

The face of famine: <i>Introduction by Sandhya Srinivasan</i>	2
Health through the hunger lens <i>by Yogesh Jain</i>	4
Layperson's guide to nutrition and malnutrition <i>by Ramani Atkuri</i>	9
The career of hunger: Part 1 <i>by Veena Shatrugna</i>	12
What individuals spend on a monthly food basket <i>by Rahul Goswami</i>	18
The poor spend more of their income, but eat less <i>by Sachin Kumar Jain</i>	21
Land alienation and starvation <i>by Mari Marcel Thekaekara</i>	22
The shadow of hunger <i>by Aditya Malaviya</i>	25
Poor fare <i>by Rajashri Dasgupta</i>	28
The underfed and the unscrupulous <i>by Shahina K K</i>	31
The wider effects of nutrition research: Part 2 <i>by Veena Shatrugna</i>	33
The writ of a compartmented government <i>by Rahul Goswami</i>	38
Commodifying malnutrition <i>by Radha Holla</i>	39
Plumpy Nut or indigenous foods? <i>by Vandana Prasad</i>	42
Micro, bio and packaged — how India's nutrition mix is being reshaped <i>by Rahul Goswami</i>	45
Universal malnutrition? <i>by Sridhar Srikanthiah</i>	50
Mal-Mal approach to malnutrition <i>by John Oommen</i>	53
Combating under-3 malnutrition <i>by Ramani Atkuri</i>	58
'Malnutrition will not change unless women exclusively breastfeed': Armida Fernandez: <i>Interview by Sharmila Joshi</i>	62
'The Food Security Bill is regressive': Biraj Patnaik	64

This volume has been guest-edited by Sandhya Srinivasan

Cover photograph by Sudhakar Olwe

Editors: Hutokshi Doctor, John Samuel
 Production and layout: Gita Vasudevan, Sameer Karmarkar
 Infochange team: K C Dwarkanath,
 Rifat Mumtaz, Vijay Narvekar, Vishnu Walje

The face of famine

Forty-three per cent of all children under 5 in India are underweight, and more than half of all under-5 deaths are linked to malnutrition. One in three adults too is underweight, and 60% of deaths due to infectious diseases are caused by the coexistence of undernutrition. These figures represent a composite index of chronic and acute deprivation and hunger. As Dr Binayak Sen says, the poor are walking with famine by their side

SANDHYA
SRINIVASAN

ONE OF THE MOST PAINFUL IMAGES in the collection of articles in this issue is of a boy hunched over a mortar and pestle while another little boy stands patiently by him. Dr Ramani Atkuri found Sumit preparing a paste of garlic so that his toddler brother could stave off hunger until their parents returned from the fields. It is a heart-rending story, about how the poor grow up early, how children care for other children, and how the destitute just cope. The tragedy is that Sumit's story is not new. Dr Atkuri and others working among the poor in India are witness to such scenes every day.

The bigger picture is in the statistics. These faceless figures are no less distressing.

Forty-eight per cent of all children under 5 in India are stunted for their age — the impact of longstanding hunger which, in turn, is a result of sheer poverty, marginalisation and a government that clearly does not care. Twenty per cent of children are wasted — they are stick-thin because a drought or other crisis has forced the family to *further* cut back on food. And an outrageous 43% of all children under 5 are underweight — a composite index of chronic or acute deprivation.

The Integrated Child Development Services (ICDS) programme is supposed to address this extreme deprivation by providing supplementary food, rations and growth monitoring through community-level anganwadis for children under the age of six years. However, though a whopping 70% of children in India between six months and five years are anaemic, 74% of children under 6 do not receive *any* supplementary food from the anganwadi in their region. Convert those numbers into more than 100 million children who don't get enough to eat.

Hunger pursues the survivors of childhood into adulthood. More than one in three adults (36% of women and 34% of men) is underweight. Fifty six per cent of all women (and 24% of men) are anaemic. In turn, adult malnutrition casts a lifelong shadow over the health of the next generation: 59% of pregnant women are anaemic, and the NFHS indicates this figure is *rising*. The government has a programme to provide food supplements for pregnant and lactating women — for their own health and that of their child

(women past reproductive age are of no interest). But just 21% of pregnant women and 17% of lactating women received any food supplementation.

Needless to say, those numbers are averages. The picture is particularly bleak in Madhya Pradesh, Jharkhand, Bihar, Chhattisgarh and Orissa. It is influenced by multiple exclusions — from food and health services to social marginalisation, affecting the scheduled tribes, scheduled caste communities and Muslims the worst. As eminent public health specialist Dr Binayak Sen says, the poor are virtually walking with famine by their side.

More than half of all deaths in India of children under 5 are linked to malnutrition — it reduces their immunity to illness as well as the ability to fight it if they do fall ill. The Indian National Science Association notes that “60% of deaths due to infectious diseases are caused by coexistence of undernutrition”. Indeed, India ranks 41st among 41 developing countries in the prevalence of underweight in children — it is twice as high as in 26 countries in sub-Saharan Africa.

There are scores of newspaper reports on children whose illness was hunger but whose cause of death is recorded as measles or diarrhoea. Alongside these reports are horrifying photographs of skeletal babies with distended abdomens. Like Raichur district in Karnataka which *officially* recorded an average of three malnutrition deaths daily in the last two years. Starvation death also strikes in Baran, Rajasthan, where the Sahariya tribals are rendered landless and destitute. It is a matter of disgrace that a Maharashtra minister can actually announce without shame that 1.17 lakh children died of malnutrition over four years — or 80 children every day across the state.

The urban poor are not much better off. The particularly marginalised, such as children of ragpickers and construction workers, are more at risk, without even token access to health and nutrition schemes. Twenty-six per cent of all children in Mumbai are underweight.

And surveys show that calorie intake has declined and the poor are eating even less today than they were 40 years ago. Government committees actually conclude that this drop is

voluntary, and merits a reduction in the prescribed minimum calorie requirements, allowing it to further reduce the amount of grain available through the public distribution system (PDS), forcing the poor to pay market rates for food — or do without. This is a scandal when families are cooking wild roots and leaves to stave off hunger.

In this issue of *Agenda*, researchers, physicians, journalists and health activists take a look behind such figures.

The first set of articles sets the stage for this discussion. Paediatrician Yogesh Jain describes how the massive burden of chronic as well as infectious diseases in poor communities, seen every day at a community health programme in Chhattisgarh, is clearly linked to food deprivation. Ramani Atkuri's guide to terms explains how malnutrition is measured. In the first extract from her essay 'The Career of Hunger: Critical Reflections on the History of Nutrition Science and Policy', senior nutritionist Veena Shatrugna explains how politics conspired with science to develop a cereal-based diet bereft of animal protein, a diet which has played its part in promoting malnutrition and disease. Researcher Rahul Goswami goes through the latest data from the National Sample Survey 66th Round to summarise what people are eating. Activist Sachin Kumar Jain provides statistics to show that the poor spend more of their income on food, but get less to eat.

Reports from the field tell the stories behind the numbers — how people survive. Mari Marcel Thekaekara in Gudalur, Tamil Nadu, spoke to community health activists across the country for a picture of malnutrition in adivasi communities, finding a direct link between land alienation and starvation. Aditya Malaviya visited Baran, Rajasthan, to interview families of Sahariyas, where starvation deaths are reported with depressing regularity. Rajashri Dasgupta talked to migrant workers, street children and the homeless in Kolkata who depend on roadside stalls for at least one meal every day. Shahina K K travelled to Karnataka's Raichur district where *anganwadis* are stocked with packaged foods from a processed food company: "It is hard to tell which is the worse scandal: the lack of nutrition here or the money being made off it."

The third set of articles focuses on the government response. In the second extract from her essay, Dr Shatrugna discusses the decision to focus on cheap calories and its influence on major policy decisions such as the low poverty line, a minimum wage to meet these low dietary requirements, a public distribution system limited to cereals, and high-input monoculture to produce these cereals. Rahul Goswami gives a macro analysis of the government's approach to malnutrition — providing space for industrial monoculture and the ready-to-eat food industry. Government programmes with great potential, such as the ICDS and the PDS, have been sabotaged. The commodification of malnutrition is discussed in more detail by health activist Radha Holla, as the government forges

partnerships with companies making biscuits and baby food — and running mines. The same private interests also fund non-governmental organisations that promote biscuits as nutrition. Paediatrician Vandana Prasad presents the position paper of the Working Group for Children Under 6, attacking the government's use of a commercial product for treatment of severe acute malnutrition when locally made foods are effective, appropriate and cheaper.

The final set of essays looks at what can be done. Paediatrician Sridhar Srikantiah looks at various approaches to addressing malnutrition, to see what works and what does not. In tribal Orissa, community physician John Oommen and his colleagues found that most severely malnourished children there also had malaria — and when the malaria was treated, the children finally started putting on weight. Ramani Atkuri describes a successful *creche* programme in Chhattisgarh, a contrast to the government's ICDS. Can the JSS (Jan Swasthya Sahyog) model be replicated by the government? Sharmila Joshi interviews neonatologist Armida Fernandez on the achievements of the breastfeeding-promotion network, and barriers yet to be overcome.

Community involvement — through feeding programmes, self-help groups, grain banks, and so on — has a critical role to play in tackling malnutrition. But it is of limited value unless the government acknowledges its obligation to ensuring people's right to food. The flaws in the National Food Security Bill are touched upon by many writers in this issue of *Agenda* (see <http://www.infochangeindia.org/agriculture> for detailed discussions on the bill). Without an assurance of sufficient food through the PDS, people are left to the mercy of the market — and the consequences are evident. So it is a matter of concern that even as the government talks about expanding food security, we read of proposals for conditional cash transfers that would effectively wind down the PDS. In the last piece in this issue, Biraj Patnaik discusses the work of the Right to Food Campaign. Finally, people must act through civil society organisations to get the government to meet its commitment to the country's poor and hungry.

Sandhya Srinivasan is a freelance journalist specialising in public health and development issues. She has a Master's in public health and is Consulting Editor of the Indian Journal of Medical Ethics and Consulting Editor, Public Health, for www.infochangeindia.org. She was a Panos Reproductive Health Media Fellow in 1998 and an Ashoka Fellow

References

- 1 Arnold, F, et al. *Nutrition in India*. National Family Health Survey 3, India, 2005-06. Mumbai: International Institute for Population Studies; 2009
- 2 Hunger and Health: An Interdisciplinary Dialogue. Joint statement from a workshop. Bilaspur, February 10-11, 2006. *mfc bulletin*. 2006 February-March. <http://www.mfcindia.org/mfcpdfs/MFC315.pdf>
- 3 Sen, Binayak. 'Ethics, equity and genocide'. *Indian J Med Ethics*. 2011 January; 8 (1): 12-15.
4. The Right to Food Campaign. www.righttofoodindia.org

Health through the hunger lens

In tribal-dominated Chhattisgarh, where this writer works, men and women are at least 10 kg lighter than the reference Indian, and even the popular PDS rice scheme lasts a family only 11 days. The high burden of all diseases, from TB and malaria to cancer and heart disease, has clear links with the ‘lifestyle’ of poverty and hunger in this region

YOGESH JAIN
with
JAN SWASTHYA
SAHYOG

Sudharak Olwe



ON FEBRUARY 8, 2012, 36-year-old Dhansai Portey walked into our out-patient department. He was the image of a person literally consumed by tuberculosis. Though normal in height, he weighed just 35 kg. An x-ray of his chest revealed lungs that had turned almost white from the disease (normal is black). For the last six months or so, he had been experiencing several symptoms and had become too weak to pull a rickshaw to earn his living in Bilaspur, Chhattisgarh, in central India.

For me this was a familiar picture of deprivation and injustice, of which disease is only the embodiment. I have become

immune to such medical situations which can only be described as ‘violence’. The low body weight (at 36, Dhansai weighed as much as a 12-year-old child) led me to check for other causes of immune deficiency, such as HIV. Thankfully, these were negative. Dhansai told me that for the last six years he had been living with his wife and three children. Through the much-applauded public distribution system (PDS) in Chhattisgarh, he received 35 kg of rice a month, at Rs 2 per kg. He ate almost nothing else. In fact, little remained of the Rs 70-80 that he managed to earn from his rickshaw every day: Rs 400 was spent on rent for his one-room tenement, and another Rs 100 went on electricity every month.

I thought about the drugs he should take; I worried whether he had acquired a resistance due to irrational anti-TB drug combinations prescribed by other doctors; I thought about the points that needed to be stressed during counselling; I wondered whether his weight loss was due to lack of food or because his symptoms had been ignored by the health system.

Records of his previous visit to Jan Swasthya Sahyog (JSS) seven months earlier showed his weight at 43 kg. He had come to look after his sister who was being treated for advanced tuberculosis requiring hospitalisation. Dhansai believed he had developed tuberculosis because he had been sleeping on the cold hospital floor. The physician who saw him then had prescribed analgesics for his bodyache and given him some iron tablets for his mild anaemia.

This long story taught me many things. One striking lesson was that we should have recognised that Dhansai was already at risk of developing tuberculosis when he came in with his sister last May. Though 8 kg heavier, he was already at much greater risk than someone like me, at 65 kg, who sees, along with others at JSS, over 500 new tuberculosis patients every year. Even in an organisation that is committed to understanding hunger as it relates to health, we did not appreciate Dhansai’s greater risk of becoming a victim of what can only be called a ‘disease of poverty or hunger’. Should something have been done when Dhansai first came to us at 43 kg?

Hunger

When I say that one-third of all men and about half of all women in India have weights or body masses less than

Dhansai's 43 kg, it is not a mere nutrition statistic. Statistics confuse most of us, yet they are enormously significant. What the numbers tell me is that a large proportion of our people are at great risk of contracting illnesses like tuberculosis and worse. They are also less likely to survive these illnesses even if they do manage to receive the best treatment available. Those who survive may be left unable to work. Yet these facts do not impinge upon our consciousness, or even our conscience. Spurred on by Michelle Obama, American society, which recognises that the health costs of obesity due to overeating runs into billions of dollars, unleashes programmes to address the problem. We, on the other hand, occasionally distracted by the 'HUNGaMA' of statistics (1), continue to be blissfully smug and ignorant about the huge health costs of undernutrition, or its less sanitised synonym, hunger.

If the first question that occurred to me was: Should something have been done for Dhansai when he first came to JSS, the questions that followed were: What are 'good weights' for men and women? What about height? How does height and weight translate into an ability to earn, or into being healthy or unhealthy? How much food does a person require to remain healthy or to maintain a normal weight? What amount and type of food should the right to food entitlements and security and the right to good health translate to? And finally, when whole communities remain hungry what are the consequences on their health, at different points in life? Where do the present food entitlement programmes lead us? And is there hope for them?

I will explore some of these questions from the vantage point of the junction of health and hunger, situated as I am in a community health programme in an area where deprivation is entrenched; where, in fact, deprivation is actually promoted by the exploitation of rural areas, ineffective development programmes, and a public distribution system that has increasingly restricted its coverage. All of these lie within the rubric of structural violence.

If one gets enough to eat, the National Institute of Nutrition (NIN) recommends that, as a reference, a rural Indian adult man should weigh 60 kg and be 173 cm tall, and a woman should weigh 55 kg and be 161 cm tall (2). These obviously are the ideal to which one must aspire. The mean heights of both men and women in India are lower than these references or standards by a little more than 10 cm. The National Family Health Survey does not publish data on weight alone, but it does give information on body mass index (BMI), a derived indicator representing weight for height, which is another measure of nutritional status. According to NFHS-3 data, going by the standards of BMI, as many as one-third of India's adults are undernourished, with a BMI of less than 18.5. There is also a clear pecking order in the social group, with scheduled tribes faring the worst, followed by scheduled castes, other backward castes, and the general category, in that order. There are also variations between states (3). At JSS, among the people in tribal-dominated forest fringe villages, the median weights of men

and women are 49 and 41.5 kg respectively, or at least 10 kg lighter than the reference Indian. And this has not changed in the last decade that we have worked here and collected such information.

Why are we so fixated on weights and heights? The reason is that these measures are robust indicators of food security. If you discount those who have certain psychiatric problems, no one would have a lower weight or height if he/she had access to adequate food. The proof of the pudding is in the eating. We can judge all processes like the efficacy of the PDS, the importance given to growing food crops, and the purchasing power of people by looking at body parameters like their weight and height. Besides, a person's height can also tell us whether adequate food was available during his/her childhood.

Why should we call undernutrition hunger? Let me give you a reason. Nutritionists say that to lose (as well as to gain) each kilo, the cost would be 7,000 calorie units. NIN and other bodies recommend 2,325 and 1,900 calories for the sedentary Indian man and woman respectively, and additional calories for physical work (4). As mentioned above, Indian men and women weigh at least 10 kg less than what they would have weighed had they been eating well. Thus, the hunger cost of their nutrition is 70,000 calories. Even if we assume that an average Indian goes hungry by 500 calories every day, it would take at least 140 consecutive days to reach that state.

We can still choose to describe underweight and stunted people as 'malnourished' if we like. But I suggest the correct term would be 'hunger'.

How did food security get reduced to food 'entitlements'? That too, targeted at the officially poor? And that in turn into cereals alone? And that too into a magical figure of 35 kg, or, worse, 25? This is beyond my comprehension. One administrator in my own state of Chhattisgarh said it was his personal assumption — not based on any research or guideline — that an adult required 10 kg of cereals every month and a child 5 kg; thus, a family of five that had three children required 35 kg. Simple! The Food and Agriculture Organisation recommends that every person living on a predominantly, though not exclusively, cereal-based diet requires about 18 kg per month (5). Our studies in Bilaspur, with an average family size of 5.5, aimed to look at how long PDS rice lasts. We learned that PDS grain (35 kg per family) lasts just 11 days. That leaves families to fend for themselves for the rest of the month, from the market or from their own produce. And the Food Security Bill is aiming for 25 kg per family!

Why only cereals? The Chhattisgarh government has piloted giving 2 kg of channa (gram) monthly to the officially poor in Bastar and Sarguja divisions; this may be extended to the rest of the state. It experimented with providing 1 kg of oil at a little less than the market rate, but that did not succeed. In Chhattisgarh, the JSS has recommended that the state implement a better PDS that would meet more than half

people’s calorie and protein intake (6). We hope that the state will heed our plea.

Has the presence of a PDS ever shown an improvement in people’s nutritional status, or in their food intake? I have not found any studies to show this, although some are still underway. It seems to me that at the very least, given that there are so many needs, the money saved due to the availability of subsidised foodgrain from the PDS allows people to buy other things, possibly other foods. With PDS food lasting just a few days, families are victims of spiralling food prices in the market.

Yet it is true that the public distribution system is quite popular, allowing the present government to come back for a second term. Efficient overseeing of this programme has plugged leakages, delays and non-delivery. It has weathered criticism from the middle class that people are less interested in agriculture due to easy availability of foodgrain for a majority of working people. Yet, it is inadequate. The people of Chhattisgarh have some of the poorest nutrition indicators in the country.

The consequences of food deprivation

How do we view the food situation from a health window? What we see are massive levels of morbidity which can be shown to be a consequence of deprivation, of which food deprivation is the most important one. In our clinics, we check the weights of everyone who attends any level of our health programme, and are astounded to find that the median weights of men and women are 42 kg in women and 49 kg in men. It may be argued that these are patients and therefore they have low weights. However, even among the healthy in the community, with 79% of them being adivasis, the median BMI is 19.1 among men and 18.4 in women, and the median heights are 160 cm and 151 cm respectively. These are in some ways not much worse than what is seen at the state or the country level. Given the stark association in our community between undernutrition on the one hand and high rates of disease and death on the other, we can easily imagine the situation across India for the deprived people of an entire country.

The first point that strikes us in our work is the massive numbers of people with sickness of all types. The prevalence rates of chronic illnesses like rheumatic heart disease, rheumatoid arthritis, cancers, asthma, low body weight, diabetes, hypertension and severe anaemia surprised us for some time, but now seem to make sense. The incidence rates of new illnesses like upper respiratory illnesses, pneumonias and soft tissue infections and tuberculosis are higher than we have seen in most literature on the health status of rural Indians, which itself is scarce. While the purists may question whether these huge numbers are directly attributable to hunger or food deprivation, or whether they should rather be associated with ‘poverty’, the weights and heights of people with these illnesses are compelling enough for us to attribute

Figure 1: Is malaria related to food availability or to nutrition?

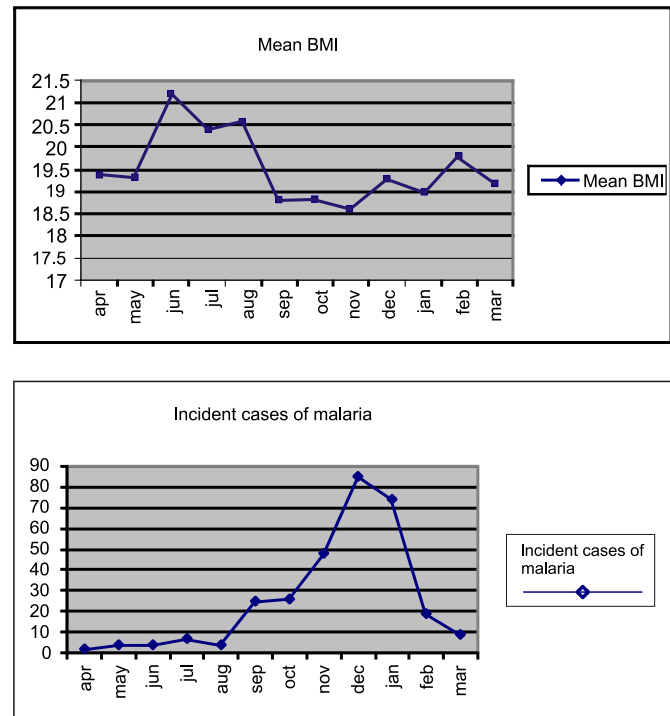


Figure 2: Burden of major illnesses seen in the JSS community health programme, rural Bilaspur, January-December 2011

Illness	New patients seen
Tuberculosis	587
Leprosy	132
Hypertension	478
Rheumatic heart disease	89
Cancers	400
Condition requiring surgery	1,473
Sickle cell disease	99
Diabetes	258

these diseases to food deprivation. At another level, we feel it is unnecessary to disentangle food deprivation from other forms of deprivation.

The second point is about the types of illnesses. If illnesses are biological ‘embodiments’ of deprivation, then we can really see the ‘soul’ of food deprivation through the illnesses. For example, we see a higher than expected incidence of maternal exhaustion during delivery, leading to higher caesarean rates for women with lower body weights. We also see a higher percentage of deaths in people with tuberculosis among those with lower body weights. Likewise, there are a massive number of hernias among underweight men.

We have wondered why we have malaria incidence and deaths peaking in November and December, months which are relatively cool and have lower mosquito biting rates (Figure 1).

In most discussions on infectious diseases, the focus is on the agent — the bacteria, virus or parasite — the vector, and sometimes the environment. There is very little interest in the host, the person who suffers the illness. For example, in TB, one is obsessed with the bacteria and its spread through sputum, but not in people's weights which are so much more important. In malaria, the obsession is with resistance in the malarial parasite, or the mosquitoes, or water stagnation. There is very little about the determinants of the human being's vulnerability. One of the most important determinants is nutritional status.

In most of India, the major crop is sown pre-monsoon, in May-June, and harvested around November. Thus, food stocks for most people become available in December and then decrease over the year, even if there is a smaller, second crop. Food stocks are lowest just before the annual harvest in November. Indeed, when we check people's weights through the year, we find that weights are the lowest around harvest time. We suggest that the 'unseasonal' malaria outbreaks in central India are precipitated by the dip in nutrition in November and therefore an increased vulnerability in the host.

No one who works with malaria can deny the plausibility of this hypothesis. In fact, the association between hunger and malaria deaths has been elegantly argued in a study done almost a century ago in rural Punjab (7).

While tuberculosis, malaria, soft tissue infections, pneumonia with complications, and diarrhoeal deaths may be accepted as being due to the body's low immunity from hunger, which may have allowed these bugs to damage weak bodies, what surprised us is the pattern of what are called non-communicable diseases, or NCDs (Figure 2). The dominant discourse clamours for the recognition that NCDs are an emergency (8), and India is a diabetes capital.

The World Health Organisation has a uniform, single explanation for this problem — the nutritional transition, or an improvement in people's nutrition, which gives rise to a new set of NCDs. But this discourse attributes NCDs to a sedentary lifestyle, an excessive intake of high-calorie refined foods with little of the fibre contained in fruit and vegetables, and tobacco use. Data from urban and peri-urban clinics and surveys links NCDs to increasing rates of obesity and higher weights. While this may be true in urban areas, the profile of NCDs in rural areas has not been given due importance. In rural Bilaspur, we see a high prevalence of hypertension in the community; 16% of rural women more than 30 years old had hypertension and their weights or heights were not higher than in those without hypertension. In other words, their condition was not due



to their nutrition. In 2011, we saw 400 new patients with cancers, 89 with rheumatic heart disease and 258 patients with diabetes. Similarly, 80% of people with diabetes seen here have low or normal weights, something that is the inverse of what is seen in urban areas. As a group of diseases, cancers are the second most prevalent morbidity at the JSS clinics, next only to tuberculosis. In fact, it would be appropriate to say that patients with diabetes or cancer or tuberculosis, in Ganiyari in Bilaspur, have more similarities to each other in terms of weight, dietary predicament, social and economic status than to people with the same biological ailment in a city like Delhi or Mumbai. We feel that NCDs in rural India are clearly linked to the same deprivation of food and other human needs as are tuberculosis and malaria; they are not linked to affluence. Illnesses are, in fact, reflections of local deprivation rather than mere biological events with universally common appearances. There are some serious implications of neglecting the association between hunger and NCDs in mainstream discourse. If there is going to be a homogenous preventive clarion call for reducing NCDs by eating less, working or exercising more, and by stopping tobacco for both urban as well as rural people, for those who are overweight as well as

those who have low weights, then there is a problem. If the 'lifestyle' of poverty and hunger that seems to be associated with these illnesses in rural central India is ignored and all NCDs globally are attributed to a sedentary lifestyle and excess consumption, then there is also a moral problem. In fact, by correctly highlighting the association between NCDs and deprivation, we can more strongly advocate another good and strong reason to ensure adequate and balanced food for all. The bluff of the WHO should be called.

Besides infectious diseases and NCDs, there are the core diseases of undernutrition, which deserve a third category. Rates of anaemia, including severe anaemia — due to iron deficiency as well as malaria — are frightfully high in both women and children, and are not much less in men (9). While both mental and physical symptoms are attributed to even lower grades of anaemia for the rural person, it is the beginning of a vicious cycle of poor earning power, resulting in a reduced ability to purchase food, and so on. For a labourer, working with anaemia is like doing the job of a bull with the energy levels of a cow. Besides, it can't be stressed enough that anaemia poses the greatest risk of death and morbidity for women in labour because of a clearly increased chance of post-partum haemorrhage, which is the most important reason for maternal deaths in our country.

What about minerals other than iron? Most of them come from wholesome food that is associated with affluence. This includes foods that come from animal sources. Total body potassium falls in all patients with severe undernutrition, and this can lead to profound weakness. Similarly, calcium is a mineral that is more available in animal-based foods and its deficiency occurs due to deficiency of these foods plus the increased burden that women incur when they bear and suckle their babies, as calcium is extracted by the foetus as it grows, and then in breast milk. Its deficiency can cause severe painful spasms and weakness. Zinc too is a mineral of affluence and is often deficient in poor people's diets. While much is written in praise of this mineral, the best possibility of alleviating its deficiency comes from the consumption of more wholesome foods as well as increasing soil concentrations of the mineral.

And vitamins? We have a really confusing situation here. Certain minerals and vitamins are being promoted for the prevention of disease or to augment the effects of drug treatment. Micronutrient initiatives are posited almost as an alternative to the basic 'macronutrients' of calories and protein. We need to very carefully assess the health consequences of vitamin deficiency. In rural Bilaspur, we see high rates of night blindness among the poorest women during lactation and pregnancy. Vitamin A has reparative properties: it helps in the healing process, building tissue destroyed through infections. Deficiency of this vitamin can have important consequences in a situation where infections, even if they are minor, are so common. But it may be prudent

to say that vitamin deficiency almost mirrors the deficiency of macronutrients, and thus ensuring food in a balanced way will surely be able to look after these deficiencies too. There do not seem to be compelling health reasons to have special vitamin deficiency treatment programmes.

The biggest wealth of poor people is their ability to labour. Thus, the biggest health consequence of poor nutrition that we see is in the ability to labour. This ability is clearly affected by lower weights and heights. This translates to poor earnings which, by reducing the purchasing power of people, results in a continuation of the vicious cycle. Given the fact that wages are given according to work output, according to prescribed rates, it would be interesting to see how the weights of people correlate with their work output and earnings at MGNREGS sites. It seems that people with hunger and poor weights are at a disadvantage compared to their peers who eat better and weigh more.

The unfairness of this is complete when one realises that all calculations of caloric requirement that may go into any food distribution systems are defined on the basis of a sedentary lifestyle. Who cares that people with heavy work schedules and who live off the land need almost double the amount of food compared to those who live off the pen or their minds!

Note: Jan Swasthya Sahyog runs a community health programme in rural Bilaspur, central India, that includes a clinic and hospital where people from over 1,500 villages come for treatment for major health problems

Dr Yogesh Jain has an MD in paediatrics from the All India Institute of Medical Sciences in Delhi. He has been involved in issues of access, cost and quality of healthcare, specifically in hunger and health, communicable diseases control programmes, and technical aspects of women's health. He is a member of the Planning Commission's High Level Expert Group on Universal Coverage for India. He is a founding member of the Jan Swasthya Sahyog in Bilaspur, Chhattisgarh state. The ideas expressed in this article have developed through the work of the JSS collective

Endnotes

- 1 The HUNGaMA Survey Report 2011. Available at www.naandi.org/CP/HungamaBKDec11LR.pdf
- 2 'Nutrient Requirements and Recommended Dietary Allowances for Indians: A Report of the Expert Group of the Indian Council of Medical Research'. New Delhi: ICMR; 2009. pp 24-9
- 3 National Family Health Survey-3, 2005-2006. Chapter 10. 'Maternal and Child Nutrition. Nutrition and Anaemia'. p 304
- 4 ICMR, 2009. p 66
- 5 *Indian Experience on Household Food and Nutrition Security: Nutritional Requirements in India*. www.fao.org/docrep/x0172e/x0172e02.htm
- 6 Jan Swasthya Sahyog. 'An Enhanced PDS for Better Nutrition and Health of the People: Suggestions for Implementation in Chhattisgarh'. Recommendations submitted to the chief minister and chief secretary. 2011. March 18
- 7 Christopher S R. *Malaria in the Punjab*, Calcutta: Superintendent Government Printing. 1911
- 8 Narain J P, Garg R, Fric A. 'Non-communicable Diseases in the South East Asia Region: Burden, Strategies and Opportunities. *National Journal of Medicine*. India. 2011; 24:280-7
- 9 NFHS-3. p 288

Layperson's guide to nutrition and malnutrition

Malnutrition underlies 50% of all under-5 deaths worldwide. What are the links between malnutrition and ill-health? How is malnutrition to be determined and measured?

RAMANI ATKURI
with
JAN SWASTHYA
SAHYOG

MOST, IF NOT ALL OF US, have been reading the newspapers and watching on TV various observations about the high prevalence of malnutrition in India, especially among the country's children. Books and journal articles talk of stunting, wasting, weight for height measurements, and BMI. But what do all these terms mean? And what do they imply?

Malnutrition is a condition when the body's nutritional status is sub-optimal. Both overnutrition (obesity) and undernutrition are states of malnutrition. However, since the majority of people in India still suffer from undernutrition rather than obesity, this article uses the word malnutrition to refer to undernutrition.

Food is required for every essential function of the body: for energy, growth, protection against infection and the ability to fight illness. This food is obtained and consumed in the

form of carbohydrates (energy foods like oils, sugar, rice and wheat), proteins (growth foods like beans, dals, rice, wheat, meat, eggs), vitamins (protective foods available in fruits and several green leafy vegetables, as well as in the outer coating of unpolished rice, sprouted lentils, etc), and minerals (iron in green leafy vegetables and meat, calcium in ragi).

The body requires energy to function — every organ, be it the intestines, heart or brain, works only if it gets enough glucose to burn. This glucose is obtained from the food we eat. When we eat more than is required, the excess carbohydrate is stored as fat in our body, to be broken down and used whenever we need it. This fat is stored under our skin, in our abdominal wall, the cheeks, buttocks and also around our intestines.

