

Diabetes in Indians–Potential Solutions: Primary Prevention a Way Forward?

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Prevalence of type 2 diabetes is increasing globally, but the change is very significant in the developing countries. This is evident from the list of top 10 countries with the highest number of adults with type 2 diabetes published in the world diabetes atlas by the International Diabetes Federation.¹ Five of the nations are in Asia (Table 1).

Table 1. Countries/Territories of Number of People With Diabetes (20–79 years of age), 2011 and 2030¹

COUNTRY /TERRITORY		2011 (Millions)	COUNTRY /TERRITORY		2030 (Millions)
1	China	90.0	1	China	129.7
2	India	61.3	2	India	101.2
3	United States of America	23.7	3	United States of America	29.6
4	Russian Federation	12.6	4	Brazil	19.6
5	Brazil	12.4	5	Bangladesh	16.8
6	Japan	10.7	6	Mexico	16.4
7	Mexico	10.3	7	Russian Federation	14.1
8	Bangladesh	8.4	8	Egypt	12.4
9	Egypt	7.3	9	Indonesia	11.8
10	Indonesia	7.3	10	Pakistan	11.4

Source: International Diabetes Federation. *IDF Diabetes Atlas*, 5th ed. Unwin N, Whiting D, Guariguata L, Ghyoot G, Gan D, eds. IDF; 2011. Reprinted by permission.

China tops the list with 90.0 million people affected by diabetes, followed by India, which has 61.3 million affected people. The numbers are estimated to rise to 129.7 million and 101.2 million, respectively, by 2030.¹ These estimates are likely to be underestimations as the prevalence data are mostly available for urban areas and reports from rural areas are scanty. With the rapid socioeconomic changes occurring in the rural areas, the prevalence of diabetes and other noncommunicable diseases (NCDs) are bound to increase several-fold. These diseases contribute largely to early morbidity and mortality among the population.

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Indians have a high ethnic and genetic susceptibility to the disease, and also have lower threshold limits for the environmental risk factors.² It is a matter of major concern that Indians develop type 2 diabetes at a younger age than do western populations (Figure). They also develop diabetes with minor weight gain.

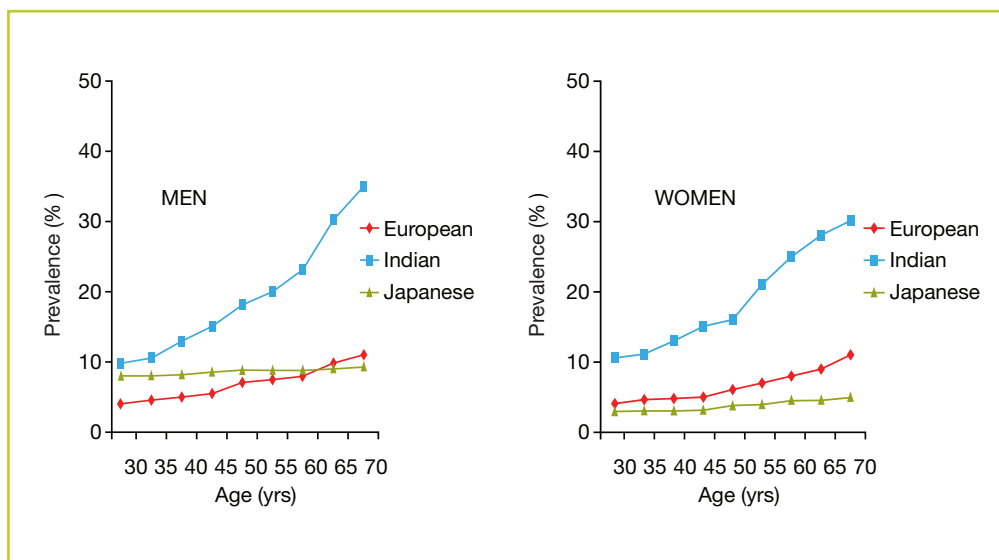


Figure. Age-specific prevalence of diabetes among Indian, European, and Japanese people.²

