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Original Research Article

No time to waste for wasted children in Bihar: time to reset

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ABSTRACT

Background: Severe acute malnutrition (SAM) with severe wasting remains a major killer of children. In Bihar, 48% of children are stunted, 21 % are wasted, and 7% are severely wasted. Even during the first six months of life, 31% are wasted. The objective of this study was to study wasting trends and contributing factors responsible for changes in Bihar among children 0-5 years.
Methods: This cross-sectional study was done using a data of NFHS-5 survey in Bihar (N=35,834) conducted in all 38 districts of the state from July, 2019 to February, 2020. The Bihar NFHS-5 report and factsheets, including NFHS-4 data, were downloaded and converted to excel to enable data visualization and trend analysis. The outcome variable Wasting was measured using NFHS-5 relevant questionnaires given under nutrition category. We analyzed trends between NFHS-5 and NFHS-4 Bihar data for severe wasting/wasting, determinants, and coverage of interventions.
Results: The prevalence of severe wasting has increased from 7% to 8.8%, while wasting increased from 20.8% to 22.9% (NFHS-5). The severe wasting and wasting has reversed or worsened in 27 districts. There is a mixed picture of infant feeding- early initiation of breastfeeding worsening and some improvements in exclusive breastfeeding and timely introduction of complementary feeding. Consistent improvement across districts for underlying determinants, but slight, in women's education, teenage pregnancy, and marriage before 18 years.
Conclusions: Need to invest in improving maternal determinants-age at marriage, education, ANC coverage, and teenage pregnancy. It is imperative to focus on preventing, identifying, and treating wasting.

Keywords: Wasting, Severe wasting, Under-nutrition, Severe acute malnutrition, Malnutrition, NFHS

INTRODUCTION

Severe acute malnutrition (SAM) is one of the most life-threatening forms of undernutrition and remains a major killer of children. NFHS-5 Bihar data reveals that the prevalence of severe wasting is alarming and has increased from 7% to 8.8%.[1] The gains made under child wasting (low weight for height) seem to be reversing as the prevalence of wasting among children of Bihar has increased in the past four years. Severe acute malnutrition is defined by very low weight-for-height/length (Z-score below -3 SD of the median WHO child growth standards), or by the presence of nutritional oedema.[2] It can be a direct or indirect cause of child death by increasing the case fatality rate in children suffering from such common illnesses as diarrhoea, acute respiratory infections, malaria, and measles.

The National Family and Health Survey (NFHS) has provided critical data on India's health, nutrition, and population indicators. The fact sheets and state-specific reports from the fifth round of the NFHS (NFHS-5) conducted in 2019-20 are available for all states.[1] The objective of this study was to understand trends of severe wasting and wasting in Bihar along with their contributing factors and systematically demonstrate to multiple

stakeholders, mainly policymakers and researchers, about changes between NFHS-4 and NFHS-5 in wasting and related indicators for 38 districts in Bihar.

METHODS

The cross-sectional study was done using a data of NFHS-5 survey in Bihar (N=35,834) conducted in all 38 districts of the state from July, 2019 to February, 2020. For the present cross-sectional study and analysis, data is derived from a large-scale NFHS-5 conducted by the International Institute for Population Sciences (IIPS), Mumbai, under the Ministry of Health and Family Welfare supervision, Government of India. The fact sheets are publicly available on the respective website (http://rchiips.org/nfhs/).

The survey gathered information from women and men in their reproductive age groups, 15-49 years and 15-54 years, respectively. In total, 42,483 women were successfully interviewed (aged 15-49 years) in NFHS-5 Bihar data at the time of survey. This study was carried out based upon two-time frames of the NFHS (NFHS-4, 2015-2016 and NFHS-5, 2019-2020) series.