Protein is required for body building and body repair. Many tissues in the body are routinely broken down and replaced



Sudharak Olwe

BMI values for different conditions

Condition	Men	Women
Malnutrition	<17	<17
Underweight	<20	<19
Acceptable	20.7-27.8	19.1-27.3
Intervention needed	>26.4	>25.8
Obese	>27.8	>27.3
Severely obese	>31.1	>32.2

BMI = Wt in kg/m² (ht in metres x ht in metres)

by newer tissue. Our blood, the outer layer of skin, etc, are constantly being replaced.

Vitamins are needed for certain vital functions like eyesight, proper functioning of our nervous system, the ability to maintain our bones and skin, for making blood, and for enhancing the capacity of our body to fight infections.

Minerals are required in minute quantities for many essential functions of the body, the most common being the requirement for iron to make blood. Iron deficiency anaemia is a very common illness in Indians. However, haemoglobin (the essential component of blood) requires both iron and protein for its synthesis, so just giving iron tablets to an undernourished anaemic person will not be enough to improve their anaemia. We must at the same time ensure that they have sufficient protein in their diet to be able to utilise the iron effectively.

Measuring nutritional status

How do we measure whether a person is well-nourished or malnourished? The nutritional status of a person depends on many factors, including whether they are eating enough and whether they are ill or well. Measuring vitamin or protein levels in the body is not easily done, and is expensive. Moreover, such facilities are not available everywhere.

Therefore, we use other means to determine the nutritional status of a person (adult or child) or community. One of the commonest means of doing this is by anthropometry, which is the measurement of size and proportion of various body parts.

The most common measures taken in nutritional anthropometry are height, weight and skin-fold thickness. From these, various indices are calculated. To measure the nutritional status of a population, we need not measure everyone. Measuring a sample is enough. And if we take repeated measures over a period of time, we get information on the growth of the individual or nutritional status of that community.

Weight for age: This is the commonest indicator used in children. Since children grow very fast, their weight changes significantly with age, unlike in adults. By measuring a very large number of children, standards have been developed

that give the expected weight for any given age. A child whose weight is less than expected for his/her age is said to be underweight. This may be due to insufficient food or illness, and often signifies food deprivation in the recent past. This indicator requires that the age of the child be known.

Height for age: When a child has been undernourished for a long time, her bone growth is also affected. Such a child remains short for her age. Low height for age indicates chronic hunger, and such children are said to be stunted. This indicator requires that the age of the child be known.

Weight for height: This is an age-independent measurement. A child who has been malnourished for a long time will be short and underweight. However, the ratio of her weight for height will be normal, or near-normal. A child whose weight for height is low indicates that she has recently lost weight: her long-term nutrition and bone growth may have been normal or below normal but she has suddenly lost weight. Such a child is said to be ‘wasted’. When a malnourished child is given sufficient food to eat (as in a nutritional rehabilitation programme), the weight starts increasing almost immediately, though the height will take much longer to increase. Therefore, the ratio of weight for height will improve dramatically within a week or two.

Body mass index (BMI): Generally, body weight is used as an indicator of an individual’s health. This is compared with a desirable weight range to identify whether the individual is underweight or overweight. The body mass index is worked out by dividing the individual’s weight in kilograms by height in metres squared. A high value can indicate excess fat while a low value indicates reduced fat. Hence, body mass index correlates the individual’s height and weight. It is considered a useful tool in identifying obesity or malnutrition.

BMI value for normal men and women should be within the range of 19 to 27 kg/m². A BMI between 13 and 15 corresponds to 48-55% of desirable body weight for a given height and is considered the lowest body weight that can sustain life. At this level of BMI, the body fat is less than 5%.

The BMI for children varies with each age-group, whereas for adults it is constant across age.

Link between malnutrition and ill-health

I remember my mother and her friends discussing how someone they knew looked ‘thin and sick’, and how someone else had put on weight and was looking ‘healthy’. While I scoffed at this equating of fat with health, there is little doubt that undernourished people — children or adults — are more prone to illness and also more severe manifestations and consequences of illness.

Malnutrition in a person reduces their immunity to infection, making them more susceptible. More particularly in children,

poor appetite during an illness episode reduces their body weight, further affecting their immune system and making them more prone to continuing or newer infections.

Malnutrition in children increases their risk of death from many diseases, most prominently measles, pneumonia and diarrhoea. That is, a well-nourished child who gets measles will lose some body weight, may also get pneumonia or diarrhoea after measles, but will recover. Children who are already malnourished and get measles will most probably get severe pneumonia or diarrhoea, and their chances of death following measles are many times higher than their well-nourished counterparts. Thus, programmes to prevent malnutrition can significantly reduce death from these diseases.

It has been shown that malnutrition underlies over 50% of all under-5 deaths worldwide.

On average, a child who is severely malnourished is 8.4 times more likely to die due to an infection than a well-nourished child. However, over 80% of deaths attributed to malnutrition occur in children who are mildly to moderately malnourished.

Even in adults, chances of death due to common illnesses like tuberculosis are much higher in malnourished individuals than in well-nourished ones.

Growth monitoring and growth charts

How do we know whether a child's weight is normal or not? We compare her weight with the 'expected' weight for her age. This 'expected' weight has been developed by several groups, by weighing a very large number of healthy children of the same age-group and finding the average (mean) or the median (middle) weight and defining a range of values that are above and below this value as 'normal'. Normally, values within plus and minus 2 standard deviation is considered normal.

If we define the range in percentiles, the median weight would be at the 50th percentile. A value of +2SD corresponds to the 97th percentile, which means that only 3% of children in any sample would weigh more than this, and this is considered outside the normal range. Similarly, children below the 3rd percentile (below -2SD) are considered outside the normal range — only 3% of normal children would weigh less than this, and so children having this weight would be considered to have a below normal weight. In other words, any child whose weight falls between the 3rd and 97th percentile will be considered to have a normal weight.

The most commonly used growth monitoring tool is the growth curve depicting standard curves for weight for age. This is what is used in the ICDS system in anganwadis. The weight of the child is plotted on the graph each month

against her age, and is compared to the standard growth curve.

The chart is different for boys and for girls, following the WHO Child Growth Standards (<http://www.who.int/nutrition/publications/severemalnutrition/9789241598163/en/index.html>).

The growth chart can be used to record the weight of a child at specified intervals to detect any growth faltering at an early stage. It can also be used as a tool to educate parents about their child's growth. The main point to note is that the weight of the child should increase each month, so a growth curve going up is a good sign. A flat graph for two or more months, or a curve going down signifies that the child needs special care and attention.

However, it must be mentioned that a large majority of field workers, including anganwadi workers and supervisors, find it difficult to comprehend the concept of graphs with the two axes, and have difficulty filling it in.

Dr Ramani Atkuri did her MD in Community Medicine from the Christian Medical College, Vellore. Her area of interest has been maternal and child health in rural areas, and has focused on training village-level and paramedical workers, and traditional birth attendants. She has worked in rural Orissa and Madhya Pradesh and is now with the Jan Swasthya Sahyog in Bilaspur, Chhattisgarh state. Her article is based on the work of the JSS collective

Jan Swasthya Sahyog (JSS) is an organisation of health and allied professionals established in 1999 in Bilaspur district of Chhattisgarh. Its objective is to develop and provide a low-cost, effective, community-based model of primary healthcare. JSS runs a community health programme in 53 tribal villages using trained women health workers to raise awareness about significant causes of mortality in the region, and also work on important issues including malnutrition, waterborne diseases and childbirth (www.jssbilaspur.org)

The career of hunger

Nutrition research in 1920-30 ‘extracted’ about 10-15 nutrients out of nearly 900 foods: carbohydrates, proteins, fats and vitamins. By 1950, Indian scientists were estimating people’s requirements based on their own largely vegetarian diets, prioritising cost and recommending a diet of cereal for the nation and excluding animal protein. This exclusively cereal diet underlies the profile of malnutrition and disease today

VEENA
SHATRUGNA

RAPID ADVANCES in analytical techniques in the late-19th and early-20th century discovered the nutrients contained in foods such as grains, milk, pulses, vegetables, meats, fish, nuts, etc. This was the necessary first step to classifying foods as rich in carbohydrate, protein, vitamins and minerals, and in oils and fats. It was known by this time that proteins, carbohydrates and fats were the energy (calorie)-yielding foods necessary for daily activity: simple work when seated (sedentary), while standing (usually moderate), or walking and bending, or running (mostly heavy). It was also demonstrated that a person spent energy even at rest or while sleeping. This was called basal metabolic rate (BMR) essential for the heart to keep beating, breathing, maintaining body temperature, etc. Proteins were found to be necessary for laying down muscle, bone and other tissue during growth and to repair the wear-and-tear of tissue in later stages. Vitamins and minerals were discovered to be important for physiological functioning of the body. They were seen to work as lubricants that help the body function more efficiently, and as detoxifiers that remove unwanted substances, and to help speed up reactions in the body.

By 1937, over 300 foods had been analysed and categorised in what is now recognised as the early classic *Health Bulletin No 23*, 1st edition (hereafter called the *Bulletin*). Dr W R Aykroyd, the lead author of this landmark publication, was the director of the Nutrition Research Laboratories, Coonoor, under the Nutrition Research Fund Association of the Government of India. The *Bulletin* was produced to summarise nutrition information so that administrators, doctors and other functionaries could work with the concept of balanced diets for people. While the substantive title of the *Bulletin*, *The Nutritive Value of Indian Foods and the Planning of Satisfactory Diets*, reflects the confidence that nutrition science had in its ability to determine the kind of food (to be) consumed by a nation, the initiative as such is doubtless a product of political and intellectual ferment during that period.

The *Bulletin* sets out broad principles for carbohydrate, protein and fat requirements, borrowing from the work of the expert commission of the League of Nations (1936). The emphasis is on calorie requirements in relation to work. This is achieved by acknowledging the relationship between

food needs of workers and the intensity of work done, and then translating this food needed to calorie requirements. It thus lays the ground for later scientific research and policy pronouncements that similarly assume the primacy of calories. The justification for expressing requirements first in terms of calories and second in terms of proteins is clarified by the authors who gave energy needs priority. Drawing from the report of the League of Nations, it recommends a 2,400-calorie allowance for a sedentary male or female, with added intake for each hour of light, moderate and heavy work (Aykroyd, 1937). It is interesting to note that the figure of 2,400 calories mentioned probably for the first time in an official document, comes to haunt research in India for the next 70 years. Cheap energy foods like cereals thus begin to find a central place in discussions on calorie requirements and in the planning of diets.

While the *Bulletin* sees that cereals give bulk and provide satiety, and are the staple diet of Indians, it also recognises the importance of animal proteins. It expresses the doubt that perhaps no combination of vegetable proteins is adequate for healthy development. The higher biological value of animal protein had already been argued by the League of Nations report. The *Bulletin* asserts that growing children and pregnant and lactating mothers need more protein. It proposes that calculations of cheap balanced diets must include adequate quantities of protein, even though it would be difficult to do so under financial constraints. This important caution was ignored in the following decades.

It is salutary that in 1937 this document does not construct a diet but points to the fact that many poor people eat ill-balanced diets because they cannot afford milk and other flesh foods. Throughout the text it advocates milk for children, replacement of milled rice by parboiled rice to maximise retention of nutritional value in the grain, and addition of oil or ghee to children’s diet. While the *Bulletin* appears to represent, in the best faith, the cutting edge of pure nutritional science in the 1930s, it is also likely that the nascent knowledge it dealt with was too young for anyone to corrupt, misrepresent or to begin cutting corners with. It was also too early to understand the ramifications of this knowledge for governmental policy.

This publication was the most popular document of the Nutrition Research Laboratories and was reprinted many times, revised every time new scientific information was generated (the 5th edition came out in 1954).

It was in 1944 that the first officially recommended diet was formulated based on the principles laid down in 1937, in the report of the Subcommittee on Nutritional Requirements headed by Aykroyd (Aykroyd, 1944; hereafter called the 1944 report), set up by the Nutrition Advisory Committee of the Nutrition Research Fund Association. This committee was constituted in response to World War II, when it became clear that there were no institutions in place to address problems of food deficits caused by failure of imports, war demands, drought, cyclones, transport difficulties, crop disease, etc. The food department of the Government of India had been set up only in 1942 to deal with the urgent task of food procurement and distribution. The above committee was to draft a food policy that was based on the science of nutrition.

The 1944 report uses evidence produced by the League of Nations Health Organisation and prescribes calories needed by men for different intensities of work, but stresses

essential nutrition through the non-cereal portion of the diet. The importance of proteins for growth in children, for mothers during pregnancy, and for the replacement of tissue wear-and-tear in adults is recognised. There is also a note of caution that proteins derived from vegetable foods had less value for the body than proteins derived from animal foods. This is in contrast to the centrality cereals achieve in official proposals and nutritional truths by the '70s and '80s when 80% of calories are estimated as coming from cereals. In recent times, both industry and nutritionists have endorsed using cereal as a dietary vehicle to be fortified with synthetic vitamins instead of introducing non-cereal nutrient-rich foods like meat, eggs, milk, etc.

Biological value of protein

The most important issue raised by the *Bulletin* and reiterated in the report of 1944 was regarding what is known in nutritional science as the *biological value* (BV) of proteins, "...the more closely the amino acid make-up of a protein resembles that of the (human) tissues the greater its value," (Aykroyd, 1937:5). In addition, "...more important than the total protein content of the diet is the proportion of protein of high biological value. In general, protein derived from vegetable foods is of less value to the body



Sudhakar Olwe

than protein derived from animal food,” (*ibid.*, 4-5). Eggs and milk protein were set as the standard with a BV of over 90. The BV of pulses was around 60 and that of cereals falls between 60 and 70. The 1944 report also reiterated the importance of protein from animal sources, but assumed that the staple food of Indians was rice in the south and wheat in the north, and constructed a diet. Since energy is the major component of food required for the body it was obvious that this could be derived largely from grains, pulses and some other foods.

In order to ensure adequate protein intake, the group tried to include milk, fish, meat and eggs, in addition to vegetables and fruit. The crucial element in this report is an insistence on 10 oz (280 ml) of milk, hoping to double the recommendation to 20 oz as soon as possible.

This recommended dietary allowance (RDA) as it is now known is commendable coming as it did during the scarcity and hunger of the war periods.

Consumption units for national food requirements

The 1944 report also had a mandate to suggest policies for food production in India. They constructed another table of an estimated annual national requirement of cereals, pulses, milk, fish, etc (in million tonnes) using a coefficient to express the quantity of food consumed by women or children as a fraction of men’s consumption. This is what is popularly known as the consumption unit (CU). Recognising the problems with this method the report adds, “...in case of certain protective foods such as milk, children require more and not a fraction of the adult requirement,” (1944 report:2). There were other problems too, for example the recommended intake of a miner’s wife would be greater than that of a clerk’s wife, even when both did the same kind of work, because the husband’s food consumption was greater due to an occupation demanding heavy manual labour (Cathcart and Murray, 1931). This anomaly led to much confusion in research done over the next 20 years. In recognition of these problems the CU was used to plan food and specially calorie requirements for populations and not at individual levels. It was also not considered suitable for proteins or other nutrients.

Implications of the Aykroyd legacy

Nutritional research under Aykroyd, though brilliantly innovative and deeply committed to the welfare of Indians, opened a Pandora’s Box: concepts like consumption units, biological value of proteins, RDA based on calories, calorie needs of workers, the importance of animal proteins, etc, which became subjects for scientific research and nutritional policy. Over a short period these concepts were recast and deployed in administrative initiatives that, we will argue, systematically transformed the diets of the poor in India to cereals devoid of nutrients.

The consequences of this nutritional depletion have been

far-reaching, and are responsible for a large measure of (our present) ill-health. We look at two such implications in the concept of calculated diets, and the search for milk substitutes.

Calculated diets

One of the most ambivalent results of Aykroyd’s nutritional research was the idea of calculated diets. While it could be argued that calculation of the food requirements of a nation is necessary to determine volumes of agricultural production, it provided another handle for scientific policy and administration: it was now possible to look at food, the measurement of its composition and the calculation of its norms, as scientific facts divorced from the daily lives of people. Scientists and policymakers now had unlimited power to create artificial diets through simple calculation and unleash them on an unsuspecting population in the name of science, cost-effectiveness and the national interest. Since RDA computations were based largely on calories, cheaper foods rich in calories could be put together to provide 2,400 calories or 1 Man Value. For example, it was quickly understood that since almost all foods such as cereals, eggs, sugar, mangoes, pulses, oils, etc, contained energy, scientists could theoretically advocate cheap but adequate sources of calories with either 650 gm of cereals (or 650 gm of sugar) and negligible amounts of pulses, vegetables or oil, thus satisfying the 2,400 calories norm at least cost.

Search for milk substitutes — vegetarian sources of proteins

With heightened interest in low-cost vegetable sources of proteins that were nutritionally as useful as milk proteins, the biological values of a large number of foods were calculated. In the late-1930s, ’40s and ’50s, experiments were carried out on children from economically backward communities where one group was given milk powder (1 oz providing 10 gm of protein) and the control group received an extra helping of the usual rice and vegetables. It was found that children given milk had significant increases in height and weight when compared to the control group (Aykroyd and Krishnan 1937; Someshwar Rao, 1961). A daily addition of 1 oz of skimmed milk powder proved to be a valuable supplement to cereal-based diets. Aykroyd and Krishnan (1937) too had investigated the value of cheaper foods like cooked soya beans, and found it inferior to skimmed milk. This failure of soya was ascribed to the low biological value of soya proteins, and all studies on soya were terminated. Meanwhile, with advances in technology, processed milk from various oilseeds, pulses and vegetable products was also tried.

In 1955, a special report on milk substitutes of vegetable origin was published by the Indian Council of Medical Research (ICMR, 1955). This report reviews all the studies using milk made from various vegetarian products such as soya, groundnut, pulses, from mixed plant products, and concludes that such processed milk should only be used

While it could be argued that calculation of the food requirements of a nation is necessary to determine volumes of agricultural production, it provided another handle for scientific policy and administration: it was now possible to look at food, the measurement of its composition and the calculation of its norms, as scientific facts divorced from the daily lives of people. Scientists and policymakers now had unlimited power to create artificial diets through simple calculation and unleash them on an unsuspecting population in the name of science, cost-effectiveness and the national interest

in regions where it has been found difficult to rear mulch cattle, as in Assam and the Western Ghats. They however do not comment on the additional cost of such processing.

By 1955 it was clear that whatever the sources of vegetable proteins, when they were compared to milk protein in trials feeding sick or undernourished children, it was obvious that milk protein was far superior.

These conclusive findings notwithstanding, the search for cheap, and preferably vegetarian, solutions to the country's state of undernutrition resulted in a paper titled 'Treatment of Nutritional Oedema Syndrome (Kwashiorkor) With Vegetable Protein' (Venkatachalam *et al*, 1956). This paper argued that though skim milk protein may be unsurpassed in its biological value in treatment of Kwashiorkor, underdeveloped countries could not use it as a basis for

large-scale solutions. It conducted an experiment comparing skim milk protein and other vegetarian substitutes. The results of this study clearly pointed to the superior efficacy of the skim milk protein when evaluated by the two biochemical criteria adopted for assessing satisfactory recovery: the rise in serum proteins and albumin. In spite of this, the authors concluded, "the 'slight inferiority' of vegetable proteins should not obscure the fact that remarkable clinical improvement almost as striking as with skim milk was noticeable in cases treated with these diets". They further state that, "the real importance of this study would lie in that it has revealed such satisfactory therapeutic possibilities with cheap vegetable protein diet in this disease," (Venkatachalam *et al*, 1956:544).

Though the authors' conclusions were at variance with the findings in the empirical data of the paper, the scientific community remained silent; after all, the nation's economic burden came before charity, and the poor ought to be satisfied with a cheaper vegetarian solution to a protein deprivation that made them ill in the first place.

This was the first major attempt to wean the nutritionists away from advocating milk for poor, sick, undernourished children, and justifying inferior quality foods, thus shrinking and redefining the range of foods for the children of the poor in India.

The economics and culture of nutritional research in free India

The RDA debates

The debates on the sources of proteins and their biological values were still raging when a revised RDA was presented in 1958 (Patwardhan, 1960). This report does not recommend a diet but presents evidence for fine-tuning the requirements of calories and proteins for Indians in relation to weights, heights, age, type of work, gender, etc. Patwardhan draws on the FAO report (1957) which suggests that since no single figure of calorie requirement can be applicable to all individuals, it would be advisable to define the calorie requirements of a reference adult first, and then apply corrections for age, weight, sex, occupation, etc. The FAO report (1957) defines a reference man as one who weighs 65 kg doing a moderately heavy job for eight hours, sleeps for eight hours with another eight hours spent on recreation, self-care, walking around, socialising, etc. A diet of 3,200 calories is recommended for this reference man, with a proviso that it is balanced (it is implicit that calories are derived from many food sources). The normal woman is defined as weighing 55 kg, working at home, or at an occupation for eight hours, sleeping for eight hours, and spending the rest of her time on recreation, walking, sitting, or doing domestic chores. Her requirement is fixed at 2,300 calories, again with the proviso that it comes from a balanced diet. Patwardhan uncritically reproduces the 'standard reference man', a model of the post-Industrial

Revolution worker, and then attempts to apply ‘corrections’ for India, arriving at a figure of 2,770 calories for men and 1,950 calories for women. It is surprising that scientists did not see that the completely different work patterns in (largely rural) India would not be addressed by corrections and factors. It would need original research leading to a fresh statement of the problem.

In the case of protein requirements, new evidence had come in that though vegetable proteins had low biological value, when two or three vegetarian foods are consumed in one meal the biological value of the combination can become as good as milk protein.

(A normative value of 100 is given to milk or egg protein. Individual vegetable proteins have a BV of 50 to 70, but a rice pulse diet or a rice curd meal in the ratio of 2:1 or 3:1 [cereal protein: pulse protein] can improve the BV of food to even 80 or 85.) The report asserts, “People do not consume cereals or pulses alone to meet their requirements of protein, and hence there is little chance of deficiency of a particular essential amino acid setting in through a diet, provided the total protein intake is adequate. Judicious combination of proteins from different sources will reduce the deficiency of the limiting amino acid which is otherwise present from a single source, etc,” (Patwardhan, 1960:25). A little thought makes it obvious that the “people” referred to in the report belong to a particular class and caste; not many poor people were consuming rice and pulse proteins in the ratio of 2:1 in 1960.

Without cutting down on calorie requirements, Patwardhan reduced protein requirements by about 32%, ie, from 82 gm to 55 gm for men and 67 gm to 45 gm for women, expressing the confidence that all people get their proteins from many sources, and thus implicitly putting an end to the debates on the BV of proteins. Once the ghost of low BV of proteins from vegetarian foods was laid to rest, a revised and updated publication in 1968 confidently states: “In devising cheap well-balanced diets in India, economic considerations often preclude the inclusion of milk or other animal foods in adequate amounts... A judicious mixture of vegetable foods like cereals and pulses can be cheap and at the same time can provide nearly as good an amino acid pattern as that of the costly animal food,” (Gopalan, 1968:6-7).

This balanced diet was separated for the vegetarian and non-vegetarian groups and the latter were given an allowance of 45 gm of pulses and 100 gm of milk with added 30 gm of meat or fish and 30 gm of eggs.

Another committee to revise the recommended dietary allowances was set up in 1978 (ICMR, 1980). The preface states: “The most important change has been with regard to suggested balanced diets... (which) have been formulated using linear programming techniques to arrive at the least-cost formulations.” This diet is based on cereals as

the major source of calories and proteins, with reduced milk and no separate diet provided for non-vegetarians. It does not recommend fruits, flesh foods, eggs, nuts and oilseeds... in the name of economy. In hindsight, it is difficult not to be critical about this eradication of flesh foods from normative diets, in spite of their proven superior efficacy as proteins for the body. The entire debate on RDA is directed at finding the theoretically adequate but most economical solution to a difficult problem. However, the specific governmental solution arrived at clearly draws on a culture of vegetarianism common to the planners who thought on behalf of the nation. Food options and crucial dietary diversity for the majority of poor, dalits, BC, tribals, minorities, etc, in fact for 80-85% of the population, had been closed in the structure of plan thinking. Thus, it was enough to provide for distribution of cereals with little scientific consideration about what these cereals were eaten with.

An expert committee was constituted in 1988 to revise the RDA, and special attention was paid to the requirements of energy, fats and other trace elements (ICMR, 1990). Occupations were classified into various intensities and energy requirements for different kinds of work provided.

Over the years, there was stiff opposition from trade unions, institutions such as hostels, and other locations where the ICMR reports with RDA were used for planning diets based on the least-cost recommendations of earlier reports. The workers, for example, did not want the scientists to exert a downward pressure on wages by suggesting a cheap balanced diet devoid of flesh foods, fruits, nuts, eggs, etc. In response to this opposition, a balanced diet was not provided with the RDA document in 1988. However, other publications of the ICMR keep the least-cost balanced diet alive, for purposes of research and dissemination (NNMB, 2006; Gopalan *et al*, 1989) (1). The consumption unit was used for calculation of adequacy in all large-scale surveys carried out by the NNMB.

Reading the RDA debates and the changing recommendations over the decades it becomes obvious that when adults were advised to consume over half-a-kilo of cereals to meet their calorie needs, young children in the age-group 1-3 years and 3-5 years were required to consume a quarter-kilo of cereals to satisfy their calorie needs. The CU of children is 0.4 and 0.5, when compared to the norm of 1 for an adult male. The amount of milk recommended for children was not more than 300 ml, and as in the case of adults no recommendations were made for eggs, fish, flesh foods, oilseeds and fruits. The children were expected to eat an adult diet in quantities proportionate to their age. There was minimal allowance of milk (proteins) for their growth, though the actual consumption of milk in all the surveys is less than 100 ml. If children have managed to grow to their present heights, it is clear that they do so despite the RDA that the government has declared is adequate for them.

'The myth of protein gap'

The work on the biological value of proteins from vegetarian sources had, as we have seen, put its full weight behind the consumption of vegetable proteins as against milk proteins or even animal proteins, by advocating a ratio of cereal-to-pulse intakes. As a result, the story of 'poor quality' of cereal and pulse protein ends and RDA for proteins is drastically reduced (Patwardhan, 1960). Vegetarianism for the poor had been endorsed scientifically; but the next step takes the country hurtling down a cereal trap.

In the late-'60s, with food shortages and famine-like conditions in India, there was pressure from the West that India accept food aid and specially milk powder proteins for starving children. In response to this, the Nutrition Research Laboratories published a review of diet surveys carried out on children subsisting largely on cereals and reported that 92% of the children surveyed had calorie deficits while only 35% of them were on an inadequate level of protein intake when compared to the requirements based on actual body weights (Gopalan, 1970). Since the 35% of children who were protein deficient were also calorie deficient, while the remaining 57% were only calorie deficient, it was inferred that the major bottleneck in the diets of pre-school children as far as India was concerned was calorie deficiency (which by then meant, of course, cereal deficiency!).

The paper concluded that: "These studies would indicate that if the children consume the same type of diets on which they have been subsisting, in amounts sufficient to satisfy their calorie needs, the problem of protein calorie malnutrition would be greatly minimised. It is clear by the same token that provisions of protein concentrates in the face of existing calorie deficiency would perhaps be a wasteful approach towards solving this problem in these children," (Gopalan, 1970:36). However, the paper also hints at the possible negative consequences of his recommendation when it states that: "Supplements of Vitamin A and iron are, therefore, essential," (*ibid*). The argument continues: "There has been, unfortunately, an overwhelming emphasis on protein concentrates and special protein formulations in the prevention and control of undernutrition... In the light of recent reassessments of protein and calorie requirements and in view of 'precise data' now available with regard to the actual diets of poor segments of pre-school child populations in India, it is clear that the major deficiency in the diets of pre-school children in India is calorie deficiency. Under these circumstances, the obvious approach would be to promote increased production and facilitate better distribution and utilisation of existing conventional foods rather than a diversion of such foods for the preparation of sophisticated food formulations," (Gopalan, 1970:37).

Paper calculations thus allowed the conclusion that children consuming more of the usual diets would get adequate calories and proteins. The low-cost scientific recommendation for children was a largely cereal-based diet with inadequate or virtually no pulses, milk, eggs or meat. The calculations were based on 6-8% protein in every 100 gm of cereal. If a child could eat 300-400 gm, or better still half-a-kilo, of cereal, he would actually get the necessary 25-30 gm of protein. Clearly, this diet was not alert to the fact that children are unable to eat large amounts of cereal. Their stomachs are too small for that bulk. They need high-calorie foods (1 gm cooked cereals provides 0.5 to 1 calorie, whereas 1 gm of fat provides 9 calories). The giants of nutrition research who computed the most economic options could not see that at least 30-40% of children's calorie requirement must be derived from fat.

Nutrition research has always prided itself on the scientific basis of its theories and the objective, rational logic behind its proposals. Yet, this section demonstrates development priorities were never far from scientific thought. There is no other explanation why the scientifically derived nutritious diet should be the cheapest. There are specific mutual effects of this close stitching of government and nutritional science.

Firstly, research is always applied, governmental and policy-oriented, carrying the hazards of such an orientation: cultural bias, governmental imperatives, international honour, and lack of critical distance. Secondly, nutritional research begins to speak both with the might of governmental authority and the majesty of scientific rationality. Thirdly, governmental policy receives the backing of science in support of its priorities, and therefore ultimately for the specific details through which it articulates its developmental goals: thus, the poor need only eat cereals.

Veena Shatrugna joined the National Institute of Nutrition (NIN), Hyderabad, as a medical graduate, and spent 34 years there, retiring as Deputy Director. Here, she was witness to the big debates raging on nutrition such as the Myth of Protein Gap, the Green Revolution and the National Nutrition Programmes. She has worked and published in the areas of nutrition in pregnancy, lactation, women's work, energy requirements, osteoporosis, and child nutrition and growth. She helped form Anveshi, a centre for women's studies in Hyderabad

This article is excerpted from 'The Career of Hunger: Critical Reflections on the History of Nutrition Science and Policy', by Veena Shatrugna, in Towards a Critical Medical Practice: Reflections on the Dilemmas of Medical Culture Today, edited by Anand Zachariah, R Srivatsan and Susie Tharu on behalf of the CMC-Anveshi Collective, Hyderabad: Orient Blackswan; 2010. Reprinted with permission of the author and editors

Endnotes

1 Gopalan, C, et al. *The Nutritive Value of Indian Foods* was published in 1971, revised in 1989, and reprinted 10 times from 1991 to 2007

What individuals spend on a monthly food basket

Though the amounts spent on cereals are largely the same, there are clear differences between the spending of rural and urban consumers on milk and milk products, sugar and oil. Urban consumers spend 104% more than rural consumers on beverages, refreshments and processed foods

RAHUL GOSWAMI

THE NUTRITIONAL INTAKE of an individual and of a household can be gauged from the data provided through a reading of one of the first reports from the 66th Round of the National Sample Survey Office. 'Key Indicators of Household Consumer Expenditure in India 2009-10' has collected and presented the findings of the 66th Round, that is, July 2009-June 2010. The accompanying table is comprehensive for a 'national' average indicator of monthly per capita expenditure on — and consumption of — a basket of 142 food items in 11 categories. This 'national' average is provided for rural and urban consumers. The salient inferences drawn from this data are:

- Within the cereals group, for both rural and urban household members alike, rice and wheat dominate consumption. For a rural resident, total rice consumption in a month (both PDS rice and open market rice) is just over 6 kg, while wheat/atta (PDS and open market) is 4.24 kg. For an urban resident, total rice consumption in a month (both PDS rice and open market rice) is just over 4.52 kg, while wheat/atta (PDS and open market) is 4.07 kg. In both categories of consumer, the top five cereal items account for around 92% of the total monthly expenditure on cereals. Total consumption of cereals by the rural resident is 11.34 kg, more than the 9.37 kg for the urban resident. The urban consumer paid, in 2009-2010, Rs 161 for cereals in a month while the rural consumer paid Rs 144 for her monthly cereal quantities.

- In the pulses and pulses products category, arhar/tur is the most common dal. The rural consumer bought 0.16 kg of arhar/tur spending Rs 11.5 a month while the urban consumer bought 0.26 kg of arhar/tur spending Rs 20.1 a month. Moong, masur and urad are the next most commonly used pulses and these three, in combination with arhar/tur, account for 72% and 77% respectively for rural and urban consumers of the total monthly expense on pulses and pulses products. As an average, the urban consumer pays about Rs 14 more (40% more than the rural) for about 0.13 kg more (21% more than the rural) on pulses and pulses products. Cereals are usually a person's staple food in India. But sometimes, by choice or due to scarcity, a person may consume little or no cereal. The food requirement is partially or wholly met in such cases by consumption of food items which could be treated as substitutes for cereals. Tapioca,

for example, is consumed in some parts of the country as a substitute for cereals. Similarly, jackfruit seed, mahua, etc, are also consumed as substitutes for cereals.

