Child Health Scenario in the slums of Meerut, Uttar Pradesh: Implications for Programs & Policy

India accounts for 2.1 million of the 9.7 million annual under-five child deaths globally, thereby contributing to about 21 per cent of the global burden of child deaths[1]. Nearly 26 million infants are born each year, of which 1.7 million die before reaching the first birthday[2]. The country's infant mortality rate (IMR) and under-five mortality rate (U5MR) stands at 57 and 74 per 1000 live births respectively[3].

Infectious diseases such as acute respiratory infections, diarrhea, measles and malaria are the most common causes of deaths during late infancy[4]. Diarrhea (22%) and acute respiratory infection (ARI) (20%) together account for more than 40% of all deaths in children under-5 years[5]. Malnutrition is a leading contributor to infant and child morbidity and mortality; an estimated 53% of all child deaths are associated with underweight status. Being underweight puts children at greater risk of mortality from infectious diseases such as diarrhea (61%), malaria (57%), pneumonia (52%), and measles (45%)[6]. In turn, infections contribute to malnutrition through a variety of mechanisms, including loss of appetite and reduced capacity to absorb nutrients[7].

Uttar Pradesh has a high IMR and U5MR of 73 and 96 per 1000 live births respectively[8]. Further variations exist based on the living conditions. Urban poor have the highest IMR of 86 and U5MR of 110 within the state[9]. The urban poor constitute a high risk group with regard to child health and have a substantially higher prevalence of child morbidity and mortality due to malnutrition and infectious diseases on account of poverty, poor living conditions, inadequate diet, harmful social practices and poor access to healthcare[10].

Background of the study

In order to assess the status of maternal, neonatal, child and reproductive health in the urban slums of Meerut city, Uttar Pradesh[a], Urban Health Resource Center (UHRC) conducted a study in collaboration with the Johns Hopkins Bloomberg School of Public Health, USA and Chatrapati Sahuji Maharaj Medical University, Lucknow. The study included use of both qualitative and quantitative methods. A household survey was conducted between October 2007 and March 2008. The survey covered 15,025 women who had a live or still birth in the three year preceding the survey. These women are, hereafter, referred to as recently delivered women and were drawn from 44,888 households across 45 slums within the city[b]. The scope of the survey was very similar to the DHS/ NFHS and was adapted to capture information specific to urban slum context.

What did the survey find?

The IMR[c] in the surveyed slums was 59.8[d]. The survey revealed inadequate feeding practices, poor nutritional status with considerable percentage of children suffering from underweight, stunting and wasting, low immunization coverage, exposure to unhealthy environment, high burden of infectious diseases and poor case management of childhood diseases. These indicators relate to increased vulnerability to child morbidity and mortality[11].

Sub-optimal breastfeeding practices and delayed initiation of complementary feeding among children under-three years of age

- Exclusive breast feeding was rare -only 12.0% of the infants were exclusively breastfed for at least six months.
- Complementary feeding is often delayed - only a quarter of the children (23.9%) received timely initiation of semi-solid food at the start of seventh month.

Exclusive breastfeeding during the first 6 months of life is critical for child's health as it improves the child's nutritional status and reduces morbidity and mortality[12]. Exclusive breastfeeding for the first six months of life has the potential to avert 13 per cent of all under-five deaths in developing countries. Along with breastfeeding, infants also require complementary feeding after six months of age, when human milk is no longer sufficient to meet their nutrient needs. Timely complementary feeding could avert a further six per cent of under-five deaths[13].

Nutritional status of children below three years of age was poor as assessed by underweight, stunting and wasting status

- Almost 43.0% of the children were underweight (weight for age <mean-2SD). Severe underweight (<mean -3SD) was found among 16.6% of the children.
- The overall prevalence of stunting (height for age <mean - 2 SD), an indicator of chronic malnutrition was about 68.2%, while the extent of severe stunting (<mean - 3 SD) was about 44.5%.