Indians have peculiar characteristics that lead to great economic and healthcare burdens.³

- Young age at onset. Diabetes is common even among people in their thirties.
- Diabetes develops even in non-obese people. Many of them have “metabolic obesity,” with low body mass index (BMI), high body fat percentage and abdominal obesity, and high insulin resistance.
- Patients seek medical help at a late stage due to lack of awareness and economic reasons.⁴ Therefore, occurrence of complications and metabolic risk factors are common.
- Infectious complications resulting in hospitalization are highly common.
- Cost of treatment is very high, especially for people in lower socioeconomic strata (SES) (Table 2, 2005 data).⁵ Therefore, these people tend to neglect regular treatment.

Table 2. Percentage of Income Spent on Diabetes Care Is Higher in Lower SES⁵

SES	% of income
High	4.8
Upper middle	9.3
Middle	16.9
Low	34.0

SES=socioeconomic strata

Studies by our team have shown that the cost of diabetes management is increasing in urban and rural populations.^{5,6} Cost increases several-fold in the presence of complications. We commonly assess the direct cost of treating diabetes and money lost on productivity. Creating general awareness about diabetes and complications is the primary and most important step in the crusade against the disease. Awareness regarding chronic diseases must be raised, and a national priority should be created to improve treatment facilities for patients with these diseases.

Primary prevention of diabetes is found to be feasible and practical, even in low-income countries such as India⁷ and China.⁸ It is possible to prevent diabetes using healthy lifestyle practices that are highly cost effective. At present, the target population for intervention is the high-risk group with prediabetes or a history of gestational diabetes. Research findings should be translated for use among the general public and, for this effort, inexpensive and widespread methods of communication and motivation are required. Studies are now being conducted toward achieving this goal.

Steps also are being taken to improve the national capacity for management and prevention of diabetes by training large numbers of doctors and paramedical personnel. A united effort by the government and nongovernment agencies is required to fight against the onslaught of the disease.

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References

1. International Diabetes Federation. *IDF Diabetes Atlas*, 5th ed. Unwin N, Whiting D, Guariguata L, Ghyoot G, Gan D, eds. IDF; 2011.
2. Ramachandran A, Ma RC, Snehalatha C. Diabetes in Asia. *Lancet*. 2010 Jan;375:408–418.
3. Ramachandran A, Snehalatha C, Vijay V. Low risk threshold for acquired diabetogenic factors in Asian Indians. *Diabetes Res Clin Pract*. 2004 Sep;65:189–195.
4. Murugesan N, Snehalatha C, Shobhana R, Roglic G, Ramachandran A. Awareness about diabetes and its complications in the general and diabetic population in a city in southern India. *Diabetes Res Clin Pract*. 2007 Sep;77:433–437.
5. Ramachandran A, Ramachandran S, Snehalatha C, et al. Increasing expenditure on health care incurred by diabetic subjects in a developing country: a study from India. *Diabetes Care*. 2007 Feb;30:252–256.
6. Kapur A, Björk S, Nair J, Kelkar S, Ramachandran A. Socio-economic determinants of the cost of diabetes in India. *Diabetes Voice*. 2004 Sep;49:18–21.
7. Ramachandran A, Snehalatha C, Mary S, Mukesh B, Bhaskar AD, Vijay V; Indian Diabetes Prevention Programme (IDPP). The Indian Diabetes Prevention Programme shows that lifestyle modification and metformin prevent type 2 diabetes in Asian Indian subjects with impaired glucose tolerance (IDPP-1). *Diabetologia*. 2006 Feb;49:289–297.
8. Pan XR, Li GW, Hu YH, et al. Effects of diet and exercise in preventing NIDDM in people with impaired glucose tolerance. The Da Qing IGT and Diabetes Study. *Diabetes Care*. 1997 Apr;20:537–544.