- It is in milk and milk products that we see the largest difference between the rural and urban consumer. The rural consumer paid Rs 76.1 for 4.1 litres of milk a month, while the urban consumer paid Rs 119.4 for 5.3 litres of milk a month — Rs 43 more for an additional 1.2 litres. While the rural resident consumed 0.01 kg of ghee (costing Rs 2.8) per month, the urban resident consumed 0.04 kg which cost Rs 11.5, a difference of over Rs 8.7 per month. For both consumer categories, liquid milk and ghee accounted for 98% and 95% (rural and urban) expenditure on milk and milk products. However, the urban consumer spent over Rs 56 more (70% more) than the rural consumer on milk and milk products.

- Sugar is consumed in greater quantity by the urban consumer (0.7 kg) than the rural (0.56 kg), with total monthly expenditure on sugar and sugar-bearing products (including gur and honey) being Rs 22.6 for the rural and Rs 27.1 for the urban consumer.

- The difference in edible oil consumption is considerable between urban and rural. The urban consumer bought



Sudharak Olive

0.4 kg of edible oil costing Rs 25.1 and this expenditure was 47% of the total on edible oils amounting to 0.81 kg. The rural consumer bought 0.28 kg and 0.24 kg of mustard oil and edible oil, altogether spending Rs 38.9 on oils amounting to 0.63 kg. Thus, the urban consumer spent 35% more on oils that were 0.18 kg more by weight.

- On animal protein (mainly eggs, fish and meat) the urban consumer spent Rs 71.9 a month which was Rs 22 more than the Rs 49.8 spent by the rural consumer on these foods. Fish/prawn was the most common source of animal protein with the urban consumer having bought 0.23 kg and the rural consumer having bought 0.26 kg. The urban consumer bought more chicken (0.18 kg) than the rural (0.12 kg), more goat meat (0.09 kg compared with 0.04 kg) and more eggs (eight compared with five).

- The rural consumer bought about 1 kg more of vegetables than the urban consumer (8 kg and 7 kg) in a month, but for both categories the bulk of this weight was potato, onion, tomato, brinjal, cauliflower, palak and lady's finger. For both consumer categories, the top four vegetables by value accounted for 49% and 43% (rural and urban) of the total monthly expenditure on vegetables. However, the urban consumer paid Rs 25 more (28.7% more) than the rural consumer for 12% less vegetables by weight.

- The difference in fresh fruit consumption between urban and rural consumer is conspicuous from total monthly expenditure (weights are difficult to standardise in this food category). Bananas accounted for 28% and 24% of rural and urban monthly spending on the food category. The urban consumer spent Rs 29.9 more per month (147% more) with markedly more being spent on apples and mangoes.

- The 'beverages' food category stands for 'beverages, refreshments and processed food'. It includes tea, coffee, mineral water, soft drinks, fruit juice (not prepared at home), soda water, other beverages such as cocoa, biscuits, cakes, pastries, pickles, sauce, jam, jelly, and other salted refreshments and sweets not prepared at home. Food purchased in the form of cooked meals is also included in 'processed food'. Urban monthly per capita expenditure on this category was Rs 159.3 and Rs 81.4 more (104% more) than rural expenditure (Rs 77.9). The top five items of consumption by value for the urban consumer were cooked meals purchased, cups of tea, tea leaf, other processed food and biscuits. For the rural consumer, the top five items by value were cooked meals received as assistance or payment, tea leaf, cups of tea, biscuits and other processed food. For both rural and urban consumers the spending on the top five items was 71% (rural) and 68% (urban) of total monthly expenditure on this food category.

Rahul Goswami researches rural economies with a focus on agro-ecology. He is a consultant with the National Agricultural Innovation Project, Ministry of Agriculture, and is an examiner for UNESCO's Culture Sector, on intangible cultural heritage. He writes on issues concerning food and energy

Monthly per capita quantity and value of consumption of food items, all-India					
Rural			Urban		
Food item	Rupees	Quantity kg/litre	Food item	Rupees	Quantity kg/litre
Cereal					
Rice — other sources	76.81	4.594	Rice — other sources	84.41	3.706
Wheat/atta — other sources	44.64	3.625	Wheat/atta — other sources	56.07	3.706
Rice — PDS	4.89	1.408	Bread: bakery	3.00	0.091
Jowar and its products	3.42	0.292	Rice — PDS	2.48	0.814
Wheat/atta — PDS	2.99	0.619	Jowar and its products	2.47	0.184
Bajra and its products	2.64	0.255	Wheat/atta — PDS	2.38	0.371
Maize and its products	2.10	0.199	Suji, rawa	2.26	0.098
Muri	1.49	0.061	Chira	1.52	0.063
Chira	1.19	0.06	Muri	1.16	0.045
Suji, rawa	1.10	0.052	Sewai, noodles	1.13	0.021
Ragi and its products	0.97	0.092	Bajra and its products	1.11	0.094
Bread: bakery	0.79	0.023	Maida	1.02	0.051
Maida	0.53	0.03	Ragi and its products	0.92	0.074
Other rice products	0.32	0.015	Other rice products	0.53	0.024
Sewai, noodles	0.23	0.006	Maize and its products	0.26	0.021
Other cereals	0.10	0.004	Other cereals	0.19	0.004
Other wheat products	0.08	0.004	Other wheat products	0.11	0.003
Small millets and their products	0.08	0.006	Khoi, lawa	0.08	0.003
Khoi, lawa	0.06	0.002	Small millets and their products	0.05	0.001
Barley and its products	0.03	0.003	Barley and its products	0.01	0.001
	144.44	11.349		161.17	9.374
Pulses and pulses products					
Arhar, tur	11.54	0.163	Arhar, tur	20.10	0.264
Moong	4.86	0.073	Moong	7.35	0.104
Masur	4.83	0.079	Urad	5.68	0.09
Urad	4.07	0.072	Masur	4.98	0.078
Gram: split	2.91	0.077	Gram: split	3.24	0.079
Besan	1.55	0.038	Besan	2.48	0.058
Peas	1.51	0.057	Gram: whole	1.65	0.039
Other pulses	1.33	0.03	Other pulses	1.46	0.027
Gram: whole	1.19	0.033	Other pulses products	0.87	0.014
Cereal substitutes: tapioca, etc	0.68	0.037	Peas	0.82	0.025
Other pulses products	0.56	0.01	Cereal substitutes: tapioca, etc	0.77	0.025
Khesari	0.43	0.013	Gram products	0.41	0.009
Gram products	0.24	0.005	Khesari	0.07	0.002
	35.03	0.651		49.12	0.788
Milk and milk products					
Milk: liquid (litre)	76.16	4.117	Milk: liquid (litre)	119.43	5.358
Ghee	2.88	0.011	Ghee	11.59	0.046
Milk: condensed/powder	0.51	0.003	Curd	1.46	0.048
Curd	0.41	0.015	Ice-cream	1.17	-
Baby food	0.28	0.001	Baby food	1.05	0.006
Other milk products	0.18	-	Milk: condensed/powder	0.88	0.005
Ice-cream	0.10	-	Other milk products	0.88	-
Butter	0.03	0	Butter	0.57	0.003
	80.55			137.01	
Sugar					
Sugar — other sources	19.65	0.563	Sugar — other sources	24.31	0.7

Gur	1.48	0.043	Gur	1.40	0.039
Sugar — PDS	1.40	0.097	Sugar — PDS	1.15	0.08
Candy, misri	0.05	0.001	Honey	0.26	0.001
Honey	0.03	0	Candy, misri	0.05	0.001
	22.61	0.705		27.16	0.821
Edible oil					
Mustard oil	18.94	0.287	Edible oil: others	25.13	0.408
Edible oil: others	13.36	0.243	Mustard oil	15.32	0.23
Groundnut oil	3.69	0.054	Groundnut oil	9.13	0.126
Salt	2.05	0.261	Salt	2.33	0.245
Vanaspati, margarine	1.99	0.036	Vanaspati, margarine	2.12	0.036
Coconut oil	0.94	0.016	Coconut oil	1.15	0.018
	38.92	0.636		52.85	0.818
Eggs, fish and meat					
Fish, prawn	18.81	0.269	Fish, prawn	20.74	0.238
Chicken	12.66	0.123	Chicken	19.23	0.18
Goat meat/mutton	8.74	0.047	Goat meat/mutton	18.66	0.091
Eggs (number)	5.35	1.733	Eggs (number)	8.15	2.674
Beef/buffalo meat	3.10	0.037	Beef/buffalo meat	4.42	0.051
Pork	0.86	0.008	Pork	0.58	0.005
Others: birds, crab, oyster, tortoise, etc	0.38	0.005	Others: birds, crab, oyster, tortoise, etc	0.20	0.002
	49.89	-		71.98	-
Vegetables					
Potato	18.40	1.666	Potato	17.29	1.368
Onion	10.89	0.741	Onion	13.34	0.854
Tomato	7.47	0.537	Tomato	11.66	0.757
Brinjal	6.42	0.518	Brinjal	6.86	0.441
Palak/other leafy vegetables	5.84	0.605	Palak/other leafy vegetables	6.76	0.497
Chillies: green	4.09	0.145	Cauliflower	5.92	0.362
Other vegetables	3.94	0.284	Lady's finger	5.86	0.282
Cauliflower	3.53	0.302	Other vegetables	4.90	0.27
Lady's finger	3.13	0.202	Cabbage	4.60	0.337
Gourd	2.95	0.302	Chillies: green	4.42	0.148
Cabbage	2.90	0.275	Gourd	3.70	0.284
Jhinga, torai	2.48	0.209	Lemon (number)	3.00	1.72
Pumpkin	2.21	0.25	Cucumber	2.93	0.208
Cucumber	1.57	0.136	Carrot	2.77	0.153
Radish	1.43	0.186	Bitter gourd	2.56	0.117
Bitter gourd	1.43	0.08	Jhinga, torai	2.44	0.148
Parwal, patal	1.42	0.097	French beans, barbate	2.07	0.092
French beans, barbati	1.20	0.073	Peas	2.02	0.09
Lemon (number)	1.19	1.27	Pumpkin	1.89	0.166
Carrot	1.08	0.073	Radish	1.79	0.176
Peas	0.88	0.05	Parwal, patal	1.68	0.087
Arum	0.86	0.063	Arum	0.84	0.046
Papaya: green	0.70	0.085	Beet	0.66	0.036
Plantain: green	0.30	0.022	Capsicum	0.65	0.021
Snake gourd	0.29	0.022	Snake gourd	0.58	0.036
Jackfruit: green	0.23	0.024	Papaya: green	0.43	0.039
Beet	0.20	0.013	Plantain: green	0.34	0.02
Sweet potato	0.13	0.01	Jackfruit: green	0.24	0.015
Capsicum	0.11	0.005	Sweet potato	0.15	0.009
Turnip	0.07	0.006	Turnip	0.11	0.008
Fresh fruit					
Banana (number)	5.88	3.86	Banana (number)	12.18	6.65
Coconut (number)	2.79	0.456	Apple	12.09	0.158
Apple	2.73	0.045	Mango	5.52	0.158
Mango	2.54	0.108	Coconut (number)	4.15	0.628
Grapes	1.23	0.026	Grapes	3.51	0.073
Orange, mausambi (number)	1.05	0.364	Orange/mausambi (number)	3.20	0.86
Other fresh fruits	1.05	-	Other fresh fruits	2.67	-
Guava	1.00	0.07	Guava	1.62	0.087
Watermelon	0.58	0.072	Papaya	1.55	0.079
Coconut green (number)	0.41	0.057	Coconut: green (number)	1.07	0.11
Papaya	0.38	0.027	Watermelon	1.05	0.094
Kharbooza	0.21	0.023	Kharbooza	0.57	0.032

Pineapple (number)	0.12	0.012	Pineapple (number)	0.41	0.025
Singara	0.10	0.007	Leechi	0.25	0.004
Jackfruit	0.07	0.014	Pear/naspati	0.23	0.006
Pear/naspati	0.07	0.003	Singara	0.13	0.007
Berries	0.07	0.005	Berries	0.08	0.004
Leechi	0.06	0.002	Jackfruit	0.05	0.007
	20.36	-		50.33	-
Dry fruit					
Groundnut	2.52	0.05	Groundnut	3.72	0.067
Coconut: copra	0.80	0.012	Cashewnut	2.41	0.007
Raisin, kishmish, monacca, etc	0.63	0.004	Raisin, kishmish, monacca, etc	1.54	0.008
Other dry fruits	0.51	0.003	Other dry fruits	1.47	0.007
Cashewnut	0.33	0.001	Coconut: copra	1.41	0.02
Dates	0.29	0.005	Dates	1.00	0.012
Walnut	0.07	0.001	Other nuts	0.52	0.002
Other nuts	0.06	0	Walnut	0.38	0.001
	5.21	0.074		12.43	0.123
Spices					
Other spices (gm)	8.31	62.1	Other spices (gm)	9.90	67.1
Dry chillies (gm)	6.71	72.6	Dry chillies (gm)	7.50	76.1
Turmeric (gm)	5.95	50.5	Turmeric (gm)	6.26	50
Garlic (gm)	5.00	75.3	Garlic (gm)	6.08	83.4
Ginger (gm)	2.76	42.7	Ginger (gm)	4.06	60.6
Curry powder (gm)	2.38	17.8	Curry powder (gm)	3.96	26.7
Tamarind (gm)	1.58	32.7	Tamarind (gm)	2.28	43.4
Oilseeds (gm)	1.37	18.7	Black pepper (gm)	2.10	11.4
Black pepper (gm)	1.31	7.3	Oilseeds (gm)	1.71	20.7
	35.37	379.7		43.86	439.3
Beverages/refreshments, etc					
Cooked meals received as assistance or payment (number)	15.04	2.04	Cooked meals purchased (number)	35.65	1.4
Tea: leaf (gm)	13.34	75.1	Tea: cups (number)	20.93	6.39
Tea: cups (number)	9.89	3.77	Tea: leaf (gm)	18.61	93.6
Biscuits	9.70	-	Other processed food	17.48	-
Other processed food	7.58	-	Biscuits	17.18	-
Cooked meals purchased (number)	7.46	0.35	Prepared sweets	10.77	-
Prepared sweets	5.39	-	Salted refreshments	10.57	0.113
Salted refreshments	5.34	0.069	Cooked meals received as assistance or payment (number)	9.99	0.94
Other beverages: cocoa, chocolate, etc	1.09	-	Fruit juice and shakes (litre)	3.63	0.075
Pickles (gm)	0.68	8.08	Cold beverages: bottled/canned (litre)	3.27	0.092
Cold beverages: bottled/canned (litre)	0.66	0.02	Other beverages: cocoa, chocolate, etc	3.16	-
Coffee: powder (gm)	0.62	3.07	Coffee: powder (gm)	2.18	7.43
Cake, pastry	0.48	0.006	Pickles (gm)	1.52	14.3
Fruit juice and shakes (litre)	0.33	0.008	Cake, pastry	1.51	0.013
Coffee: cups (number)	0.14	0.044	Mineral water (litre)	1.09	0.348
Mineral water (litre)	0.06	0.019	Coffee: cups (number)	0.84	0.184
Jam, jelly (gm)	0.06	0.54	Sauce (gm)	0.56	4.68
Sauce (gm)	0.04	0.34	Jam, jelly (gm)	0.45	3
	77.92			159.37	

Source: 'Nutrient Requirements and Recommended Dietary Allowances for Indians'

The poor spend more of their income, but eat less

The top 10% in rural areas spend Rs 913 per capita per month on food — just 38.1% of their total expenditure per month — to get 2,617 calories, 73.8 gm of protein and 65.5 gm of fat daily. The bottom 10% spend 66.5% of their total expenditure per month on food — just Rs 251 per capita per month — for a mere 1,545 calories, 40.7 gm of protein and 19.5 gm of fat daily

SACHIN KUMAR
JAIN

THE FOLLOWING KEY FIGURES from the report of the latest National Sample Survey Organisation's 66th Round (NSS Report No 540 *Nutritional Intake in India*) give us an idea of the trends in nutrition in India.

Average daily per capita calorie consumption in the rural population has dropped to 2,020 calories from 2,266 in 1972-3; in urban areas the average daily per capita calorie intake has declined to 1,946 calories from 2,107 in the same period. The official calorie norms (on which the official poverty estimates are anchored) are 2,400 calories per capita per day in rural areas and 2,100 in urban areas. Average daily protein intake has fallen from 60.2 gm in rural areas (57.2 urban) in 1993-4 to 55 gm in rural areas (53.5 urban) in 2009-10. The average monthly consumption of dal in 2009-10 was 622 gm in rural areas and 751 gm in urban areas. The poorest 10% of the population got only 407 gm in rural areas and 469 gm in urban areas. Per capita net daily availability of pulses was 47 gm in 1972; it fell to 31.6 gm by 2010.

The official calorie norms are the basis for determining a 'poverty line'. People spending less than the amount at which minimum calorie norms can be met, with some provision for non-food consumption needs, are deemed to be below the poverty line. There has been much debate about these figures and the calculations behind them, partly because they are used to determine who should qualify for subsidised rations under the public distribution system and other welfare schemes. The Planning Commission, in an affidavit submitted in the Supreme Court in September 2011, arrived at a poverty line of (daily per capita expenditure) Rs 26 in rural areas and Rs 32 in urban areas as in June 2011. Different committees have used different calculations to conclude that between 30% and 77% of India's population live at a subsistence level, or below the poverty line.

The Jagriti Adivasi Dalit Sangathana (JADS), a people's organisation active in Badwani district of Madhya Pradesh, conducted a rapid assessment of food consumption patterns in Pati block of the district to find out how much people actually spend to fulfil their daily food consumption requirements. JADS, which works with tribals in the region,

asked people what they ate and how much they spent on food. They found that people spent Rs 19 daily on food alone. The tribal community spends more than half of total food expenditure on cereals; a very small amount is spent on expensive meat, dairy products, fruits and pulses. A person's minimum requirement of calories and protein cannot be met with cereals alone.

People's food intake depends on how much they spend on food. The NSSO found that the poorest spend the least amount — but also the maximum proportion of their monthly expenditure — on food. They have to do the most physical labour to earn their daily livelihood but they cannot afford to purchase food containing the energy and protein they need.

According to the NSS report on consumer expenditure in 2009-10, the average per capita monthly expenditure in rural areas is Rs 928, of which Rs 497 (53.6%) is spent on food; the numbers in the urban population are Rs 1,759 of which Rs 727 (40.7%) is spent on food.

There are variations according to income. The top 10% in the rural areas spend Rs 913 per capita per month on food — just 38.1% of their total expenditure per month — to get 2,617 calories, 73.8 gm of protein and 65.5 gm of fat daily. The bottom 10% of the population in rural areas spend 66.5% of their total expenditure per month on food — just Rs 251 per capita per month — for a mere 1,545 calories, 40.7 gm of protein and 19.5 gm of fat daily.

The top 10% in urban areas spend Rs 1,443 per capita per month on food — just 25.4% of their total expenditure per month — to get 2,425 calories, 66.9 gm of protein and 73.8 gm of fat daily. The bottom 10% of the population in urban areas spend Rs 326 per capita per month on food — 62.5% of their total expenditure — to get 1,549 calories, 42.5 gm of protein, and 25.4 gm of fat daily.

It is easy to understand how multi-dimensional inequality affects nutritional requirements.

Sachin Kumar Jain is a development journalist based in Madhya Pradesh, working on issues of poverty and hunger. He heads the Vikas Samvad Human Development Resource Organisation and is associated with the Right to Food Campaign

Land alienation and starvation

From the south to the northeast, health professionals and social scientists working at the grassroots report that adivasis are at the bottom of the nutritional ladder, worse off than dalits in most cases. Where adivasis retain control over even a small piece of land, there is some food security. It is the landless who are on the brink of starvation

MARI MARCEL
THEKAEKARA

IT'S OFFICIAL NOW. India's adivasi people are the worst-off in the country. Activists have known this for decades. And now survey after survey confirms this. In the latest such survey, a comparison of the nutritional status of children in nine states found that adivasis are below the national average in every state, and at the bottom of the nutritional ladder in all except Uttar Pradesh and Jharkhand. Of course, this is not news to those working in the field. Here's a bird's eye view of malnutrition in India from informed experts.

Dr Narayanan Devadasan, founder, Institute for Public Health, Bangalore, regularly visits remote corners of the country, teaching, training and researching health issues. "This is purely anecdotal," he says, "but if you take India as a whole, adivasis are definitely the poorest. However, if they have even a small patch of land on which to grow food, they can manage." Deva often visits Chhattisgarh. "In the poor districts of Sarguja, Jashpur and Korea, you don't see large-scale malnutrition. But in Gudalur, in the Nilgiris, Tamil Nadu, though the adivasis have higher incomes, where they are totally wage-dependent, where people don't grow food, I see severely malnourished children as well as emaciated adults. Consistently, all over the country, when people have a tiny plot of land and can grow their staple food, there's less malnutrition. Malnutrition is not just lack of food, it is multi-factorial. It means that people are losing control of their livelihood," Deva concludes. "The government's focus is on children under 5, and on anaemia in pregnant women. In our poorest states, I have seen large numbers of emaciated adults with a body mass index of less than 18 (the normal range is between 18 and 25). These people subsist on unacceptably low amounts of food — they are in a state of starvation. After 64 years of independence, 42% of our children and 50% of our women are malnourished. Nothing has changed."

Back in Gudalur, Dr Shylaja Menon, founder of Gudalur Adivasi Hospital, is appalled at the existence of malnutrition in a relatively better-off community. "To me, with wages of Rs 150 per day, going up to Rs 300 in the coffee/pepper season, plus free rice, there shouldn't be malnutrition in this region." Here the culprit is more likely a combination of widespread alcoholism and badly planned nutrition. "The men spend money on alcohol, leaving little money for the

women to buy food. The women bear the burden of taking care of the family. They are exhausted and depressed and don't have the energy to feed their children. A malnourished child has no appetite, no interest in food. You need to actively feed that child every two hours, or it won't eat. The women don't have the energy to pursue the feeding plan. The mood in our villages is one of depression. Alcohol ruins the family; the men are violent and abusive. It takes its toll on the women."

We visit the Srimadurai area in the Nilgiris. In Gundur village we meet Kulathi, from the Paniya tribe. Her twins Divya and Kannan are both severely malnourished. Her older daughter is 15 years old. Her husband is the only earning member and the entire village is extremely poor. Kulathi is lethargic, she is most likely anaemic. Her nutrition during the pregnancy was probably poor, and having twins didn't help. They have no land of their own. The hut is basic, badly maintained, with just a few pots and pans. Not a hint of any luxury item here.

Nearby, in an interior forest village, I see adivasi women with cell phones. One mother placates her whining child with a Rs 10 note. He returns from the local shop with a plastic packet of Lays crisps. Nutrition-wise, a piece of chikki or a handful of masala peanuts would have provided him much-needed protein. But junk food has entered every nook and corner of almost every village.

Uma, our health worker, shows us a list of 12 children categorised as malnourished. Two have fathers who are alcoholic. Another had a father whose death was alcohol-related. A few mothers had TB, others were anaemic. All of these affect pregnancy and result in malnutrition. Older children also suffered when the mother had another child; when the mother became pregnant again, the older child stopped breastfeeding.

Dr Premila Nair, who has monitored and trained the Gudalur health workers for almost two decades, says: "Between 1998 and 2000, we were worried because of a surge in the incidence of severe malnutrition in our under-5 children. With our adivasi health staff, we drew up an emergency action plan to combat this problem. We actively involved parents and other carers, the entire area team, *thalaivars*

(village heads), health volunteers and hospital staff, so that everyone understood the gravity of the situation. We made sure that more than one monitoring visit was made to the family by the team, and that there was supplemental feeding of sattu mavu, a high-protein, calorie-dense mixture of ragi, green gram and groundnuts with added jaggery for iron and coconut oil which provides high-density energy. We made sure they received their immunisations, and were de-wormed every six months. The government programme of six doses of Vitamin A to prevent night blindness was ensured, because of the bonus it gives in enhancing immunity against respiratory infections. Every malnourished child was brought to hospital for a thorough check-up for treatable causes of malnutrition, like tuberculosis. In six months, we were able to bring about a sustained improvement in nutrition levels.

“Now, in 2012, the figures for severe malnutrition have, surprisingly, almost doubled despite improvements in

many other health parameters like increase in hospital deliveries, reduction in maternal and infant mortality, and greatly improved figures for antenatal care. The worrying thing is it’s not an income problem. We have to look at the social, economic and cultural factors. We try to impress on the families that Grade 3 malnutrition is an emergency — two bouts of diarrhoea and the child can die. The health worker needs to spend time with each family and find out the causes of the severe malnutrition and talk to them, explain the urgency of the situation. Fifty per cent of our mothers are undernourished and anaemic, as a result of which their children have low birth weights. The issue is complex and has to be tackled from many angles.”

There’s a huge divide between north and south India. While lack of money is definitely not an issue in Gudalur, the poverty in the tribal belts of Jharkhand, Chhattisgarh and Madhya Pradesh is stark.

Dr Prabir Chatterjee has worked at the grassroots for many years. He now visits West Bengal and Jharkhand as a Unicef consultant. “In West Bengal, at least 40% of the population is malnourished, worse than neighbouring Bangladesh. Adivasis are generally worse-off than others. In Bengal, the BMI is not as bad as in Jharkhand and Bihar except among the adivasi population.

“CINI (Child In Need Institute), which has worked for many years on child nutrition, was running a nutrition rehabilitation centre in six or seven blocks. Recently, the government started nutrition rehabilitation centres in many states for severely malnourished kids. Children are encouraged to spend 14 days as in-patients. They are tested for TB, low haemoglobin and worms, and given high-calorie cereals and milk. A social worker and nurse help prime the mothers about subsequent care and feeding. The child is sent back home when it is better and follow-up is monitored.

“Among the Grade 3 kids, I always noticed a few Santhals. Adivasis never get ICDS (Integrated Child Development Services) centres because their mohallas are small. Pradhan had 60 centres in tribal villages. They weighed all the children; the adivasi kids were worse-off than the others.

“In Jharkhand, people sell their ration cards to the local mahajan for Rs 100, to buy food. Though Jharkhand is supposedly an adivasi state, the ICDS officials are all dominant-caste, city-based people who impose their vegetarianism on the adivasis, discouraging eggs and meat in favour of rice. This is less nutritious than adivasi food which is often maize and forest-based produce like fish and game. The anganwadi will introduce the kids to polished rice and change the child’s food habits. As a result, adivasis now eat a lot of rice, which gives them energy to work but very little protein.”

Aditya Malaviya



In Cachar district of Assam, a tea garden was closed for four months recently. The labourers were abandoned, not paid their wages, bonus or dues, including provident fund. In spite of lower-than-minimum wages, workers went back to the tea garden when it re-opened on February 8. But in the four months when there was no work, 10 plantation workers died of hunger.

Government welfare schemes are non-functional and starvation deaths continue to be reported every day. An investigative report stated that contributory causes for all the deaths were starvation, malnutrition and lack of medical care.

The ANT (Action Northeast Trust), as its name suggests, covers the Northeast. Its founder, Dr Sunil Kaul, says: “Being an advisor to the government is frustrating. No one listens to us.” He shrugs. “Two years ago, the Supreme Court commissioner ordered an inquiry on right to food violations and the starvation deaths here. The government of Assam did not respond. They never respond. You may find small pockets of malnutrition in Arunachal Pradesh, Nagaland and Mizoram but by and large people have control over their land and still produce their own food. The really pathetic people here are the adivasis from Jharkhand, Orissa and Andhra Pradesh who were brought in 100 years ago by the British as tea plantation labour. They are despised, ill-treated and live in abject poverty. There’s huge malnutrition among them. And organised discrimination against them — they come under the Plantation Act and get about Rs 50 a day. Not even minimum wages. They are the poorest, most hungry, most discriminated against people I know in the northeast.”

In the west, in prosperous Gujarat, Martin Macwan, dalit leader and founder of Navsarjan Trust, Ahmedabad, says: “We run skills-training classes. The kids write daily diaries. The adivasi girls write that at home they often eat only one meal a day. I was shocked. I’ve never seen a dalit kid this hungry, though I have been working the length and breadth of Gujarat for 25 years. The adivasis are the poorest people in this state, and their nutrition is also pathetic.”

Soumik Banerjee works with Santhals and Paharias in Godda district, Jharkhand. “I’ve monitored under-3 children for over three years. More than 50% are malnourished. The BMI of over 80% is below 18. Most of the women weigh 30 to 35 kg. More than three-fourths are anaemic. We’ve seen 22 maternal deaths in the last 10 months, all termed ‘controversial deaths’. NGOs are afraid of announcing them because of the adverse repercussions. The reasons for starvation are poor rainfall and hence dwindling or failed crops.

“Mining is taking away land from the adivasis. The government staff is indifferent. Schemes like the ICDS and midday meals are riddled with corruption. People are lucky if they get 50% of the loans or food meant for them. They

survive at a subsistence level because of the forests. Their diet is all rice. No pulses, fat or protein. Infant and maternal mortality here is three times the state average.”

From Rajasthan, the same bleak scenario emerges. Dr Narendra Gupta from Chittorgarh reports: “Hunger deaths among Sahariya adivasis from Kota and Baran districts hit the newspaper headlines recently because of the high concentration of acutely malnourished kids. In south Rajasthan, from Udaipur, Banswara, Tungapur and Pratapgarh districts, the most severely malnourished kids are from the Bhil and Meena tribes. Poverty is widespread, government infrastructure very weak, the PDS hardly works, and access to forests is severely restricted (adivasis got their food primarily from forest resources in happier times). People have no alternative but to provide cheap labour wherever it’s available. Migration is common. There’s little choice. Many young kids around 9 to 10 years old go to north Gujarat to cross-pollinate the BT cotton grown there. The cotton-growers prefer children’s nimble fingers. These kids are often malnourished. We work in 66 villages. We found 62% of the kids underweight. Shockingly, 42% of girls and 18% of boys were categorised as ‘severely acutely malnourished’. This means they can’t eat normal food and must have specially prepared ‘ready-to-use therapeutic food’. If we look at the larger picture, that’s 82% of girls and 60% of boys. We also discovered 60% of women were anaemic and 30% were severely anaemic. Their kids will have low birth weights, and the cycle continues. Indeed, adivasis are the most excluded group in the country.”

Kerala, our southernmost state, with 100% literacy, prosperity and awareness, is no different when it comes to adivasis. When I arrived in the Nilgiris in 1984, the adivasis in Kerala were in a far better state than their neighbouring Tamil Nadu relatives. The scenario has changed drastically. As the rest of the state grew more prosperous, Kerala’s adivasis have been exploited and excluded. They are definitely the poorest people in Kerala today.

This bird’s eye view of the hunger and nutrition status of adivasis comes from doctors, health professionals and social scientists who have worked among them for over a decade. It is a dismal scenario. A wake-up call straight from the grassroots. It needs urgent solutions.

Mari Marcel Thekaekara is Founder-Associate Director of ACCORD, an organisation that works with the tribals of Gudalur, Tamil Nadu. She is a frequent contributor to The Hindu and Frontline and was a columnist for New Internationalist, UK. She is the author of Endless Filth, a book on the safai kamdars of Gujarat, published by Books for Change

The shadow of hunger

Baran is one of 22 districts in Rajasthan designated 'food insecure'. The Sahariya tribals who have a per capita income of roughly Rs 7 a day live in the shadow of hunger, with not enough money to buy even BPL rations. Children are brought up on little more than bajra rotis with salt and chillies and, not surprisingly, child deaths from hunger are reported every few months

ADITYA MALAVIYA

THE UNPAVED ROAD twists and turns over a barren rocky escarpment as we make our way to the village of Baseli. The tree stumps and brush are interspersed with occasional patches of green. Eventually we reach a cluster of mud huts. Outside one of them is three-year-old Piyo. She clings to her sister's hand as she tries to stand. Her frame is so wasted that she barely has the strength to cry. Her oversized dress only serves to emphasise her withered body. "I don't know about nutrition and malnutrition," says her mother, Radha Sahariya. "I just know my daughter cannot walk, she is too weak."

Why don't they take Piyo to the mother-child centre located on the nearby hilltop? "Even if we spend precious time and money to take our children to the *ma-baari* centre, they will be in the same situation soon after their treatment finishes," says Piyo's father, Ishwarlal. "Our crop is fed only by the rains, and we live a hand-to-mouth existence."

Baseli, in Shahbad block of Baran district in southeast Rajasthan, is populated by the Sahariyas, categorised as a 'primitive tribal group' by the government. Even though they represent approximately one-third of the population in the Shahbad and Kishanganj blocks, the Sahariyas remain marginalised.

