

The Epidemiological Transition from Acute to Chronic, Health Inequalities in India

by Dagmar Rinnenburger*

Abstract

An epidemiological change has already taken place, and also in the post coronavirus phase the number of chronic diseases will be higher than acute and communicable ones. According to the WHO (2), in 2015 5.8 million people in India died of NCDs (non-communicable diseases), i.e. chronic diseases: cardiovascular and lung diseases, cancer, and diabetes. In 2015 diabetics were 69.2 million and will be almost 100 million in 2030. The complexity of interventions is linked to socio-economic conditions and, in particular, to access to education and drinking water. In Mumbai 40% of the population lives in slums. Four main social factors impact the health of people living in poverty: dirty water, low education, physical inactivity, and transportation. These elements cause situations to further deteriorate, and chronic disease plays a complex role. There are no easy solutions to this: India, which is both very rich and very poor, requires specific interventions aimed at different contexts, and it must be noted that a shift towards an anticipatory and proactive approach can be found both in rich and in poor countries.

Keywords

Epidemiological change, India, slum, global burden of disease, diabetes, rural public health system.

All over the world chronicity is rising. In the developed world people get much older and multimorbidity is more frequent, acute infectious diseases were under control until the pandemic of SARS-CoV-2 started in 2020. In emerging countries like India acute and chronic stay together in a different way. Its growth

rate is similar to that of China – its GDP (Gross Domestic Product) increased by 8.2% in 2016 and by 6.1% in 2019; also, the gap between rich and poor seems to be widening. There is a rich India, similar to Western countries, where the “middle class” is on the rise and poverty is dropping.

India still struggles with infectious diseases such as

AIDS and malaria; it struggles to treat about 400,000 children who die of diarrhoea and hosts about a quarter of the world's cases of tuberculosis. When we think of India in terms of health, infectious diseases and starvation come to the fore. Infectious diseases, although slowly decreasing, still absorb a considerable amount of resources.

* Private practice, Rome.

“With a population of 1.34 billion, the burden of disease in India is closely monitored by scientists interested in health globally. India’s burden of disease is dominated by 2 apparently divergent clusters of disease – on the one hand, cardiovascular conditions that are classically associated with overnutrition and affluence; and on the other, diarrheal disease and lower respiratory tract infections that are classically associated with undernutrition and poverty. This paradoxical mix of diseases reflects an ongoing epidemiologic transition, which has emerged alongside the transition from a low-income to middle-income economy. India boasts one of the fastest growing economies in the world, but economic gains have been heterogeneously distributed across the population. Against this dynamic epidemiologic and economic backdrop, there is growing interest in disaggregating national health statistics by socioeconomic groups, in part to inform discussions on allocation of finite resources for health and health care”¹.

According to the WHO², in 2015 5.8 million people in India died of NCDs (non-com-

municable diseases), i.e. chronic diseases: cardiovascular and lung diseases, cancer, and diabetes. One in four people in India are at risk of dying of a chronic disease before reaching the age of 70. India is also a country with a huge number of diabetic patients. According to the WHO, in 2015 diabetics were 69.2 million and will be almost 100 million in 2030. The consequence is a large number of patients with kidney failure.

In December 2017 «The Lancet»³ published an epidemiological report on India titled *Nations within a nation: variations in epidemiological transition across the states of India*; 18% of the world’s population lives in India: 1.340 million people; here states are more similar to nations. The conclusion of the article is that in India in the past 25 years, NCDs (Non communicable diseases), which are chronic diseases, have surpassed CMNNDs (communicable, maternal, neonatal and nutritional diseases), at a rate that varies greatly from state to state.

Maternal diseases and perinatal deaths are a very important factor, although they appear to be constantly

decreasing. According to the Unicef website more than 60,000 children are born every day in India – that is one sixth of global births. We may take a European country such as Italy to make a comparison: in 2018 about 1,200 babies a day were born here. Perinatal mortality in India has dropped significantly in the last 25 years. In 2018 about 30 children died in India for every 1000 (in Italy 2.59), but in 1996 there were still 76 deaths for every 1000 births (WHO source). The reduction has been achieved by working on the safety of mothers and newborns, on the conditions that allow women to give birth in protected environments: most deaths of mothers and children occur in fact in the 48 hours around delivery.

