

Urgent Need to Orient Public Health Response to Rapid Nutrition Transition

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ABSTRACT

India is currently undergoing a rapid transition on economic, demographic, epidemiologic, nutrition, and sociological fronts. There is evidence of a decline in undernutrition with a simultaneous escalation in overnutrition and associated non-communicable diseases (NCDs). However, the current concern and national policy response for tackling malnutrition in India is still primarily restricted to undernutrition diagnosed on the basis of body size (anthropometry). A complex range of interacting factors have been linked to the rising trend of overnutrition and associated NCDs from a global perspective. The burden of overnutrition and associated morbidities is rapidly escalating to alarming proportions, particularly in urban areas and high socio-economic status groups. The poor are not spared from this transition. It is predicted that a more rapid transition may occur amongst poor populations in future with higher economic development. The need of the hour is to launch an integrated public health response to the dual burden beginning from pregnancy and early life. This will obviously require careful deliberation of the strategy and interventions, and a multi-sectoral approach, especially involving the health, women and child development, nutrition, education, agriculture, food processing, trade, architecture, water supply and sanitation, community and non-governmental organizations.

Keywords: Nutrition, undernutrition, overnutrition, non-communicable diseases

India is currently undergoing a rapid transition on economic, demographic, epidemiologic, nutrition, and sociological fronts.⁽¹⁻⁴⁾ Since 1980, the gross domestic product per capita has risen by 230% (4% annually), and poverty has declined (0.88% annually from 1983-1994 and 0.77% from 1993-2005). Life expectancy has risen from 54 years to 69 years while the birth rate has fallen from 34 to 22 between 1980 and 2008. The average annual growth rate of urban population (1990-2007) was 2.8% and by the year 2030, 41% of India's population is expected to be living in cities and towns. Specifically, in the context of nutrition, there is evidence of a decline in undernutrition with a simultaneous escalation in overnutrition and associated non-communicable

diseases (NCDs). However, the current concern and national policy response for tackling malnutrition in India is still primarily restricted to undernutrition diagnosed on the basis of body size (anthropometry). In light of the rapidly ongoing nutrition transition, we advocate urgent policy response to simultaneously address the overnutrition burden.

Declining Undernutrition

Evidence from many sources indicates that undernutrition, while still unacceptably high, has declined substantially.^(5,6) The most outstanding achievement has been the virtual banishment of acute large-scale famines and the virtual disappearance of classical kwashiorkor and severe forms of marasmus. Over the past 3 decades, national surveys in under-5 children have documented a sustained and substantial decline in underweight and stunting, and to a lesser extent in wasting. A comparison of undernutrition indices, defined as per the WHO growth reference, is possible between 1998-1999 and 2005-2006 from the National Family Health Surveys (NFHS), only in children below 3 years age. There was a substantial decline in

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DOI:

10.4103/0970-0218.103465

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Received: 25-07-2012, **Accepted:** 25-07-2012

stunting (51% to 45%) and a marginal reduction in underweight (43% to 40%). This trend was evident for both urban and under-privileged rural areas.⁽⁷⁾ There is some evidence of a slight increase in birth weight.

Rapidly Escalating Burden of Overnutrition and Associated Morbidity

Local, regional, and national surveys indicate that the prevalence of overweight and obesity, as defined by international criteria, has increased over the past decade in children, adolescents, and adults.^(1-4,6,8,9) The most recent national estimates (NFHS 3 in 2005-2006) of overweight (body mass index (BMI) ≥ 25 kg/m²) in adults in rural and urban areas were 7.3% and 22.2% in men and 8.6% and 28.9% in women. This escalation has been relatively rapid in urban areas and in high socio-economic strata; the current magnitude of overweight (body mass index or BMI ≥ 25) in adults in some groups is relatively high (28% to 40%). An increase in overweight has also been documented amongst the poor population (rural areas and urban slums). In some parts of Chennai, rural population had a more rapid escalation of overweight (2% to 17.1% or 8.6-fold) in comparison to urban areas.⁽¹⁰⁾ A recent analysis from low and middle income countries also highlights faster overweight growth amongst the poor in association with higher economic development contexts, particularly when combined with lower income inequality.⁽¹¹⁾ It is, therefore, likely that with greater balanced economic growth in future in India, the poor will experience a more rapid escalation of overnutrition.