Health of tribals in Rajasthan

Tribals represent 8.2% of the country's population, but 14.8% of them were in poverty in 1993-94, increasing to 17.5% in 1999-2000 (1). In Rajasthan, the numbers are 28.8% in 1993-94, increasing to 36.5% in 1999-2000. Just 47.1% of India's tribals are literate (2) (the all-India figure is 64.8%).

According to the District-Level Household Survey on Reproductive and Child Health, 2002-2004 (3), more than one-fourth (28%) of children in Rajasthan are severely underweight and nearly three-fifths (58%) are underweight. The proportion of undernourished children increases rapidly with the child's age, up to 6-11 months, and shows a decrease thereafter. More than two-fifths (42%) of children in the age-group 12-23 months are severely underweight, whereas more than three-fifths (71%) of children in the same age-group are underweight. By age 48-71 months, the corresponding figures for severely underweight and underweight children stabilise at 18% and 50% respectively.

Twenty-two of Rajasthan's 32 districts are designated 'food insecure' in a report of the United Nations World Food Programme and the Institute of Human Development. Baran is one of these, a 'hot spot' designated as 'most food insecure' (4). In 1998, the Department of Women and Child Development published a report on India's nutrition profile covering 18 states and union territories. It found that 44% of rural children in the age-group 1-5 years were underweight in Rajasthan compared to about one-third in Punjab, Haryana and Himachal Pradesh (5). The Sahariyas are the worst-off among an already marginalised population.

The 700,000-strong Sahariya tribe is scattered over 11 districts in Madhya Pradesh, Rajasthan and Uttar Pradesh. Originally self-reliant forest-dwellers, they were dispossessed by the Forest Conservation Act, 1980 and reduced to unskilled landless labourers. A study by the Centre for Tribal Development in 2002 (6) reported that the annual per capita income among Sahariyas was Rs 2,691, or about Rs 7 a day — less than one-third of the official poverty line figure of Rs 26 a day in rural areas. They face social discrimination at the hands of sarpanches, upper-caste villagers and government officials. Longstanding neglect by the state has ensured that they remain largely bereft of the benefits of development. Just as their dwellings are isolated from the rest of the village, the Sahariyas seem to exist on the periphery of society.

Child deaths are not uncommon among the Sahariyas. Angoori Bai lost her five-year-old son Vishal last year; she had already lost her two-year-old daughter the year before to "*anaj ki bhookh*", or "hunger for grain". Guddi Bai lost her five-year-old son Chander Bhan to chronic hunger as well. Guddi Bai struggles to feed her children. "I give them bajra rotis with a chutney of chana plant leaves; we cannot afford oil so I just boil the leaves with salt and chilli." The family certainly cannot afford milk, pulses or vegetables. Her husband earns Rs 70-80 per day as an agricultural labourer on the few days he gets work on land mostly owned by the Kerada (agricultural caste).

The anganwadi is as good — or bad — as their home

The two pillars of early childhood care — *ma-baari* centres where children 6-12 years are provided primary education along with free school clothes and midday meals, and

anganwadis or government-run creches for children under 6 — have failed to address the widespread undernourishment crippling the community.

Under the government of Rajasthan’s programme exclusively for the Sahariyas, parents of Sahariya children identified by either the auxiliary nurse midwife or the accredited social health activist as malnourished are brought to nutrition rehabilitation centres for 10 days of treatment, for which they are paid Rs 100 as incentive. But taking children like Piyo to the centre in Shahbad, 35 km away, is “not an option,” says Ishwarlal Sahariya. “Travelling to the hospital costs Rs 15 for each person — after walking 3 km to the main road from our village. Even if one of us goes, we lose Rs 100 per day as wages. And though we are promised an incentive of Rs 100 when we go to the centre, we get paid only Rs 30. Moreover, they treat us like dirt, taunting and chiding us.”

Parents also complain that children do not like the soya bean kurkure (soya puffs) that are given as part of the nutrition package. “The taste is alien; they prefer something akin to what they eat at home,” says Angoori Bai of Kasba Thana village. Similarly, *ghooghri*, a gruel made of wheat and jaggery, which is the midday meal served by the anganwadi, “looks and tastes so unappetising that most children prefer to go hungry rather than eat it,” says Guddi Bai. There is no milk, even for those who are willing to buy it from the market. This is ironic, since Rajasthan is the third largest milk producing state in the country (7).

‘Do you think we like to live like this?’

Sahariya habitations are usually located outside the main village, called *seharana*, a cluster of ramshackle stone-and-mud homes with stone slab roofs. In some villages, the mud structures have tin roofs. Brick and concrete are rare, and even these homes are shoddily built one-room tenements with no toilets (the logic being that water is scarce and the Sahariyas will not flush this precious commodity down the toilet). Indeed, in Kasba Thana, the *seharana* had no drainage, sanitation or paving. It is surrounded by overflowing drains close to open wells. Ram Pal asks: “Do you think we like to live like this? When government officials come, they are more concerned with holding a handkerchief to their noses; what will anyone say with a handkerchief to his nose?”

The door to the tiny ten-by-five-foot structure that Guddi Bai calls home is so small you have to get down on your knees to enter. It is pitch black inside, and I bump into the roof. As my eyes adjust to the dark, I notice I am standing on a floor of crudely plastered mud. The walls are made from a mix of jungle brush plastered with mud. There is no electricity or drinking water source. Vegetable oil lanterns are the only source of light at night (kerosene is not cheap or freely available). The roof is improvised with paddy or wheat straw, thatch grass, and a sheet of old plastic to keep the rain away. The kitchen occupies a tiny corner of the hut; it comprises a small mud chullah, an iron kadhai and a few aluminium pots

and pans for eating or storing water. A small stone slab, used to grind masala or make vegetable paste, stands against the wall. Bags of foodgrain occupy another corner of the hut. The remaining space is taken by a worn cotton mattress for a bed; a jute rope on which to hang clothes runs from one corner to another. The worldly belongings of Guddi Bai and her family are, quite literally, on a string.

“Food is cooked twice daily, around 11 am and then in the evening before it gets dark. Chapattis made of bajra or wheat are eaten during the day. In the evening we usually cook gruel or porridge; it requires less grain, allowing more family members to eat.” His family shares about half-a-cup of boiled pulses or vegetables, says Arjun Sahariya, who lives in another part of the village. “When things are really bad, we eat *lapti* of wheat flour and gur (jaggery).” The morning meal, for those who can afford it, is roti and one vegetable or onion, or a thin buttermilk, or tea, or dal diluted with water, and with lots of red chillies. Intake of vegetables is very low and seasonal. Usually, leaves of plants like chana (gram) are added to boiled lentils or just boiled into a paste and eaten with chapattis. Milk is rare because the Sahariyas do not domesticate buffaloes or cows. To that extent, milk and milk products are denied to infants and small children. The only milk that is consumed is in tea, which is also given to children. Meat is eaten rarely, only on ceremonial and festive days.

Sahariya women are back at work a day or two after delivery. The only ‘special’ diet they get is gur or wheat rotis, with some milk if it is available. Compare this to the Kerada women who get milk every day, nutritious food made with cooking oil, as well as gur, nuts, etc.

No work, no money, no food, no healthcare

The arid, rocky landscape means that most Sahariyas have little land to cultivate. “Many still have not been issued below-poverty-line ration cards, which would make them eligible for subsidised grain at the rate of Rs 2 per kg (35 kg per month) through the public distribution system (PDS). The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), a central scheme, promises — especially for the Sahariyas — 200 days of employment to every poor rural household. However, either the job card issued to some Sahariyas like Ram Singh under this scheme is kept with the village head or the wages are never received. Many are yet to get their job cards allowing them to register for work under the MGNREGS,” says Chittarmal Jat of the Centre for Community Economics and Development Consultants Society (CECOEDECON), a non-government organisation working in the area.

Even when PDS grain is available, the capacity of the Sahariyas to buy food or clothes is limited, and barter is used to buy essentials like oil, sugar and salt, exchanging either a portion of grain stored at home or firewood collected from the forest. Everything — even the humble *gutkha* which costs Rs 2 — is bought by bartering grain.

People like Kumar Pal and Ram Singh have an Antyodaya Anna Yojana card that is issued to the poorest of the poor living below the poverty line. But most times they can collect only a small amount of the 35 kg earmarked for them; sugar and rice are perpetually “out of stock” at the ration shop.

Curative health in tribal hamlets is almost absent. There are not even private hospitals to be found. This means easy pickings for the ‘Bengali doctor’, or quack. Most ‘Bengali doctors’ charge Rs 50-100 for each visit, including medicines, the favourite being bottles of intravenous glucose for every ailment. “Long distances, unaffordable fees and the callous attitude of health staff at health centres means that the Sahariya is forced to rely on quacks when illness strikes — and strike it does, with regularity. “We rarely know what is being prescribed, but the medicines usually cure us, even if temporarily,” says Kumar Pal, a labourer in Kasba Thana village, Shahbad block. “Most doctors do not come to the health centre. The nurse or compounder prescribes the same white tablets for every ailment. If we ask for better medicines, they write a prescription and tell us to buy the medicines from the market. Because we cannot afford it, we go back to the ‘Bengali doctor’ to seek relief.”

Is there hope?

Poor land quality, gradual loss of community resources such as water, land and forests, dependence on manual labour and outdated agriculture skills, inadequate knowledge of natural resource management, and poor outreach of government schemes and programmes — all this has meant that the Sahariyas have limited livelihood options, and these too have shrunk over the years. Non-government organisations like CECOEDCON are chipping away at the problem through broad-based interventions including education, agriculture, natural resource management and mobilising community-based organisations.

Compared to other *taleti* (lowland) areas, Ogad village in Shahbad block looks green and relatively more prosperous, thanks partly to the availability of water. While the problems facing the Sahariyas here are as daunting as anywhere else, some people feel that the difference here is that solutions are being explored and newer ideas taking root. One such idea is that of a grain bank.

“The grain bank was set up in this village to overcome the chronic shortage of foodgrain that forced most families to go to bed on an empty stomach. Twenty families came together to start it three years ago, with a loan of Rs 18,000 from CECOEDCON, and Rs 500 as membership fee from each member. Since then, it has been able to ‘bank’ 29 quintals (1 quintal = 100 kg) of foodgrain, primarily wheat. Anyone — whether or not a member — who faces a shortage of foodgrain can borrow so long as s/he returns the borrowed grain along with ‘interest’ in kind; the amount is determined on a case-by-case basis by those who run the grain bank, says Chittarmal Jat of CECOEDCON.

Kesri Chand Jatav, a member of the grain bank, says: “The PDS grain is not enough for a family of six to eight members. Also, we never get the PDS grain on time. Sometimes, it is two months late. Will hunger wait?”

While the interest in the grain bank is lower than the usurious rates charged by moneylenders, it still represents a substantial amount to the borrower. The grain bank can work only if members are in a position to return the grain they borrow. This is now a reality, thanks to better yields made possible by water harvesting. In Sanwada village, 23-year-old Bajwal Sahariya’s 3 bigha patch of land is covered with ripening stalks of wheat. “The land was on a rocky slope. A small stream flowed through it, eroding the soil during the monsoons and dwindling to a trickle in the hot summer months,” he says. CECOEDCON helped construct an anicut, a micro-reservoir to store run-off water. A boundary wall was built to stop animals from grazing on the crops. Bunds and other inexpensive techniques ensured that water was retained on the land without stripping it of soil cover. The arid landscape was transformed into a patch of green and a much-needed source of income and food for the Sahariyas.

Says Kanhaiya Sahariya: “The availability of water allows us to harvest at least 15-20 quintals of wheat. This can be sold in the market at Rs 1,500 per quintal. Even otherwise, the grain can sustain a small family for a few months.” A local saying goes like this: “*Do bigha Mali ka, nau bigha Jat ka, aur bees bigha Rajput ka.*” What the Mali (agricultural class) grows in two bighas, the Jat grows in nine, and the Rajput in 20. There is no mention of the Sahariya. Perhaps it is time the Sahariya is finally allowed to correct this historical aberration by coming out of the shadow of hunger.

Note: The field visit for this article was facilitated by Chittarmal Jat, programme coordinator with the Centre for Community Economics and Development Consultants, Jaipur (Rajasthan)

Aditya Malaviya is a researcher and journalist based in Bhopal

Endnotes

- 1 Report of the Steering Committee on Rapid Poverty Reduction and Local Area Development for the Eleventh Five-Year Plan (2007-2012), Government of India, Planning Commission, New Delhi. www.planningcommission.nic.in/aboutus/committee/strgrp11/str11_rpr.pdf
- 2 Annual Report, Ministry of Tribal Affairs, Government of India, 2008-9. www.tribal.nic.in/writereaddata/mainlinkfile/File1155.pdf
- 3 Nutritional Status of Children and Prevalence of Anaemia Among Children, Adolescent Girls and Pregnant Women, District-Level Household Survey on Reproductive and Child Health, India 2002-2004. www.rchiips.org/pdf/rch2/National_Nutrition_Report_RCH-II.pdf
- 4 *Food Security Atlas of Rural Rajasthan*. World Food Programme, Institute for Human Development, 2009. <http://www.wfp.org.in/displaymorePub.asp?itemid=81&subckey=11&chname=Publications>
- 5 *National Human Development Report, 2001*, ‘Health Attainments and Demographic Concerns’. www.igidr.ac.in/conf/ysp/nhd2001.pdf
- 6 Mentioned in the eighth report of the commissioners of the Supreme Court, August 2008, available from: http://www.righttofoodindia.org/comrs/comrs_reports.html
- 7 Department of Animal Husbandry, government of Rajasthan. http://animalhusbandry.rajasthan.gov.in/about_us.asp

Poor fare

This article details how the urban poor stave off hunger, cooking just one meal a day, scrounging for chicken waste, and making do with the empty calories offered by street food. Even the nutritious sattu that Kolkata's poor traditionally survived on now costs Rs 9 a portion and is beyond the reach of many

RAJASHRI
DASGUPTA

“I SURVIVE BY DRINKING TEA throughout the day,” says Shakila Bibi, covering up her embarrassment with a giggle and a shrug when she sees my shocked face. “It suppresses my hunger.” She was responding to my query about what she had eaten till lunchtime. Shakila, who claims to be “perhaps 30 years old”, has the crumpled look of a 70-year-old while sporting the spirit of a 15-year-old. Her husband abandoned her five years ago when her youngest daughter was born, leaving her to take care of six children, the eldest a boy of 15 years crippled in an accident.

Food in Shakila's home is cooked once a day, in the evening; the family eats leftovers for lunch the next day. “When do I have the time during the day?” Every morning she leaves home at the crack of dawn to travel by bus to the city to build roads. On a good day, she makes Rs 100. The money is handed over with scowls, because flirting with the sardar “does not come easily” to her, she says. Two of the children attend a school run by the Sarva Shiksha Abhiyan in the slum where they eat a midday meal which usually consists of rice and soya nuggets. “My children love it and if there is extra food the teachers give it to us.”

There is seldom a variation in the family's daily diet of 1 kg of rice and 750 gm of potatoes for two meals. So when Shakila struck lucky recently and bought a small fish at Rs 10 for half-a-kilo, the family rejoiced. “That day my children gorged on the food,” she laughs.

While Shakila drinks tea to stave off hunger, her neighbours — migrant workers and homeless people — tend to smoke bidis, drink country liquor and chew tobacco and tiranga to kill the hunger pangs. Like Shakila, most poor households cook only once a day, stretching the food and eating leftovers the next day to save time and fuel. In the sprawling slum of migrant labourers where Shakila lives, along the rail tracks of Brace Bridge in Kolkata, close to the docks, I am warned, “*Do nambari kaarbar hota hai* (illegal activities take place here)”. The men, both Hindus and Muslims, are either head-loaders at the docks or daily wage earners in the nearby vegetable market; the women work mainly as domestic help in nearby homes.

In the 41 urban local municipalities of Kolkata Metropolitan

Area (KMA), around 35% of the total population live in slums and informal settlements largely comprising scheduled castes and Muslims. The settlements lack basic services like sanitation and electricity, with families crowded into tiny, dark shacks bereft of ventilation. Shakila's children sleep below the raised bed in her tiny room, a plastic sheet for a roof; her neighbour Laila Bibi's 15-member family lives in a space divided by a bamboo mat to make two rooms for her married sons. The long queues for water for drinking, cooking and bathing, and the feverish search for work every day leaves little time to do other chores. Convenience and the absence of infrastructure make eating out the easier option.

Dotting the settlements are stalls offering food to working people. The 12 food stalls along Southern Avenue in posh south Kolkata serve lunch to mobile populations like rickshaw-pullers, taxi and bus drivers. The stalls, illegal structures, survive by paying the local *thana* Rs 400 a month so that taxis and buses can park without fear of being fined, drivers can eat without being harassed, and the stalls can do brisk business. “I cannot fight the crocodile, being deep in water myself,” says the proprietor of a popular eatery, Rani Manna (name changed), philosophically. “We have to survive. I do what the others do.” By 4 pm, the area is cleaned and the utensils and dishes washed and stored away. The space is transformed to serve the needs of youngsters and office-goers stopping for tea, cold drinks or snacks like spicy fried puffed rice, chaat masala and golgappas on their way home.

The roadside stalls offer a varied menu for lunch. A mutton lunch for Rs 32 at Rani's stall, for instance, consists of two very small meat pieces. “What can we do,” asks Rani. “Meat is expensive but customers love it.” A fish dish, says Rani, is the all-time favourite. For Rs 22, a small bit of fish curry is sold with rice and a vegetable curry. “The curry has to be very spicy,” says Rani, “otherwise no one will eat it. But I myself avoid this food because it gives me a stomach ache.” Minakhi Sen, professor of physiology, Agartala, explains that a lot of spices in the food stimulate the digestive juices whilst at the same time masking the offensive smell of inferior quality fish or meat.

For most Bengalis, a meal without *maach*, or fish, is unimaginable and most unsatisfying. Households spend a considerable amount of their food budget on at least a small piece of fish every day. If roadside stalls offer a cheaper variety of rahu, poorer sections of society like the homeless buy small fish like lotte, which the middle class dislikes, or cheaper varieties of sea fish, as the Bengali *bhadralok* prefer fresh river fish.

But Swati Halder, a 35-year-old squatter living in an unregistered slum close to Rani's stall, says she and her two school-going children have forgotten the taste of fish. A domestic worker and only earning member in her family, Swati buys 30 kg of rice, her monthly requirement, the very day she gets her salary, so that her husband cannot spend the money on liquor. Her children eat rice three times a day, the first meal with boiled potatoes before they leave for school. Swati sometimes brings home chapattis and vegetables from the houses where she works. "If my husband also worked and contributed towards the food expenses, there would be no shortage at home. I don't pay rent or money for my electricity, and have only two

children." The threat of eviction has hung over Swati's head and those of her neighbours for over five years since they are considered illegal occupants of government land.

If the roadside stalls provide food to millions of working people in the city, the neighbourhood grocer steps in to provide credit to households like Swati's. Bored of the daily fare of potato curry, her two children buy snacks like spicy peanuts in the evenings from the grocer whom Swati pays off at the end of the month. Even migrants like Ramu from Jharkhand, who prefer to cook meals at home because it is "healthier and cheaper", are dependent on pavement stalls offering credit for their early morning meal. This has led to a change in dietary patterns as they now eat whatever is available, cheap and on credit. Earlier, Ramu and his brothers and hundreds of corporation workers, migrants from Bihar and Jharkhand who keep the city's roads and homes clean, would eat the high-protein sattu or powdered mixture of many grains with chopped raw onions and green chillies that are a good source of Vitamin C. They now have to be satisfied with samosas. Sattu prices have shot up to Rs 90 a kilo, and the local samosa stall offers Ramu credit. A



Rajesh Vora

hundred grams of the nutritious sattu would cost Ramu Rs 9 a day; two potato-stuffed samosas cost Rs 6. In the process of saving a few bucks, he misses out on valuable nutrition and suffers indigestion thanks to the oily samosas.

The most frequent visitors to small food stalls dotting the pavements are the ragpicker street children. They earn between Rs 80-100 on a good day, but blow up their earnings, says Shamim, project worker at Calcutta Samaritans that works with marginalised people like the homeless. “Mothers do not know how much their children earn and are happy to get Rs 30 a day from them towards expenses,” she says. Though the children live with their families in makeshift shacks on the pavements, they tend to eat only at night with their parents.

Every day, street children spend at least Rs 30 on additives, whether it is the deadly tiranga, bought at Rs 2 a packet, or ‘glue’ or tobacco. Moving around the city, the ragpickers spend the rest of their earnings on street food rather than trudge miles back home to eat what they consider “drab fare”. “My favourite is chow mein,” says 10-year-old Aslam who looks like a bony six-year-old. “It’s delicious with egg.” A stall where Aslam eats regularly, near a blocked drain teeming with mosquitoes and insects, gives him a discount of a rupee or two since he helps clear away the garbage. His friend Ratul prefers the greasy biryani he buys for Rs 12 from the corner shop. “Every day I can eat it, one full pot,” he laughs. “Try me out,” he dares cheekily. The plate of suspiciously-coloured orange biryani contains a red egg and a yellow potato, with a sprinkling of fried red chillies.

Although the staple food may be rice and potatoes, the diet of the poor in West Bengal is certainly not vegetarian. In this deltaic state, filled with waterbodies, streams and ponds, fish is the traditional food, with rice, egg and meat the next best choice especially for ‘non-Bengali’ inhabitants. A survey of 1,675 households conducted by Right Track, a non-government organisation working with deprived communities in a municipality of west Kolkata, found that vegetables and fruits make up less than 1% of people’s diet, while 24% of the diet is animal protein from various sources. For Ramu and his brothers, late lunch is a hurriedly cooked vegetarian meal, and for dinner, grins Ramu, “*kuch special hota hai*”. “We have to eat either fish or mutton at night otherwise we feel hungry,” he says, “but mutton is too costly.” The treat for the brothers is when Ramu splurges Rs 100 on the head of a goat and cooks it with potatoes and onions.

Unlike Shakila’s children, Laila Bibi’s grandchildren not only refuse to eat the “dirty rice” served in the slum school, they grumble if there is no meat served at home. Beef is their favourite and Laila’s family of 15 relishes it at least thrice a week. They are willing to travel several kilometres by bus to buy it since it is not available in every market; the dominant Hindu population refuse to allow it to be sold. Laila says: “Meals of meat or fish satisfy the family and that is why

it’s easiest to cook. Everyone grumbles if there are only vegetables; they make my life miserable.” The meals could have been better. Laila complains that the men in her home (her husband and her married sons) are not hardworking. “They are lazy, earn one day, and sleep at home for 10 days.” If they worked regularly, she complains, they could have made a decent living at the docks. “We could have eaten meat every day.”

The homeless people living on the pavements in central Kolkata, largely dominated by Muslims and scheduled caste families, scrounge the markets for discarded parts of chicken such as feathers and feet, sold at Rs 40 a kg, and vegetables that have started rotting by late evening and are sold cheap. The feathers are nimbly plucked off the tender cartilage which, with the remaining flesh, discarded chicken fat, stomach and other organs, is boiled for a long time with chillies and lots of turmeric and vegetables in an aluminium pot raised on four bricks on a fire. Though initially the food smells offensive, it finally tastes good. According to Pachhu Roy, retired senior microbiologist who writes extensively on the diet of the poor in Kolkata, the extended boiling kills germs and the broth is nutritious, consisting of protein and fat from the chicken, minerals and phosphate from the bones and legs, and vitamins from the vegetables. “The poor use a lot of turmeric because it is affordable and changes the colour of food and makes it appetising,” says Roy. In fact, fish head and the blob of oil extracted from large fish like *rahu* is another delicacy cooked either with greens and onions and garlic, or potatoes and vegetables.

For the large number of urban poor living a tenuous existence, survival is a daily struggle. Despite the cheap eateries, the credit shops and the food preferences of the elite making it possible for the poor to stretch their last pennies, the poor in Kolkata have had to juggle their traditional knowledge, cultural food habits and common sense to eat to live.

Rajashri Dasgupta is an independent journalist based in Kolkata specialising in issues related to gender, health, human rights and social movements

The underfed and the unscrupulous

In Raichur district of Karnataka, where over 4,500 children face acute malnutrition and 2,689 have died of malnutrition in two years, there is a vested interest in maintaining the status quo. The greater the problem, the higher the multi-crore contracts for supply of completely inedible, even dangerous, supplementary food packets to anganwadis

SHAHINA K K

'MALNUTRITION is what you have when your body does not get enough nutrients': I boarded the train to Raichur with this bit of Wiki knowledge. I was going to Raichur for a reason. This district of northern Karnataka was recently made infamous by a report that said 2,689 children here had died of malnutrition over the past two years; and this was the official figure, with the state's Department of Women and Child Development expecting even more deaths. The number of children facing acute malnutrition in Raichur was estimated at 4,531.

As it turns out, the men and women I meet in Raichur's villages have never heard the word 'malnutrition' before. It is not the fault of the local language. They don't know *apoushtikatha*, Kannada for malnutrition, either. Hasn't anyone from the government ever told them about it? The answer is uniform: nobody has.

Malnutrition is not to be confused with starvation. In this part of Karnataka, it is not difficult to find a family of five or six surviving on just 250 gm of rice — or five-six rotis, one for each — every day; sometimes accompanied by bhindi or palak. Dal is an unaffordable luxury, meat is for very rare occasions, and milk for children is something they never think about. This is enough to stay alive, but not for a normal existence.

The difference, or lack thereof, hits us in the gut when we enter a small mud house in Chikkasugur village. As we open the door, it's dark inside. Lying on the floor we spot little Divyashree trying to raise her arms to cover her eyes because they can't take the intrusion of sunlight. But she fails. She doesn't have the strength. She looks like a six-month-old baby with bony limbs. But she is three years old, we learn, and running a fever.

Divyashree, who is among Raichur's 4,531 malnourished children, is being taken care of by her sister Ashwini, a 10-year-old who has stopped going to school because there is nobody else to look after Divyashree when their mother goes to work. Madhavi, their mother, is out by nine in the morning and returns home at six. She cooks rice before leaving. Rice and chilli are what these two children eat the entire day. Occasionally, there is potato and palak, even bhindi or brinjal. The list of vegetables familiar to them is short.

"She does not like rice," says Ashwini, of her sister. "She often cries in hunger. I give her kurkure when she cries." A crispy snack that takes its name from a Pepsico product, kurkure is something they get free. In Raichur, it is a standard hand-out of India's anganwadi network, which was set up in the mid-1970s to combat child hunger under the Integrated Child Development Services (ICDS) scheme. But Ashwini also buys small Rs 2 packets of kurkure from a nearby grocery shop. That's 2% or more of the daily budget. "I get hardly Rs 100 for a day's work (and that's when I do get work)," says Madhavi, trying to explain how she manages life on her own. Her husband left them a month after Divyashree was born. "I don't buy milk or dal because both are expensive. Rice costs Rs 20 per kg." In their single-room hut, the only food item we see is a 5 kg sack of rice. She says she also buys 300 gm of tea and 1 kg of sugar, to be used sparingly to last an entire month, from the open market.

Madhavi knows Divyashree is underweight, just 4 kg. She could not breastfeed her because she had "no milk at all" to do so. Why, Madhavi does not know. She has no idea whether she is anaemic or not. Clueless about her own health, she was married at the age of 12. Her elder child Ashwini was born healthy, but Divyashree was visibly much too tiny. "The doctor kept her in a box made of glass with a light inside," recalls the mother. The baby was allowed home after a week and the doctor wanted her brought back for regular check-ups. "It was not possible," says Madhavi. "We could not afford regular hospital visits... so no treatment was given after that." Every month or so, Divyashree gets diarrhoea and fever, but Madhavi has no option but to go to work, leaving the three-year-old with Ashwini.

Mallamma, living in a hut not too far away, had two children: Anjaneya, 5, and Bhagyalakshmi, 2. The younger one died in August, and Anjaneya one month later. Both were on the official list of children facing acute malnutrition since 2010. But being on the list was not enough to save their lives. In fact, it made no difference. Bhagyalakshmi had stopped walking and talking two months before her death. Anjaneya had been unable to walk for quite some time.

Till this day, Mallamma has no clear idea of what malnutrition is. She once heard the word used by someone to explain a death in the village, that's all. She is clearer about how little she earns: Rs 50 a day, if she manages to get work, which is

something she can count on only in the rainy season. A bag of rice is all the food they have at home. She hardly buys vegetables, dal or milk. She is reluctant to talk about her children, but admits they did not have enough to eat. She tried feeding them anganwadi-dispensed food. “The children did not like that food,” she sighs. “It had a bad smell and often caused stomach pain.”

Both Anjaneya and Bhagyalakshmi had recurring fever and diarrhoea, their bouts of illness lasting four-five days each month. If Mallamma had the money, she would take them to a private hospital 25 km away from the village, since the primary health centre nearby was closed most of the time. “The doctor would say nothing,” she recalls, clueless about the cause of their illness, “just prescribe medicines”.

Mallamma, who was married at 12 and is still a teenager, is currently in her ninth month of pregnancy with a third child. The delivery will take place at home. “It is not practical to go to hospital,” says her husband Venkitesh. But it’s not as if she has had no medical attention. A month ago, she had a scan and blood test, we are informed, as medical reports are fished out and presented to us as proof. She cannot read them. They are in English and suggest that Mallamma has acute anaemia. She does not know that she has this condition. Or what it is.

Their elder daughter’s death received its share of media coverage, public outcry and political posturing. But Mallamma’s life has not changed at all. “A minister came. He told us that they would call us soon,” she says. Her guest was C C Patil, Karnataka’s minister for women and child welfare. That was the last they heard from the minister.

If the people in Raichur are unclear about malnutrition, district officials appear only slightly better informed. District Collector (DC) V Anupkumar, for example, is vague about how malnutrition is measured in the area. “We have launched a programme to measure the weight of all children,” he says. Asked if that’s enough to identify an undernourished child, he says nothing. On relief provisions, the DC says: “We give nutrition supplements, but that is only an addition to the regular food they consume.” What the ‘regular food’ is, he has no clue, since no proper survey has been done by the government to find out. And the ‘nutrition supplements’ he speaks of are the food packets handed out by the anganwadi network. Lately, the quantity of packaged food delivered to it has been doubled, adds the DC, hoping to impress us. Whether the food causes diarrhoea or whether children find it edible are questions he does not answer.

Malnutrition data in the district is dodgy for a reason. Somebody seems to have an ulterior interest in keeping the numbers large. This is clear from a visit to an anganwadi in Chikkasugur village. It has 123 children on its rolls as malnourished. We meet only 14, and the teacher present here — the scheme covers education as well — says that daily attendance ranges from 15 to 20.

The food hand-outs, we discover, are not very sought after. “Please take more packets, we don’t want it here,” the

teacher tells us when we ask for a few sample packets. “The children hate this food. Their stomachs ache and they have diarrhoea when they eat this. When we complained, we were told that there would not be any change in supply for two more years. That is when the tenure of the contract with the private supplier of these packets will end.”

There is a pile of food packets dumped in a corner of the hall, easily traceable by its unpleasant odour. There we spot packets of Nutri kesari bhaath, Nutri masala mix, kurkure and a nameless powder in pale yellow without any label. “Till 2009, the menu was different. Rice and green dal were provided to children. Now they are provided with these powder packets,” says the teacher. Another anganwadi teacher opens a packet and hands us crispy munchies popularly called ‘kurkure’. In shape, it does not look like the branded variety made by Pepsico, but it tastes much the same. She also opens a packet of masala mix, which claims to be a nutritious mix to be cooked with rice (not on offer). This brown powder also tastes like kurkure.

“Kurkure is nutritious,” says a senior official at Karnataka’s Women and Child Welfare Department later, on condition of anonymity. “The allegations of diarrhoea and stomach pain are baseless. People are always reluctant to eat something new.” Why supply these packets instead of regular rice and dal? His answer is simple: “To attract more children to anganwadis.” More children means a larger contract. Explains Kavita Ratna, communications director of the Bangalore-based NGO Concerned for Working Children: “The contract is of Rs 900 crore, and M/s Christy Friedgram Industry, a processed food company based in Tamil Nadu (which did not respond to our queries), provides these food packets to anganwadis.” She adds: “It is a clear case of violation of the rights of children and the Supreme Court order prohibiting the use of contractors in the ICDS.” In an order dated October 7, 2004, India’s apex court made it clear that the procurement and preparation of ICDS food should be carried out only through village communities and self-help groups. “Besides,” says Kavita, “the food contains certain constituents in higher quantities than the permitted levels. For example, in the tested results, it was found that the content of zinc is in dangerous proportions. It is a nutrient, but if it crosses the permitted limit, it turns toxic.” In tests conducted in early-2010, the NGO found that the content of trans fats (commonly found in hydrogenated vegetable oils like Dalda) was much too high. “They changed it when we made a great hue and cry,” says Kavita, who alleges that the children’s food scheme has become a sordid money-spinning exercise for those involved. This also explains why control of the ICDS, a scheme that was placed in the charge of gram panchayats by the 73rd Amendment of the Indian Constitution (as also the Karnataka Panchayati Raj Act), was taken back by the state government.