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a. Meerut was selected for the trial, in view of presence of large urban slum population (highest among cities in Uttar Pradesh). Situation analysis of the slums revealed existence of unlisted slums, pockets of underserved slum population and underutilization of existing health services.

b. The indexed women were the one who had a live birth during the last 36 months preceding the survey

c. Number of infant deaths per 1,000 live births in the last 3 years; in contrast NFHS-3 calculated infant deaths in the last 5 years while calculating IMR.

d. Since the Meerut study only covered children less than 3 years of age, U5MR could not be calculated.

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- Wasting (weight for height<mean-2SD), an indicator of acute under nutrition, was prevalent among 12.4% children. Severe wasting (<mean-3SD) was found in about 5.4% children.

Nutritional status is a major determinant of health and well being of children, as undernutrition is a common cause for child morbidity and mortality, especially among the poor. Malnutrition among children is often caused by the synergistic effects of inadequate or improper food intake, repeated episodes of infectious diseases, and improper care during illness[14].

Immunization coverage rates were low and complete immunization among children aged 12-23 months was dismal at 12%

- Around 42.0% of the children received BCG.
- Only a quarter of the children received measles vaccine (24.3%) and a similar percentage received DPT 3 (23.7%).
- There was a considerable drop in the percentage of children who received DPT1 (37.8%) and DPT3 (23.7%). This reflects a substantial percentage of drop-outs. Similar trend could be seen in case of children who received Polio 1 (33%) and Polio 3 (22%).
- Vaccination card was available with only 38.6% of mothers whose child received any immunization.
- Multiple reasons were cited by the women for poor immunization. These included long distance to the nearest public health facility, after affects of vaccination like fever, swelling, and pain and strong belief that polio vaccine can cause sterility in their children.

Measles is often complicated by pneumonia or diarrhea. Decreases in the immune defenses as a consequence of measles lead to a high rate of these subsequent infectious diseases, and also to a higher case fatality rate when they do occur[15]. A large proportion of child deaths occurring in India every year are easily preventable through immunization[16]. Vaccination of children against six serious yet preventable diseases, namely tuberculosis, measles, diphtheria, whooping cough, tetanus and polio, is thus the basis of child health programs in India. Children of the urban poor suffer accentuated vulnerability to such illnesses, as outbreaks of vaccine preventable diseases are more common in urban slums owing to high population density and continuous influx of new pool of infective agents with immigrating population[17].

The burden of diarrhea and acute respiratory infection (ARI) in <5 children were very high

- Around a quarter of the children reported suffering from diarrhea (24.2%) in the 15 days preceding the survey
- About 22.2% of the children reported having signs of ARI (cough with short, rapid and difficult breathing) in the 15 days preceding the survey.

Worldwide, 22% of deaths among children under-5 years are attributed to diarrhea and 21% to pneumonia[18]. The common causes of death i.e., diarrhea, pneumonia and fevers are the most prevalent diseases identified among slum children besides nutritional deficiencies[19].

Unsatisfactory treatment seeking behavior for childhood diseases

- While almost 80.0% of the women were aware of Oral Rehydration Solution (ORS), only 21.2% of the children suffering from diarrhea were given ORS. This underlines the fact that their awareness was not getting translated into practice.
- Over 80% of the children suffering from diarrhea (85.5%) and ARI (92.4%) sought some kind of treatment.
- The private sector was the the preferred source of care for diarrhea (94.5%) and for ARI (96.7%). Of the mothers seeking care in the private sector for diarrhea only 50.5% sought care from a qualified provider (MBBS) while the others sought care from an unqualified provider which includes drugstores/pharmacies, untrained doctors, dai, homeopath or traditional healer. Of the mothers seeking care from an unqualified practitioner the most commonly sought was the untrained doctors (76.7%). Again, for ARI the private sector was the main source of seeking care (96.7%). Only 53.2% of these mothers sought care from a qualified (MBBS) provider.

