

Editorial:**Hunger To Haunt Us How Long?****Nimain Mohanty, Vijay Kamale**

It seems we have been fighting a never-ending battle against hunger and under-nutrition in this country for over last 300 years! Although the horrific stories of famines, its endemicity in the Indian sub-continent causing mass casualties, wiping cities and villages are now just the nightmares of the past. The main thrust of various national and state Government policy has been to fight under-nutrition. Still we are only inching towards the better, in a snail's pace albeit. Among our under-5 children today, still 15% are wasted and 39% are stunted. India's place is at 97 in the global hunger index (GHI), below Rwanda and Bangladesh; among 118 developing countries in terms of acute on chronic under-nutrition! For our consolation as an emerging superpower, apparently satisfied to be just above Niger, Chad, Ethiopia, Sierra Leone, North Korea, Afghanistan and after all, Pakistan in GHI. We are happy!

Obviously, our priorities have been misplaced and policies flawed. No less than the Prime Minister of India in 2012 had admitted it to be a national shame. On 23rd September this year the current PM challenged all neighboring countries to compete with India to throw the menace out from its root. Let's not sit back to see how and when this is going to happen. It is high time we all join hands.

Are we not doing enough? That can't be true looking at the green revolution we ushered in the sixties, doing away with import of wheat from US under PL-480 grant. There are then other factors to be accounted for. Our political leadership mainly resorted to few populist measures, rather than on any planned scientific basis. With poor communication system, dismal infrastructure, control and permit Raj leading to rampant corruption in our ever-leaking distribution system is a matter of fact.

We learnt our lessons in the refugee camps of Bangladesh evacuees while handling thousands of severely malnourished children in 1971. The experience gained by the team under Dr. B. N. Tandon, the Head of Gastro-enterology from AIIMS, New-Delhi, who spearhead the UNICEF Nutrition Therapy Project in these camps (This editor happened to be a fresh medical Graduate as a volunteer in the team there) gave birth to the ICDS concept to combat malnutrition in the country on long-term basis. The result is for everyone to see. There is mid-day meal system in schools up-to 14 years is available in most of our states. Only one meal to children can not obviously take care of their holistic nutrition requirement. On the other hand, many in rural areas sell such ration from schools as cattle feed to wealthy farmers. Rice is being provided at one rupee a Kg in Odisha and at three to five rupees in several other states. It is just unbelievable as to how our population is facing death from hunger. Many control shop contractors actually sell this heavily subsidized rice meant for the poor in the open market at handsome profit, in collusion with concerned officials and political patronage.

Does our genetic predisposition to blame? After all, several generations of ours have suffered repeated famine; seasonal hungers cycles in non-harvest months, draught and floods. Genetic shifts, genetic drifts and the role of a thrifty gene are not merely for consolation in academic discussions. Something urgent is required to be intervened. What is the real solution? Something is amiss; looking at our GDP and purchasing power of average Indian now. Even the developed countries have taken note of the sudden food purchasing power of Indians, allegedly contributing to global food shortage of late, pointed out by one of US past president! Scientists and economists need to put their head

together. It is high time our policy planners, political leadership and NitiAyog give a serious thought on to it.

Death, consequent upon hunger among children in the community, is invariably due to Severe Acute Malnutrition (SAM) with its known complications. It is a silent but life-threatening emergency both for the community as well as the medical fraternity. Illiteracy, gaps in livelihood generation, poverty, lack of exclusive breast-feeding and late introduction of complimentary feeding and poor coverage of effective immunization are direct causes of such misery. Due to consequent immune-compromised state in malnutrition, such children also suffer from repeated diarrhea, pneumonia, tuberculosis and their worst complications repeatedly, resulting in growth faltering, higher mortality and morbidity. With the biggest invention called ORS in the last century and thanks to better primary care, no child with diarrhea dies once brought to hospital, except when malnourished. Such social evil deserves to be dealt with utmost priority at all levels - home, health-care facilities and the community, following meticulously planned scientific steps, not just bridging the calorie gap.