So long as there are multi-crore contracts to be had, you can be sure of two things: long malnutrition lists and apathy towards the malnourished.

Shahina K K is Assistant Editor of Open magazine. This article first appeared in Open

The wider effects of nutrition research

The decision to focus on calories from cheap sources of food influenced many of independent India's major policy decisions such as the shamefully low poverty line, a minimum wage to meet these low dietary requirements, a public distribution system limited to cereals, and high-input monoculture to produce these cereals. The combined results are seen in the undernutrition and catastrophic health profiles of Indians today. Micronutrient programmes are the natural extension of this policy

VEENA
SHATRUGNA

THE CONSISTENT STAND towards minimising costs in the interests of development priorities at the expense of sound nutritional practice on the one hand directly affects the manner in which policy pronouncements in adjacent domains are made. This section of the paper deals with the effects of nutritional science in the administrative definitions of poverty, calculation of minimum wages, agricultural policy and the nutritional supplementation schemes.

The poverty line

The decades between the 1950s and 1970s saw a group of committed, well-meaning administrators/intellectuals/scientists (almost invariably upper-class and upper-caste liberal) who saw it as their calling to solve the country's problems. It would not be an exaggeration to say that the trajectory of development in India was determined by the intellectual hegemony and persuasive power of this group. Trained in the best western universities, they wielded the power of their disciplines to offer solutions to address the country's problems. Whether it was C Gopalan, V M Dandekar, Nilakanth Rath, or M S Swaminathan, among many others, they looked for simple, upscalegable formulations at almost a laboratory level that could be applied across the nation. So a thesis like 'adequate calories are the solution to the country's food problem' held an inherent appeal to both scientists and administrators, and of course bred a whole class of large-scale single-grain farmers (1). This was despite the fact that the foods eaten across the length and breadth of India consisted of vegetables, fruit, greens, wild berries, roots, tubers and leaves, mushrooms, eggs, lamb, pork, beef, birds, insects, fish, frog, small jungle animals like rabbits, snails and tortoises and many such sources. For purposes of calculations, calories sufficed. The focus on calories (and by reduction, on vegetarianism) also reflected the fact that they had no experience or understanding of the quality of life and culture among the marginalised.

The '60s saw a crisis of agriculture, famine-like conditions and unmitigated poverty engulf most of India. The Ford Foundation commissioned a study on 'Poverty in India' in 1969-70 and asked V M Dandekar and Nilakanth Rath of the Indian School of Political Economy, Pune, to investigate the

phenomenon. The report (Dandekar and Rath, 1971) tries to throw light on a whole range of issues related to poverty such as land policy, labour-intensive technology, questions of equity, etc. The section 'Defining the Poor' proposes what is now famous as the poverty line. Even today the government uses the Dandekar-Rath calculation to classify people in the so-called BPL (below the poverty line) category and APL (above the poverty line) category.

In the '70s, the poverty line expenditure level was defined as that level of expenditure per capita per month, on all goods and services, of which the food component provided an energy intake of 2,400 calories per capita in rural areas and 2,100 calories per capita in urban areas. Since goods and services other than food were not defined or quantified in the poverty line calculation, a person would be considered above the poverty line even if 90% of his expenditure were on food alone. As Utsa Patnaik points out: "This is a very minimalistic definition of poverty since no norms are set for essential non-food items of spending such as on fuel for cooking and lighting, clothing, shelter, transport, medical care or education (Patnaik, 2006:10). According to Dandekar and Rath (1971:6), in 1960-61, an annual per capita consumer expenditure of Rs 170 was essential to give a diet adequate at least in respect of calories, and about one-third of the rural population lived on diets that were inadequate even in respect of calories. In the case of urban households, this figure was Rs 271, and nearly half the population lived on diets inadequate even in respect of calories. According to Patnaik, poverty line calculations in recent years have used the early expenditure figures, "simply adjusted upwards by using a price index while using an invariant 1973-74 consumption basket," (Patnaik, 2005). She argues that if calculations were done keeping in view the changed consumption necessities and constraints over the years, the percentage of people falling below the poverty line would be far higher.

Be that as it may, what we should note in this saga of the poverty line is that the calorie, which was meant to be one index among many of nutrition, acquires a life of its own, and is used for measuring and setting the social and economic standards of a nation.

Minimum Wages Act, 1948

Another ‘progressive’ development in post-independence India was the attempt to fix minimum wages ‘scientifically’. India was one of the few countries which acknowledged the need for minimum wages, but the procedures adopted bear the imprint of the kind of administrative thinking being discussed in this paper. Recall that all attempts at formulating diets, RDA and calorie recommendations were made for different kinds of work (sedentary, moderate and heavy). Different kinds of work were identified and the calorie cost computed (for example, carry loads, dig a well or climb stairs) and then multiplied by the number of minutes or hours for which that work was done. However, there was no way of knowing what damage was done to the body when people did heavy work and consumed only cereals for calories without other nutrients like vitamins, minerals from milk, eggs, vegetables and fruits. Only one parameter was known — the calorie cost of that work. There was no direct information on the diversity of foods needed for work. There was indirect information on the different aspects such as the amount of B-complex vitamins needed for 1,000 calories. Some of the studies were done on emaciated individuals. The calories needed for the underweight body to put on weight even as one carried out heavy work was nobody’s concern.

A Minimum Wages Act came into force in 1948, under which central and state governments were nominated as the appropriate agencies to 1) notify scheduled employment, and 2) fix/revise minimum wages. A Committee on Fair Wages was set up in 1948 to provide these agencies guidelines for wage structures. The work took over a decade. Their landmark recommendations set out the key concepts: *living wage*, *minimum wages* and *fair wage* besides setting out guidelines for wage fixation. Early discussions in these forums were not centred on food, much less on the concept of a balanced diet. The 1944 report (Aykroyd, 1944) came up for consideration in the 1950s.

However in 1957, the Indian Labour Conference rejected these recommendations for a balanced diet and accepted the simpler and seemingly more scientific recommendations based on calories alone. They suggested that the minimum wage should comprise the following:

- Three consumption units for one earner.
- Minimum food requirements of 2,700 calories per average Indian adult (now 2,400 calories).
- Clothing requirements of 72 yards per annum per family.
- Rent corresponding to the minimum area provided for under the government’s industrial housing scheme.
- Fuel, lighting and other miscellaneous items of expenditure to constitute 20% of the total minimum wages.

- Other parameters.

It took a trade union agitation leading to a litigation 40 years later to get a clause in the Supreme Court judgment reading, ‘children’s education, medical requirement, minimum recreation including festivals/ceremonies and provision for old age, marriage, etc, should further constitute 25% of the total minimum wage’ (Supreme Court of India in 1991 in the case of Raptakos Brett and Co vs its workmen).

Nutrition policy and agriculture

The emphasis on the RDA based on calories from cheap sources was one of the factors that fed into the large-scale investment in what is now called the Green Revolution in India. By the early-’60s, there was an ongoing collaboration between the National Institute of Nutrition and the Indian Council of Agricultural Research on the nutritive value of different varieties of foodgrain being studied for large-scale agriculture. M S Swaminathan, the noted agriculture scientist, had been inducted into the Nutrition Society of India (NSI) in 1967 and was privy to the discussion on nutrition problems, calories, RDA, cereals, etc. It would not be farfetched to surmise that the close relationship and collaborative efforts between agriculture and nutrition research were germane to Swaminathan’s work that led to the boost of high-input (of hybrid seeds, fertilisers and pesticides) cereal production that came to be called the Green Revolution.

Large-scale monoculture of rice and wheat in this strategy created the broad market conditions that limited the choice of purchasable food to cereals. By this time, food/cereal were being used as interchangeable terms in government discourse. Subsidised irrigation, fertilisers, pesticides and research for the large-scale production of cereals (rice and wheat), with financial and technical aid from the US, led to a more than doubling of the production of cereals from 98 million tonnes to over 230 million tonnes since the 1970s.

At about the same time, the public distribution system (PDS), designed for providing infrastructure for procuring, storing, transporting and distributing cheap/subsidised cereals to ward off hunger, had been set up throughout the country. Fixation of a procurement price and minimum support price by the government assured farmers some returns. The rice and wheat thus procured by the government were sold through the PDS network across the country. This subsidy and support for high-impact cereals production saw the decline of millets and even pulses in the follow-up to the Green Revolution. It is important to see that against such massive governmental support for cereal production and distribution, other dietary choices or strategies would have little chance to prove their economic viability.

It is my argument that this dietary monoculture that has

been fostered and inculcated as the single and only choice by government policy has been instrumental in producing undernutrition and, as its consequence, the catastrophic health profiles we see today.

Nutrition programmes

In response to the large-scale distress among the rural and urban poor in the 1960s and 1970s, the government set up PDS outlets (ration shops) in the mid-1960s to provide subsidised cereals to the population. By 1990, these ration shops had covered over 80% of the population, and a large number of people, especially the poor, began depending on grain supplied by PDS outlets which, since it was subsidised, was often cheaper than the millets they produced. Investigations reveal that availability of food/cereal at affordable rates meant that people had some cash left to buy oil, pulses, and other food from the market. Every time the PDS was withdrawn, or became non-functional, it created unrest in those regions. The hunger for cereals increased with a supply and marketing system that led to cereals becoming the principal source of calories, and gradually the only food available to a large majority. It is significant that in recent years, many political parties have ridden to power on the promise of 'two-rupee-per-kilo' rice in the PDS.

In addition, food-for-work programmes were set up from time to time during the lean season or during times of drought. Cereals formed a part of the wages at these work sites. In every such welfare measure, the use of cereals to the exclusion of other dietary choices has led to the inevitable sharpening of the health deficit borne by the populations that are targeted by them. This is not to argue that such measures must be eliminated, rather that the foods that are distributed to the poor must be chosen not as an act of minimal charity, but as an important input that strengthens the life and viability of the severely disadvantaged.

Supplementary Nutrition Programme (SNP) and ICDS

Supplementary programmes to augment nutrition were also started in the '60s. In addition to the PDS, the SNP actually provided cooked food to children. The extent of malnutrition had reached unacceptable levels of 60-80% among the poor, and especially among children. Scientists continued to argue that calorie deficiency was the major problem. The SNP was originally designed to be a cereal, pulse, oil and sugar mixture for children, but very soon a cereal-based 300-calorie food which provided 10 gm of protein (100 gm of any cereal provides 6-10 gm of protein anyway) began to be provided in these programmes. The idea was to use local foods (cereal/



Desmond Roberts

millet and pulses) for this programme. While it may be argued that nobody was aware at the time of the possible molecular damage caused by excess cereals, it is difficult to evade the manner in which scientists thought of implementing solutions for the poor that they under no circumstance would have accepted for themselves or for their own kind.

This food was distributed to pre-schoolers, especially in rural areas. It later included pregnant and lactating women. A large number of international agencies contributed supplies to the SNP. Cereals such as soya, corn, oil in different combinations were imported and fed to the children. This programme was later incorporated into the Integrated Child Development Services (ICDS) scheme in 1970 (the ICDS was an amalgamation of the SNP with education, health services, etc). Over time, the calculation of 300 calories per child resulted in the distribution of extremely poor quality broken wheat to children less than six years of age, in large parts of the country.

The programmes were kept alive only because of the huge network of government employees and contractors who made sure that ICDS money accrued to their businesses year after year. The programme was regarded officially as a failure. Reasons given were: the women did not care; the food was taken home and shared with siblings; the mother stopped giving the child other food turning ICDS food into a substitute, not a supplement.

It is not difficult to guess why the extent of malnutrition in children has stayed at over 50%. If the 300 calories had been derived from a variety of foods such as cereal, pulses, fat, milk, eggs, potatoes, fruits like bananas, nuts, oilseeds, communities would have some reason to make sure the programmes functioned. But cereal powders for which one had to take a child and stand in a queue did not attract mothers.

By the 1970s, it was also clear that advocating cereal diets would require countervailing 'short-term measures' in the form of nutrients such as Vitamin A and iron, folate, iodine, etc. Subsisting on cereals was naturally associated with large-scale anaemia (incidence of anaemia: 90% in pregnancy, 60-70% in children, and 50-60% in non-pregnant non-lactating women; even men were anaemic). The vicious cycle of anaemia with undernutrition in children and even adults cannot be addressed with either iron-fortified foods or iron tablets, or even kilograms of green leafy vegetables. It is known that a small amount of meat protein can help solve the problem of anaemia in a large number of cases, because meat proteins help absorb food iron. Vegetarian foods have high phytates, which inhibit iron absorption. There is also obviously a need for foods other than cereals for the poor such as milk, meat, eggs and fish, which have by now become illegitimate desires in the governmental perspective. With characteristic tunnel vision, public health measures addressed anaemia, which is not just a result of iron deficiency, but also due to deficiency of other nutrients such as protein, folic acid, B12, copper and many other nutrients, with a programme to distribute iron and folic acid to semi-starved pregnant women

(and giving a smaller dose to children) in 1970. Today, this tunnel vision manifests itself in proposals and strategies to fortify wheat and rice with iron.

Insistence on vegetarian sources of protein followed up with programmes that supplied cereals invited large-scale and multiple nutrient deficiencies among populations. The problem of calcium requirement was simply addressed: by reducing the requirement from 1 gm (Aykroyd, 1944) to 400 mg (Gopalan and Narsinga Rao, 1968). The argument was that milk was expensive, and there were no other 'cheap' foods which could provide calcium. In any case there were no 'biochemical' parameters that showed deficiency, and green leafy vegetables could always be eaten. But most importantly, the common practice of chewing betel leaves smeared with slaked lime would increase calcium intake (Gopalan and Narsinga Rao, 1968). By now, the short heights were perceived as 'normal'.

Again in the 1960s-1970s there were unacceptable levels of Vitamin A deficiency, manifesting as conjunctival xerosis, corneal ulcer and even blindness in children. It was suggested that massive oral doses of Vitamin A (in the form of drops) to children (2 lakh IU) once in six months would see us through this crisis.

By the 1990s, scientists have 'discovered' newer micronutrient deficiencies because of the cereal overload and virtual absence of any protective food in the diets of the poor. Technologies are now in place for the fortification of cereals (rice or wheat) with a range of micronutrients by the food and drug industry. Studies are also in place to push for multiple micronutrient fortification which include iron, zinc, iodine, Vitamin A, riboflavin, Vitamin B12, Vitamin D, etc.

Consequences

The nutrition and food policies of this country were set on this disastrous course in the '50s and '60s when 'vegetarian sources of protein are adequate' studies were followed by the 'myth of the protein gap' in the '60s, and the 300 calories for children in the SNP. These steps were taken on the basis of strong and authoritative arguments by scientists of repute. The fixation of minimum wages, the shamefully low poverty line datum and the BPL and APL categories have remained unchallenged. The PDS/Green Revolution/ food programmes further contributed to the problem because they dealt with only cereal. The molecular damage to the body when energy from cereals burns without the necessary nutrients such as vitamins and minerals is only now recognised. It is now known that excess cereal results in a particular kind of fat accumulation in Indians called triglyceride with abdominal obesity in men and women (Esmailzadeh, Mirmiran, Azizi, 2005; Merchant *et al*, 2007). This is associated with early onset of diabetes or of what is called the metabolic syndrome. At even normal weights Indians have a higher fat content in their bodies especially around the abdomen. The only way of avoiding this is to

increase muscle mass during childhood, and this means we must move away from the cereal trap.

Muscle mass

Many studies quoted above carried out in the '40s and '50s showed that children consuming milk grow tall as compared to children on rice diets. It is known that the only way to lay down more muscle mass is through consumption of milk or animal proteins such as flesh foods, meat extracts, eggs and perhaps some nuts in infancy and childhood (Rogers *et al*, 2006). Recent studies at the National Institute of Nutrition have confirmed the important role of milk proteins with abundant sources of nutrients like vitamins and minerals for increase in muscle mass, heights and weights of school children (Shatrugna *et al*, 2006).

Diabetes, blood pressure and cardiovascular diseases in Indians have been produced in epidemic proportions with the overemphasis on cereals in the diets of the poor. When short, lean children without adequate muscle mass put on weight as adults it is known that their weight increase happens due to fat increase (Kurpad, 2005; James, 2005). Some cynics even argue that short individuals should remain underweight if they have to escape these new diseases. It may be too late to reverse this body composition in our generation.

This article is excerpted from 'The Career of Hunger: Critical Reflections on the History of Nutrition Science and Policy', by Veena Shatrugna, in Towards a Critical Medical Practice: Reflections on the Dilemmas of Medical Culture Today, edited by Anand Zachariah, R Srivatsan and Susie Tharu on behalf of the CMC-Anveshi Collective, Hyderabad: Orient Blackswan; 2010. Reprinted with permission of the author and editors

Endnotes

1 In fact, the well-known mode of production debate in the '70s was precisely on the extent to which this new group of large farmers represented the emergence of a new capitalist class in India. See Alavi (1990) for an influential review

References

Alavi, H. 'India and the Colonial Mode of Production'. In *Agrarian Relations and Accumulation: The 'Mode of Production' Debate in India*, ed, U Patnaik (Bombay: Sameeksha Trust and OUP, 1990)

Aykroyd, W R. Report of the eleventh meeting of the Nutrition Advisory Committee of the Indian Research Fund Association held in New Delhi on March 27, 28, 1944

Aykroyd, W R. *The Nutritive Value of Indian Foods and the Planning of Satisfactory Diets*. Indian Research Fund Association, Health Bulletin No 23 (1937)

Aykroyd, W R and Krishnan, B G. 'The Effect of Skimmed Milk, Soya Bean, and Other Foods in Supplementing Typical Indian Diets'. *Ind Jour Med Res*, 24. 1937

Cathcart, E P and Murray, A M T. 1931. Quoted in Nelson, M 'The Distribution of Nutrient Intake Within Families'. *Brit J Nutr* 55. 1986, 267-77

Dandekar, V M and Rath, N. *Poverty in India*. Bombay: Krishna Raj for EPW, 1971

Esmailzadeh, A, Mirmiran, P, Azizi, F. 'Whole-grain Intake and the Prevalence of Hypertriglyceridemic Waist Phenotype in Tehranian Adults'. *Am J Clin Nutr* 81, No 1. 2005. 55-63

Ferro-Luzzi, A, Sette, S, Franklin, M, and James, W P T. 'A Simplified Approach to Assessing Adult Chronic Energy Deficiency'. *Eur J Clin Nutr* 46. 1992. 173-186

Food and Agriculture Organisation of the United Nations. Report of the 2nd Committee on Calorie Requirement. Rome, 1957

Gopalan, C. 'Some Recent Studies in Nutrition Research Laboratories, Hyderabad'. *Amer J Clin Nutr* 23 No 1. 1970. 35-51

Gopalan, C and Narsinga Rao, B S. 'Dietary Allowances for Indians' (Special Report Series No 60). Indian Council of Medical Research. 1968

Gopalan, C, Sastri B V R, and Balasubramanian, S C. *Nutritive Value of Indian Foods*. Hyderabad: National Institute of Nutrition, Indian Council of Medical Research, 1989

Indian Council of Medical Research. 'Recommended Dietary Intakes for Indians'. New Delhi: 1980

Indian Council of Medical Research, Special Report Series No 31, 'Milk Substitutes of Vegetable Origin'. New Delhi, 1955

Indian Council of Medical Research, 'Recommended Dietary Intakes for Indians'. 1980

James, W P T, Ferro-Luzzi, A and Waterlow, J C. 'Definition of Chronic Energy Deficiency in Adults. Report of Working Party of IDECG'. *Eur J Clin Nutr* 42. 1988, 969-981

James, W P T. 'The Policy Challenge Of Co-existing Undernutrition and Nutrition-Related Chronic Diseases'. *Maternal and Child Nutrition* 2005; 197-203

Kurpad, A V. 'Body Composition and BMI Criterion for Indians'. *NFI Bulletin* 26, No 4. 2005. 1-4

League of Nations Report on the Physiological Bases of Nutrition. 1936. H2PHC

Merchant, A T, Anand, S S, Kelemen, L E, Vuksan, V, Jacob, R, Davis, B, Teo, K, Yusuf, S (for the SHARE SHARE-AP Investigators). 'Carbohydrate Intake and HDL in a Multi-Ethnic Population'. *Am J Clin Nutr* 85. 2008. 225-230

Naidu, A N, Neela, J and Rao, N P. 'Maternal Body Mass Index and Birth Weight'. *Nutr News* 12, 1991. National Institute of Nutrition, Hyderabad

National Nutrition Monitoring Bureau Report 1977, National Institute of Nutrition (ICMR), Hyderabad

National Nutrition Monitoring Bureau, Report of Urban Survey-Slums 1993-94. National Institute of Nutrition (ICMR), Hyderabad

National Nutrition Monitoring Bureau, Report of Second Repeat Survey 1996-97. National Institute of Nutrition (ICMR), Hyderabad

National Nutrition Monitoring Bureau Report 2006, National Institute of Nutrition (ICMR), Hyderabad

Nutrition Research Laboratories. Annual Report. Hyderabad, 1958

Patnaik, U. 'How to Count the Poor Correctly Versus Illogical Official Procedures'. *Social Scientist* 33, No 7-8. 2005. 386-387

Patwardhan, V N. 'Dietary Allowances for Indians, Calories and Proteins'. Indian Council of Medical Research, Special Report Series No 35. New Delhi. 1960

Reddy, V, Shekar, M, Rao, P, Gillespie, S. 'A UN ACC/SCN Country Case Study: Supported by UNICEF'. *Nutrition in India*. 1992, 1-55

Rogers, I, Emmett, P, Gunnell, D, Holly, J, and the ALSPAC Study Team. 'Milk as Food for Growth? The Insulin-like Growth Factor Link'. *Publ Hlth Nutr* 9, No 3. 2006. 359-68

Shatrugna, V, Ammini, A C, Tandon, N, Goswami, R, Gupta, N, Bhatia, E, Bhatia, V, *et al*. 'Population-Based Reference Standards of Peak Bone Mineral Density of Indian Males and Females'. ICMR Multi-Centre Task Force Study, 1-34. New Delhi: ICMR, 2008

Shatrugna, V, *Women's Work And Its Impact On Child Health And Nutrition*, National Institute of Nutrition (ICMR) 1993. Hyderabad

Shatrugna, V, Balakrishna, N, and Krishnaswamy, K. 'Effect of Micronutrient Supplement on Health and Nutritional Status of School Children: Bone Health and Body Composition'. *Nutrition* 2006. S33-S39

Shetty, P S, James, W P T. 'Body Mass Index, A Measure of Chronic Energy Deficiency in Adults'. Rowett Research Institute Aberdeen, UK. Food and Agriculture Organisation of the United Nations. 1994

Someshwar Rao, K. Review of Nutrition Surveys. Carried out in India. Indian Council of Medical Research, Special Report Series No 56. 1961

Venkatachalam, P S, Srikantia, S G, Mehta, G, and Gopalan, C. 'Treatment of Nutritional Oedema Syndrome (Kwashiorkor) with Vegetable Protein Diets'. *Ind Jour Med Res* 44. 1956. 539-545

WHO Technical Report Series, 854. Physical status: The Use and Interpretation of Anthropometry. WHO. 1995

The writ of a compartmented government

The absence of inter-sectoral programmes covering the entire lifecycle of women and children in particular and requiring coordination between different ministries such as women and child development, health and family welfare, and human resource development is the reason why, at the start of the Twelfth Five-Year Plan period (2012-17), the fundamental causes of malnutrition in India remain as they were during the First Five-Year Plan

RAHUL GOSWAMI

FOR AT LEAST the last two Five-Year Plan periods (the Tenth and Eleventh, 2002-07 and 2007-12), nutritionists and food welfare practitioners in India have been advocating multi-sectoral approaches for first reducing, then extinguishing, malnutrition. As a community, their shared view has been that no single intervention can eradicate malnutrition — whether in the health or education sectors, whether by bolstering farm and rural livelihoods with employment guarantee programmes, or through supporting self-help groups and expanding rural credit.

Towards this primary recommendation, although the advice has been to develop, in step, a package of interventions that are widely inter-sectoral so as to address at least a majority of the causes, the Government of India at the central level has been disinterested. An inter-sectoral approach that is designed to work together from the start (rather than to find linkages halfway through a plan period, as has happened with the Eleventh Plan) has been argued for by administrators and academics, NGOs and programme evaluators. Far too many programmes — conceived of as ‘interventions’ by various line departments of the concerned ministries — have aimed at improving a single index, such as enrolment percentages of children within a school-going age-group, or meeting a goal in covering households in a region for sanitation. Apart from being a sink for public monies in the long-term — for, once the unitary objective is met the programme is wound up, the utilisation certificates are duly filed — they are a dreadfully inefficient way of using money.

That is why the direction taken by thinking on rural development over the last decade is that efforts in major sectors must be simultaneous so that the benefit of one intervention does not quickly diminish because another has been left incomplete, or has not been addressed at all. It is, in fact, to allow the combined benefits of spending on development to work that planning at the local level (the block or zilla if not the gram panchayat) with devolvement of powers to panchayats was encouraged by legislation and by financial support. That devolvement where labour and therefore income is concerned has been advanced, even if piecemeal and in a limited manner, by panchayats setting their work agendas for MGNREGA activity.

The large number of evaluations of the ICDS and midday meal programme, and the lessons learnt from them have, for the last two plan periods, pointed to the need for such programmes to cover the entire lifecycle of women and children. Only such an approach will create an immediate impact within one generation on the nutritional status of the three critical links of malnutrition: children, adolescent girls, and women. When this is the platform from which different ministries and their partners work, that is when the benefits will be sustainable enough to break the inter-generational cycle, and when these development gaps will not be transferred to the following generation.

This absence of coherence between the ministries involved — women and child development, health and family welfare, agriculture, food processing industries, food and consumer affairs, human resource development — is the reason why, at the start of the Twelfth Five-Year Plan period (2012-17), the fundamental causes of malnutrition in India remain as they were during the First Five-Year Plan. The inter-generational cycle is as prevalent now as it was then: low birth weight babies, underweight children, malnourished and anaemic adolescent girls and pregnant women.

The new Food Security Act has become a first step — although incomplete and with its scope diluted — to legalising what must be a universal entitlement to food and thereby helping break the inter-generational cycle which is marked most visibly by malnutrition. Yet the present provisions for basic entitlements fall short: the 35 kg of rice or wheat for a family in a month will cost that family Rs 3 per kg and is to sustain the family’s (typical) five members. At about 235 gm a day of cereal, a family member will be provided about 650 kcal, whereas the recommended dietary allowance ought to be no lower than 2,400 kcal. Will the balance come from cereals purchased outside the PDS and outside the food-based remedial programmes? At what cost? And what other much-needed expenses will they displace?

In its present form, the Government of India’s articulation of anti-poverty measures is at best a clumsy response to the prevention of starvation.

Commodifying malnutrition

Government is abdicating its responsibility to guarantee the food and health rights of its people by entering into partnerships with the commercial sector. Corporations are only too happy to capitalise on malnutrition by supplying pre-mixed food packets to anganwadis instead of hot cooked meals, trumpeting their social responsibility even as they create markets for their fortified foods

RADHA HOLLA

WHEN THE DRAFT APPROACH PAPER for the Twelfth Five-Year Plan 2012-17 was released, Sachin Jain, a journalist-activist with the Right to Food Campaign, pointed out that the document contained the words *dignity, hunger, equality, human rights, and exclusion* zero times: in contrast to this, the word *PPP* (public private partnership) was used 45 times, *market* 67 times and *growth* 279 times. While the Draft Approach Paper did not mention PPP or market in the section related to children's nutrition and development, these have become keywords in commodifying malnutrition.

Today malnutrition in India, especially among children, has reached unprecedented levels. Studies and reports from across the country link this to inadequate feeding practices, brought about by ignorance about nutrition, lack of access to potable water and sanitation, destruction of livelihoods, increase in poverty which in turn leads to lack of access to adequate amounts of food, changing cropping patterns leading to reduced diversity of food, astronomical increases in the price of food, and aggressive promotion of unhealthy foods. However, rather than investing in structural changes that improve people's access to diverse foods, the primary response of the government appears to be to view malnutrition as an opportunity for the private sector to make profits.

The Supreme Court, in the public interest litigation *PUCL vs Union of India and Others, Writ Petition (Civil) 196 of 2001 (1)*, and in the context of meals for children under the Integrated Child Development Services (ICDS) scheme, passed orders that contractors should not be used to provide supplementary nutrition to the ICDS; village communities, mahila mandals and self-help groups should be given preference for preparing food to be served under the ICDS. As regards midday meals for schools, the Supreme Court ordered that women from marginalised communities be hired to cook the meals. These orders were primarily based on the fact that malnutrition is rarely recognised as a serious health condition by people and communities; that people and communities where malnutrition occurs have the biggest stake in the health of their children; that participating in the reduction of child malnutrition through cooking meals will help people understand the nutritional requirements of their children as well as give children a balanced meal based on local food diversity; and, in the case

of midday meals, cooking and eating meals together will help school children and communities not just improve their nutrition but also help to eradicate social discrimination based on caste, ethnicity and religion.

The Supreme Court orders are being ignored by government ministries and departments. The Ministry of Women and Child Development sought to bypass the order related to the ICDS by contracting out the processing of take-home rations (THR) for children under three years of age; it laid down conditionalities that could not be met by these bodies, which among others included requirements such as using the extrusion process for soya bean (the specific protein source laid down), and that processors have a turnover of at least Rs 1 crore annually. As a result, Andhra Pradesh, Karnataka and Maharashtra have outsourced production of THR to companies, sometimes even outside the state, which also manufacture pre-mixes that only need to be mixed with water and cooked to serve as hot cooked meals in anganwadis. In the case of hot cooked meals, contracts are being given to large non-governmental organisations like Naandi Foundation and ISKCON's Akshaya Patra, to supply schools with such meals, thereby ignoring the spirit of the order that relates to providing livelihoods for women from marginalised communities, and removing social discrimination.

The commodification of malnutrition can be done in several ways. Firstly, malnutrition can create markets for specific products — products that reduce iron deficiency (caused mainly by reduced consumption of iron-rich foods), products that provide high levels of energy and/or protein to reduce undernutrition (caused mainly by lack of food), and so on. Secondly, malnutrition can be used to greenwash corporations that are being targeted for abusing people's right to health, environment, livelihood, shelter, etc. Thirdly, corporations use 'nutrition education' to build brand loyalty for tomorrow.

The Global Alliance for Improved Nutrition (GAIN) has been a leader in using malnutrition to create markets for the food industry. The GAIN-Naandi Foundation-Britannia collaboration in 2007 that helped Britannia promote its fortified Tiger biscuits by distributing them to 150,000 school children in Hyderabad (2), has today resulted in the company fortifying 50% of the total volume of biscuits

manufactured, and selling 3.5 billion packs of them annually (3). Besides iron-fortified Tiger biscuits, according to the company, there is a biscuit brand that contains five vitamins and two minerals, another biscuit brand with 10 vitamins, minerals and proteins, a milk-based health drink with seven nutrients that are supposedly good for the brain, and bread with 10 vitamins and minerals added (4). Incidentally, when the project was launched, GAIN's chairman was the chief of Danone, then a partner of Britannia and a baby food company that is a major violator of the International Code of Marketing of Breastmilk Substitutes.

GAIN, along with its partners Unicef, Micronutrient Initiative, and others, has also been instrumental in getting several states to shift from using paediatric drops for iron supplementation, to Sprinkles, with technical assistance from H J Heinz; while the supplement is currently being produced on a 'cost recovery' basis, when commercial production is introduced, Heinz will be offered the 'right of first refusal' to develop, manufacture and market the product commercially.

The most vivid example of the commodification of malnutrition for greenwash is the case of Vedanta Resources plc. The giant mining corporation has taken over the running of over 3,000 anganwadi centres in Orissa and Rajasthan, of which approximately half are in the Kalahandi and Rayagada districts of Orissa, catering to over 75,000 children below five years of age (5). Vedanta has been the target of national and international protests for attempting to take over the natural resources of the tribal people of these districts, as well as in Chhattisgarh (6). The London-based owner of Vedanta, Anil Agarwal, is worth 4.1 billion pounds and is currently the tenth richest person in Britain. His personal wealth has grown even in the recession, by 583%. Vedanta and Agarwal have been accused of "corruption, fraud, forgery, manipulation of share prices, and insider trading," according to Norway's Council of Ethics. More recently, massive publicity of Vedanta's crimes forced the British government to criticise it for not having a human rights policy (7). Vedanta is running the anganwadis in Orissa and Rajasthan as a PPP.

