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India, Dietary Diseases

### **India: An Incubation Chamber for Dietary Disease**

India is the second most populated nation in the world with over 17% of the world's population. It is the homeland of many religions and people of many backgrounds, yet almost everyone, whether rich or poor, urban or rural, faces three major issues: pollution, sanitation, and the increasingly severe issue of unhealthy diets. These issues work together as an assailant team, constantly wreaking havoc on Indian health. Throughout the duration of this report, we will explore these three issues and how they lead to chronic diseases that are preventable with government intervention and lifestyle changes.

An essential component to understanding these diseases is first understanding India as a whole. The population is about 1.5 billion with about 35% of people living in urban centers. The amount of people living below the poverty line, 2.15 dollars or 180 rupees a day, is about 10% with unemployment at 7% of the total labor force. Almost all the population has access to electricity, but less than 50% have access to clean, safely managed drinking water and sanitation services (The World Bank). The low sanitation makes it no wonder that major riverways, such as the Ganges and Indus, are heavily polluted with sewage and harmful bacteria. This pollution doesn't stop at water though, Indian air quality is very poor with an average AQI of about 120, with some cities reaching severe levels of 250. These values show three to five times more pollution than healthy levels (AQI). India's economy consists of small and large-scale agriculture as well as modern industries. The major exports are wheat, rice, and pulses, grown in accordance with the warm and humid climate of India. Lastly, religion is a major part of Indian society. The country has people who are Muslim, Hindu, Sikh, and Christian, just to name a few. Many decisions made by the government, which is a parliamentary democracy, have to keep religion and culture in mind to be effective.

Along with religion, Indians have developed a complex culture that greatly influences their day to day lives. A typical urban family usually consists of grandparents, about 2 children, a mother, and a father. Extended families usually live together or close to each other; however, the number of nuclear families in India has been consistently rising. The father typically serves as the head of the household and the main source of the family's income. In upper and middle class families, parents usually provide for their children until they complete their education or get a job; however, in many lower class families children start working at an early age to support their families (CultureGrams). The Indian diet varies by region, but usually is spicy, has some form of meat restriction (vegetarian or pollotarian), and contains many starchy foods and grains such as potatoes, lentils, wheat, and rice. (CultureGrams).

Throughout India, the rate of dietary diseases has consistently risen over the past few decades- regardless of government spending. Just in the last 25 years, diabetes rates in India have increased by 64% even though the government spent 31 billion dollars on improving healthcare (Dey). Furthermore, these diseases are getting increasingly fatal. A 2018 Lancet study on noncommunicable diseases in India found

that, “leading cardiovascular diseases—*ischaemic heart disease and stroke*—made the largest contribution to the total burden of mortality in India in 2016, at 28.1%, (and) the contribution of cardiovascular diseases to mortality increased by 34.3% from 1990 to 2016” (Arokiasamy). The government is spending money on healthcare, so what allows these diseases to proliferate?

The answer has four parts: unhealthy eating culture, cost, sedentary lifestyle, and air pollution. Firstly, the Indian diet does not align with current measures of a healthy diet. If we use the EAT Lancet Reference Diet as a baseline (Willett et al. 10-16), or even other diets from the Indian Council of Research, the average Indian diet would fail to correctly complete almost all of the requirements. Starting at the calorie intake, Indian diets are on average 10% less calorific than a healthy diet. If we consider protein, the Indian diet has the right types of protein, meat, poultry and fish, but doesn't have enough of it. The protein deficit between the recommended diet and the Indian diet is almost 22%. One last notable point in the Indian diet is that the consumption of starchy vegetables and cereals is on average 30% higher than the recommended value. This food group takes up space in the Indian diet that should instead be used for high protein and non-processed, nutrient rich foods. If you would like to see a full comparison of the Indian Diet and EAT Reference Diet, access this [table](#) from a BMC public health study (Sharma et al.). Backtracking to the reduced caloric intake, this statistic seems to completely contradict the results of the World Obesity Study, which concluded that 23% of adults in India are obese (Obesity Report 2). Although there could be a genetic component at play here, the relationship between these opposing statistics is most likely a combination of lifestyle and processed foods. A study by the Indian Council of Medical Research concluded that, “a large percentage of people in India are inactive with fewer than 10% engaging in recreational physical activity” (Pradeepa, Rajendra, et al.); if we combine these results with the knowledge that processed foods have high levels of calories but mostly empty calories, we can conclude that the obesity epidemic is caused by eating high levels of processed foods and living a sedentary lifestyle.

Secondly, if we observe the cost of a healthy diet, many Indians simply can't afford to eat healthy foods which forces them to consume cheap processed food to satisfy their energy needs. A CSE (Center for Science and Environment) report from 2022 states, “Seventy-one percent Indians cannot afford a healthy diet and 1.7 million die every year due to diseases attributable to poor diet” (PTI). The prices of healthy food in India is drastically higher than processed food and food on which farmers receive subsidies; High healthy food prices drive people away from good diets regardless of what the person wants to eat. These prices are also continuously increasing as the CSE report expands saying, “the consumer food price index (CFPI) inflation has seen a 327 per cent increase in the past year, while the consumer price index (CPI) – which includes CFPI -- has seen an 84 per cent jump” (PTI). As many Indians continue to prioritize financial health over physical health, the number of deaths due to dietary diseases will continue to increase along with food prices. Furthermore, the air pollution in India ensures physical struggle which enhances the prevalence of dietary disease. Air pollution leads to this as it is an environmental factor that alerts the General Adaptation System (GAS) in humans. Overactivity of the GAS system has been linked to high blood pressure and reduced heart and major organ health which amplifies the damage from a bad diet.

