



## National programme on prevention and control of diabetes in India: Need to focus

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### EDITORIAL

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Diabetes is part of a larger global epidemic of non-communicable diseases. It has become a major public health challenge globally. This disease affects 6.6% (285 million people) of the world's population in the 20-79 years age group.<sup>1</sup> According to the International Diabetic Federation (IDF), this number is expected to grow to 380 million by 2025.<sup>2-4</sup> The IDF published findings revealing that in 2007, the country with the largest numbers of people with diabetes is India (40.9 million), followed by China (39.8 million), the United States (19.2 million), Russia (9.6 million) and Germany (7.4 million).<sup>5-8</sup>

India is home to 40.9 million people with diabetes – nearly 15% of the global diabetes burden; it contributes 1% of the world's diabetes research.<sup>9</sup> Projections show that this will increase to 70 million by 2025. As India has a population of 1.2 billion, 40% of whom are under the age of 18, investment in the health of India's future workforce is crucial.<sup>10</sup> With the largest number of diabetic patients, India leads the world with earning the dubious distinction of being termed the "Diabetes Capital of the World". The problem has been well documented in a battery of recent papers.<sup>5-7</sup> Between 5% and 10% of the nation's health budget is spent on the prevention and treatment of diabetes. Projections show that in the next decade, India will lose US\$237 billion due to diabetes, stroke and heart disease.<sup>11</sup>

Impaired Glucose Tolerance (IGT) is also a mounting problem in India. It has been noticed that with every diagnosed case of

diabetes there is at least one undiagnosed case of glucose intolerance. So the actual population at risk would be much greater than our current estimate. The prevalence of IGT is thought to be around 8.7% in urban areas and 7.9% in rural areas. Around 35% of IGT sufferers go on to develop type-2 diabetes, so India is genuinely facing a healthcare crisis.<sup>12</sup>

Type-2 diabetes is also known as non-insulin-dependent or adult-onset diabetes and this form of the disease is far more common than type-1 (insulin dependent or juvenile-onset) diabetes. It results from a genetic predisposition and from lifestyle factors, especially those of the so-called Western lifestyle, characterised by a high calorie intake and little exercise. Until recently, type-2 diabetes – henceforth simply 'diabetes' – was viewed as a disease of overfed, sedentary people of European ancestry, but it is now exploding around the world owing to the spread of Western habits. The age of onset in India has been shifting towards ever-younger people. Among Indians in their late teens, 'adult-onset' diabetes already manifests itself more often than 'juvenile onset' diabetes does. In Britain, the prevalence of type 2 diabetes is 14 times higher in Asian than European children.

In India (2010), a wide range of outcomes for different groups<sup>13, 14</sup> is buried within the average diabetes prevalence of 8% higher than that in most European countries. Prevalence is only 0.7% for non-obese, physically active, rural Indians. It reaches 11% for obese, sedentary, urban Indians; and it peaks at 20% in the Ernakulam district of Kerala, one of India's most urbanised states.<sup>13,14</sup>

By contrast, surveys in 1938 and 1959, in large Indian cities that are today diabetes strongholds, yielded a prevalence of just 1% or less. Only in the 1980s did those numbers start to rise, first slowly and now explosively.<sup>15</sup> During 1971–2000, urban diabetes prevalence rose from 1.2% to 12.1%.<sup>16</sup> However, studies show that diabetes has risen rapidly in rural areas, with a threefold increase (from 2.4% to 6.4%) in rural southern India over a 14-year



period.<sup>17</sup> The reasons are the same as those behind the diabetes epidemic worldwide. One set of factors is urbanisation, a rise in living standards and the spread of calorie-rich, fatty, fast foods cheaply available in cities to rich and poor alike. Another is the increased sedentariness that has resulted from the replacement of manual labour by service jobs, and from the advent of video games, television and computers that keep people seated lethargically watching screens for hours every day. Among lifestyle factors predicting the incidence of diabetes in India, some are familiar from the West, whereas others turn expectations upside down.<sup>13, 14</sup>