In 2012, the World Health Assembly Resolution 65.6, endorsed a Comprehensive implementation plan on maternal, infant and young child nutrition, with specified six global nutrition targets for 2025. Sixth target is to reduce and maintain childhood wasting to less than 5%. The global target 2025 will be achieved if high burden countries take stock of the current prevalence, projected population growth, underlying causes of wasting and the resources available to address them, setting target on annual reduction rates, guiding intervention, mobilize necessary resources; develop and implement systematic plans for reduction of wasting. In addition, all countries need to examine inequalities among ethnic populations and identify priority actions among them as specific vulnerable or marginalized groups, where there are clusters of large numbers of wasting children. Such an equity-inspired approach is both an ethical imperative and

a judicious investment strategy may pay dividends.

Wasting is a reduction or loss of body weight in relation to height. Managing wasting is really important because of the increased risk of disease and death of children. Acute malnutrition in children aged 6 to 59 months can be either moderate or severe. Severe acute malnutrition is defined as severe wasting (low weight for-height) and/or mid-upper arm circumference (MUAC) <115 mm and/or bilateral pitting oedema. Moderate acute malnutrition is defined as moderate wasting and/or MUAC \geq 115 mm and <125 mm. The World Health Organization classifies wasting in children as severe or moderate, according to its growth reference for weight-for-height chart. This definition does not include children with bilateral pitting oedema (Kwashiorkor) – a form of acute under-nutrition that results from similar causal pathways to wasting. Child survival is not easy without improvements in the proportion of wasted children receiving timely and appropriate life-saving treatment, as well as reductions with primary prevention, in the number of children becoming wasted in the first place.

Target:

It is estimated that, at any point in time, 52 million children in the world aged less than 5 years are wasted, with 17 million of those estimated to be severely wasted, based on national-level prevalence data, as high as 48% in India. The World Health Assembly target has two aspects – first reducing and then maintaining childhood wasting to below 5%. Both these are major challenges. Currently, some highly populated countries report a prevalence of severe wasting of more than 10% throughout the year such as - Nigeria (10%), Pakistan (15%) and India (20%). These levels usually rise during lean seasons, as rates of wasting tend to “Surge” seasonally. Globally, wasting accounts for 4.7% of all deaths of children aged less than 5 years. Severely wasted children are 11 times more likely to die than their healthy counterparts. The current global levels of severe wasting are responsible for up to 2 million deaths annually. Even higher

mortality has been reported in children who are both wasted and stunted (Low height-for-age). Of 118 countries those showing prevalence of wasting in 2013, only 49 (42%) report the average prevalence of less than 5%. However, there is no data to confirm that the levels did not rise above 5% at any point during that year. The rest 69 countries are currently falling short of the target. There are additional 78 countries for which data are not available.

The majority of all moderately (69%) and severely (71%) wasted children live in Asia. Just over one quarter of all moderately (28%) and severely (28%) wasted children live in Africa. It is estimated that, globally, less than 15% of wasted children are now able to access treatment services. In some countries this percentage is further less. These statistics are warning signals for global policymakers. Sub-optimum growth, indicative of wasting has been shown to increase the risk of death in childhood from infectious diseases such as diarrhoea, pneumonia and measles. It is not well understood as to how much wasting contributes to conditions such as stunting, low birth weight and anemia. Evidence does suggest, however, that episodes of wasting negatively affect linear growth and therefore undermine child growth and development.

Wasting and stunting share both direct and indirect factors. Preventive services tackling such factors do impact both. Associations between episodic variable weight-for-height and low linear growth have been seen. There must be a clear recognition that wasting confers double the risk of mortality associated with stunting. Being both stunted as well as wasted, result in still higher mortality. Failure to recognize increased mortality risks indicate that policy-makers might not be aware how important it is to tackle wasting with due priority. Following are the actions they ought to consider to reduce and maintain rate of wasting 5% or less:

- a) Improve identification, measurement and understanding of severe acute malnutrition; and scale up coverage of services for the

identification and treatment of severe acute malnutrition.