In yet another clear instance of greenwash, Nestle, the leading violator of the International Code of Marketing of Breastmilk Substitutes (8) globally, has initiated a programme called Creating Shared Value, which it describes as "a fundamental part of Nestle's way of doing business that focuses on specific areas of the company's core business activities — namely water, nutrition and rural development — where value can best be created both for society and shareholders" (9). An example of its work in this area is its partnership with the Fair Labour Association to investigate whether children are working on cocoa farms supplying to their factories. Nestle's Healthy Kids Programme, implemented in every country where the company operates directly, is designed to raise nutrition, health and wellness awareness among primary school children. It includes nutrition education.

For corporations like Nestle, 'raising nutrition awareness' is a means of using the public education system to create brand loyalty for the future. The company entered into PPPs with four agricultural universities in India to take up nutrition education programmes for adolescent girls in government schools. This is in keeping with the company's global policy articulated in London at the Creating Shared Value Forum on May 27, 2010, to reach about 5 million children with a programme "to educate teenage girls on good nutrition before they get married and become pregnant, because that's where we think we have to start, really — before the woman even becomes pregnant" (10).

The Alliance Against Conflict of Interest, an informal network of food rights and health activists, medical professionals and lawyers, protested the MoUs between Nestle and Indian public sector universities, calling it particularly reprehensible as "Nestle is facing a criminal case in India for violation of the Infant Milk Substitutes, Feeding Bottles and Infant Foods (Regulation of Production, Supply and Distribution) Act, 1992 as amended in 2003 (IMS Act)". (11)

PPPs in nutrition with the commercial, for-profit sector highlight the government's abdication of responsibility to ensure the food and health rights of its people. As Urban Jonsson, a former chief of nutrition at Unicef, speaking about Nestle's PPPs in Africa, puts it: "The business of Nestle is to make money selling processed foods, notably infant formula, weaning products, and products for young children. It is absurd that they should now be acting as if they are in the business of saving Africa. Public health is the responsibility of the public sector, including the UN system." (12)

Policymaking in health and nutrition is today heavily influenced by the private for-profit sector. Ex-bureaucrats join the corporate sector or their lobbying bodies immediately after retirement on the one hand, and on the other hand, representatives of the private sector sit on government regulatory bodies. Examples include:

- Naresh Dayal, ex-secretary, Ministry of Health and Family Welfare, who retired on September 30, 2009, and soon after joined GlaxoSmithKline Consumer Healthcare as a non-official director (13).
- Dr Veena Rao, former secretary to the government, and Dr Kamala Krishnaswamy, former director, National Institute of Nutrition, are on the board of Britannia (14).
- Dr B Sesikaran (Director, National Institute of Nutrition) and Dr V Prakash (Director, Central Food Technological Research Institute) are on the board of trustees of the International Life Sciences Institute, an industry lobbying body whose members include corporations like Nestle, Pepsico, Coca-Cola, Monsanto, Britannia and others (15).
- Vinita Bali, CEO of Britannia, is on the board of GAIN, whose Business Alliance serves as a platform where

companies can network and share market-based solutions to tackling malnutrition worldwide (16).

- Nestle's tie-up with agriculture universities to provide nutrition education to adolescent girls, Pepsico's tie-up with schools to impart education on healthy living and nutrition to students.
- Food manufacturing companies on scientific panels to evaluate research and to set food standards (for example, Nestle, Hindustan Lever, Coca-Cola, Pepsico, ITC on scientific panels of FSSAI [17]); food manufacturers, pesticide manufacturers included as members of the national delegation at international bodies such as CODEX ALIMENTARIUS that set standards for foods.

When the state does not carry out its duty, it can be called to account through tools such as PILs and RTIs. The Supreme Court orders in the Right to Food Campaign's PIL are examples of how these tools can be used. However, in the case of PPPs, this is not easy. The answer to an RTI application to Punjab Agriculture University on its MoU with Nestle to provide nutrition education to school children said that the MoU could not be disclosed as it contained information of a commercial nature. This is also the view of the deputy chairperson of the Planning Commission who, reacting to Chief Information Commissioner Satyananda Mishra's letter asking for PPP documents to be made public, said: "Right to information is not right to information of private companies. It is right to information on public authorities." (18) This view blatantly ignores the fact that public money is being transferred to a private corporation to create markets and earn profits through PPPs which, in the case of the Nestle-PAU PPP, allows Nestle to use the public education system to strengthen its brand image, and be paid public money to do this.

The right to life, enshrined in Article 21 as a fundamental right, has been extended to cover the right to live with human dignity. In *Bandhua Mukti Morcha v Union of India*, Justice Bhagwati, referring to Francis Coralie Mullin v Administrator, Union Territory of Delhi, stated:

It is the fundamental right of everyone in this country, assured under the interpretation given to Article 21 by this court in Francis Mullin's case, to live with human dignity, free from exploitation. This right to live with human dignity ... must include protection of the health and strength of workers, men and women, and of the tender age of children against abuse, opportunities and facilities for children to develop in a healthy manner and in conditions of freedom and dignity, educational facilities, just and humane conditions of work, etc. These are the minimum requirements which must exist in order to enable a person to live with human dignity, and no state neither the central government nor any state government has the right to take any action which will deprive a person of the enjoyment of these basic essentials.

The existence of malnutrition is an indication of the violation of the right to life, the most basic of all human rights. The state has a responsibility to ensure that no man, woman or child in India suffers from malnutrition. It cannot abdicate this responsibility to the for-profit sector.

Radha Holla is the Campaign Coordinator for International Baby Food Action Network and the Breastfeeding Promotion Network of India. She has been working in the areas of environment, health and nutrition, and gender for over 35 years

Endnotes

1 The campaign began with a writ petition submitted to the Supreme Court in April 2001 by People's Union for Civil Liberties, Rajasthan. Briefly, the petition demands that the country's gigantic food stocks be used without delay to protect people from hunger and starvation. This petition led to a prolonged public interest litigation (PUCL vs Union of India and Others, Writ Petition (Civil) 196 of 2001). Supreme Court hearings have been held at regular intervals, and significant "interim orders" have been issued from time to time

2 <http://www.britannia.co.in/bnf/bbeim.html> (accessed on January 7, 2012)

3 Britannia Industries Ltd, Health and Nutrition Initiatives. <http://www.britannia.co.in/bnf/media/britannia-in-health-nutrition.pdf> (accessed on January 7, 2012)

4 *Ibid*

5 Vedanta Resources plc, Annual Report 2011, p 23; 'Vedanta Bal Chetna Project expanded in Rayagada', March 18, 2011. <http://orissadiary.com/Rayagarda/ShowDistrictNews.asp?id=25346> (accessed January 5, 2012)

6 'Vedanta coalmine proposal fuels villagers' displacement fears', *The Hindu*, February 1, 2011. <http://www.hindu.com/2011/02/01/stories/2011020164930600.htm> (accessed January 3, 2011)

7 <http://www.countercurrents.org/fvd230710.htm> (accessed January 7, 2012)

8 Recognising that formula milk was a major cause of malnutrition, disease and death among infants, and that formula milk manufacturers were influencing infant feeding practices through aggressive advertising and marketing tactics, WHO and Unicef developed the International Code for Marketing of Breastmilk Substitutes in 1981. The code restricts manufacturers of breastmilk substitutes from promoting their products for infants under six months of age; subsequent World Health Assembly resolutions have restricted the inappropriate promotion of baby milks and foods for children under two years of age. In India, the code has been legislated as the Indian Milk Substitutes, Feeding Bottles and Infant Foods (Regulation of Production, Supply and Distribution) Act, 1992, and amended in the 2003 Act, commonly known as the IMS Act; this Act prevents baby food manufacturers from using the health system to promote their products, besides preventing other forms of promotion

9 <http://www.nestle.com/CSV/Pages/CSV.aspx>

10 <http://info.babymilkaction.org/update/update43page13> (accessed October 18, 2011)

11 <http://www.aaci-india.org/doc/AACI-Letter.pdf>

12 <http://info.babymilkaction.org/update/update43page13>

13 http://hotnews.com/India_A_Democracy_on_the_Road_to_Kleptocracy_by_Piyush_Pant_020311006.htm (accessed April 8, 2011)

14 <http://www.britannia.co.in/bnf/bnf-board.html>

15 <http://ilsa-india.org/about-ilsa-india/board-of-trustees.htm>

16 <http://www.gainhealth.org/partnerships>

17 Because of the evident conflict of interest, in March 2011 the Supreme Court ordered that the scientific panels of FSSAI be disbanded and new ones, with independent scientists, be set up; however it is not clear from the information on the FSSAI website whether these independent scientists have recent connections with industry

18 'Pvt cos outside RTI purview: Planning Commission', *Times of India*, March 5, 2011

Plumpy Nut or indigenous foods?

Imported ready-to-use therapeutic foods such as Plumpy Nut are being pushed to supplant locally prepared indigenous foods in the treatment of severe acute malnutrition, ignoring the multiple causes of malnutrition and destroying the diversity of potential solutions based on locally available foods

VANDANA PRASAD
for Working
Group for Children
Under 6

GLOBALLY, nearly 20 million children under 5 suffer from severe acute malnutrition (SAM), a condition which contributes to 1 million child deaths annually. In India, 48% of children under 5 years of age are stunted and 43% are underweight; almost 8 million suffer from SAM.

Malnutrition is not a new problem in India, nor is SAM. Several hospitals and non-government organisations are engaged in community-based management of malnutrition using locally produced/procured and locally processed foods along with intensive nutrition education. These programmes enable parents to meet the nutritional requirements of their children with foods that are available at low cost. The Supreme Court of India has also directed the government to universalise the Integrated Child Development Services

scheme and provide one hot cooked meal to children under 6 years of age, to supplement their nutrition.

The blame for the increasing number of severely malnourished children can be laid at the door of policies that have destroyed poor people's access to food. Nonetheless, there is urgent need to ensure that these children do not die; that they *recover* and *maintain* a healthy nutritional status. The current thinking — that a centrally produced and processed ready-to-use therapeutic food (RUTF) should supplant the locally prepared indigenous foods in treatment of SAM — ignores the multiple causes of malnutrition and destroys the diversity of potential solutions based on locally available foods. This position paper has been drafted by Dr Vandana Prasad, Radha Holla and

Sudharak Olwe



Name of mix	Composition and calorific value	Developed by	Locally prepared by	State
Davangere Mix	Laddus made of equal quantities of groundnut, roasted Bengal gram, jaggery and ragi. 100 gm gives 400 calories and 15 gm of protein	Medical College, Davangere	Women's groups	Karnataka
Shakti Nutrimix	Rice, wheat, whole gram (chana), groundnut, sugar, salt, cardamom, black pepper, vitamins and minerals. Each 100 gm of mix provides 10.4 gm of protein, 5.3 gm of fat, and 402 calories	Shibpur People's Care Organisation, 23/1 Baze Shibpur Road, Shibpur, Howrah/Village and PO Tapan, Dt Dakshin Dinajpur	Women's groups	West Bengal
Nutrimix	Wheat (400 gm), rice (400 gm), gram (75 gm), moong (75 gm), groundnut (50 gm); sprouted, dried, roasted and powdered. Two heaped spoons in a glass of water or milk with sugar twice a day	Development Research Communication and Service Centre, 58 A, Dharmotala Road Bosepur, Kasba Kolkata 700 042	Women's groups	West Bengal
Nutrimix	Wheat/rice and Bengal gram/moong in ratio of 4:1. Used for treating SAM, for preparing F 75, F 100, as starter and catch-up foods. Each 100 gm cooked provides 120-150 kilocalories and protein 2-3 gm. Can be made more energy-dense by adding seasonal fruits, and micronutrient-rich by adding electrolyte mineral solution	CINI (Child In Need Institute), Kolkata	Women's groups	West Bengal
LAPSI	Green millet, peanut, jaggery. Successfully used for quick recovery from SAM	Bharat Agro Industries Foundation and CAPART		Maharashtra
SAT Mix	Roasted and ground rice, wheat, black gram and sugar in ratio 1:1:1:2. Provides 380 calories per 100 gm	Sree Avittom Thirunal Hospital		Kerala
MIX		National Institute of Nutrition, Hyderabad		Andhra Pradesh
HCCM (high-calorie cereal milk)		Christian Medical College, Vellore		Tamil Nadu
Sattu maavu (Anuradha K. Rajivan, 'History of Direct Nutrition Programmes in Tamil Nadu', www.righttofoodindia.org/data/anuradha.pdf)	Wheat flour 42%, maize flour 10%, malted ragi flour 5%, Bengal gram flour 12%, jaggery 30%, vitamin pre-mix 1%. 100 gm provides protein 9-10% and calories 360	Nutrition Monitoring Programme (state programme)		Tamil Nadu

NB: Shelf life is not a necessary condition for these locally produced ready-to-eat foods as they are prepared in quantities needed by local women's groups under the supervision of the respective hospital or NGO

Dr Arun Gupta, members of the Working Group for Children Under 6 — a joint effort of Jan Swasthya Abhiyan (People's Health Movement-India) and the Right to Food Campaign which has been advocating for the last three years with the Indian government for decentralised and community-based strategies to combat and prevent malnutrition in children (1).

How should India approach the management of SAM? A position paper

The number of children currently suffering from malnutrition in India is an extremely serious matter of national shame and distress. Not only has this situation persisted for far too long, it remains intractable even during the recent phase of rapid economic growth. Of late, there has been intense debate and discussion on how best to intervene to make a change that is both substantial and rapid, and various groups of experts have presented strategies to policymakers to prevent malnutrition and treat its most severe forms.

This position paper responds to a particular strategy that has been introduced at the state level without due process of discussion on its repercussions and implications: namely, the

use of imported ready-to-use therapeutic foods (henceforth RUTF) for the management of SAM.

The current situation

1 A product called Plumpy Nut has been imported for distribution to children with SAM in several states, including Madhya Pradesh, Jharkhand, Orissa, Bihar and Maharashtra under the aegis of Unicef and through the mechanism of nutrition rehabilitation centres (NRCs). There is a proposal to make it the 'prescribed treatment' for SAM.

2 This product is imported from a company called Nutriset in France. If produced in India, it would cost approximately US\$ 40 or approximately Rs 2,000 per child per treatment (2).

3 Plumpy Nut efficacy has been demonstrated in other countries such as Malawi, Niger, Ethiopia, D R Congo and Mozambique in conditions of disaster and famine.

4 Studies demonstrating the efficacy of Plumpy Nut have been primarily conducted in disaster situations, where other community-based treatments for SAM have not existed, for

example refugee camps, famines, etc. There are few studies comparing the impact of Plumpy Nut with other specific community-based treatments for SAM developed from local indigenous foods.

In juxtaposition of these facts

1 The guidelines for community and home-based treatment of SAM formulated by a large group of experts and supported by the Indian Academy of Paediatrics recommends the use of home-based food (modified from the family pot). It specifically warns that commercially available international RUTF may not be suitable, acceptable, cost-effective and sustainable (3).

2 Many locally produced/produced foods that are culturally acceptable and relatively low-cost have been used for SAM in India for many decades by reliable academic and medical institutions as well as by non-governmental groups. The accompanying table gives details of some of these mixes.

3 Several experiments are ongoing, using modified family foods to treat SAM. Jodhpur Medical College has been using a mix of energy-dense khichdi, milk, arar, dal, sugar, fruit, fruit juice and egg to treat SAM both in institutional and home settings. This is in the process of analysis and documentation. In Tamil Nadu, the Direct Nutrition Programme gives a mix of 80 gm of rice, 10 gm of dal, 2 gm of oil, 50 gm of vegetables and condiments at a total cost of Rs 1.07 to each child between two and four years of age. This provides 358.2 calories and 8.2 gm of protein per child (4). The sattu maavu listed in the table is given as a complementary food for children between six and 36 months of age, and pregnant and lactating women, and costs approximately Rs 15 per kg. Other experiments by NGOs such as Mobile Creches have used common foods including eggs, soya products and milk for demonstrable impact at a cost of Rs 8 per child per day for full day-care nutritional facilities (5).

4 These foods have been completely ignored in the haste to introduce Plumpy Nut, which, though an efficacious formula, seriously disturbs the concept of self-reliance in food security and creates unnecessary dependence on a product upon which families and communities have little control.

5 The alternative foods listed above have many additional advantages.

- They promote local agricultural practices as they use millets and locally available foods.
- They promote local livelihoods amongst the very families that may be harbouring children with SAM in a milieu of general poverty and food insecurity, thus conferring more than food supplementation — an opportunity to raise economic status. They may use the agency of existing women’s groups and SHGs as well as small-scale industry.
- By being a much more decentralised process, they allow greater community participation and control.

Evidently, though there are few formal studies documenting their efficacy there are some, along with plenty of anecdotal evidence of success. The very fact that these pre-existing attempts have not been properly studied, analysed and documented by research and expert bodies on nutrition is a matter of concern. It is hard to explain why it has been permitted for a somewhat alien product to be introduced on such a large scale without investigating the relative merits and demerits of the ready-to-use foods that we have been using in such prestigious institutes as mentioned above. It would not have been either difficult or time-consuming to study these further for a few months before arriving at a suitable strategy for SAM that includes supplementary food.

Perhaps it leads us to our longstanding recommendation and demand: that the country needs to develop a well-discussed and debated policy on child nutrition rather than having to combat each contingency as it arises. This policy necessarily needs to keep in mind that supplementary nutrition is one, though important, part of the multi-pronged strategy to bring about overall food security for children and families, and the best supplementary nutrition would be one that promotes self-reliance, decentralisation, community participation and is low-cost and culturally acceptable. An imported or centrally prepared very expensive food that displaces other locally producible options can hardly hope to fulfil these criteria and should be abandoned in favour of the ‘right’ product. Adequate thought, planning and research should go into developing such policies rather than succumbing to various pressures in haste and allowing unsustainable processes that may prove difficult to reverse and will cause long-term harm to the very communities and families whose children we aim to ‘treat’. We also need to continuously remind ourselves of the comprehensive set of strategies that will bring about the ultimate goal of child health, nutrition and wellbeing through services of general care, health and nutrition in an environment of overall food, economic and social security.

Dr Vandana Prasad is a community paediatrician and the Founding Secretary and National Convenor of the Public Health Resource Network. Her special areas of interest are child health and nutrition. She has been closely associated with many national health movements such as the People’s Health Movement and the Right to Food Campaign. This position paper for the Working Group for Children Under 6 was first published in the journal Social Medicine (Vol 4, No 1, March 2009)

Endnotes

1 ‘Working Group for Children Under 6, Strategies For Children Under 6’, special article, *Economic and Political Weekly*, December 29, 2007

2 1 sachet is 92 gm. Treatment for SAM requires 90 sachets per child of 10 kg. (Nutriset site: http://www.nutriset.fr/index.php?option=com_content&task=view&id=30&Itemid=28). Each kilo of RUTF costs approximately US\$ 4. (Powerpoint presentation by Steve Jarrett, Unicef, September 20, 2008: ‘Ready-to-Use Therapeutic Foods (RUTF): Addressing the Situation of Children With Severe Acute Malnutrition — Production in India’)

3 Gupta, P, Kapil, U, *et al*, ‘National Workshop on Development of Guidelines for Effective Home-based Care and Treatment of Children Suffering from Severe Acute Malnutrition’, *Indian Paediatrics*, Vol 43, February 17, 2006

4 *Ibid*

5 Working paper Mobile Creches, ‘Impact of Strategies for Children Under 6 on Malnutrition; Evidence from Two Microstudies’, 2008

Micro, bio and packaged: How India's nutrition mix is being reshaped

Crop and food multinationals, ably assisted by government, are using the 'reduce hidden hunger' platform to push hunger-busting technologies that best suit them — including biofortification of crops, the use of supplementation, and of commercial fortification of prepared and processed foods

RAHUL GOSWAMI

IN JUNE 2011, the Ministry of Women and Child Development presented a 'situation analysis' to the Planning Commission's Working Group on Nutrition. Focusing on children, women and adolescent girls, the assessment was worse than grim. Preparing for the Twelfth Five-Year Plan, with the Eleventh drawing to a close, the assessment showed that India's women, girls and children benefit little from the so-called development gains of 55 years of planned development.

This is the view of the ministry, unfiltered by any political consideration, untreated by any development ideology:

At a paise per calorie, the biscuit as food staple



	Tiger Glucose	Monaco	Milk Bikis	Parle-G
Weight (gm)	79	51.8	60	84.6
Price (Rs)	5.00	5.00	5.00	5.00
Wheat flour %	66	-	56	66.5
Nutrition per 100 gm				
Carbohydrates	73	66.5	74	78.2
of which sugar	25	7.3	28	25.4
Protein	7	7.3	7.5	6.5
Fat	13.3	23.2	13.5	12.5
Energy (kcal)	440	504	447	451

Source: Manufacturers' packet labels

Children: Every fifth child in the world lives in India; 22% of babies are born with a low birth weight; 50 out of 1,000 live births do not complete their first year of life; 42.5% of children in the 0-5 age-group are underweight; 79% of children in the 6-35 months age-group are anaemic.

Women: More than a third (36%) of women have a BMI (body mass index) below 18.5; among women who are thin, 44% are moderately or severely thin; 36% of women suffer from chronic energy deficiencies; 56.2% of women are anaemic; women suffer from a dual burden of malnutrition with nearly half of them being either too thin or overweight; the percentage of ever-married women in the 15-49 years age-group who are overweight or obese increased from 11% in NFHS-2 (National Family Health Survey) to 15% in NFHS-3.

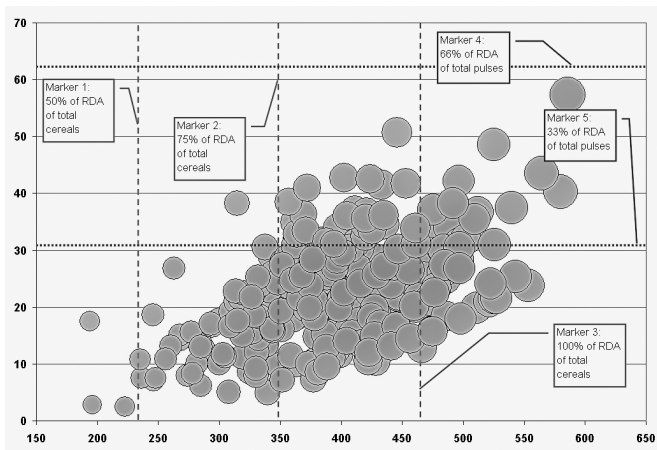
Adolescent girls: In the 11-18 years age-group, there are approximately 83.2 million adolescent girls (about 16.7% of the country's female population); 33% of adolescent girls are undernourished; 56% of adolescent girls are anaemic;



30% of women gave their first births before they were 18 years old, contributing to a high maternal mortality rate and anaemia; the drop-out rate for adolescent girls (Classes I to X) is 63.5%; in the 15-19 age-group, almost half the total adolescent girls are undernourished.

Re-emphasised in mid-2011 but shunted into the background by misleading statements from the central government about the deceleration of food inflation, the impact of malnutrition and undernutrition on millions of Indians — rural and urban poor, but also including sections of the urban middle class — is still not treated as a continuing national emergency (see box ‘The ICDS as 36 years of proof that PPP is not an answer’).

Rural RDA intake by decile classes



The chart above plots the consumption of total cereals and total pulses (and pulses products) recorded by the NSS 61st Round (2004-05) from rural households. This set takes the rural average quantity of consumption of cereals and pulses per person for each class of monthly per capita expenditure (MPCE) (there are 12).

The ‘y’ (vertical) scale is pulses (gm/day) and the ‘x’ (horizontal) scale is cereals (gm/day). Each circle in the plot area represents an MPCE expenditure class in a state, scaled in size to represent consumption of cereals and pulses combined.

The dashed and dotted lines sectioning the plot show consumption percentage markers based on a recommended daily allowance (RDA) provided by the National Institute of Nutrition and adapted here as an average of male and female, for moderate and heavy activity. The RDA line markers are: 100% of total cereals — 465 gm/day; 75% of total cereals — 349 gm/day; 50% of total cereals — 233 gm/day; 66% of total pulses — 62 gm/day; and 33% of total pulses — 31 gm/day.

In the quadrant that is less than 75% of the total cereals RDA and less than 33% of the total pulses RDA, the income categories represented are: Andhra Pradesh, 2; Assam,

1; Bihar, 1; Chhattisgarh, 1; Gujarat, 9; Haryana, 9; Himachal Pradesh, 4; Jammu and Kashmir, 2; Jharkhand, 1; Karnataka, 4; Kerala, 11; Madhya Pradesh, 1; Maharashtra, 5; Punjab, 10; Rajasthan, 1; Tamil Nadu, 4; Uttar Pradesh, 1; Uttarakhand, 3; and West Bengal, 1.

The background against which the Prime Minister’s National Council on India’s Nutrition Challenges was formed in 2008 has not changed (it has representation from more than a dozen ministries and its key recommendations include the creation of new institutional arrangements that are supposed to encourage different sectors to work together) (see Table 1). Yet, like seed, whose public legacy in India of use, distribution, breeding and exchange is being reshaped and redirected to conform to the Green Revolution 2 model, so it is with nutrition.

Now, like seed, it is agricultural biotechnology and privately directed crop research that determine cultivation options and food outcomes, and through them determine the nutritional choices and mix that hundreds of thousands of urban households take decisions about every day. This trend is supported by legislation which, on the one hand (as the Biotechnology Regulatory Authority of India, BRAI, does), destroys the idea and practice of traditional cultivators’ cooperation on breeding, and on the other is converting India’s National Agricultural Research System (NARS) into a science and technology provider that will ensure what the central government now calls demand-driven agriculture, and

The industrialisation of agriculture will proceed at the pace desired by the processed and packaged food industry and by food retail. India’s food industry will increasingly move into the food and agricultural policy space once occupied by academia and research institutions, which will now abase themselves before the attractive private and ‘foundation’ funding sources available for narrowcast research agendas

Table 1: Nutrition, health, women and child development — the government view

Target group	Schemes	Expansion
Pregnant and lactating mothers	ICDS, RCH-II, NRHM, JSY, Indira Gandhi Matritva Sahyog Yojana (IGMSY) — CMB Scheme	NRHM (2005-06), JSY (2006-07), ICDS (2008-09)
Children 0-3 years	ICDS, RCH-II, NRHM, ICPS, Rajiv Gandhi National Creche Scheme (RGNCs)	RGNCs (2005-06), ICDS (2008-09)
Children 3-6 years	ICDS, RCH-II, NRHM, ICPS, Rajiv Gandhi National Creche Scheme, Total Sanitation Campaign (TSC), National Rural Drinking Water Programme (NRDWP)	TSC (2008-09)
School-going children 6-14 years	Midday meals scheme (MDM), Sarva Shiksha Abhiyan (SSA), ICPS	SSA (2002/2005-06), MDM (2008-09)
Adolescent girls 11-18 years	Rajiv Gandhi Scheme for the Empowerment of Adolescent Girls (RGSEAG), Kishori Shakti Yojana, Total Sanitation Campaign (TSC), National Rural Drinking Water Programme (NRDWP), ICPS	NRDWP (2010), RGSEAG (2010-11)
Adults	MGNREGS, NRLM, Skill Development Mission, Women Welfare and Support Programme, Adult Literacy Programme, TPDS, AAY, Old and Infirm Persons Annapurna, Rashtriya Krishi Vikas Yojana, Food Security Mission, Safe Drinking Water and Sanitation Programmes, National Horticulture Mission, National Iodine Deficiency Disorders Control Programme (NIDDCP), Nutrition Education and Extension, Bharat Nirman, Rashtriya Swasthya Bima Yojana	NHM (2005-06), MGNREGS (2005-06), NRLM (2010-11), NIDDCP (1992), RSBY (2007), Bharat Nirman (2005)

Source: Presentation (June 2011) to the Working Group on Nutrition, Planning Commission, by Ministry of Women and Child Development, Government of India

which is designed to encourage the depopulation of Indian agriculture and by so doing steadily erode the cultural and agro-ecological underpinnings of our traditional household food baskets and their nutritional diversity (see Table 2).

The concerned central ministries — the Ministry of Agriculture, Ministry of Food Processing Industries, Ministry of Commerce — have during much of the Eleventh Plan period laid the foundation for this transformation. They have, with the uncritical aid of the Indian Council of Agricultural Research (ICAR), adopted the sloganeering of the international agricultural research consortia that work closely with food and crop multinationals and which drive research agendas along

Table 2: Balanced diet for adults — sedentary/moderate/heavy activity

Food category	Grams per day required by type of work					
	Sedentary		Moderate		Heavy	
	Man	Woman	Man	Woman	Man	Woman
Cereals and millets	375	270	450	330	600	480
Pulses	75	60	90	75	120	90
Milk and milk products (ml)	300	300	300	300	300	300
Roots and tubers	200	200	200	200	200	200
Green leafy vegetables	100	100	100	100	100	100
Other vegetables	200	200	200	200	200	200
Fruits	100	100	100	100	100	100
Sugar	20	20	30	30	55	45
Fat	25	20	30	25	40	30

Source: 'Dietary Guidelines For Indians, A Manual', National Institute of Nutrition (NIN), 2010

the lines required by the global food and retail industry.

Thus it is that in India, these ministries and their supporters (in industry and also in allied ancillaries) repeat a mendacious manifesto of food conversion: that Indians suffer from 'hidden hunger' or micronutrient malnutrition; that they do not get enough micronutrients required to lead healthy productive lives from the foods they eat; that the diets of our poor usually consist of very high amounts of staple foods (cereals and pulses) but few micronutrient-rich foods such as fruits, vegetables, and animal and fish products; and finally that biofortified foods which have been bred to have higher amounts of micronutrients can provide these needed vitamins and minerals. Biofortification is a process of breeding higher levels of micronutrients (especially zinc, iron, and Vitamin A) directly into key staple foods using either conventional breeding methods or biotechnology.

It is now apparent that the Rashtriya Krishi Vikas Yojana (RKVY), the national flagship programme under which the bulk of agricultural research is being implemented, will be exploited to advance in the states the message that nutrition and health gaps can be bridged through new agricultural practices. This is already the argument developed by the International Food Policy Research Institute (IFPRI, the policy advocacy and analysis centre of the Consultative Group on International Agricultural Research, the CGIAR) in India. In fact, the RKVY matrix of sectors, years and states show that technology-specific thrusts have been provided at different times in the last three years to recipient states — with no explanation available either from the central Ministry of Agriculture or the departments of agriculture of the receiving states as to the rationale for such interventions.

The ICDS as 36 years of proof that PPP is not an answer

Services provided by the Integrated Child Development Services (ICDS) include supplementary nutrition, non-formal education, immunisation, health check-ups, referral services, and nutrition and health education. These are provided at anganwadis located within the village itself. The (woman) anganwadi worker is the key functionary who, with a helper, is responsible for the population of an average village (about 1,000 people).

The anganwadi worker surveys all the families in the community and identifies children younger than six and pregnant and lactating women. Eligible individuals are given supplementary feeding support for 300 days per year. On average, the daily supplement is expected to provide 500 calories and 12-15 gm of protein to children, and 600 calories and 18-20 gm of protein to pregnant or lactating women. Children who are severely malnourished are given an additional 300 calories and 8-10 gm of protein on the basis of medical advice. The anganwadi worker also monitors and plots the growth of children who attend the anganwadi by weighing them periodically and plotting the data on weight-for-age growth cards. Additionally, she is entrusted with the responsibility of nutrition and health education of women aged 15-45 years.

Launched in 1975, the programme has gradually increased from 33 projects to 7,073 projects in 2009, catering to about 87 million beneficiaries through a network of about 1 million anganwadis. The allocation of funds for the scheme has steadily increased from Rs 2,600 crore in the Eighth Five-Year Plan (1992-97) to Rs 44,000 crore in the Eleventh Five-Year Plan (2007-12).

According to an assessment of the ICDS, 'Reproductive Health, and Child Health and Nutrition in India: Meeting the Challenge' (in *The Lancet*, January 22, 2011), the programme has not been able to achieve the necessary results despite three decades of existence. The assessment noted that results of studies have shown little or no association between the presence of an ICDS centre and the nutritional status of children.

The focus on children younger than three years is inadequate, thus missing the critical window of opportunity to avert avoidable undernutrition — a point often repeated especially by non-profit and civil society groups delivering midday meals. About 20% of children younger than six years live in areas that do not have an anganwadi centre (as the National Family Health Survey-3 has documented). Even in those areas that do, almost three-quarters of children did not receive any supplementary food from an anganwadi centre in the 12 months before the survey.