Although poor Indians are currently at lower risk than affluent Indians, the rapid spread of fast food exposes even urban Indian slum dwellers to the risk of diabetes. In India, diabetes is no longer a disease of the affluent or a rich man's disease. It is becoming a problem even among the middle income and poorer sections of the society. Studies have shown that poor diabetic subjects are more prone to complications as they have less access to quality healthcare.<sup>18</sup>

The nutrition transition refers to a shift from consumption of simple, traditional foods to heavily marketed foods high in calories, sugar, and animal fat but low in vitamins and minerals derived from fruits and vegetables.<sup>19</sup> Although the nutrition transition has reduced under nutrition, it increases diabetes risk.<sup>20</sup> Obesity is a key risk factor for diabetes. In 2005, urban obesity prevalence in India was in the range of 19.2–38.0%.<sup>21</sup> Although obesity is a risk factor for diabetes both in India and in the West, the disease appears at a lower threshold of obesity in India, as is also the case in China, Japan and other Asian countries.<sup>14</sup>

The key is to harness its positive aspects to improve the equitable distribution of healthier, higher-quality food. These global trends have an increased impact on the Indian population, who have the following biological susceptibilities to diabetes: (1) Lower threshold for development: Indians have, on average, a lower body mass index (BMI) than those of European descent, and risk of diabetes starts to increase at very low levels of BMI for Indians.<sup>22</sup> (2) Higher percentage of body fat that is concentrated in the abdominal area: Indians have, on average, a higher percentage of body fat than those of European descent, and it is concentrated in the abdominal area. Abdominal obesity is a key risk factor for development of diabetes. (3) Programmed during pregnancy: Because of the coexistence of underweight and overweight, children are often born underweight and adapted to a low-nutrition environment. Low-birth weight infants are more susceptible than those of normal birth weight to obesity and diabetes, especially when raised in an obesogenic environment.<sup>21</sup> (4) Insulin resistance: Excessive insulin resistance has been

observed in Asian Indians as a predominant mechanism leading to Type 2 diabetes; ENPP1 121Q has recently been identified as one of the genes that may contribute to this resistance.<sup>23</sup>

This alarming scenario led the Government of India to start the National Diabetes Control Programme on pilot basis during the seventh five year plan in 1987 in some districts of Tamil Nadu, J & K and Karnataka, but due to paucity of funds in subsequent years this programme could not be expanded further in remaining states. However, during 1995-96, a sum of 12 lakh rupees was allocated for the programme and subsequently in 1997-98 an allocation of one crore was made.<sup>24</sup>

The objectives of the programme were:<sup>24</sup>

- prevention of diabetes through identification of high-risk subjects and early intervention in the form of health education;
- early diagnosis of disease and appropriate treatment; reduction of morbidity and mortality with reference to the high-risk group;
- ☐ prevention of acute and chronic metabolic, cardiovascular, renal and ocular complications of the disease;
- ☐ provision of equal opportunities for physical attainment and scholastic achievement for the diabetic patients; and
- ☐ rehabilitation of those partially or totally handicapped diabetes people.

No national awareness survey has been performed, but a study in Chennai found that awareness of diabetes as a public health priority and knowledge of diabetes prevention is poor, especially among women and people with little education.<sup>25</sup> Nearly 25% of Indian city dwellers (the subpopulation most at risk) have not even heard of diabetes.<sup>12</sup>

The community empowerment can greatly increase physical activity. For example, it motivated a community in Chennai to construct a public park with its own funds, which suggests that community involvement can strengthen government efforts.<sup>26</sup> Central/state governments can drive diabetes prevention and treatment efforts. A positive step is Healthy-India.org, a new website sponsored by the Ministry of Health and Family Welfare and the Public Health Foundation of India (PHFI), which advocates healthy living and the prevention of diabetes and other non-communicable diseases. Central and state governments could develop better surveillance systems. More research is needed to



understand diabetes risk factors in India and to guide effective policy. The Integrated Disease Surveillance (IDS) programme analyses chronic disease risk factors and could be improved to obtain data more frequently and systematically using high-quality methods.