- b) Develop improved methods and linkages for identification and treatment of severe acute malnutrition, both within the health sector and across sectors.
- c) Rapidly develop evidence for effective prevention strategies to reduce the burden of wasting, translating those into policy actions.
- d) Encourage and commission research to better understand the links between wasting and stunting in order to ensure maximum leverage, realized from current investments in nutrition programming.
- c) Encourage the increase of long-term funding for the prevention and treatment of acute malnutrition.
- d) Improve coordination between key government ministries to link treatment strategies for acute malnutrition and prevention strategies to address both acute malnutrition (Wasting) and stunting, throughout the life-course.

Principal causes of wasting:

Children become wasted when they lose weight rapidly, usually as a direct result of a combination of infection and diets that do not cover nutritional needs. Principal underlying causes of wasting are:

- a) Poor access to appropriate, timely and affordable health care.
- b) Inadequate caring and feeding practices (e.g. Exclusive breastfeeding or low quantity and quality of complementary food).
- c) Poor food security – not only in humanitarian situations, also the ongoing lack of food quantity and diversity, characterized by a monotonous diet with low nutrient density, together with inadequate knowledge of food storage, preparation and consumption.

- d) Lack of warehouses and cold storages.
- e) Lack of environmental sanitation, access to safe and wholesome water.

These factors are strongly related to each other and have a cyclical relationship with wasting. Poor diet leads to increased risk of infection, and infection has a profound effect on nutritional status. A previously healthy child can quickly become wasted when faced with a severe infection, potentially leading to a loss of appetite. As wasting worsens, children become more susceptible to infections. This is known as the “vicious cycle” between infection and wasting. Diarrhoeal disease is common in low-income countries, where hygiene and sanitation can be suboptimal. Diarrhoea has been identified as a particular culprit in causing rapid weight loss pushing down-hill the already malnourished children in the border zone. Another risk factor for wasting is having low birth weight or being small for gestational age that may be important in regions that have a high prevalence of small babies e.g. South Asia.

Action plan:

The global extent and consequences of wasting, particularly in some high-burden countries, have been recognized through joint statements issued by the United Nations, in which it endorsed community-based approaches for improving management of wasting. It includes use of MUAC as an alternative to assessing weight-for-height and aid in timely identification of severe acute malnutrition. Decentralized outpatient services are also recommended for those with severe acute malnutrition (Severe wasting and/or low MUAC and/or bilateral oedema), based on community identification and referral. Inpatient care is also provided for those with poor appetite, severe bilateral oedema, and/or additional complications. Cases of moderate acute malnutrition are cared for on outpatient basis, with provision of supplementary foods when necessary, screening for medical conditions, routine health-related interventions and nutrition education for caregivers. Since the joint statements were issued

and guidelines developed, some countries rapidly scaled up treatment services to national level. Ethiopia was most successful in effective service decentralization.

Since 2008, the Ethiopian Ministry of Health have decentralized treatment services for ensure wider access and coverage of services to treat severe acute malnutrition. The service was decentralized to health posts following simplification of protocols and training of 8500 front-line health workers (Health extension workers). During 2013 (The year of good harvest), a total of 2,67,500 children were admitted for therapeutic care (250 000 to out-patient and 17,500 inpatient care). Results have been continually above internationally recommended standards, with a recovery rate of 86% reported for the year. During the early stages, trained staff turnover was an issue and the reporting rate was poor. These challenges were soon overcome, with 86% of facilities providing regular reports during 2013.