However, although the ICDS may not have succeeded in substantially reducing the burden of undernutrition, the presence of an anganwadi worker and a physical site for health and nutrition activities in villages and poor urban areas offers a great opportunity to improve nutritional status and provide healthcare services for mothers and children. — **RG**

Thus the conditions have carefully been created for the introduction of the idea that biofortification of staple crops in India must accelerate and be intensified. The realisation of the claimed potential of biofortified crops is now one of the core subjects in the ministries of agriculture, of food processing industries and within the NARS. Hence the orchestrated exhortations from India's food industry and its collaborators, the Indian administration and its NARS — that India must prioritise public research investment to ramp up the development of technologies and effective supply chains to increase the production and consumption of these nutrient-rich foods.

When that public research investment does not materialise — as it has been prevented from doing in the Tenth and Eleventh Plan periods — then the PPP advocates will strengthen their claim to both determining the course of the 'nutrition challenge' in India and simultaneously promise the delivery of the hunger-busting package of technologies. That is why the Britannia Nutrition Foundation has partnerships with the Global Alliance for Improved Nutrition (GAIN),

the Clinton Global Initiative, the World Bank Institute, the UN World Food Programme and the Naandi Foundation (Hyderabad-based, which is already engaged in centralised kitchens that provide midday meals, and whose 'HUNGAMA Report' on child malnutrition was released in January 2012 by Prime Minister Manmohan Singh).

For members of the Indian Biscuit Manufacturers Association and of the Federation of Biscuit Manufacturers of India, the combined potential from (a) the 'agriculture for nutrition and health' mission, advanced by the international agri-research consortia, and (b) the evolving mandate to tackle 'hidden hunger' in India through packaged food formulas, is enormous.

The biscuit industry in India is already very large, estimated to be Rs 12,600 crore in 2010-11, and has grown at over 14% per year for the last three years (compared with an annual average agricultural growth rate of less than 4%, as the Planning Commission bemoans). The industry leaders are Parle Products, Britannia and ITC. They are being joined by

Table 3: Recommended dietary allowances for Indians, including macronutrients and minerals

Group	Particulars	Body wt (kg)	Net energy		Visible fat gm/day	Calcium mg/day	Iron mg/day
			kcal/day	Protein gm/day			
Man	Sedentary work	60	2,320	60	25	600	17
	Moderate work		2,730		30		
	Heavy work		3,490		40		
Woman	Sedentary work	55	1,900	55	20	600	21
	Moderate work		2,230		25		
	Heavy work		2,850		30		
	Pregnant woman		.+350	82.2	30	1,200	35
	Lactation 0-6 months		.+600	77.9	30		25
	Lactation 6-12 months		.+520	70.2	30		
Infants	0-6 months	5.4	92 kcal/kg/day	1.16 gm/kg/day	-	500	.-
	6-12 months	8.4	80 kcal/kg/day	1.69 gm/kg/day	19	-	46 mcg/kg/day
Children	1-3 years	12.9	1,060	16.7	27	600	9
	4-6 years	18	1,350	20.1	25		13
	7-9 years	25.1	1,690	29.5	30		16
Boys	10-12 years	34.3	2,190	39.9	35	800	21
Girls	10-12 years	35	2,010	40.4	35		27
Boys	13-15 years	47.6	2,750	54.3	45		32
Girls	13-15 years	46.6	2,330	51.9	40		27
Boys	16-17 years	55.4	3,020	61.5	50		28
Girls	16-17 years	52.1	2,440	55.5	35		26

Source: 'Dietary Guidelines For Indians, A Manual', National Institute of Nutrition (NIN), 2010

multinationals including Kraft and Pepsico, Britain's United Biscuits, GlaxoSmithKline Consumer Healthcare and the French foods giant Danone.

For India's food industry, the intention is to use the 'reduce hidden hunger' platform provided by the central government and the agri-research system as part of a strategy that includes bringing about dietary diversification, the use of supplementation, and of commercial fortification of prepared and processed foods, also called 'ready-to-eat' or 'take-home rations' (see Table 3). Already, for the last three years, the registered 'mandis' (over 7,000) are being steadily linked to what is called the supply chain and thereby to the commodity markets. As this has happened, the cooperative legacy of agriculture in India has been slipping away. With it, nutritional independence is weakening, aided by the massive growth in retail foods in both urban and rural India.

Drafted by IFPRI and subscribed to by central planners and agricultural economists, there is now a call for a minimum of 15% of all RKVY and National Horticulture Mission (NHM) funds to be channelled towards the 'agriculture for health and nutrition' package of technologies. With state departments of agriculture being pressurised to fall into line, with extension systems being revived under corporate

banners and with new public private partnership (PPP)-led funding, state governments are being told that they must integrate nutrition security concerns into their planning, implementation, and monitoring.

The ICAR network of research institutions, supported by the Department of Agricultural Research and Education and a raft of new 'agripreneur' schemes, is strenuously advocating that RKVY, NHM, and other platforms "create nutrition-sensitive value chains". In this transformation, we will see the establishment of public private partnerships that will be called 'accelerating development' and 'encouraging innovation'. The industrialisation of agriculture will proceed at the pace desired by the processed and packaged food industry and by food retail. India's food industry will increasingly move into the food and agricultural policy space once occupied by academia and research institutions, which will now abase themselves before the attractive private and 'foundation' funding sources available for narrowcast research agendas. Nutrition will relate not to a wholesome thali but to a negotiated RDA set by a market oligopoly assisted by turncoat technologists. If unchecked, this will be the nature of nutrition in India from the Twelfth Plan onwards.

Universal malnutrition?

All children in India display a slower growth rate, but we look only at those that have ‘fallen’ below the cut-off and call the rest ‘normal’. Surely poverty and hunger cannot be the only cause of this near-universal malnutrition? Is malnutrition caused by not feeding our children enough dal, milk, eggs, meat and vegetables, in addition to cereals, in the first two years? Does that explain why cereal-based ICDS food supplements are ineffective in reducing malnutrition?

SRIDHAR
SRIKANTIAH

‘MALNUTRITION’ is a much-defined term even within the limited context of India. It stands for the numbers that determine national shame, as in India being home to more malnourished children than any other nation in the world. It connotes a range of nutrient deficiencies — such as iron, Vitamin A, iodine or zinc — which are known to be widely prevalent in India and in most developing economies. It describes and explains why South Asian adults are so much shorter than Scandinavians, for instance. It also includes the complex of excessive food intake and genetic predisposition that contributes to a disproportionate incidence of diabetes and coronary heart disease in the subcontinent. But for the purposes of this essay, ‘malnutrition’ means the phenomenon of children not growing quite as well as expected and becoming vulnerable to high death rates as infants and under-5s, or ending up as stunted adults.

One of the first instincts in tackling malnourished children is the ‘find them and fix them’ approach: design a programme that efficiently and accurately identifies the 50% of all children who are malnourished, and then proceed to make good the gap in nourishment. Programmes like the Integrated Child Development Services (ICDS) appear to have been conceived on the basis of this principle: weigh children monthly, identify those not growing well, and offer the most severely malnourished double the amount of food supplements that ‘normal’ children are provided. In addition, for good measure, identify children who fall sick and send them to the doctor for treatment. Ask almost any ICDS official and you are likely to be told that malnutrition is all a matter of poverty, and that the ICDS is supplying the food that children from poor families need.

This is not quite the truth. There are many fatal flaws in this logic, some of which are widely spoken of, others not. To understand these, it would help to begin with understanding how malnutrition is measured.

Measuring and classifying poor growth

Children grow. In the womb, the foetus begins as a tiny mass of cells, develops all its limbs and organs by about 10 weeks after conception, but at this stage weighs very little. Its growth in length accelerates over the next three months,

and slows down a little after the sixth month. The foetus nearly triples in weight in the last three months by the time the baby is born at 40 weeks. At birth, a ‘normal’ baby is well-proportioned — the body weight being in proportion to the length. After birth, the baby continues to grow but at a progressively slower rate, in both length and weight accretion until the age of about two, by which time both height and weight gains have slowed to a minimal, steady pace. The adolescent growth spurt begins any time after the age of eight, when both height and weight increase. Adult height is largely determined by the sum of length or height accretions during the two spurts: the first between the second trimester of pregnancy until about two years of age, and the second at adolescence.

Indians are short or ‘stunted’ because something gets messed up during one or both height spurts. Weight can, in principle, be gained or lost (unlike height) at any time, and is indeed largely a function of height: the tendency is to have weight that is appropriate for height. If one is too heavy for one’s height, one is obese; if too light, one is thin or ‘wasted’. While good height is a function of long-standing wellness and adequate nourishment, wasting is often a function of relatively recent illness — when weight was lost due to the illness. When we say someone is stunted or wasted (or obese), we are comparing the height to the expected height for that age, and weight to the expected weight for the height. The ‘expected’ heights and weights come from reference standards which are now accepted as globally applicable: we know now that given the right environment, Indian children would grow as well as any other children in the world. This fact is no longer seriously disputed.

The standardisation of norms and terms allows us to compare the prevalence of malnutrition across countries. Figures, such as from the National Family Health Survey (NFHS), tell us that about half our children under three years of age are stunted and about a fifth wasted. These categories are based on statistically determined cut-offs. For instance, a boy is expected to be about 77 cm long at 12 months, on average, and the distribution of heights around the average is such that most boys fall within 72 and 82 cm at this age — these are the cut-offs or limits of ‘normal’;

a 12-month-old boy with a length of less than 72 cm is therefore considered stunted. One instinctively assumes that if half the children are stunted, the rest must be normal. In reality, even children above the cut-off are not necessarily growing to their potential. If they had all been growing normally, one would have expected about half of them to fall somewhere between the average and the upper limit of normal; a cursory analysis of most data sets such as the NFHS tells us that by the age of two almost no single child in most communities, rural or urban, falls above the 'average'. What we are witnessing is a wholesale slowdown in the growth rate of *all* children — almost no one is growing normally — but we are trained to look only at those that have 'fallen' below the cut-off and happily call the rest 'normal'. Seen thus, malnutrition in India is close to 100%.

So, what causes malnutrition?

That effectively pulls several rugs from under our feet: we are no longer justified in the 'find them and fix them' approach when it comes to stunting — there is no need to seek what is universal. A moment's reflection tells us that poverty alone cannot explain a lot of malnutrition, nor can hunger: neither is as universal as poor growth is in India. One must rather ask, what is it that makes *all* our children grow inadequately? Is there a universal 'cause' that afflicts all of us?

From what we understand today, there are not one, but two and perhaps three such 'causes'. The earliest operative cause is what has been called the 'intergenerational factor': at the core, there appears to be a complex metabolic regulation where the past experience of a hostile environment (insufficient nutrients, too many infections) or its consequence (smaller achieved body size, particularly of the mother) makes the child's body grow to a smaller than full size — an adaptation in anticipation of a sustained hostile environment, tending to conserve losses and minimise maintenance costs. This complex hypothesis is still being fleshed out with empirical evidence. The second 'cause' is the nearly universal poor feeding of children in the first two years: neither breastfeeding nor complementary feeding (what the child must get in addition to breastfeeding once breastfeeds become insufficient for the infant's needs by about six months of age) is optimal — complementary feeding practices being particularly poor. The third 'cause' is the high frequency of common infections (such as diarrhoea and fevers) during this age, significantly interrupting growth.

Plenty of empirical evidence exists to show that the latter two causes apply to a large proportion of children. We also observe that malnutrition prevalence peaks around the age of two, by which time the child learns to demand food and feed herself, and by which time the child has passed the age of peak vulnerability to repeated infections.

Where does poverty fit into this? It undoubtedly heightens

the risk of malnutrition in many ways: more infections, less access to healthcare and health information, poor variety and quality of food, less time for childcare, diffidence and demoralisation. In most contexts, however, it is not hunger: adults in families with malnourished children (even if we consider only those below the cut-off) eat five to 10 times as much as an under-two-year-old needs to eat, and even desperate families are not generally given to selectively starving children. In better-off families, children are fed equally poorly. Poor feeding is a societal norm, and its effect on growth is not visible because poor growth in children is also a societal 'norm' — everyone feeds the same small amounts, no child grows much better than others. If, in this scenario, all families were to substantially increase the amount of home-available foods they feed their children, one would predict that children in better-off homes would begin to grow visibly better — because they have access to a variety of foods and thus a variety of nutrients. That is where poverty kicks in: not in terms of how much cereal is available at home, but how much dal, milk, eggs, meat, vegetables are available. That ICDS food supplements are largely cereal-based, and that they are rarely consumed by children under 2, explains why the 'main' intervention of the ICDS is singularly ineffective in moving malnutrition rates down. This also explains why the provisions of the new Food Security Act are likely to leave malnutrition rates unscathed, even if well-implemented.

Some red herrings

A number of other potential causes of malnutrition — and interventions stemming from these — have been considered in literature and merit attention, even if only to acknowledge that they are not likely to be of immediate consequence in combating malnutrition.

A commonly discussed hypothesis is whether cultural vegetarianism in India leads to poor growth in children. The fact is that the majority of families in most states in India are culturally not vegetarian. However, among non-vegetarians, the frequency of consumption of meat is very low, at least partly because many of them cannot afford more meat. In addition, even where foods from animal sources are available at home, cultural proscriptions appear to severely limit consumption by children — the proportion of children under-two who actually consumed milk, fish, poultry or meat is much lower than the proportion of families that consumed these items. This is found in secondary analyses of large surveys (1, 2). Poverty and such cultural feeding norms appear to be responsible for poor intake of foods from animal sources more often than cultural vegetarianism.

To what extent can the lack of food quality be compensated by micronutrient supplements or food fortification? Despite extensive research, there is thus far no evidence of a viable micronutrient intervention that can, of itself, alter rates of stunting. Zinc is the most promising micronutrient

in this regard, but has not yet been unequivocally recommended for regular supplementation, from lack of consistent evidence. It is now well-accepted that iodine, iron, Vitamin A and zinc deficiencies are not amenable to dietary interventions alone — they require fortification or supplementation. Potentially, food supplements fortified with micronutrients could address specific deficiencies, provided there is a way to cut through the diversity of food sources and deliver fortified food to families in need. Micronutrient interventions have proven effective in correcting nutritional anaemia, for instance, which is a nutritional deficiency of considerable importance, but not in reducing stunting or wasting (3).

Even after decades of research on prenatal interventions to impact low birth weight, there is little concrete evidence that such interventions have a demonstrably large effect on either low birth weight or longer-term nutritional status. Considerable interest persists, however, in interventions that can partly or wholly overcome the intergenerational factor. Such an effect would presumably add to the effect of other direct interventions, such as interventions to improve feeding practices, nutrient availability and sanitation.

Would interventions to address wasting be more fruitful? After all, recent weight loss is the easiest to regain, and as mentioned earlier, the cause of wasting is often an acute illness, which is treatable. While finding and fixing wasting does work in individual cases, it is unlikely to make a serious dent on overall malnutrition rates. For one, wasting rates are much lower than stunting rates. Secondly, very few children are purely wasted — most of them are stunted to a degree as well. Short-term feeding interventions, which are the standard of care for the wasted (in addition to the management of any infections), could raise wasted children to a non-wasted state, but will not substantially affect concurrent stunting, and therefore will only marginally affect malnutrition rates. Interventions for severe acute malnutrition (SAM), which is the same as severe wasting, are in the same genre: not more than 5% of children in most states are severely wasted, and while nutritional rehabilitation would save lives, rates of malnutrition would remain largely untouched. Nonetheless, the health and ICDS programmes should be addressing SAM as a routine, since a lot of malnutrition-related mortality comes from wasted children.

What about interventions that can influence growth during the adolescent growth spurt? There is probably some truth in the belief that adolescence is not too late to intervene and prevent further loss of growth opportunity. Wholesome food, with micronutrient supplements, should be the best bet. However, obviously, child malnutrition rates will not be affected by such interventions for adolescents, except as a hypothesised intergenerational effect: when better-fed adolescents become adult parents, their children are likely to start with a smaller handicap than

they themselves did as children.

Focused, direct interventions and patience

Interventions that might bring about a measurable change in rates of stunting would thus necessarily address the more proximal causes that we understand well: tackle feeding practices, food quality, infections — addressing all children, not targeting ‘malnourished’ children only. *The Lancet* estimates (4) that such ‘direct’ interventions could reduce stunting rates by about 30%, given near-universal coverage of all children using effective interventions. The challenge currently is not so much about what happens to the rest of malnutrition, as whether we will ever get our act together to deliver even these relatively simple, direct interventions to all our children. On the face of it, none of these direct interventions are by themselves extraordinarily difficult to implement — what is lacking is focused effort, and an acknowledgement that hunger and malnutrition (as we measure it) are largely unrelated and require very different approaches to eliminate. And that both are worth eliminating.

For the rest of malnutrition to disappear, however, we will probably need to wait a long time, as each successive generation experiences a more growth-friendly environment, and this triggers less inhibited growth during intrauterine life and early childhood for the next generation. At least we will need to wait for a deepened understanding of the mechanisms that impair growth during intrauterine life and during early infancy, and hope that new, effective interventions emerge from these explorations. But if we are unable to deliver interventions that we have understood well for decades to the people who need them, is it rational to believe that some future magic bullet will perchance find its mark?

Dr Sridhar Srikanthiah is a public health consultant supporting a number of national programmes, including the ICDS, malaria and kala-azar. He received his MD in paediatrics from the Medical College at MS University, Baroda. He has worked with community health organisations and NGOs to initiate alternative, comprehensive and effective approaches to healthcare. He is currently Technical Director, Integrated Family Health Initiative, a project of CARE-India in Bihar

References

- 1 CARE-India. ‘Changing Infant and Child Feeding Behaviours’. In *Women and Child Health at Scale*. Working Paper Series 4. 2008. Available from http://www.basics.org/documents/Changing_Infant_and_Child_Feeding_Behaviours.pdf
- 2 Patel, Archana, *et al.* ‘Determinants of Inappropriate Complementary Feeding Practices in Young Children in India: Secondary Analysis of National Family Health Survey 2005-2006’. In *Complementary Feeding Practices in South Asia: Analyses by the South Asia Infant Feeding Research Network (SAIFRN)*, Maternal and Child Nutrition, Volume 8, Supplement 1, January 2012. Pp 28-44. Available from <http://onlinelibrary.wiley.com/doi/10.1111/j.1740-8709.2011.00385.x/pdf>
- 3 WHO. ‘Guideline: Use of Multiple Micronutrient Powders for Home Fortification of Foods Consumed by Infants and Children 6-23 Months of Age’. 2011. Available from http://www.who.int/nutrition/publications/micronutrients/guidelines/guideline_mnp_infants_children/en/index.html
- 4 Bhutta, Z A, Ahmad, T, Black, R E, *et al.* for the Maternal and Child Undernutrition Study Group. ‘What Works? Interventions for Maternal and Child Undernutrition and Survival’. *The Lancet*, February 2, 2008. 417-40

Mal-Mal approach to malnutrition

The determinants of nutritional status are different from place to place. The Mitra programme in adivasi areas of Orissa where 35% of children would die before the age of five, found a strong correlation between prevalence of malaria and malnutrition. Treating children for malaria immediately saw their weights jump. Identifying and dealing with specific local factors could change the game for malnourished children and communities

JOHN OOMMEN

I AM A COMMUNITY HEALTH PHYSICIAN and I have been working with a predominantly adivasi community in and around Bissamcuttack in Rayagada district of Orissa since 1993. The Christian Hospital, Bissamcuttack, is a 200-bedded, multi-disciplinary hospital that has been serving this vulnerable and needy region since 1954. The community health department is known as Mitra, meaning 'friend', and standing for 'Madsen's Institute for Tribal and Rural Advancement'. The programme works with around 12,700 people in 53 villages towards a four-fold dream: health for all, education for all, economic security for all, and social empowerment for all. We measure ourselves and our work against the realisation of these four dreams. For example, our infant mortality rate was 201 per 1,000 live births in 1994. We dreamt of a day when it would be less than 60, like they said at Alma Ata. We have now reached 79 — a long way travelled but a steeper trek ahead of us. The law of diminishing returns means the climb gets steeper on the higher slopes.

Malnutrition is part of our reality — it's something we see and face each day in children who are thinner than they should be, their potential growth stunted. It is not a cold, academic issue or a distant, emotive bandwagon; not a political football or a tear-jerking fundraiser. It's a 'normal' part of our everyday lives.

Over the years, we have tried our hand at approaching the problem from different angles and we would like to share the ideas that have emerged. We do not claim exclusivity on these ideas, nor do we say that they can be generalised to be applied everywhere; we would just like to add them to the pile of public consciousness.

What do we mean by 'malnutrition'?

Words are very powerful things. They can stimulate our thinking — or limit it. 'Malnutrition' is a powerful word that stimulates debate, but it means different things to different people. The images it conjures up in our minds are often drawn from BBC pictures of Somalia or *Frontline* photographs of Gadchiroli. Generally, each person seems to take off in the direction of their professional genes. So, say 'malnutrition' and the nutritionists talk of proteins and calories, zinc and magnesium. The economists chase

purchasing capacity, sociologists debate food security, activists raise human rights, and doctors do disease. But in the emotion and din, we forget the fundamental point that this is about a person — usually a child — and his or her health and chance at life.

While adult malnutrition is also a reality, for the sake of this discussion I will focus on childhood malnutrition.

Let's begin by stating the obvious, by clarifying what physical malnutrition is as against the more conceptual malnutrition that bandwagons thrive on.

When we talk of 'malnutrition', or 'this child is malnourished', what we usually mean is that the child has a weight or height or mid-arm circumference (or a ratio of weight to height) that is lower than a prescribed age-specific standard. Further, this shortcoming can affect the child's life — in terms of quality of life, growth potential, ability to combat illness, and life expectancy.

The opposite picture in our minds is of a 'healthy child', typified by the 'well baby' shows or the 'Amul baby' in colloquial parlance (without reference to recent political uses of the term!).

Some basic questions arise.

Who defines normal? What is that based on? Can there be a single 'normal' for all races and genders globally? Will one boy's malnutrition in one community be a girl's 'well baby' status in another?

For many years, most groups have used weight for age as the most common handle for measuring nutritional status. The normal standard used was the 50th percentile of the Harvard standard, the growth curve of the 'middle child' in a large set of 'normal' children in the USA. Any child anywhere in the world at any age from zero to five years was classified in relation to this graph. A weight for age of up to 80% of this curve was considered 'normal' or 'on the road to health'. If you were at 70-80% of this, you were said to have Grade 1 malnutrition; 60-70% was Grade 2; 50-60% Grade 3; and below 50% Grade 4. This graph was used to monitor the growth of children up to the age of five.

More recently, the World Health Organisation came out with a new set of standards based on the weights and heights of children in six countries, including India and Brazil. These WHO standards provide separate graphs for boys and for girls, as their normal growth patterns are different. Using the concept of a Bell curve, the mean or average weight of all the healthy children studied is used as the 'normal'. The weights of the children to be monitored are plotted on the graph in terms of their variation from the normal. Based on these standards, a child's weight for age is classified into 'normal', 'moderately underweight' and 'severely underweight'. The cut-offs are based on standard deviations (SD), a statistical concept that measures variation from the normal. Children with weights that are over three SD away from the normal are called 'severely underweight'. Those between two and three SD are classified as 'moderately underweight'.

Most groups are now switching over to this system, including the Integrated Child Development Services (ICDS), as it is considered more appropriate and correct. The change in system has meant that children can suddenly change categories of health and risk overnight, depending on which growth monitoring card you use. An individual child could be malnourished in the old system, but normal in the new one. From a public health perspective, the move from the Harvard-standard-based cards to the WHO growth standards increases the number of children in the 'normal' zone, and also in the 'severely underweight' zone. The number of children qualifying for special interventions targeted for the severely malnourished increases considerably, as the qualifying weight level is lower than in the previous system.

The Mitra approach

What do you do when you work with a predominantly adivasi community in rural Orissa? Should a child here necessarily measure the same as a child in the USA, Brazil or even Punjab? Evidence suggests that children in all communities, if given optimum conditions and inputs, grow similarly. But what do you tell a mother after taking her child's weight and height about how he/she is doing?

In the '70s and '80s, our founder, Dr Lis Madsen of Denmark, used weight for height squared as her indicator of a child's health or nutritional status in the adivasi community where people are relatively shorter than other communities. She made her own graphs for this.

Then, in the '90s and early-2000s, we took a shortcut. We monitored the growth of our children by recording their weight for age, and used 'road to health' cards based on the Harvard standard. However, we found that children classified as suffering from Grade 1 malnutrition on this basis were not different from those classified as normal in terms of their risk of mortality and their general level of activity. So we clumped them together and decided that it was the children in Grade 2, 3 and 4 that we considered 'at risk' and needing intervention.

In 2007, we revisited our textbook understanding of malnutrition, stimulated by questions from Gayatri Singh, a nutritionist then with Unicef, Bhubaneswar. The wisdom that emerged was as follows:

Our dream is that all children will be healthy and well-nourished. Nutritional status is what we are really trying to measure as an indicator of the health of the child and as a predictor of risk. To keep on track, we need to do growth monitoring — not just weight recording. We need to move from snapshots to videography, as it were. So the question for this child is not where he or she is on a chart from the WHO, but whether he or she is growing well. Each child becomes his or her own standard in a way. Healthy children grow. Failure to grow or a faltering growth curve is an indicator that something is wrong. Every mother and father should want to check their child's weight each month and compare it with the previous month. We should ask ourselves: Is my child growing enough? We studied available graphs and literature on how much a child normally grows each month; we arrived at a figure of 500 grams a month in the 0-12-month age-group, and 200 grams a month in the 13-36-month age-group. We called that 'adequate growth'.

Our approach is to try to inspire all parents to weigh their children every month. The weight change is calculated in comparison to the previous month's reading using the formula: weight change in grams x 30 divided by the gap in days between weight recordings.

This is to standardise the rate of weight change to a 30-day period for comparability. Children's growth is then classified as 'adequate', 'inadequate', 'zero change' and 'negative change'. A child who has two consecutive negative change readings or three consecutive zero change readings on monthly growth monitoring is considered to be a 'nutritionally at risk child' (NARC) needing intervention. The NARC register tracks these children, listing them when they enter the risk zone and graduating them out when they resume a healthy growth pattern.

The data collated for all children helps tell us the community's nutritional status. We also crosscheck this with the nutritional grades to see if we are going forwards or backwards.

Approaches to reducing malnutrition or improving nutritional status

The nutritional status of a child is a dynamic equilibrium between positive 'pulling-up' factors and negative 'pushing-down' factors. The pulling-up factors include food/nutrient intake and are therefore dependent on a variety of issues like poverty, access, awareness, etc. The pushing-down factors for growth include illness and disease, which can be like a hole in the proverbial bucket. All the water you pour in fails to raise the level inside unless you find ways to plug or minimise the leaks.

When I first began working in community health here, I was surprised to find that a spot check at any given point appeared to show a relatively healthy looking community. Adults and children generally looked well compared to what I was used to in rural Tamil Nadu where I grew up and trained. But a listing of deaths in the last 12 months indicated extremely high mortality levels. It was as if only the fittest survived, and you were seeing only them.

We began with traditional approaches we had been trained to use, and found the solutions we offered (like immunisation) were for problems they did not have, and the problems they had (like overwhelming malaria) were not on our standard menu for community health.

The malnutrition we saw then did not make much sense to us. Here was a community that cared deeply for their children. Since survival was almost a hit-or-miss thing, with 20% of children dying before the age of one and 35% dying before the age of five, babies were not named until they were about two years old — it made it so much harder to let go once the child had an identity. On the other hand, childcare practices were relatively good — breastfeeding was early and sustained for two years; the gap between births of children was generally two to three years (unless a child died, in which case the next came faster). And so on. Why were some children very malnourished?

About 10 years ago, we invited six severely malnourished children from our programme villages to the hospital to investigate them for possible disease factors. Four out of the six tested positive for falciparum malaria. There were two who had intestinal parasitic infections like giardiasis and/or amoebiasis in their stool samples. We treated these and put them on weekly chloroquine prophylaxis against malaria. And their weights jumped. The children quickly reversed their sinking growth curves. We tried this with other malnourished children and arrived at a medical treatment package for childhood malnutrition in our area. This was not a research study, just a desperate attempt to keep our kids alive and growing. And it worked. Today we treat nutritionally at-risk children with a medical package that includes treatment for malaria with sulfapyrimethamine, followed by three to six months of chloroquine prophylaxis against malaria; a course of metronidazole for intestinal infections; iron and folic acid supplements for anaemia; a dose of Vitamin A; and a course of antibiotics only if an infection warrants it. Children are followed up and graduated from the NARC register once they show adequate growth patterns. The data shows a sharp reduction in the number of children with negative and stagnant growth curves.

Mal-Mal: The missing link between malaria and malnutrition

The 16 districts of Orissa listed as being high burden for malaria are also listed as high burden for malnutrition. They overlap. Could there be a connection? Most studies on the link between the two talk of the effect of the nutritional

status of the child on the possible outcome of a severe attack of malaria. Malnourished children are less likely to survive an attack of severe falciparum malaria than their well-nourished counterparts. Very few have asked the reverse question: Can chronic or recurrent malaria be a cause for malnutrition? Any healthcare professional working in high malaria-high malnutrition regions of Africa and India instinctively knows the truth in this. There is already a lot of evidence that maternal malaria can cause low birth weight in babies, hence the strategies for prophylaxis or intermittent presumptive treatment in pregnancy. Why can't this be true for the following years of life too? We believe that reduction of malaria prevalence will cause an improvement in nutritional status in such areas — both at the individual child level and at the community level. There is a lot of 'asymptomatic' malaria in our areas. But we call it 'asymptomatic' because we think the only symptom for malaria is fever. But malaria also causes anaemia, growth faltering, and less-than-normal performance. And it is well known that malnourished children often do not display fever even with an attack of malaria.

One problem is that we do not know how much malaria there is in India — our data is so infamously unreliable. The National Vector-Borne Disease Control Programme (NVBDCP) estimates that there are about 1,000 malaria deaths per year in the country. The WHO suggests it could be 15,000-20,000. The Million Death Study published in *The Lancet* in October 2010 estimated that there could be 200,000 deaths a year in India, with 51,000 in Orissa alone. What do you believe?

The indicators of malaria occurrence commonly used in the national programme (such as annual parasite incidence) are as much an indicator of programme efficiency, staff performance, availability of microscopy services, etc, as they are of the amount of malaria itself. They are all based on the number of positive malaria slide tests in the public health system.

We suggest that the most objective indicator of whether malaria is endemic in a region is the point prevalence of malaria parasitaemia in children under five years in this community; that is, what percentage of children under the age of five tests positive for malaria on a blood test in a mass survey. The approach in high-burden malaria areas would be to test all children for malaria during the high transmission season, and to treat all those who test positive. Active screening and treatment for malaria in children is both a diagnostic and a therapeutic option, on a mass scale, in areas of hyper-endemic malaria — and that could decrease both malnutrition and malaria in one stroke. Of course, this has to be combined with personal protection measures and other sustained interventions.

This is what we now call the 'Mal-Mal' approach. We offer Mal-Mal camps for children in our project villages where each child has a general check-up, growth monitoring and discussion, treatment of minor ailments, a blood smear for malaria parasites, treatment of all positives with ACT, and access to medicated mosquito nets. We undertake this

Table 1

Evidence on Point Prevalence of Malaria Parasitemia in Children Under 5 Years						
Surveys done by Civil Society Organisations in Orissa						
YEAR	ORGANISN	DISTRICT	No. of Villages Surveyed	No. of Children (< 5 yrs) Tested	No. of Children Positive	Percentage Positive for Malaria
2001	Prem Plan & 16 Partner NGOs	Gajapati	1000	15,676	5613	35.8 %
2004	Mitra	Rayagada	5	169	99	58.6 %
2010	6 Partner NGOs of SDTT	Kalahandi, Kondhamal & Malkangiri	190	4755	1898	39.9 %
2010	Mitra	Rayagada	50	1245	730	58.6 %

annual exercise in the peak transmission months, helping detect children with malaria parasitaemia and clearing it with effective treatment embedded within a regular growth monitoring programme.

We would like to share some data from these pursuits.

Question 1: How much malaria is there in reality?

Table 1 provides information from surveys undertaken by civil society organisations in Orissa over the last 10 years that suggests that malaria is not an occasional attack but a fact of our existence — between 36% and 58.6% of children tested positive for the malaria parasite. It is pertinent to mention here that the 2010 survey by six NGOs quoted here used rapid diagnostic kits, while the other three surveys used malaria microscopy. Microscopy is considered to be the gold standard for diagnosis of malaria, but requires skilled personnel. The rapid diagnostic kits are much easier to do especially out in the field, but are not considered as accurate as microscopy.

Question 2: What is the impact of the Mitra approach on malaria prevalence?

The embarrassing fact from Table 1 is that the percentage positivity in Mitra areas appears to have not changed at all between 2004 and 2010. In reality, we had a decrease and then a resurgence. Malaria control achieved is not a permanent state, but a slippery slope that needs continuous effort to sustain.