To prevent diabetes through healthier diets, India's dietary guidelines should be revised to reflect principles of chronic disease prevention and health promotion; food availability and affordability should reflect these guidelines through agricultural policies. In Brazil, for example, updated Food Guidelines were implemented in 2000–01 and distributed during a national hypertension screening campaign.<sup>27</sup> In 2000, Brazil also legislated that at least 70% of the school meals program's budget be spent on fresh vegetables, fresh fruit, and minimally processed foods, preferably purchased from local producers and small farmers.<sup>28</sup>

Ghee, a saturated fat, is popular in traditional Indian cooking. Replacing it with healthier cooking oils could reduce intake of fatty acids, serum cholesterol levels, and ultimately Cardiovascular Disease (CVD) — risk factors associated with diabetes. A successful model of such government intervention comes from Mauritius, where changes in government nutrition policies in the 1990s and education led to a greater preference for healthier types of cooking oil among the population.<sup>29</sup> Healthier packaged and processed foods are possible through government intervention, with food industry support. Through amendments to the Prevention of Food Adulteration Act of 1954, levels of salt, sugar, and saturated fats in manufactured food products can be limited; this should be considered.

Governments should implement urban design policies to facilitate physical activity as a component of daily life. In India, management of urban transportation currently rests with state governments, but a central policy is needed. Globally, cycling shows potential as a cost-effective way to encourage physical activity, especially in cities. Because of India's tropical climate, cycling may be more difficult to encourage than in less extreme climates; such initiatives should be considered and evaluated in an India-specific context.

The private sector can collaborate to implement many of the prevention-oriented governmental policies proposed above, through funding, expertise in distribution systems for provision of healthier foods (and low-cost medicines for treatment), and market innovation encouraging healthy eating and physical activity. Research suggests that providing incentives for food manufacturers is an effective way to improve dietary habits, especially where the cost of healthier foods is an issue.<sup>30</sup> The food industry should work with the

health ministry to implement a national nutrition policy by developing foods that comply with dietary and labeling guidelines and are thus more marketable as healthy options. Expertise in distribution systems for providing affordable fruit and vegetables to hard-to-reach populations is the key.

Non-Governmental Organizations (NGOs) have a role in both prevention and treatment. In India, NGOs wield significant power—much occurs at the grassroots level, bolstered by NGO support. NGOs also can assist with the formation of multi-sectoral international networks and alliances to advocate for policy change, knowledge generation, and translation of research findings for policymakers. Academics and researchers should engage by improving research and surveillance systems and training young professionals to tackle these complex issues. Priorities include community-based studies of primary prevention and identification of safer and cheaper drugs to prevent diabetes when lifestyle intervention is not feasible or fails; epidemiological and economics research; and health systems and operational research.

India has taken steps toward an integrated approach to diabetes prevention and control, but these ideas are not fully implemented, partly because of insufficient funding. Public-private partnerships are necessary at all levels of policy. The Public Health Foundation of India (PHFI), a partnership to address the limited institutional capacity for strengthening public health training, research, and policy development in India, is a good example. Funding comes primarily from the private sector, and the government is encouraged to match it.

Although India accounts for about 15% of the world's diabetes burden, its spending on healthcare related to diabetes is only 6.4% of worldwide spending; health resource allocations should reflect the burden of disease. Additional resources allocated to diabetes care should go toward stronger prevention efforts, diagnostic infrastructure (especially in rural areas), accessibility and affordability of treatment, and skilled healthcare workers, as recommended by the WHO Global Strategy. Screening for people with diabetes or pre-diabetes is crucial and can help stop or slow the progression to diabetes. For those with diabetes, cost-effective, accessible, and comprehensive care is needed.<sup>31</sup>

Patient education and empowerment in healthcare settings is crucial for ensuring good management and control, coupled with guidelines to standardise



management and control practices. In Mexico, the number of people with well-controlled diabetes increased because of an initiative of the Secretariat of Health, which aimed to provide better healthcare to people with non-communicable diseases through improved quality and a "structured diabetes education program". In India, the National Diabetes Control Programme and the National Rural Health Mission could be strengthened and expanded to reach more of the population.

