4.2)	Rajasthan (4.7)	Rajasthan (8.1)	Jharkhand (10.3)	Meghalaya (10.1)	Sikkim (6.4)	Sikkim (2.4)
2	Kerala (6.8)	Daman and Diu (7.6)	Maharashtra (5.3)	Haryana (8.2)	Bihar (11.7)	Chhattisgarh (10.2)	Mizoram (8.3)	Mizoram (7.2)
3	Rajasthan (6.9)	Bihar (9.4)	Bihar (6.1)	Maharashtra (8.4)	Chhattisgarh (11.9)	Madhya Pradesh (10.9)	Arunachal Pradesh (8.5)	Lakshadweep (7.4)
4	Dadra and Naga Haveli (7.4)	Kerala (9.5)	Meghalaya (6.1)	Jammu and Kashmir (9.1)	Meghalaya (12.2)	Jharkhand (11.1)	Manipur (8.8)	Arunachal Pradesh (8.3)
5	Daman and Diu (7.4)	Lakshadweep (9.9)	Haryana (6.6)	Meghalaya (9.3)	Assam (13.2)	Bihar (12.6)	Kerala (9.7)	Andaman Nicobar (8.7)
India average (%)	8.8	13.6	8.6	11.9	20.7	18.6	22.9	20.2

Table 2: Bottom five states for metabolic health

Rank	High blood pressure		High blood sugar		Obesity		Underweight	
	Women (%)	Men (%)	Women (%)	Men (%)	Women (%)	Men (%)	Women (%)	Men (%)
1	Sikkim (16.5)	Andaman Nicobar (27.9)	Lakshadweep (17.2)	Andaman Nicobar (26.0)	Chandigarh (41.5)	Arunachal Pradesh (38.2)	Jharkhand (31.5)	Madhya Pradesh (28.4)
2	Assam (16.0)	Sikkim (27.3)	Arunachal Pradesh (14.5)	Goa (19.6)	Lakshadweep (41.4)	Puducherry (37.1)	Bihar (30.4)	Uttar Pradesh (25.9)
3	Nagaland (16.0)	Himachal Pradesh (21.9)	Goa (14.1)	Kerala (19.40)	NCT Delhi (34.9)	Sikkim (34.8)	Dadra and Naga Haveli (28.5)	Bihar (25.4)
4	Punjab (13.2)	Punjab (21.8)	Kerala (13.5)	Lakshadweep (19.0)	Andhra Pradesh (33.2)	Andhra Pradesh (33.5)	Madhya Pradesh (28.3)	Gujarat (24.7)
5	Tripura (12.6)	Arunachal Pradesh (21.6)	Mizoram (12.5)	West Bengal (17.3)	Punjab (31.3)	Goa (32.6)	Gujarat (27.2)	Chhattisgarh (24.1)
India average (%)	8.8	13.6	8.6	11.9	20.7	18.6	22.9	20.2

in Jharkhand (31.5%), Bihar (30.4%), Dadra and Nagar Haveli (28.5%), Madhya Pradesh (28.3%), and Gujarat (27.2%). The maximum proportion of underweight men is in Madhya Pradesh (28.4%), Uttar Pradesh (25.9%), Bihar (25.4%), Gujarat (24.7%), and Chhattisgarh (24.1%).

Underweight is least common in women of Sikkim (6.4%), Mizoram (8.3%), Arunachal Pradesh (8.5%), Manipur (8.8%), and Kerala (9.7%). In men, the least underweight states are Sikkim (2.4%), Mizoram (7.2%), Lakshadweep (7.4%), Arunachal Pradesh (8.3%), and AN (8.7%).

ANALYSIS

Certain facts are clear from the NFHS4 data. India faces a heavy burden of high blood pressure, uncontrolled glycemia, and obesity. At the same time, it still has to tackle adult undernutrition. The various states of India are heterogeneous in their genotype and lifestyle, and this is evident in their phenotype and health patterns. High blood pressure is most prevalent in the Northeast and the Northwest Himachal Pradesh and Punjab. This may be due to dietary habits such as high intake of salt. The inclusion of Delhi and Kerala on the list of states with least prevalence of high blood pressure is an anomaly which needs to be explored in NFHS5.

“High blood sugar,” as measured in NFHS4, cannot be taken to reflect the actual prevalence of diabetes. However, it is clear that smaller states, such as Lakshadweep, AN, Goa, Mizoram, and Kerala, have the highest prevalence of impaired glucose tolerance. This may be due to rapid development, which brings with it urbanization and change of lifestyle.

Obesity, too, is relatively more common in the smaller states and union territories. Punjab, which had the distinction of being the heaviest state of India, has been relegated to 5th place in women and 10th in men. Its capital Chandigarh, however, ranks heaviest in the female and 6th heaviest in the male category. Viewed from the other sides of the spectrum, a different list of states emerges. States such as Bihar, Jharkhand, and Rajasthan rank among the healthiest with regard to blood pressure, blood sugar, and overweight.

Haryana is considered the sports nursery of the country and is expected to rank among the fittest. Careful analysis shows that Haryanvi women and men rank near median for the prevalence of obesity and hypertension. The state is listed toward the healthier end of the spectrum for “high blood sugar,” and underweight prevalence.

The results of NFHS4 need to be analyzed carefully, with an understanding of the methodology used. NDHS4 is a population-based survey, which provides an idea of the state of the nation’s health and helps in policy planning and decision-making.

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