The survey included women who were usual residents in the sample households or visitors who had stayed in the sample households the night before the interview. A detailed description of the study design, sampling procedure, frame, and the non-response rate is published in the round-specific reports (IIPS, 2020). The outcome variable Wasting was measured using NFHS-5 relevant questionnaires given under nutrition category. The state Bihar and district-specific NFHS-5 factsheets, including NFHS-4 data, were downloaded, and converted to excel to enable data visualization and trend analysis.[1]

We conducted focused research for an indicator related to immediate determinants, underlying determinants, and critical intervention coverage. Our research interest is to study trends between NFHS-5 and NFHS-4 data for severe wasting/wasting, determinants and coverage of interventions.

RESULTS

Severe wasting

It is very striking to observe from Figure 1 that, except for Sheohar, all red zone district is in the west part of Bihar. Severe wasting has increased in 28 districts, highest in Sheohar (21.4%) followed by Aurangabad (18.5%) and Rohtas (18%). The state average prevalence of severe wasting is 8.8 %.[1]

In Figure 2, there are 26 districts with increasing trends in severe wasting compared to NFHS-4. It is observed that there are 11 districts in the dark red zone, demonstrating that absolute changes are reversed and higher than the median values.

In Figure 3, it is clear that there are 15 districts where absolute changes between NFHS-5 and NFHS-4 are reversed.

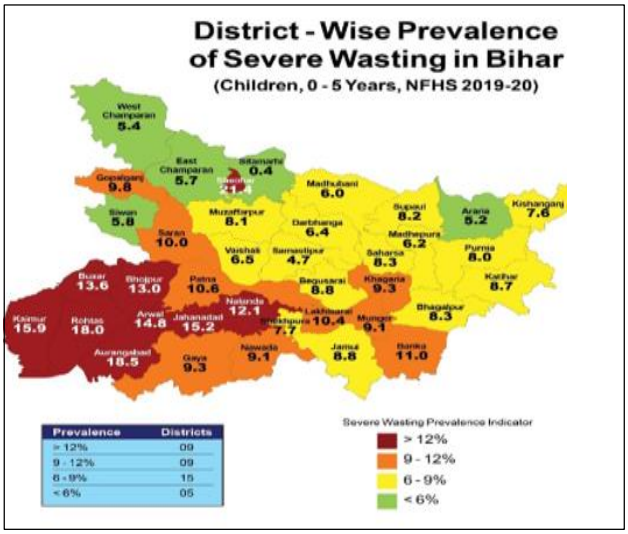

Figure 1: District wise prevalence in Bihar.[1]

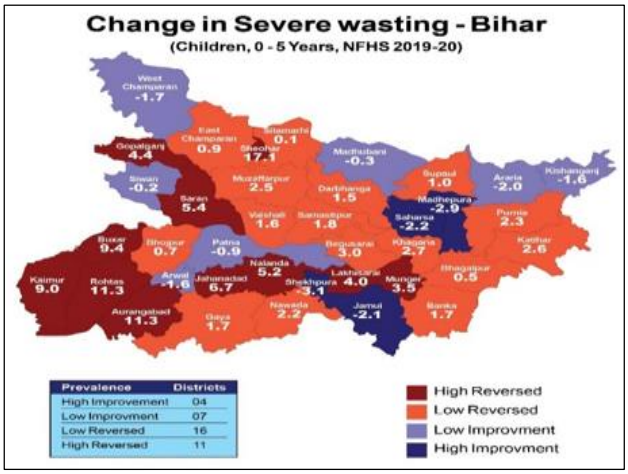

Figure 2: Severe wasting in Bihar.[1]

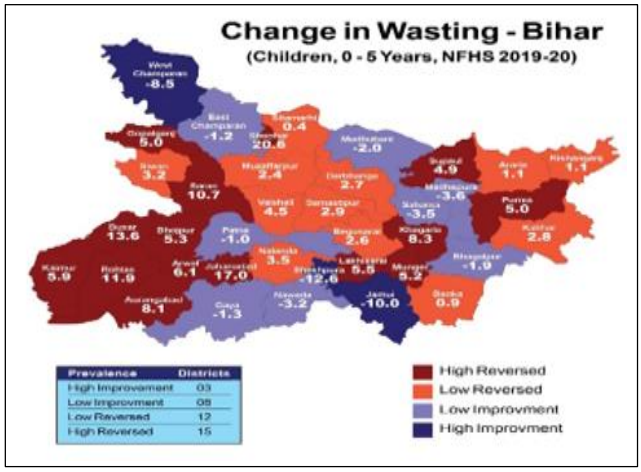

Figure 3: Change in wasting in Bihar.[1]