An estimated 60-70% of diarrhea deaths are caused by dehydration. Oral Rehydration Therapy (ORT) can prevent about 90% of child deaths from dehydration[20]. Around 30-60% of ARI related child deaths can be averted by appropriate recognition of symptoms, timely care seeking and treatment including community case management[21] .

Program implications of the findings for urban health program in UP and India

The findings on child health indicators in the Meerut slums highlight the need for strategies to improve household bahviours and access to effective child survival interventions. These include promoting exclusive breastfeeding, timely complementary feeding, complete immunization and proper management of infections/diseases. Such interventions would also have a beneficial impact on the nutritional status of children. It is therefore important to ensure that these interventions reach the most vulnerable children, especially the poor and marginalized in the slums. Key program strategies to implement these interventions can be divided into technical and operational interventions.

Technical Interventions include promoting child survival practices including breastfeeding, complementary feeding, complete immunization, and management of childhood diseases.

Dedicated efforts to improve exclusive breastfeeding: The survey findings highlighted that children under three years of age received sub-optimal breast milk. Only 12% were being exclusively breastfed. Exclusive breastfeeding implies that the infant only receives breast milk without any additional food or drink, not even water for at least six months after birth[22]. Exclusive breastfeeding in addition to providing adequate nutrients also reduces infant mortality due to common childhood illnesses such as diarrhea or pneumonia, and helps in quicker recovery during

illness[23]. While breastfeeding is a natural act, it is also a learned behavior. An extensive body of research has demonstrated that mothers and other caregivers require active support for establishing and sustaining appropriate breastfeeding practices[24]. It is therefore crucial that the slum women be made aware of the benefits of breast milk through inter-personal communication, group counseling, community mobilization and mass media.

Focus on initiating timely complementary feeding: This study showed that only a quarter of the infants received timely complementary feeding at the start of seventh month. Faulty feeding practices that includes giving any other food but breast milk before initiation of complementary feeding places babies at risk of infections and illnesses, even death[25]. Nutritionally inadequate or contaminated food and starting complementary feeding too early or too late are major causes of malnutrition in infants and young children. All the mothers should have access to skilled support to ensure the timely introduction of adequate and safe complementary foods with continued breastfeeding at least up to two years[26] .

Concentrated efforts to improve nutrition status of children: Children below three years of age in the study had pitiable nutrition status. Almost half of the children were underweight or stunted. It is therefore crucial that these indicators be improved. Breast milk is the natural first food for babies, it provides all the energy and nutrients that the infant needs for the first months of life, and it continues to provide up to half or more of a child's nutritional needs during the second half of the first year, and up to one-third during the second year of life[27]. Addressing the community's beliefs related to infant feeding practices and proper management of infections through regular counseling by trained health volunteers can improve the nutritional status of the children.

Need to enhance immunization coverage: The study underscores poor immunization coverage with only 12% receiving complete immunization. There was 14% drop in the percentage of children between receipt of DPT1 and DPT3. This highlights an underlying need to educate the community regarding the need of complete and timely immunization and make them aware of the nearest health facility to avail these services. Common misconceptions in the communities including fever, swelling and sterility associated with vaccinations need to be dispelled.

Need to facilitate early identification of danger signs of diarrhea and acute respiratory infection (ARI) and provide timely treatment: The findings revealed that about a quarter of children suffered from diarrhea and ARI in the two weeks preceding the survey. Although majority of women were aware of ORS, only one in five children who suffered from diarrhea received ORS. This emphasizes the need to increase awareness of the community on ORS as the most inexpensive, easily available, and effective treatment for diarrhea. It is also important to educate the community to recognize the symptoms of diarrhea and ARI for proper and timely treatment.

Operational Interventions include promoting behavior change of the community to follow appropriate child survival practices and building linkages with health facility.

Strategies to influence behavior change: Promotion of optimal feeding practices including early and exclusive breast feeding for the first 6 month of live, economical complementary foods, and hygiene maintenance of complimentary feeds should be undertaken in slum community through peer counseling and regular visits by trained community groups or other slum level health volunteers.