Treatment for severe acute malnutrition (SAM) is not only vital but also cost effective, with an estimated cost of US\$ 200 to treat each child with SAM. The 2013 Lancet series on under-nutrition recognized treatment of severe acute malnutrition as the most cost effective of the various direct nutrition interventions. The earlier the child receives treatment, the cheaper it will be, as they are less likely to have developed additional medical complications and recovery times will be shorter. Nutrition offers one of the best returns on investment. Every US\$ 1 invested in nutrition, including treatment of SAM, generates as much as US\$ 138 in better health and increased productivity. At the other end, not investing in nutrition perpetuates economic losses to individuals and to countries - at an estimated cost of up to 11% loss in annual gross domestic product (GDP) in productivity. While the treatment of SAM is a well-established, evidence-based intervention, integrating it into essential health packages at national level has been challenging. This is partly due to existing weaknesses in health systems and challenges in securing sufficient long-term funding

to adequately scale up the service to national level, besides difficulties along supply chain and availability of treatment logistics. Challenges in identification and treatment of acute malnutrition are also partly due to disagreements over accountability on responsibilities. The international community often supported treatment of acute malnutrition during emergency situations. However, in order to reach the majority of children suffering from wasting in high-burden areas, it is vital for treatment of wasting to be integrated into a country's essential health package, training and supervision of health staff involved in managing acute malnutrition, community mobilization and early identification, to be included in the curriculum.

In many countries where the burden of wasting is high, there are no specific activities for either treatment or prevention of moderate wasting. To address the burden of moderate wasting in children aged 0–24 months, the package of “Essential nutrition actions” should be implemented, including activities such as promotion of and support for breastfeeding, nutrition counseling for families regarding complementary feeding practices and the provision of food supplements. For older children, the focus should be on improving family foods (Diversity, quality and safety). Linear programming (Optifood) is a tool that can be used to assess whether specific available foods (i) Can meet recommendations for nutrient intake, (ii) Can be afforded by households and (iii) Are part of the current diet. Children with moderate acute malnutrition (MAM) also need to have access to health services and treatment for any medical conditions.

In emergency contexts, including food-insecure settings, treatment of moderate wasting usually consists of provision of a supplementary food. Beyond nutrition counseling or the increased availability of appropriate supplementary foods, provision of cash vouchers/transfers are being explored further by a number of actors and may present advantages over product-based strategies for addressing moderate acute malnutrition.

However, there is still poor consensus among the international community about the best approaches for either treatment or prevention of moderate acute malnutrition. The nature of nutrition is that it spans many sectors and relationships are keys to reaching multiple global targets.

Currently, evidence regarding the best ways to integrate nutrition within other sectors to achieve the desired improvements is limited. Impact of nutrition-sensitive interventions on acute malnutrition (Such as- Agriculture, social protection, education, water, sanitation etc.) have not yet been actuated. Improvement in design of nutrition sensitive services e.g.- monitoring and evaluation will increase the ability to:

- a) Identify which of the indirect programs have greatest effect on improving nutrition outcomes
- b) Attribute any improvement in nutritional status to the investments made.

Those few countries which developed multi-sectoral plan to treat and prevent wasting as well, are certainly increasing. Nepal is a good example, experiencing high levels of under-nutrition, with wasting of 11%. The management of severe acute malnutrition has been included in the Multi-Sector Nutrition Plan (MSNP), developed by the Government of Nepal. A high-level steering committee oversees the operationalization of this plan and reports to the Prime Minister's office. There is obviously good government “buy-in” and commitment. The plan will be monitored and results measured against the details outlined in the plan's logical framework. Progress to achieve this target will depend not only on the scale-up of interventions to treat severe acute malnutrition but also on the strength and effectiveness of prevention strategies. While Ethiopia is having impressive success in treating hundreds of thousands of children each year, the large numbers of children becoming wasted is only slowly reducing, and seasonal surges of wasting are still occurring, even in years of good harvest.