Vast resources still go to infectious diseases, while the threat of chronicity is looming, and affects not only the elderly. As a tracer of epidemics we may take diabetes, as suggested by Gavino Maciocco in the book *La salute globale* (Global Health)⁴. The choice of diabetes is due to the fact that this disease occupies a middle position: towards the top of the curve we have risk factors and obesity in particu-

lar, towards the bottom there are cardiovascular diseases and a series of related conditions (from kidney failure to blindness), more frequent among diabetic patients than in the rest of the population. In India, type 2 diabetes is more frequent and is correlated with lower body weight than in other countries.

The most striking fact is that the rapid increase in diabetes and insulin resistance in India is not only linked to an increase in obesity: both abundant nutrition and malnutrition of pregnant women are to blame. A real paradox. The fact that low birth weight is a risk factor for the development of type 2 diabetes, especially in women, was the subject of an article published in 2015⁵. It means that in order to effectively prevent diabetes, it is necessary not only to improve people's diet and enhance physical activity but also to improve nutrition for pregnant women. Diabetes in India starts earlier, at a younger age, and has less to do with obesity.

Ketoacidosis, retinopathy neuropathy, nephropathy and coronary heart disease and foot infections are the sad consequence of poorly man-

aged diabetes, so the question is: can we afford to be ignorant and continue spreading false information about the disease? The poorer a country is, the less we can afford the price of ignorance. The conclusion is that prevention should begin in school. Siddhartha is a young man and type 1 diabetes affects only 10% of Indian diabetics, but the difficulties in finding the right treatment and the prejudices related to the disease are similar in other cases. In fact, there is a strong prejudice against diabetes also outside India.

How can such a huge nation react to this challenge? The Kaiser Permanent Model (Kaiser Permanent is one of the largest non-profit Health Care Plans in the United States) clearly shows that 5% of the most severe cases absorbs 70% of the resources. The challenge is: not to allow these cases to reach such an advanced stage, but act much earlier, with a model centred on prevention.

In India it is very difficult to access treatment, especially in rural areas, and in the enormous slums of big cities, because of lack of infrastructure. The National Health

Service is free and is used by the less well-off. The rich generally seek private healthcare. However, the figures in table 1 show that the service is clearly unable to guarantee universal coverage.

The guidelines that apply in the Western world are not always applicable throughout India. In particular, they do not apply to poor people, for whom access to care, from a logistical and economic point of view, is an insurmountable problem, especially in rural areas. Chronic diseases such as diabetes are not funded as much as AIDS, for example. The costs of treatment are an important factor and often push people to seek alternative, non-validated herbal therapies. Also, not all general practitioners treat diabetes and patients are often sent to specialists who in many cases cannot be reached. Although adapted to the Indian context, many recommendations based on guidelines are difficult to implement in the context of rural and in particular urban poverty. Poverty in India means living in a slum. When the coronavirus pandemic struck in April 2020 the «Financial Times» noted that in India 101 million peo-

ple live in slums, 24% of the population.

The definition of slums given by the United Nations is: “highly populated urban residential area consisting mostly of closely packed, decrepit housing units inhabited primarily by impoverished persons”. In Mumbai 40% of the population lives in slums. Of course most of the inhabitants are poor. Personal conditions vary. Mumbai is an extremely expensive city and some workers actually choose to live in a slum to save on rent and utilities. Clearly in this context it is impossible to keep a safe distance and often even wash one’s hands, as has become essential since the start of the coronavirus pandemic.

In situations such as these, where does one locate chronic diseases, such as diabetes? An article published in 2018⁶ seeks to understand the main difficulties of slums and the way problems overlap, something that contributes to the complexity of this scenario. It concludes that four main social factors impact the health of people living in poverty: dirty water, low education, physical inactivity, and transportation. These elements cause situations to further de-

teriorate, and chronic disease plays a complex role. The low level of education is linked to cardiovascular diseases. The lack of public transport leads to increased use of mopeds, which reduce physical activity: this leads to an increased risk of cardiovascular disease and diabetes. Standing in line for hours to collect water increases stress and blood pressure. The analysis of the complexity of these interactions could motivate politicians to change the situation. Socio-economic and epidemiological changes do not stop in the poorest part of society, where people live in slums and in poor rural areas. The risk factors of diabetes is the same everywhere: a sedentary life, a poor diet, excessive weight and heredity.

