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Undernutrition among refugee children aged 6–59 months is a critical public health concern due to the subsequent increased morbidity and mortality in this age group and the food insecurity facing refugee populations worldwide.[1,2] As part of the refugee health assessments at key locations around the world, IOM Migration Health Division teams routinely conduct anthropometric measurements on all persons examined. Using these data, IOM provides regular Nutrition Surveillance Reports that are disseminated to key partner agencies, including the United Nations High Commissioner for Refugees (UNHCR) and other non-governmental organizations (NGOs). These reports will contribute to refugee health monitoring and aid in the planning of essential nutrition interventions for refugee children.

Child growth and nutrition indicators

This report presents the prevalence of two key indicators for protein–energy malnutrition as recommended by the World Health Organization (WHO),[3] UNHCR,[4,5] and the World Food Programme (WFP),[6] namely, weight-for-height (or 'wasting') and height-for-age (or 'stunting'). Wasting is generally indicative of recent and severe weight loss, and is often associated with acute starvation and/or recent disease. Wasting is considered the best indicator of acute malnutrition and is a strong predictor of mortality among children under age five. Stunting is generally indicative of a more chronic process that results from suboptimal nutrition and/or health conditions.

Data collection and analysis

The IOM data management software called Migrant Management Operational System Application (MiMOSA) is used in refugee health assessments to capture and analyze operational data. MiMOSA data are gathered and undergo quality control in a Central Data Repository (CDR) used for generating statistical reports. This report uses 2012 MiMOSA data on the country of origin, and the age, gender, height (or length) and weight of refugee children aged 6–59 months from IOM sites in seven countries, namely, Ethiopia, Iraq, Jordan, Kenya, Malaysia, Nepal and Thailand. As recommended for population-based assessments, the z-score system of expressing indicators as the number of standard deviations (SD), that is, z-scores above or below the reference mean, was used. Summary statistics on the z-scores were computed using the SQL 2005 functions STDEV and AVG for the standard deviation and mean z-scores, respectively. The new WHO Child Growth Standards were applied to estimate wasting and stunting.[3] The severity or public health importance of malnutrition among refugees aged 6–59 months examined in various countries – overall and at specific sites was assessed using prevalence ranges recommended by WHO.[7] Prevalence of wasting in previous years is presented to show the observed changes at each site. The report presents the prevalence point estimates alongwith comments on prevalence levels [low, medium, high, very high] of wasting and stunting for each population group, using WHO ranges. Confidence interval estimates of prevalence proportions obtained for each location in 2011 were also compared with those calculated in 2012. Statistically significant differences were noted in cases where confidence intervals did not overlap.

Summary of findings

A total of 7,439 refugee children (11% of the 66,253 refugees examined in 2012) were included in this report. Overall, this population showed medium prevalence level of wasting (7.5%; 95% CI: 6.9–8.1) and low prevalence level of stunting (19.4%; 95% CI: 18.5–20.3). The prevalence levels of wasting were very high among refugee children in Iraq (32.2%; 95% CI: 27.5–37) and borderline high in children from Ethiopia (9.9%; 95% CI: 7.8–11.9). Refugee children from Malaysia (6.7%; 95% CI: 5.6–7.8), Nepal (6.1%; 95% CI: 4.9–7.3) and Kenya (5.8%; 95% CI: 4.4–7.1) had medium prevalence levels of wasting. Jordan (4.3%; 95% CI: 2.8–5.9) and Thailand (4.9%; 95% CI: 3.7–6.1) showed relatively low levels of wasting or acute malnutrition in refugee children.

The prevalence levels of stunting were high in Thailand (37.2%; 95% CI: 34.5–39.9); medium in Nepal (23.5%; 95% CI: 21.3–25.7) and Ethiopia (22%; 95% CI: 19.1–24.8); and low in Kenya (16.7%; 95% CI: 14.5–18.9), Iraq (12%; 95% CI:8.7–15.4), Malaysia (11.2%; 95% CI: 9.7–12.6) and Jordan (4.8%; 95% CI: 3.2–6.5).

Height measurement in child refugee as part of the IOM routine health assessment and resettlement activities in Kuala Lumpur, Malaysia (left) and Addis Ababa, Ethiopia (right). © IOM 2013.