Better links with preventive services are urgently required, in order to reduce the number of wasted children. Services should be tailored to the context and encompass a range of different services e.g.– promotion of improved infant and young child feeding; promotion of good hygiene and sanitation; and better social protection policies and programs (e.g.- Targeted to poorest families who need social support to ensure access to diets that cover nutritional needs year round). Country level contextualization is essential, since strategies that are successful in Asia might not have the same success in Africa. As India accounts for approximately one half of the global burden of wasting, reductions in its overall burden will be highly dependent on the extent to which India places treatment and prevention of wasting as a national priority. Finally, programs, policy, research and financing for wasting and stunting have been separate. Both wasting and stunting (Including micronutrient deficiencies) share causal pathways, which suggest that action on one is very likely to impact the other. Hence it is important to include treatment and prevention of wasting in development plans and goals. Wasting is a condition that millions of children develop each year, with a large burden of these numbers occurring in “non-emergency” situations.

Action to prevent wasting:

1. Improve the identification, measurement and understanding of wasting and scale up coverage of services for the identification and treatment of wasting.

- a) Develop national wasting targets that are in line with, and will contribute to, achievement of the global World Health Assembly targets.
- b) Strengthen methods to accurately assess the burden of acute malnutrition for service planning, design and monitoring, including assessment according to the criteria used for admission (Including bilateral oedema and MUAC); as well as supporting the widespread assessment of national treatment coverage to allow for accurate assessment of the uptake and

effectiveness of treatment services, for both severe and moderate acute malnutrition.

- c) Promote a holistic view of malnutrition, through understanding that stunting, wasting and micronutrient deficiencies can occur in the same child, family and community, and ensure services for under-nutrition are implemented in a more cohesive fashion.
- d) Develop national advocacy strategies to ensure that policy-makers understand that wasting is not a condition that only occurs in emergency contexts, but is a serious, ongoing cause of child mortality and morbidity.
- e) Develop better understanding of major causal factors of wasting, including seasonal patterns; ensure resources and capacity are available to analyse the data. Intensify prevention strategies leading up to lean/hungry periods, and ensure that treatment services have been scaled up to handle case-loads during seasonal “surges” of wasting.

2. Develop improved methods and linkages for identification and treatment of wasting, both within the health sector and cross-sectorally.

- a) Ensure treatment of severe wasting is an integral part of the health policy/system and link with existing support for health-systems strengthening, by building the national capacity. Pre-service training is essential for all levels of health staff. Inservice training is important when the new service is introduced, and as a refresher thereafter.
- b) Invest in health-system strengthening, supply chain management of ready-to-use therapeutic food, and other health commodities that are currently subject to stock-outs and are also expensive for national governments to procure. Failure to strengthen health systems to integrate nutrition at scale will hamper progress on reducing malnutrition.
- c) Ensure identification of wasting is conducted at all entry points of the health system, including vaccination services and child health days.

- d) Ensure that wasting is recorded as one of the factors in mortality statistics.
 - e) Support the inclusion of nutrition outcomes in large multi-sectoral programmes, such as safety nets and agricultural and educational initiatives, in order to establish whether services are delivering results for nutrition.
 - f) Include nutrition in the general curricula of primary and secondary school education, so that children can take these messages home and influence their own parents, and as a means of sensitizing future mothers and fathers.
- 3. Rapidly develop evidence for effective prevention strategies, to reduce the burden of wasting, which can then be translated into policy actions.**
- a) Develop practical links between treatment and prevention services appropriately.
 - b) Document how delivery of prevention strategies outside of the health system impacts nutrition outcomes. Using simple key messages (such as the essential nutrition actions) are likely to help to ensure clear and consistent messages are provided across on all contexts.
 - c) Promote more research related to seasonal approaches for preventing moderate wasting, the use of cash transfers or the distribution of specific nutrient-dense food supplements during lean seasons, and sustainable solutions to improve year-round access to an appropriate diet for the prevention of wasting.
 - d) Encourage research to better understand the links between wasting and stunting, to ensure maximum impact is realized from the current investments in nutrition programming.
 - e) Define the associations that exist between stunting and wasting in the population of children aged under 5 years and the synergistic effect on improving long-term nutritional outcomes by tackling wasting alongside other nutrition interventions.
- f) Investigate whether there are regions/countries where associations between wasting and stunting is more (Or less) evident.
 - g) Support operational research to investigate the effects of wasting and its treatment.
 - h) Support OR for integrated approaches in prevention of stunting and wasting
- 4. Research needs:**
- a. Determine optimum visit frequency if home rehabilitation is a must.
 - b. Peer support groups helping families to achieve catch-up growth. Its value is required to be tested.
 - c. Feasible modifications, culturally appropriate, retaining nutrient value in terms of energy, protein, micronutrients
 - d. Guidelines will need field-testing, their effectiveness, rates of weight gain at home might be improved by:
 - i) Inclusion of micronutrient supplements,
 - ii) Provision of ready-to-use catch-up food, fortified with micronutrients.
 - iii) Research to test their effectiveness is warranted.
 - e. Achieve catch-up growth with home-based rehabilitation, research needed to determine if these children or their families share certain identifiable characteristics that could be used to label them as high risk, for additional care.
 - f. Advice at home visits may produce a 'Ripple effect' among neighboring families influencing others' infant care, feeding practices. Such potential benefits of home visits deserve investigation.
 - g. Rehabilitation phase ends when children attain -1 SD (90%) WfH. Feasibility of using this criterion in community-based programs needs to be tested. A very few only use such indices.