The magnitude of health and economic burden attributable to overnutrition is substantially underestimated from projections based solely on international anthropometric cut-offs, particularly in under-5 children. Adult obesity appears to precede child obesity.⁽¹²⁾ Further, South Asians have higher body fat percentage (adiposity) as compared to Caucasians for a given BMI. Thus, morbidities related to excess adiposity (diabetes, hypertension, dyslipidemia, and metabolic syndrome) occur at lower BMI levels. A BMI ≥ 23 (instead of ≥ 25 kg/m²) is, therefore, now recommended to define overweight in adult Indians, which naturally elevates the magnitude of overnutrition burden.^(13,14) This lowering of cut-off naturally elevates the magnitude of overnutrition burden with recent estimates from some urban areas ranging from 51% to 80%.^(9,15)

Realistic estimates of overnutrition burden should also be based upon the trends in related morbidities, which have become quite alarming in the Indian context. During the 1960s and 1970s, adult diabetes mellitus (DM) prevalence was reported to be 1% to 4% in urban areas and 1% to 2% of rural populations. Studies since the late 1980s reported DM in 5% to 15% of urban populations, 4% to 6% of semi-urban populations, and 2% to 5% of rural populations.⁽¹⁶⁻¹⁹⁾

Data in 2005 documented a prevalence of 15% to 18% in urban areas and 8.9% in a rural study.⁽¹⁶⁾ Thus, a significantly increasing trend has been observed in urban populations (exponential trend $R^2 = 0.74$), whereas the increase is slower ($R^2 = 0.29$) in rural populations.⁽¹⁶⁾ The International Diabetes Federation predicts that 87 million adults are likely to be afflicted with DM by 2030.⁽²⁰⁾ Over the years 1942 to 1997, there was a significant increase in the mean levels of systolic blood pressure, particularly amongst urban men aged 40-49 years (from 120.4 mm to 130 mm Hg).⁽²¹⁾ A meta-analysis published in 2004 estimates that hypertension is present in 25% urban and 10% rural subjects in India.⁽²²⁾ Projections suggest that hypertensive individuals will rise from 118.2 million in 2000 to 213.5 million in 2025.⁽²³⁾ Recent evidence suggests that metabolic syndrome afflicts about one fourth to one third of middle and high SES urban adult population and 12% of adults in urban slums in some metros.^(24,25) Longitudinal data from New Delhi Birth Cohort documents an alarming annual incidence of obesity (2% for men and 2.2% for women), diabetes (1% for men and 0.5% for women), and hypertension (4.2% for men and 1.8% for women) amongst middle SES urban young adults (29 years) followed for an average duration of 7 years.

Main Likely Drivers of the Escalating Overnutrition Burden

A complex range of interacting factors have been linked to the rising trend of overnutrition and associated NCDs from a global perspective.^(2-4,10,12,18,26,27) The main postulated proximal and underlying drivers in the Indian context are summarized below.⁽²⁷⁾

Rapid demographic transition

Life expectancy is increasing while birth rates are on the decline. The share of the population above 60 years of age is growing at a rapid pace and is projected to increase from 54.7 million in 1991 to 113 million in 2016 (107% increase) or from 6.4% to 8.9% of the population; it will increase further to 179 million in 2026 (227% increase). The age group below 15 years is simultaneously declining. The changes in population age pyramid are highly variable within the country; Kerala is approaching that of developed countries while that of UP resembles less developed countries.

Socio-economic transition

Increasing affluence is fueling primary drivers of overnutrition including enhanced availability of unhealthy foods and decreased physical activity.

Rapid urbanization

Urbanization also fuels the transition because of life style (dietary habits and physical activity) changes. The pace

of urbanization is variable across the states with southern states urbanizing much faster than the northern states.

Changing patterns of disease

There is a decline in infectious and communicable diseases with a resultant nutrition sparing effect and a substitution with chronic NCDs.