Association of wasting with age of child

In Figure 4, it is found that maximum wasting is found during less than six-month, severe wasting is 15.1%, and wasting is 31.4%. In severe wasting another rise is for 12-17 months (13.1%), and in wasting for 9-11 months is 31.7%.

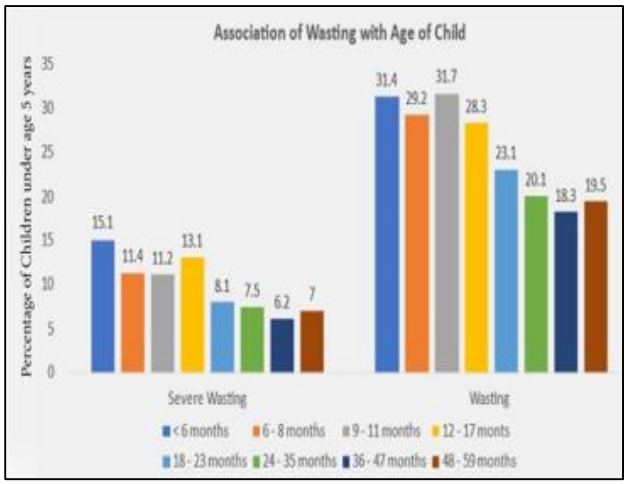

Figure 4: Association of wasting with age of child.[1]

Association of wasting with size at birth

It is evident from Figure 5 that size at the birth matter. A child who is born very small or weak will be severely wasted, and wasted most.

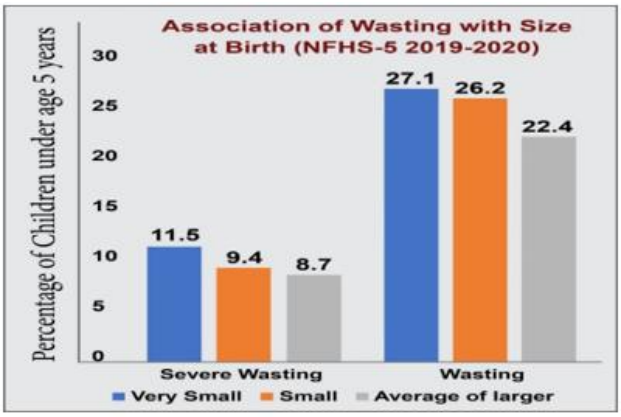

Figure 5: Association of wasting with size at birth.[1]

Association of wasting with birth order category

Maximum wasting is when there are more than six children, as shown in Figure 6. The severe wasting and wasting are 10.2% and 26%, respectively.

Association of wasting with birth interval

At first birth, severe wasting is 9 %, and wasting is 22.1%. However, when the birth interval is less than 24 months, severe wasting and wasting are significant, i. e.; 9.2% and 23.9%, respectively. Later, it declined but not much, as depicted in Figure 7.

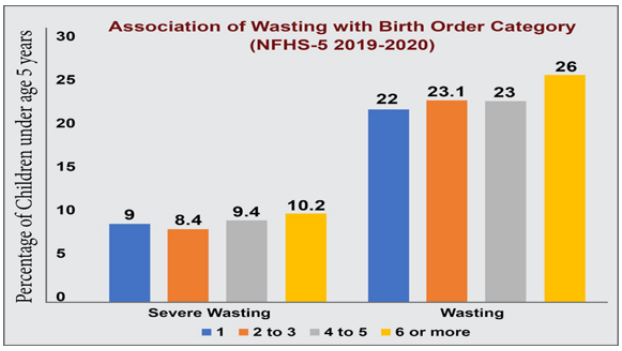

Figure 6: Association of wasting with birth order.[1]