h. There is no evidence of successful systems referring malnourished children from hospital to community for continuing rehabilitation. Following factors need to be tested:

- a) Efficient systems of transfer and tracking, avoiding gaps in treatment during referral need to be identified and tested.
- b) Onus of responsibility needs to be delineated, also whether the hospital denies accepting full responsibility or retains full / partial accountability.
- c) Whether proper instruction to mothers and caregivers about child feeding and health promotion practices adequately given in hospital, in case home rehabilitation visualized.

5. Increase of long-term funding for the prevention and treatment of acute malnutrition.

- a) Improve sustainable funding for the prevention and treatment of acute malnutrition/ wasting, in national health budgets and in the budgets of other nutrition-sensitive sectors, as appropriate.
- b) Improve coordination between key government ministries, to link treatment strategies for acute malnutrition to prevention strategies for wasting and stunting; throughout the life-course.

6. Challenges before Nutrition Rehabilitation Centre Initiative in India:

- a. Political- a. Agitations, b. Elections, c. Strikes at Anganwadi
- b. Economical – Loss of wages: Rainy season, field work harvest
- c. Logistic– a. Remote area, b. Communication, c. Transport issues
- d. Social – a. Death / Marriage in family, b. Husband not co-operating, c. Alcoholism, d. Parents using fast foods in hospitals, e. None willing to stay in hospital, f. Congenital

anomalies in child.

- e. Epidemiological - a. Swine flu, b. Dengue, c. hospital associated infections.
- f. Improve immune function and access to health care when infections occur.

Conclusion:

It is vital that policy-makers understand the importance of the problem of wasting, not only from the humanitarian perspective, but also with a wider lens, if the dramatic and consistent reductions in wasting are going to be achieved. It is high time we Pediatricians rise to the occasion and get directly involved to take on this challenge as we did to write the Polio Eradication success story in this country. Like our torch bearers in Chhatisgarh and Gadchiroli have shown to the world their resolve against all odds. We are the care-givers at grass roots – from remote villages to sub-urban slums. Therefore we are the natural arbiters for child-health-care before the policy makers, being front-line pediatricians, including those general practitioners who care for our children in these areas. We are natural social leaders in the front-line. Let's resolve to do it again!

Resources:

1. Global Burden of Diseases. Lancet, September, 2016
2. India's global health rankings. The Times of India, October 13, 2016; 8-9.
3. Lancet series on Under-nutrition, 2013
4. Operational guidelines on Management of Severely Acquired Malnutrition, NRHM, Ministry of Health and family Welfare, Govt. of India, 2011.
5. Ann Ashworth. Community-based rehabilitation of severely malnourished children: a review of successful programmes. London School of Hygiene and Tropical Medicine July 2001