Dietary changes

A sustained decline in per capita calorie consumption is evident, largely due to protein and carbohydrate intake, while fat consumption has increased, particularly from unhealthy NCD-promoting oils.⁽²⁸⁾ There is greater intake of milk and milk products and animal products (designated flesh foods). Consumption of healthful components of diet including fruits and vegetables, fiber, legumes, and coarse grains is reduced in absolute or relative terms. Processed foods with high content of unhealthy fats, sugar, and salt are being increasingly preferred. This dietary transition is being fueled by underlying major economic, marketing, and social changes including those in infrastructure, pricing and farm policies, food distribution, globalization of food trade, supermarkets, and marketing media.

Physical activity

Physical activity and energy expenditure has declined due to a sedentary lifestyle – motorized transport, labor-saving devices in the home, phasing out of physically demanding manual tasks in the workplace, and leisure time that is preponderantly devoted to physically undemanding pastimes.

Swift Orientation of Public Health Response

It is obvious that the burden of overnutrition and associated morbidities is rapidly escalating to alarming proportions, particularly in urban areas and high socio-economic status groups. The poor are not spared from this transition. It is predicted that a more rapid transition may occur amongst poor populations in future with higher economic development. The need for addressing overnutrition may be debatably greater, if not equal, because anthropometric undernutrition is declining, albeit slowly, while overnutrition and associated life-long morbidities are rapidly increasing, even amongst the poor.

Unfortunately, the current national concern and public health response for addressing malnutrition is still primarily restricted to undernutrition diagnosed on the basis of body size (anthropometry) in preschool children. Further, the usual intervention focuses on food supplementation programs (for example, mid-day meal program), which have the potential to fuel the

ongoing epidemic of overnutrition, especially if used inappropriately (supplementing older children or loose calories/fat). A swift adaptation of the public health policy response is, therefore, vital to simultaneously address the dual burden of undernutrition and overnutrition. Some cosmetic interventions have been recently initiated to identify and treat subjects with adult diabetes mellitus. However, such isolated efforts will only partially ameliorate the end effect of overnutrition accumulated over the earlier life span of an individual. All stakeholders must realize that overnutrition and associated morbidities do not occur overnight or in adulthood only; the seeds are sown in utero, infancy, children, and adolescence.

The need of the hour is to launch an integrated public health response to the dual burden beginning from pregnancy and early life. This will obviously require careful deliberation of the strategy and interventions, and a multi-sectoral approach, especially involving the health, women and child development, nutrition, education, agriculture, food processing, trade, architecture, water supply and sanitation, community and non-governmental organizations. Interventions should avoid 2 potential trade-offs: (i) Mitigation of one component of the dual burden (undernutrition and overnutrition) should not inadvertently escalate the other; and (ii) socio-economic equity should not worsen rather than improving. A few leads do emerge for mitigating overnutrition from a scrutiny of its potential drivers. Improving physical activity and fitness through interventions aimed at city planning and transport or individual exercise programs focused in schools or workplaces are likely to be beneficial for both overnutrition and undernutrition. Dietary changes are one of the main drivers of the escalating overnutrition burden. Consumption of food components promoting overnutrition (fat, vegetable oil, sugar, salt, and animal products) has increased while that of healthful components (fruits and vegetables, fiber, legumes, and coarse grains) has reduced. Cost-effective strategies that may produce the largest health gains in the shortest timeframe include: (i) Fiscal measures that increase the price of unhealthy food content or reduce the cost of healthy foods; and (ii) regulatory measures that improve nutritional information or restrict the marketing of unhealthy foods, particularly to children.⁽²⁷⁾ If carefully thought out and implemented, such interventions are unlikely to escalate the undernutrition burden.

The time to act is now by convincing the policy makers to urgently address both overnutrition and undernutrition simultaneously in an integrated manner. A delay will result in irreparable health, economic and human resource consequences for the country.

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How cite this article: Kapil U, Sachdev HS. Urgent Need to Orient Public Health Response to Rapid Nutrition Transition. *Indian J Community Med* 2012;37:207-10.

Source of Support: Nil, **Conflict of Interest:** None declared.