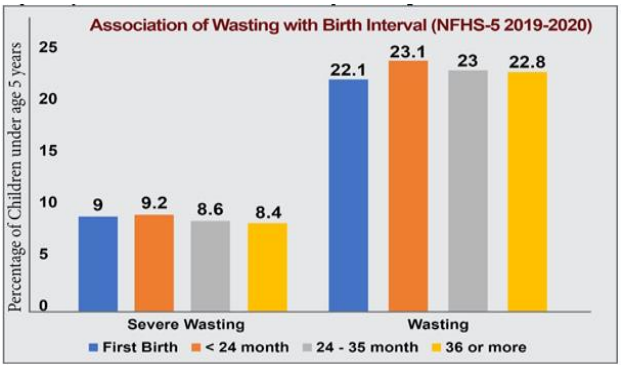

Figure 7: Association of wasting with birth interval.[1]

DISCUSSION

The current study was undertaken to document the trends of the prevalence of wasting and to study contributing factors responsible for changes in wasting. To get more insights into contributing factors responsible for changes in wasting, we have referred UNICEF conceptual framework.[3]

The benefits of mother's milk at least two years of age to address wasting and other undernutrition are closely linked and evident in current findings. Bihar's exclusive breastfeeding status in the first six months of a child's birth has improved from 53.4 % in 2015-16 to 58.9 % in 2019-20. However, in the state, only 31.1% of the children surveyed under NFHS-5 were breastfed during the first hour, a drop of 3.8%. In early breastfeeding initiation (EBI), the change reversed/worsened in 25 districts. The adequate diet among children 6-23 months has declined in 11 districts.

Among 0-5-year-old children, diarrhea has also increased from 10.4 % to 13.7%. To reduce dehydration and minimize the effects of diarrhoea on nutritional status, it is recommended that regular feeding of children be continued when they have diarrhoea and that the amount of fluids given should be increased.[2] Only 8 of children with diarrhoea received more to drink than usual. Of more

significant concern, 65% of children with diarrhoea were given less or nothing to drink. Only one-25% of children with diarrhoea were given the same amount or more food as recommended. The percentage of children with diarrhoea who received ORS in the two weeks preceding the survey has improved significantly from 45.2% to 58.2%. It is observed that there are a plethora of flavored and non-WHO standards ORS being sold in the name of oral rehydration salts (ORS).

Most parents give the wrong formula to children when they suffer from diarrhoea or vomiting. While too much sugar, on the one hand, adds to diarrhea as sugar increases the osmolarity of the drink, making it even more dehydrating, less than required salt does not adequately compensate for the loss.[4] The acute respiratory infections (ARI) reported for the state have deteriorated as it has increased from 2.5 to 3.5%. The study found that wasting status is susceptible to ARI, as other researchers wrote.[5]

Further, it was observed that almost 18% of mothers did not receive any antenatal care (ANC), and only 25% of mothers had four or more antenatal care visits. The home births attended by skilled health personnel have dropped from 8.2 to 6.1. To improve women's nutrition status at conception, it is essential to provide further attention to the nutrition needs of women before pregnancy.[6] Preconception nutrition interventions have been shown to improve fetal growth and reduce nutrition deficits in early infancy in South Asia.[7] Almost 18% of mothers consumed them for 100 days or more, and only 9 % consumed them for the recommended 180 days. The role of IFA and other micronutrients in preventing wasting are intricately linked and also evident in this study.[8] The state coverage of vitamin A dose among children 6-59 months has dropped from 63.3 to 56%.

There is marginal improvement in teenage pregnancy and marriage before 18 years. 11% have already begun childbearing, that is, they had a live birth or are pregnant with their first child. The proportion of women who have started childbearing rises sharply from 6% at age 17 to 17% among women aged 18 years and 37% among women age 19. The situation of teenage pregnancy has worsened in 16 districts, including the state capital Patna between NFHS-5 and NFHS-4.