To this one must add that there is no public healthcare system. In Dharavi, the largest slum in Mumbai, in India and in the world, there are reports⁷ of many unregistered improvised healthcare services that operate in the field of diabetes. Here many have been diagnosed with diabetes, though at an advanced stage, and are given unregistered over-the-counter medicines. Poor diabetics pay for this delay with their lives. To apply

the Kaiser Permanente Model would be unthinkable here, a model that dedicates 70% of resources to the top 5% of severe cases.

Change can only happen through healthcare policies and government action. Jeremy Ang’s⁸ article comes to the same conclusions as those reached by Julian Hart in England in the 1960s: “India will have to radically transform her mode of healthcare delivery from one that is reactive to one that is anticipative, from a system that treats episodic illnesses to one that conducts periodic checkups. Policy will also have to be ‘health-centric’ rather than healthcare-centric. For a country as large as India, the only way to bring this up to scale while improving efficiency and effectiveness is via a ‘Primary Health Care approach’. A more proactive role in preventing the urban poor from falling ill is needed”.

The complexity of interventions is linked to socio-economic conditions and, in particular, to access to education and drinking water. An image of the Dharawi slum illustrates the fact that encouraging physical activity in an environment where streets are often no

wider than 70 cm and temperatures are very high makes no sense, especially in the case of women who very often never leave the slums.

An epidemiological change has already taken place, and also in the post Coronavirus phase the number of chronic diseases will be higher than acute and communicable ones. There are no easy solutions to this: India, which is both very rich and very poor, requires specific interventions aimed at different contexts, and it must be noted that a shift towards an anticipatory and proactive approach can be found both in rich and in poor countries.

Julian Hart (8) more than 50 years ago spoke of initiative anticipatory medicine, which requires a different organiza-

tional and conceptual model. And healthcare structure to intercept people who might not know they are ill. Today the coronavirus pandemic forces us to admit that everywhere the territorial dimension has been neglected. The much discussed triad applicable to infectious diseases – test, trace, treat – can only work with a functioning territory: for example, the same network that tracks and follows diabetics can be used in cases of infectious emergencies. It requires organizational creativity outside hospitals. We have seen strong healthcare systems collapse, for instance in Italy, Spain, England and especially in the United States, where the focus was on the large hospital network, because that is where the ill went for

help. It would have been necessary to reinforce the system and implement prevention at a territorial level, to isolate new infections and flatten the curve which overwhelmed hospitals, and caused situations we thought were unthinkable – trucks carrying corpses in Bergamo, Italy, and refrigerator cells being used for bodies in New York. Territories and medicine for chronicity are intertwined with acuity, especially with infectious diseases, and it is wrong to focus on the various specialised branches inside public hospitals or private clinics of excellence. We now see that the lesson of chronicity also applies to an acute context, it is an opportunity for improvement.

Notes

1. Shivani A. Patel (PhD¹), Solveig A. Cunningham, (PhD²), Nikhil Tandon (MD³) *et al.* (2019), *Chronic Diseases in India – Ubiquitous Across the Socioeconomic Spectrum*, «JAMA Netw Open», 2(4), 2019, e190404. doi:10.1001/jamanetworkopen.2019.0404.

2. *Nations within a nation: variations in epidemiological transition across the states of India, 1990-2016*, in «Global Burden of Disease Study», Volume 390, Issue 10111, December 02, 2017, pp. 2437-2460.

3. https://www.who.int/chp/chronic_disease_report/media/INDIA.pdf.

4. Maciocco G., *La Salute Globale*, Carocci Faber, Santomauro.

5. Song Y., Huang Y., Song Y. *et al.* (2015), *Birthweight, mediating biomarkers and the development of type 2 diabetes*

later in life: a prospective study of multi-ethnic women, in «Diabetologia», 58, pp. 1220-1230 [available at <https://doi.org/10.1007/s00125-014-3479-2>].

6. Lumagbas L.B. *et al.* (2018), *Non-communicable diseases in Indian slums: re-framing the Social Determinants of Health*, in «Glob Health Action», 11(1), 2018, 1438840. Published online 2018 Mar 28; doi: 10.1080/16549716.2018.1438840.

7. Jeremy Ang, <https://muhi.org.au/primary-health-care-initiatives-for-dharavi-india/>.

8. Hart JT. (1971), *The inverse care law*, in «Lancet» 297(7696), 1971; pp. 405-412.