Since 2010, Mitra has been conducting an annual round of Mal-Mal camps. We begin with the high-burden villages and work our way through 50 villages between July and December, keeping the dates for each village as close to the previous year as possible to decrease seasonal variations. Table 2 provides comparative data for 2010 and 2011, as available this far. Between the two rounds, the Mitra team undertook street plays on malaria, promoted personal

Table 2

Results of Active Screening of Children in Mal-Mal Camps of Mitra, Bissamcuttack (2010 - 2011)		
Indicator	June – Dec 2010 (50 villages)	June – Dec 2011 (50 villages)
No. of Children examined and tested	1245	1167
No. of Children who tested positive for Malaria	730 (59 %)	386 (33%)

protection measures like neem oil and medicated mosquito nets, and provided access to treatment for malaria through mobile clinics and health workers. In addition, the NVBDCP supplied long-lasting, insecticide-treated nets to eight of the 50 villages, besides the other usual programmes.

The table shows that the percentage of children who tested positive for malaria in the mass Mal-Mal survey decreased from 59% to 33% — a dramatic change in 12 months. This, to a great extent, vindicates the approach used.

Question 3: What is the impact of the Mitra approach on the nutritional status of children?

Table 3 shows data from a review of 74 nutritionally at-risk children who received the Mitra protocol in 2009. There is a striking shift of children from weight loss and stagnation to adequate growth.

The same data set is provided in Table 4 but analysed as mean weight changes.

It is evident that clearing or suppressing malaria infection releases the growth potential of children in this hyper-endemic region.

Table 5 looks at data from the regular Mitra growth monitoring programme, in the first year of the Mal-Mal approach. It shows that during the year, the number of children losing weight halved while those with rising growth curves increased sharply.

Conclusion

It is said that malaria is a “local and focal” problem — the epidemiology of malaria differs from place to place. The solutions therefore must also be local and focal; what works in one place may not necessarily work elsewhere. This is true of nutritional issues too. What worked for the children

Table 3

Mitra, Bissamcuttack : Treating Malnutrition Analysis of 74 NAR Children Aged 1-3 Years by Adequacy of Weight Gain and Stage of Protocol			
CATEGORY	STAGE OF INTERVENTION		
	PRE	INTRA	POST
NEGATIVE	29 (39.2%)	04 (05.4%)	11 (14.9%)
ZERO	14 (18.9%)	01 (01.4%)	08 (10.8%)
INADEQUATE (<200 gm/mth)	31 (41.9%)	24 (32.4%)	17 (23.0%)
ADEQUATE (>200 gm/mth)		45 (60.8%)	38 (51.4%)
TOTAL	74	74	74

Table 5

Total No. of Children in Age Group 7–36 months = 680		
Average No. of Children Weighed each month = 516		
By Weight Change	March 2010	January 2011
Negative Change	23 %	11 %
No Change	11 %	11 %
Inadequate Growth	27 %	30 %
Adequate Growth	39 %	48 %

of our area may not be relevant to other regions. There is no magic bullet, or magic RUTF (ready-to-use therapeutic food) for that matter, that can solve all the problems of malnutrition with one stroke. And what we do at Mitra is not in isolation either. The Mal-Mal camps are part of our malaria programme that includes medicated mosquito nets, malaria education campaigns, etc. This is situated in, and not excluded from, the initiatives of the NVBDCP. Similarly, our nutrition strategy is part of our larger community health programme. But these children are also beneficiaries of the state ICDS. Our aim was not to do research; our aim was to add value to what exists, to try and keep our children alive and well.

What then is the take-home message?

Malnutrition is a word with many connotations. We need ultimately to think of nutritional status. We need to consider the local epidemiology of malnutrition and other childhood

Table 4

Mitra, Bissamcuttack : Treating Malnutrition Analysis of 74 NAR Children Aged 1-3 Years Mean Monthly Weight Gain by Stage of Protocol	
Mean weight gain per month for pre-intervention phase	- 29 gms
Mean weight gain per month for intra-intervention phase	+ 325 gms
Mean weight gain per month for post-intervention phase	+ 182 gms

issues in the specific region. The determinants of nutritional status can be very different from place to place. Identifying specific local factors and strategically dealing with them will help change the game for the individual child and the community. We cannot afford to suspend our intellect when we get into programme implementation mode. We need to constantly ask 'why'. We need to keep our processes subservient to our desired outcomes; we need to make the goals dictate the methods.

And that is true in all of public health.

Acknowledgement: The ideas and thoughts in this article are from the shared experience of the Mitra team, over many years of community work together. I wish to acknowledge the encouragement and stimulation of the Technical and Management Support Team, Government of Orissa, of which I am a member. The team, along with the Department of Health and Family Welfare and the Department of Women and Child Development, Government of Orissa, has pursued the idea, and hosted a Mal-Mal workshop in May 2010 to gather evidence on Mal-Mal. They have constantly encouraged us at Mitra to introspect and share our learning. We at Mitra also wish to acknowledge the support and partnership of the Sir Dorabji Tata Trust, Mumbai, that is currently sharing our journey. SDTT helped us set up a malaria resource centre, and, together, we are helping NGOs in south Orissa conduct community-based malaria control programmes in their areas

John Oommen is a community health physician trained at the Christian Medical College, Vellore. He has been working with the predominantly adivasi community in and around Bissamcuttack in Rayagada district of Orissa since 1993

Combating under-3 malnutrition

In the Jan Swasthya Sahyog's 72 creches across 30 Chhattisgarh villages, children aged six months to three years are given three meals that cover two-thirds of their daily requirement of calories and protein. The cost per child per day is Rs 17, but the payoffs in terms of their nutritional status and health are unquestionable

RAMANI ATKURI
with JAN
SWASTHYA
SAHYOG

WHEN WE MET SUMIT last month at his home in Chaparwa village, he was busy grinding some pods of garlic on a flat stone. At the same time, he was consoling Vishnu, his two-year-old brother who was waiting impatiently to drink the gruel that Sumit would make with the garlic and water. Besides this, there was nothing edible in the house; their parents had left early in the morning for work. Vishnu was crying with hunger. Sumit himself was confident he could wait until his parents brought something home in the evening to eat.

Sumit and Vishnu, who live in this remote corner of Bilaspur district in Chhattisgarh, are among the nearly 50% of children in India who are stunted and wasted. In other words, they are not only chronically malnourished and short for their age, but also underweight, signifying acute hunger. Half our children being undernourished means that half our children go to bed hungry every night. This is the reality in much of rural India, where both parents have to leave the house to earn every day, and there is no adult to look after young children.

Why be concerned about childhood malnutrition?

Undernutrition is perhaps the biggest problem India faces. It leads to increased chances of falling ill, and sometimes dying. It has been consistently shown that undernutrition — both severe and non-severe — is the underlying cause of over 50% of mortality in children under 5. When undernutrition occurs in

early childhood it also leads to poor intellectual development, which is likely to have a lifelong effect. Undernourished children grow into undernourished adults who have poor work capacity, affecting their earning capacity and keeping them trapped in poverty. Undernourished girls who grow into weak mothers give birth to underweight babies, thereby maintaining the vicious cycle of poverty and ill-health.

Thus, in order to prevent these avoidable deaths, to make a dent in the poverty trap and to allow children optimal physical and mental growth, there is a pressing need to prevent and treat undernutrition in the community.

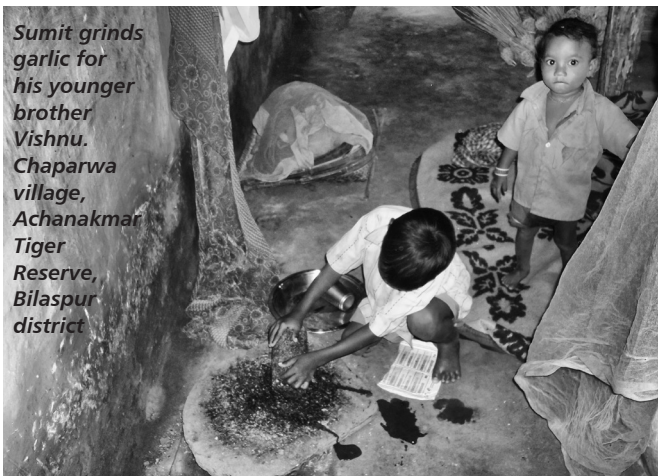
Importantly, undernutrition develops very early in life. In most parts of the country, the weight of children is normal in a majority of births. These children often maintain their weight improvement for the first six months of life, thanks to very high rates of breastfeeding. However, after six months most children do not get adequate complementary foods which are needed in order to grow well. The result is that children who are somewhat healthy become progressively weak, and by the age of two, many are significantly undernourished.

It is also true that most mental development occurs in early childhood, and most malnutrition sets in by the age of two or three. This affects the child's learning ability at school, worsening the consequences of early undernutrition.

Why don't our young children get enough complementary foods?

Various reasons have been identified:

- Delayed introduction of complementary foods, possibly due to lack of sufficient knowledge about the need for it.
- Where food is offered to the child, the portion is small, thanks to the misconception among adults that children cannot eat too much.
- Absence of a caretaker during the day to feed the child at frequent intervals, especially when both parents go out to work during the day.



Sumit grinds garlic for his younger brother Vishnu. Chaparwa village, Achanakmar Tiger Reserve, Bilaspur district

- Frequent illness following poor nutritional status further worsens malnutrition.
- Lack of purchasing power of the parents.

Though improper knowledge may be one reason, the most important reason is that there is no one to look after the child for the greater part of the day when both parents are out working. The result is that the child gets very little nutrition from an older brother or sister or an elderly grandparent appointed to look after the child.

In fact, purchasing power is not a critical factor in feeding young children, in the sense that if the family has money to buy enough food for themselves, the young child can be fed from the same food — no special purchases are necessary. In the context of the widespread prevalent hunger that we see in this part of rural Chhattisgarh, where even adults have an insufficient and poor diet, the child's diet will also be insufficient for his/her needs. A slight increase in purchasing power will not necessarily translate into better child feeding and nutrition since the parents will still go out to work and there will be no one to look after the child. The child is therefore unable to get the necessary amount of food (ideally a child should be fed at least five times a day).

Many initiatives have tried to improve nutrition of young children. Almost all of them are predicated on the fact that the mother is the primary caretaker and hence must own primary responsibility for feeding and caring for the child.

- *Kitchen gardens*: Where they work, they are a good source of vitamins and minerals, but they rarely provide all the supplementary calories or protein to the child or family.
- *Health education*: It is well known that knowledge does not automatically translate into action for a number of valid reasons. A mother may have knowledge about child feeding but may not have the time or the means to put it into practice.
- *Take-home rations*: This is often diluted at the family level.
- *Nutritional rehabilitation centres (NRCs)*: These address children with severe acute malnutrition (SAM), not mild and moderately malnourished children who make up the bulk of India's malnourished child population.

What we try to do through creches is ensure that children get complementary feeding. This means two things. First, there must be assured, child-targeted and adequate food. Second, there should be someone to ensure complementary feeding happens.

Nutrition rehabilitation centres (NRCs)

A child is kept in an NRC for roughly two weeks whilst any mild infection is treated (sick and severely malnourished children need to be admitted to hospital). The child is given a high-calorie, high-protein diet as required. The mother

is also taught during this time how to cook and feed the young child at home using locally available foods.

While in many instances NRCs have served to dramatically improve the nutritional status of malnourished children, they have not been uniformly successful. Besides, their effect is not often sustained once the child is sent back home. The family is often unwilling or unable to stay the 10 days or two weeks that the child needs to be kept at the centre to start her off on the road to recovery. This may be because there are other children at home, crops or animals to take care of, or just the need to earn a wage every day. If the mother is able to stay, and cook and feed the child, there is a significant improvement, which is expected. But what happens when they return home is key: often, the mother does not have the luxury of staying with the child or feeding it through the day, and resumes her routine of going out all day to work. That is why weight gain in many children who show improvement at the NRC is not maintained.

ICDS anganwadis

The Integrated Child Development Services is the largest programme in the world, designed to provide a comprehensive package of services to adolescent girls, pregnant and lactating women, and to children under six. It was begun in 1975 in 33 blocks of the country and has now been expanded to all blocks of India, with 11,04,262 anganwadi centres operational as of end-2009 (1), with over 15 million pregnant and lactating women enrolled, and nearly 72 million children between six months and six years receiving supplementary nutrition.

Besides supplementary nutrition, the package of services under the ICDS includes growth monitoring, health and nutrition education to mothers, facilitating immunisation services, treatment of minor ailments, referral services where required, and pre-school education.

Though anganwadis were originally planned to be one per 1,000 population, in sparsely populated areas like tribal areas one centre has been sanctioned for a 500 population.

However, the anganwadi programme has been unable to significantly reduce levels of malnutrition in the country. According to the department's own information, in Chhattisgarh, only 47.5% of sanctioned projects and 56% of sanctioned AWCs were operational as of end-2009. Of the children weighed, Chhattisgarh reported 47% of children with normal weight for their age. The all-India figure for 'normal' children was 54% (2).

Several surveys have shown that the nutritional status of children in our country has slowly declined over the years, regardless of India's so-called economic progress in the 21st century. A health and nutrition discussion paper commissioned by the World Bank in 2005 (3) has looked critically at how the ICDS functions across the country, and how its poor functioning in northern and central Indian states has resulted

in worse nutritional indicators for children here compared to states where the ICDS functions better.

It has also identified several gaps in the current ICDS programme — that it does not adequately address the most vulnerable children: — those under three years of age; that it does not function effectively where it is most needed, ie in the poorest states; and that it focuses almost exclusively on supplementary feeding while ignoring other cheaper interventions like health education within the community.

Under the ICDS programme, children below three years (the exact period when malnutrition sets in) are not looked after at the anganwadi centres. The anganwadi worker hands over to the mother the take-home rations (THR) meant for the under-3 child once a week or once a fortnight. These rations are often diluted among all the children in the household or all family members. Even if the entire ration is given to the child it is meant for, it does not overcome the issue of the child needing to be fed several times a day.

Children three to six years of age come to the centre for about four hours each day for pre-school activities and a meal (which varies — sometimes it is a dry snack, other times it is meant to be a nutritious hot cooked meal). They are looked after by the anganwadi worker, while the food is cooked by a helper. There are, on average, 30 children who come to the centre each day. If more children than are eligible turn up, the worker is unable to refuse them food, as a result of which the food that each child gets is less than he/she should. A single worker, even with a helper, can in no way look after more children, especially if they are under three, and have special needs.

Thus, if we want to prevent children from slipping into undernutrition and its lifelong consequences, we have to intervene early on.

JSS creche services

At Jan Swasthya Sahyog, we started a creche programme for children between six months and three years in consultation with the community. The programme began five years ago on a small scale, and is now spread over 30 villages covering 977 children in 72 creches.

What factors do we need to take into account when organising creche services for young children below six who have needs different from older pre-schoolers?

- They need to be fed frequently — at least five times a day.
- Food needs to be of a consistency, taste and variety that they can eat.
- Portions should be adequate: many parents feed their children small amounts, assuming that the child cannot digest too much.
- They need to be picked up and dropped at the centre.
- They have to be given food — they cannot take it themselves.
- Some need to be fed.

- They need to be cleaned up after they have gone to the toilet.
- Active children need to be in a 'safe' place and constantly watched.
- The creche needs to be located close to the children's homes.
- The woman taking care of the children has to be selected by the community — someone they can trust with their children.

We initiated the creche programme five years ago, though in the beginning the response from the community was slow and only a few creches were started. However, the demand for these centres quickly increased, more in the remote cluster of villages located within the Achanakmar sanctuary. We found that in the poorer villages, the demand for creches was higher as both parents needed to go out to work every day.

The creche is run by a woman selected by the village community. We try and keep the caretaker-child ratio at 1:10. If there are more than 13 children in the creche, we engage a second caretaker. Sometimes, there are 20 children in one creche, with two women taking care of them.

The creche usually runs from 8 am to 4 pm, but timings are flexible depending on the season and work availability. In the summer months, children are dropped off at the creche at 4 am when parents go to the MGNREGS worksite. Children are fed a meal of satttu (made of roasted and ground chana, jau, wheat and sugar), and two meals of khichdi (made of rice and dal in the ratio of 1:5). Five ml of oil is added on top of the khichdi in each plate after it is served to the child. Each child thus gets 10 ml of oil a day. Emphasis is laid on cleanliness, especially on the caretaker washing her hands after cleaning the children in the toilet and before preparing the food; and handwashing of children before eating, or of the caretaker before she feeds a child.

We aimed to provide roughly 2/3 of the daily requirements of calories and protein at the creche. Assuming that the child eats something in the morning before coming to the creche and has a meal after going home in the evening, the three meals at the creche complete the five times feeding during the day. Twice a week, the children get a boiled egg each.

All children are weighed from birth by the village health worker at specified intervals. Children who enter the creche are weighed on entry and then each month by the health worker using a Salter scale. Heights are recorded every six months using a stadiometer. Data is entered and analysed using the WHO Anthro software (4) which is available as freeware and is user-friendly.

However, in some villages, the creche was seen more as a babysitting facility while the adults were at work: on days when they were unemployed, parents often did not send their children to the creche, saying they could look after them at home. The fact that the child at the creche gets supplementary nutrition rich in calories and protein was lost on the parents; it required several individual and village meetings to discuss the issue and emphasise the need to feed the child often and

enough, whether the child is at home or outside.

Some positive outcomes have been:

- Children have begun eating more, even at home, with parents realising that young children can eat and digest larger quantities of food than they thought possible. Older siblings have started going back to school. Both parents are able to go to work without worrying about the child, thus enhancing family income.
- Children insist on handwashing before eating food even at home, forcing families to buy soap and bringing about a positive change.
- The nutritional status of children has shown a positive change — the cohort of children attending the creches regularly has shown a significant reduction in proportion of children underweight or wasted.

Challenges

There have been many challenges, and we have learnt many lessons as the programme evolved. We began with the idea of community contributions and asked parents to send their child with a handful of rice to the centre each day. However, we found that the poorest families (the ones most in need of this facility) were not sending their children because they did not have the grain to spare. So we reversed that decision.

Ensuring the supply chain of sattu, rice, dal, oil and eggs to so many creches scattered deep in the forests has not been easy, especially in the monsoons when rivers and mountain streams are full. The delivery of eggs, twice a week, to all the centres was resulting in losses due to breakage while transporting the eggs over bad/non-existent roads and pathways. We have therefore started providing boiled eggs: the eggs are boiled at the sub-centre and then delivered to the creches on motorbike or bicycle.

Initially, the preparation of khichdi was explained to the workers but we found that different women used different proportions of rice and dal to make it. Now, we have standardised the measures for rice and dal for each child (ratio of 5:1), thereby ensuring a standard protein-energy mix in the meal.

Since the creche workers are all illiterate women, we have kept record-keeping by them to a minimum. A literate boy or girl in the village helps maintain the attendance records and record the weights of children (where the health worker is also illiterate). A small honorarium is paid to the helper for record-keeping.

The steep rise in the price of foodgrain over the past two years has resulted in us exceeding our budgets by a large margin, and having to make extra effort to raise funds. We are still unable to cover the poorest families who live in scattered single-hut settlements far from the village. Often, the children here are the most malnourished.

Can this model be replicated by government?

Sceptics have told us that this kind of initiative is not sustainable as it is too expensive (Rs 17 per day per child). However, the savings in terms of reduced expenditure on treating illnesses in malnourished children (nearly 60% of under-5 deaths here occur among children who are malnourished) is far greater than the cost of providing supplementary food to young children. Trying to prevent malnutrition in young children is something we cannot afford not to do.

Funds for this can be sourced from the Tribal Welfare Department, the Panchayati Raj Department, the Women and Child Development Department and under the National Rural Health Mission. The MGNREGS has funds to pay the creche worker, but not for any facilities at the creche — this must be remedied. Whether foodgrain can be allocated under the public distribution system (PDS) especially for young children in creches per panchayat has to be discussed. Intersectoral coordination is key to the success of such an initiative. However, the programme will have to remain decentralised and be implemented with the active involvement of the community.

Future direction

We have been lobbying in different fora — with the state government and the national government — about the need to start creches for young children from poor families. While interest has been shown, it remains to be seen how the intersectoral coordination necessary for this can be brought about in a sustained manner.

In 2011, the National Advisory Council (NAC) group working on ICDS reforms invited our organisation to present a model for creches, and why we felt that this could, to some extent, address the problem of widespread childhood malnutrition. Another group that also had a day-care programme with child feeding also had an approximate cost of Rs 17 per child per day. The NAC recommended to the Planning Commission that provision be made for creches wherever there are working women unable to feed their young children through the day, and that the problem of young child malnutrition could not be effectively addressed unless this was done.

Acknowledgements: We wish to acknowledge all the women in our creches who spend their days and energy looking after the young children of the village; the field staff, supervisors and coordinators of JSS who ensure the smooth running of this activity; and all the individuals and donors who have shown their commitment to addressing the urgent and widespread problem of hunger in young children through financial and moral support

Endnotes

1 <http://wcd.nic.in/icdsimg/sanoperAWCsbenf311209.pdf>

2 <http://wcd.nic.in/icdsimg/nutstatus311209.pdf>

3 Gagnolati, M, Shekar, M, Das Gupta, M, Bredenkamp, C, Lee, Y-K. *India's Undernourished Children: A Call for Reform and Action*

4 <http://www.who.int/childgrowth/software/en/>

‘Malnutrition will not change unless women exclusively breastfeed’

Exclusive breastfeeding for the first six months of life provides comprehensive nutrition and also passes on the mother’s immunity from certain infections. Neonatologist Armida Fernandez, who started the first human milk bank in India, discusses why many women stop breastfeeding, the medical profession’s response, and the community’s role in supporting women

SHARMILA JOSHI

THE BENEFITS OF BREASTFEEDING are well-known: exclusive breastfeeding for the first six months of life provides comprehensive nutrition and also passes on the mother’s immunity from certain infections. It doesn’t cost any money (though the mother must receive proper nutrition to safeguard her own health, particularly since breastfeeding a baby will extract nutrients such as calcium from the mother). On the other hand, infants on breast milk substitutes can receive substandard nutrition — this is practically guaranteed among the poor where the substitute may be diluted in order to make the expensive powder last longer. These babies are also at much greater risk of falling ill with — and dying of — diseases transmitted through contaminated water.

Neonatologist Armida Fernandez worked with Mumbai’s municipal and state governments to incorporate breastfeeding promotion in government health services, and later helped set up the Society for Nutrition, Education and Health Care, which collaborates with the municipality to meet the healthcare needs of women and children in slums.

You started the first human milk bank in India, at Sion hospital (the Lokmanya Tilak Municipal General Hospital in Mumbai) in 1989. How is it doing, and have similar banks been established in other hospitals?

The bank is working very well. All babies at Sion hospital are still given only human milk, no formula milk. And human milk banks have started across the city and country — at JJ, KEM, Nair, in Baroda and in Hyderabad at a private hospital. All of them got in touch with us about how to start a human milk bank. A number of hospitals enquire about how to start such a bank. It does not require too much money, but a lot of commitment which stalls the process in some places.

In the 20-plus years since the bank was started, what changes have you seen in terms of awareness about, and attitudes to, breastfeeding, not only at Sion hospital but generally through your other work as well?

The National Family Health Survey, which is undertaken every four years, shows an increase in early initiation of breastfeeding from 7.8% in 1992-93 to 51.8% in 2005-06. Exclusive breastfeeding in the first six months is 53%. Still,

it’s not ideal, the numbers are not high enough, it could be much better. People still have to work hard at promoting breastfeeding. I have realised that more and more mothers want to breastfeed. I train nurses and doctors. And I find that the mothers are very keen. But the support from doctors in private practice is inadequate. It is difficult to make a generalised statement, but the reason why mothers give up, especially those from the higher socio-economic strata, is that they don’t get support from their families and their doctors — not just the gynaecologist but the paediatrician as well.

What kind of support is missing?

There is a tendency in the hospital to shift the baby to the special care unit for the slightest problem. This separates the mother from the baby and is a source of stress for the baby. Breastfeeding then receives a setback. After discharge from the hospital, the moment there is the slightest problem, for example if the baby is not gaining weight even for a short period of time, the doctors start top milk. With the Mumbai and Maharashtra Breastfeeding Promotion Initiatives (under the Baby-Friendly Hospital Initiative), we covered all the nursing homes and hospitals to promote exclusive breastfeeding, and some hospitals are now baby-friendly.

The baby food industry does not reach mothers in hospitals thanks to the Infant Baby Food Act.

Why do paediatricians have this attitude?

When many paediatricians look at babies, they follow growth curves and try to ensure that the baby is growing well and gaining weight. The moment they find the baby is a few grams less here and there they tell the mother the baby is not gaining weight properly, so start top feed. Support for breastfeeding needs a lot of time, a lot of counselling skills, a lot of effort. But to prescribe top feed is a question of a minute; it’s easy.

On the other hand there are whole teams of paediatricians and hospitals — one team in particular in north Mumbai — that have trained mothers to be counsellors. They have a training programme and a support group for mothers where women counsel other mothers, at home, or on the phone. This team is part of the Maharashtra Breastfeeding Promotion Initiative. So in many hospitals across the city,

practising paediatricians are indeed baby-friendly.

Are there economic class differentials in terms of awareness and attitudes? For example, are urban middle class women less likely to breastfeed?

In urban India, the poorer women who come to public hospitals would, as a routine, breastfeed. They need support, as I said, to continue and make it exclusive. That has to be put in place. But women from higher socio-economic groups are reading a lot and now many of them *do* want to exclusively breastfeed their babies. They may finally end up using top feed, but most of the mothers I come across, from all economic classes, want to breastfeed their babies.

One reason mothers from higher income groups who go to private hospitals may not breastfeed is because caesarean section rates have increased tremendously. It is now almost routine. With a normal delivery, the baby is with the mother and the mother is in a position to breastfeed, and the whole process becomes easier. If you have a C-section, you can still breastfeed your baby, but it becomes more difficult because sometimes they separate the baby from the mother, or they may not put the baby to the breast early, or the mother is in pain and may start breastfeeding later. If by then they have started top feed, the whole scene changes.

The other problem is shifting the baby to the intensive care unit and separating the baby from the mother. Once there is separation, breastfeeding becomes difficult unless the hospital supports breastfeeding.

What are some of the social barriers to breastfeeding?

Would you call women working a barrier? No, maybe 'factor' is a better word. Many women across all economic classes in urban areas work outside the house, and three to four months down the line they have to get back to work. Working women can continue to breastfeed their babies. Milk can be expressed and stored at room temperature for four to six hours; in the fridge for 24 hours; and in the freezer for longer periods. It's home milk banking. This advice must be given to the mother. Another social barrier is the absence of family support in a nuclear family.

Does discrimination against women, in terms of their poor access to nutrition, impact their ability to breastfeed?

Malnutrition *per se* should not impact the ability to breastfeed. Unless the mother is severely malnourished — then the quality of milk, the proteins, fats, could be affected. But mild malnourishment should not impact the ability to feed. We who promote breastfeeding so vigorously must remember to ensure that the mother gets adequate nutrition. When a mother is breastfeeding she loses calories and these calories need to be supplemented in her diet. The problem amongst the poor is that even if we advise mothers, economic and social factors come in the way of them eating adequately.

What is the status of promotion of breastfeeding in the public health system? Has the focus improved in the last 20 years?

Our nutrition policy definitely lays more emphasis now on breastfeeding. This is mainly due to lobbying by health activists who actively promote breastfeeding and have made sure it happens at the policy level. Students are trained about breastfeeding in medical colleges. With all this effort I would expect early and exclusive breastfeeding numbers to rise swiftly, because there is so much research, so much evidence to show the benefits of breastfeeding. The government has included the promotion and support of breastfeeding in all its health programmes.

How could public health policy and practice further improve in terms of promoting and supporting breastfeeding?

The whole breastfeeding effort should shift from the medical side and it should become a women's movement. Breastfeeding is natural. So instead of blaming hospitals and doctors, it would be better to empower women, give them knowledge about childbirth and about feeding. Women should know their rights. They should fight to get a normal delivery, and fight those who come in the way of that right. How can we alone in the medical system change the breastfeeding practices of millions of mothers? We need the support of all mothers, an entire women's movement. And this movement should have strong support groups. Like the La Leche League (started in the US by two women), where women support women in breastfeeding. It's also a huge community movement in Europe and Australia. Here too, support for breastfeeding should be handed back to where it belongs. This is not a medical issue. If there is a strong community movement, a women's movement, doctors will make sure there is good reason before prescribing top feed. We need to support breastfeeding practices and take it out of the hands of doctors; they don't have the time, they may not have the inclination. They are busy treating sick patients. Have breastfeeding counsellors within hospitals, but also have them within communities. We have suggested to the government to do this through the ICDS. Malnutrition is not going to change unless women exclusively breastfeed, and for poor women especially to exclusively be able to breastfeed they need support and counselling services at the right time. These services have to be broadbased, not the purview of hospitals. If you have a sickness you go to the doctor. If you have a problem with breastfeeding, other women, counsellors and the community should support you. This would make a big difference.

Sharmila Joshi works in the academic field of historical sociology, with an interest in issues related to development, gender, labour and social movements. She has been a journalist, writing for several years on social issues

‘The Food Security Bill is regressive’

The Planning Commission’s minimalist starvation line is perverse, says Biraj Patnaik, who has been working on the Right to Food Campaign for over a decade. If the government cannot move towards universal coverage for all rights, including food, it should stop expending energy on identifying the poor and should instead identify and exclude the rich from entitlements meant for the poor

BIRAJ PATNAIK is Principal Adviser to the Commissioners of the Supreme Court on the right to food and is on the steering group of the Right to Food Campaign, a network of close to 2,500 grassroots organisations initiated in 2001.

How do you view the government’s move to fix the per capita expense of Rs 28 in urban areas and Rs 22 in rural areas as the poverty line?

Coming up with a poverty line is an exercise that has carried on for decades and should continue. Unfortunately, since 1996, this poverty line has been used as a cut-off in the estimation of poor for government schemes and also for inter-state allocation of central resources. We should not use methods to determine the *number* of poor, in order to *target* the poor. If the government, for whatever reason, cannot move towards universal coverage for all rights, it should take an exclusion approach to identification. Rather than spend its energies on identifying the poor, it would be way easier for them to identify the ‘rich’ and exclude them from entitlements meant for the poor. This approach was suggested by Kirit Parikh, a former member of the Planning Commission, in the context of the Food Security Bill, and has subsequently been endorsed by Jean Dreze and many other eminent economists. Having a ‘minimalist starvation line’ like the one that the Planning Commission has come up with to target benefits for people is outright perverse.

What is your analysis of the National Food Security Bill (NFSB)?

There is a strong moral imperative for legislation on the right to food in India. It is unconscionable that the second fastest growing economy in the world should have close to half its children malnourished.

However, the National Food Security Bill in its present form does not go far enough. Take the PDS (public distribution system), for example. It legislates targeting and inequity in a way that takes us far from the directive principles of the Constitution. It ignores evidence from those states that have reformed the PDS that the PDS works best when it is universalised or near-universalised. Instead, not only does it target the PDS, for the first time it counter-poses the interests

of farmers and consumers — when close to 70% of farmers in India today are net purchasers of food. The grievance redressal system, which is the heart of the bill, has been whittled down. A number of critical programmes like pensions for the aged, widows and disabled have been left out of the bill even though they are very much part of the right to food case. I think that it is better not to have food security than to go ahead with this legislation that is regressive in many parts.

Could you speak about the NFSB from the nutrition perspective?

Nutrition is not just about food, it is also about access to good quality primary healthcare, potable water and sanitation facilities. The relation between food and nutrition is the relation between, say, textbooks and education — a necessary but insufficient condition. Since government departments and ministries work in silos, they do not contextualise nutrition as needing a multi-pronged approach. This bill reflects the lack of institutional understanding within the government on nutrition. None of the determinants of nutrition that are crucial for malnutrition are legislated through this bill, which is a missed opportunity for the nation.

There is a need for greater convergent action in tackling malnutrition, not just between the health and women and child development ministries but also between ministries that deal with water and sanitation, agriculture, horticulture, food and public distribution and, most importantly, local self-governance institutions. Without this, there is little hope that we will manage the problem of malnutrition. We still do not have programmes in place to deal with the problem of severe acute malnutrition. Severely wasted children (8 million in India) have the highest risk of mortality, and we are ignoring the global evidence suggesting the need for community-based models for acute malnutrition. Only Madhya Pradesh and Orissa are pioneering this effort through state budgets.

While there is widespread acknowledgement within policy circles in India that the first thousand days are the most critical for dealing with child malnutrition and child survival, the government’s flagship programme, the ICDS (Integrated Child Development Services), continues to focus on an older age-group of children. Such fundamental concerns should have been addressed through the NFSB.