The coverage of female child marriage has reversed or declined in 10 districts. The situation in Bihar highlights how severe wasting is passed on from generation to generation. As reported in data, literacy among women aged 15-49 is a mere 57.8%. Young women with no schooling are more than three times (25%) as likely to have begun childbearing as young women with 12 or more years of education (8%). The key indicators for water, sanitation, and hygiene indicators have improved. However, as reported, the population in households that use an improved sanitation facility is still below 50%. Further, only 9% of households in Bihar have water piped into their dwelling, yard, or plot.

A high prevalence of wasting (being wasted) is present in infants at birth; recent estimates suggest that 30% of wasting occurs during pregnancy.[9,10] Therefore, mothers' characteristics and experiences are critical predictors of wasting in infants.[11]

In addition, there can be considerable variation in nutritional status at birth depending on the month or season of birth. One study in the Gambia found that infants who were wasted during the first rainy season (typically the lean/'hungry' season) of their lives had an increased risk of wasting during the same season the following year, even if they recovered in the intervening dry season.[12]

Only 15% of households in Bihar have any health insurance/financing scheme covering at least one family member. The state average out-of-pocket expenditure per delivery in a public health facility has increased from Rs. 1784 (NFHS-4) to Rs. 2848 (NFHS-5).

Association of wasting with age of child

Maximum wasting is found during less than six-month, severe wasting is 15.1%, and wasting is 31.4%. There is a linkage of wasting with complementary feeding.[13] High severe wasting may be high low birth weight coming out during birth. Later, between 6 to 8 months get a bit normal due to breastfeeding. But as complementary feed is not introduced timely, these wasted children between 9-11 months go into severe wasting between 12-17 months. Other research studies support this assumption.[14] The maternal factor is essential in severe wasting in less than six months.[15] Other rises may be due to a lack of complementary feeding and breastfeeding practices. Wasting in early life increases the risk of wasting in later life.

Association of wasting with size at birth

The size of birth matters as a child born weak will be wasted most. Many researchers concluded that nutritional support was not in compliance with recommendations and that the rate of fetal growth restriction remained relevant as found in this study.[16] The wasted child suffers from poor growth and development and fails to thrive.

Association of wasting with birth order category

Maximum wasting is when there are more than six children. Naturally, the mother's health status and childcare breastfeeding practices get affected, and there the severe wasting is 10.2% and wasting reported is 26%. In the first birth order also, wasting is high. This may be because the first child is born at a significantly lower age. In Bihar, the median age at first marriage is 17.4 years among women aged 20-49. Two-fifths (41%) of women aged 20-24 married before attaining the legal minimum age of 18 years, almost unchanged from NFHS-4. The findings are in agreement with other research studies.[17]

Association of wasting with birth interval

At first birth, severe wasting is 9 %, and wasting is 22.1%. However, when a birth interval is less than 24 months, severe wasting and wasting are significant, i.e.; 9.2% and 23.9%, respectively. In NFHS-5, 21% were of birth order four or higher, compared with 24% in NFHS-4. Later, it declined but not much. Many researchers have reported that the relationship between chronic malnutrition and birth spacing is statistically significant. There is a clear pattern of increasing chronic and general undernutrition as the birth interval is shorter. It is recommended that mothers space births for at least 36 months.[18]

Limitations

Some of the limitations of this study are: (a) as secondary data is used so there is limited control over the data collection process and data quality; (b) this was a cross-sectional survey so data is collected at a single point in time, may not capture the trends over time; and (c) being a cross-sectional data it can only establish association between any variables at any specific point in time, can't determine about causality pathway.

CONCLUSION

It was imperative to take urgent policy and programmatic action**.** We need to focus on prevention, identification, and treatment of wasted children. Further we need to strengthen the linkages between facility-based treatment and community level. The NFHS-5 Bihar data is throwing question to researchers for future studies. We must explore locally the factors responsible for wasting in children. A relatively small additional investment- by donors, governments, and other financial instruments- would dramatically reduce child death rates and it would bring irrevocable socio-economic benefits to children who need help desperately. We have no time to waste.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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