So what approach should be used to mitigate the negative impacts of the current diet and eventually shift the Indian diet to a more healthy alternative? On the agricultural side, the government of India currently provides large subsidies for rice and wheat growers. Although these subsidies keep the prices of high energy and starchy foods low, they work so well that these types of food are overpowering other food groups in the Indian diet. The Indian government should slowly change its emphasis on rice and wheat to other lacking areas in the Indian diet such as vegetables and good protein sources. This type of solution is being implemented in Europe through reforms in the Common Agricultural Policy (CAP). Although the goal of the reforms of the CAP policy in Europe are more sustainability and climate based, a similar policy can be used to diversify crops grown by Indian farmers. A similar policy has also been implemented in Senegal where sustainable development through diverse cropping is incentivized by the government (United Nations). Funding for these subsidies could come from various sources like the National Food Security Mission, The World Bank, and the Pradhan Mantri Krishi Sinchai Yojana, all of which are currently funding other food security and diversity projects in India (TractorGyan).

A shift in farming produce could also be handled by NGOs already trying to make this change in India: Dilasa Sanstha, Vrutti, and the Watershed Organisation Trust. A study exploring solutions for diet related diseases states, “ many NGOs involved in the rural development are interested in reviving traditional foods, notably millets and some pulses...By encouraging the cultivation of lands (with millets and pulses), multiple objectives are served restraining financial alienation to fair price shops and the important diversification of the diet with crops with high nutritional value” (Sebastia and Misra 8-9). These NGOs teach and encourage the use of millets instead of rice and wheat on farmlands where rice and wheat would take a large amount of fertilizer to grow. These small shifts would be enough to increase the price of rice and wheat enough that people will consider buying healthier options instead. The millet is an ideal plant to start this shift with. Although still starchy, most millets contain more fiber, iron, minerals, calcium, and protein than similar portions of rice and wheat. Furthermore, these millets can be made into foods similar to staples in the current Indian diet like roti or chapati. Due to this, Indian culture will not totally be turned on its head as rice and wheat consumption is reduced. A shift to millets will also help biodiversity and sustainability in India because NGOs teach farmers how to grow millets efficiently and sustainably. If supported enough by government subsidies and NGOs, we can expect to see more and more healthy options in the Indian diet within the next decade.

Now that accessibility has been addressed, how can Indian citizens themselves be incentivized to eat healthy? Currently, many Indians either do not know that they are eating unhealthy or simply are struggling with accepting healthy alternatives. A popular example of low acceptability is street food. It is present throughout all of India, in all traditions. Street food is a convenient, low cost, widely accessible, and poorly regulated source of unhealthy food. A personal example of this is my Indian uncle who is a heart disease, diabetes, and kidney disease patient. Despite being at risk, my uncle will eat at street shops at least every other day. Recently, he went to the doctor complaining about chest pain, heartburn, and fatigue. The doctor suggested an angiography, but due to my uncle's kidney disease an angiography could prove fatal as the angiographic dye wouldn't be filtered out of his body fast enough. Ultimately, the angiography was approved and completed successfully, but three blockages of 40%, 30% and 70% were found in my uncle's heart. The doctor said that, if allowed to develop, these blockages could lead to a heart attack, so my uncle should focus on exercising and eating healthier foods. The doctor's

recommendation had a noticeable enough impact on my uncle to reduce his street food consumption to once weekly. Street food is a principle component of Indian Culture and although it will never be removed, we can definitely try to reduce the frequency of which people eat unhealthy street food and unhealthy food in general. The key is to do this in a way such that street food integrity stays true to its culture, while allowing people to eat healthy options more frequently. A possible solution to this issue is to incentivize healthier street vendors and healthy eating in India. A project could be started, by the Ministry of Family Health and Welfare (MoFHW), that gives benefits to street vendors and people who partake in healthy eating. For street food vendors specifically, the program could consist of a bonus if they meet some selling quota of a government approved, healthy meal or dish. Additional components of this program could include food coupons, discounts, gift cards or bonus food items for people buying healthy foods. In order to determine the intricacies of these benefits, who gets them, how they are administered, which foods qualify for benefits, and how many of them are given out, the MoFHW would possibly have to create a sub branch with a minor initial investment. The cost of this program would rise as popularity increases; however, considering the possible benefits, it is well worth starting. To supplement the healthy food program, the public and street vendors need to be informed about the foods they are eating. A way to inform Indians could be through public service announcements that make living healthy seem easy and enjoyable. Once this healthy revolution catches on, social media and the dense population of India will help it spread like wildfire.

Overall, India is a densely populated country with some of the highest dietary disease and noncommunicable disease rates in the world, but measures like crop diversification focused subsidies, NGOs, healthy incentives, and public service announcements can be effective ways to reduce these rates. India has a complex culture which is heavily centered around food, so this proposed shift to a healthy diet will take many arduous years but will be well worth the lives saved.

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