Efforts are needed to educate the public about diabetes risk factors, prevention, and complications, using clear and simple messages. Global evidence shows that awareness strengthens national policy efforts and improves health outcomes.<sup>32</sup> The media are beginning to engage but could do more. Doordarshan, India's primary television broadcaster should be involved and could learn from Brazil, where a national television channel has created videos aimed at school children, with an emphasis on healthy foods and culture. Funding could come from the private sector and funding bodies interested in building telecommunications capacity.

India is a largely federated country, which creates challenges in creating a uniform national policy. Another major political barrier is a government focused on economic growth and its role in transforming India into a developed nation by 2030. These aspirations, although positive, have resulted in neglect of related health consequences and, combined with economic growth policies described above, have contributed to a diabetes epidemic. One strategy for overcoming this is to move from health policies to "Health in all policies," as recommended by the director general of Finland's National Public Health Institute, and others.<sup>33</sup> Health impact assessments, which ensure that national and regional policies take health into consideration, are becoming more popular and could be one way of incorporating the above recommendations into India's policy development. As the communicable disease burden is reduced, it need not be replaced by a heavy burden of non-communicable diseases. With the passage of the United Nations Resolution on Diabetes in 2006 and the launch of a pilot phase of the National Programme on Prevention and Control of Diabetes, Cardiovascular diseases and Stroke (NPCDS), a national diabetes policy for India is justified and timely. Recent reports highlight growing global action on diabetes and related Non-Communicable Diseases (NCDs).<sup>34</sup>

The Ministry of Health spearheaded a national consultation in 2005 to "identify action pathways and partnerships for implementing the Global Strategy in the context of India". To contain the increasing burden of Non-Communicable Diseases, Ministry of Health and Family welfare, Government of India, has launched the National Programme on Prevention

and Control of Diabetes, Cardiovascular diseases and Stroke (NPDCS) on 8<sup>th</sup> January 2008 with the following objectives:

**Objectives of NPDCS:<sup>35</sup>**

- ☐ Prevention and control of NCDs.
- ☐ Awareness generation on lifestyle changes.
- ☐ Early detection of NCDs.
- ☐ Capacity building of health systems to tackle NCDs.

A pilot phase has been launched in 10 districts in 10 states focused on health promotion and health education advocacy at various settings.

**The following interventions are planned in the programme:**

- ☐ health promotion and health education for the community;
- ☐ early detection of persons with high levels of risk factors (at the risk of developing disease) through screening; and
- ☐ strengthening health systems at all levels to tackle NCDs and improvement of quality of care including treatment of sleep disorders and augmenting facilities of dialysis.

**The following components are envisaged in the programme:<sup>35</sup>**

- ☐ District NPDCS Programme (626 Districts)
  - Non-Communicable Diseases (NCDs) Focal Centres at Medical College (54 Medical Colleges)
- ☐ State/Union Territory NCD Cell (35)
- ☐ National NCD Cell at Centre
- ☐ Information Education and Communication (IEC) /Behaviour Change Communication (BCC)
- ☐ Capacity Building and Research
  - Inter-sectoral Convergence
- ☐ Monitoring (including Management Information System) and Evaluation

The programme shall be implemented in 626 districts in all states/UTs in India with the interventions at medical colleges (54), districts hospitals (626), Community Health Centres (CHCs) (3035), Primary Health Centres (PHCs) (16778) and all Sub-Centres (SCs) through community-level activities. The programme shall be leveraging the strengths of the National Rural Health Mission (NRHM) at the primary and secondary healthcare set up (SC/PHC/CHC/District Hospitals) through convergence, need-based training, Private Public Partnership and NGO interventions in school, workplace and community settings. Urban Social Health Activist (USHA) or any other



available health worker as well as NGOs and private practitioners shall be roped in for providing effective promotion, prevention and control strategies on diabetes and its risk factors for urban areas.<sup>35</sup>

To conclude, considering the ever-increasing burden of diabetes mellitus, a health system strengthening approach with standards of care at all levels, nationally accepted management protocols and regulatory framework are needed. The government of India has taken certain initiatives at national level which is appreciable but there is a need to implement at grass route level before it takes the shape of pandemic in India.

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## CONFLICTS OF INTEREST

None

## PEER REVIEW

Not commissioned. Externally peer reviewed.