1. Counseling should focus on key target groups such as mothers and elderly females through individual as well as group counseling.
2. Local media should be encouraged to broadcast messages on optimal feeding and child care practices such as home treatment of diarrhea using ORS or sugar-salt solution.
3. Seasonal migrants could be given pictorial cards depicting optimal feeding / child care practices as well as hygiene behavior, which they could refer to irrespective of their place of residence.

Need to enhance the knowledge and technical skills of existing health service providers to address child health issues: Majority of the mothers sought treatment for their newborns from private health providers with majority from unqualified health providers. It is therefore essential that these service providers be regularly trained to update their technical knowledge so that they are able to manage common childhood ailments and refer in case of complications. This can be done through-

1. Periodic staff sensitization and motivation workshops undertaken on a regular basis to identify need for support and training of the health staff. It would also be effective in ensuring sympathetic treatment and good quality of care to the slum dwellers.
2. Establishing linkages of existing public health staff, private doctors and pediatricians with specialists could help provide them with technical guidance and advice as required. This could be especially helpful in diagnosis and treatment of complications.

Conducting training programs for slum based health volunteers to enhance their skills to provide child survival interventions: In absence of nearby public health facility, community volunteers or the community based groups are the first point of contact for the mothers on any issue related to child care. This source needs to be properly sensitized and trained on various child survival issues so that they can transfer the knowledge to the mothers and do regular follow-up. These trainings should include-

1. Awareness regarding the benefits of exclusive breastfeeding for at least six months and timely initiation of complementary feeding. It also includes dispelling misconceptions regarding

the nutrient content of breast milk, understanding reasons for not being able to breastfeed (problems related to sucking, milk production, etc) and knowledge about various foods the child should consume under complementary feeding.

2. Knowledge on the various immunizations and their appropriate timing. They should also be aware of the nearest health facility to avail the services.

3. Knowledge regarding common ailments, awareness about home remedies and easily available treatment options like ORS for diarrhea, ability to detect danger signs among children and promptly refer them for treatment in health facilities.

Expanding coverage of ICDS and other schemes to improve the nutritional status of children[28]: The findings highlighted almost 40-60% children under- five years suffering from malnutrition. Efforts should be made to expand ICDS coverage in the slums since it would have a positive effect on the nutritional status of children. Accessibility of other food security schemes like Targeted Public Distribution System (TPDS) and Antyodaya Anna Yojana (AAY) could also be ensured through efforts of community groups or local NGO partners to have a positive impact on nutritional status of children.

Strengthened demand and supply of services can improve immunization coverage: The study revealed poor immunization coverage. Reasons included absence of public health facility in the vicinity and irregular immunization camps. This emphasizes the need to strengthen urban health delivery system along with increased demand. Immunization coverage can be improved through expanded outreach services and adequate supply of vaccines. In order to generate demand among the community, regular monitoring and counseling by slum health volunteers and linkages with local health centres is required. Community health groups could be effective in ensuring better logistics and coordination for increasing immunization coverage through outreach camps. Involvement of religious heads and community leaders in communicating the importance of timely and complete immunization will also be helpful in increasing demand and utilization.

Expanding coverage and quality of health services for proper case management of diarrhea and ARI: Slum dwellers in Meerut have shown a strong preference for the private sector for treatment of diarrhea and ARI. There could be several reasons for this, including non availability of public health centres, or poor quality of care provided by them. It is therefore essential that:

1. The coverage and quality of public health centres in slum areas should be expanded, either through new infrastructure or through mobile services or regular outreach camps.
2. Public-private partnership with local health care providers could enable expanded coverage and subsidized treatment to slum dwellers.

Increasing availability of ORS and other supplements: Although 80% of the mothers were aware of ORS to treat diarrhea, only 20% were giving it to the child in case of an episode. This could be due to non- availability of ORS packets. Local community organizations, shops or other groups could be encouraged to be depot holders of ORS packets and for other nutritional supplements.

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