Demographic characteristics

There was a total of 802 children aged 6–59 months (10% of all 8,077 refugees), with a mean age of 33.3 months, across the three sites assessed in Ethiopia. There was a similar distribution of male and female children in all sites (sex ratio of 1.1). Majority of the children in Addis Ababa came from Ethiopia (44%) and Somalia (43%), while the rest came from Eritrea (7%) and the Democratic Republic of Congo (6%). Children in Jijiga all came from Somalia and those in Shimelba were from Eritrea.

Findings

For all refugee children aged 6–59 months examined in Ethiopia, the prevalence level of wasting was at borderline high (9.9%; 95% CI: 7.8-11.9) while stunting level was medium (22%; 95% CI: 19.1-24.8). Wasting levels were high in Jijiga (12.3%; 95% CI: 9.4-15.3); medium in Addis Ababa (8.0%; 95% CI: 4.1-11.9); and low in Shimelba (4.2%; 95% CI: 0.9-7.4). Prevalence level of stunting was medium in Shimelba (25.0%; 95% CI: 17.9-32.1) and Jijiga (24.7%; 95% CI: 20.8- 28.6) and low in Addis Ababa (12.8%; 95% CI: 8-17.5).

Figure 1: Prevalence of wasting among refugees aged 6–59 months (n=802), Ethiopia, 2012

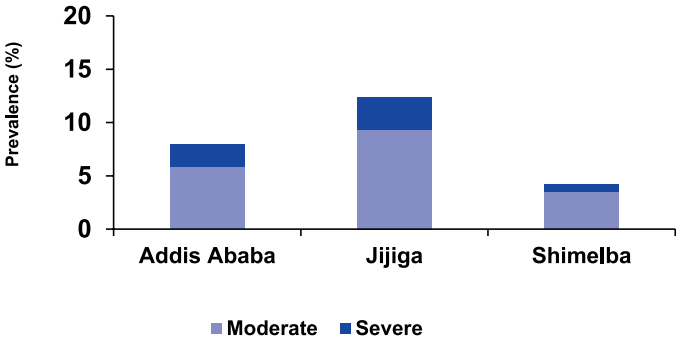
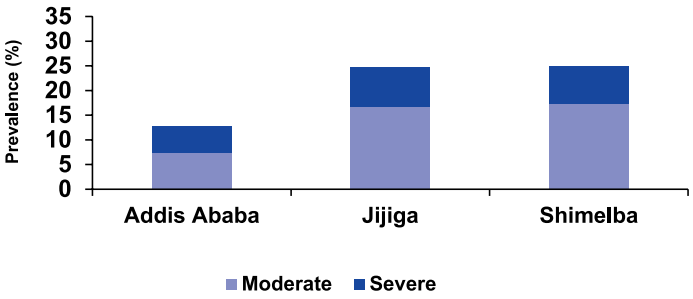
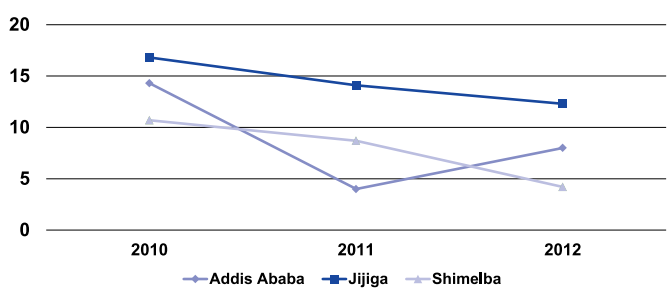


Figure 2: Prevalence of stunting among refugees aged 6–59 months (n=802), Ethiopia, 2012



The observed prevalence of wasting in previous years is shown in Figure 3. In 2012, the prevalence of wasting in Addis Ababa was found to be twice that in 2011, while prevalence of wasting decreased in Jijiga (by 1.8%) and Shimelba (by 4.5%).

Figure 3: Trends in prevalence of wasting, Ethiopia, 2010–2012



Demographic characteristics

There was a total of 366 children from Baghdad aged 6–59 months (12% of the 3,044 refugees), with a mean age of 34 months and a sex ratio of 1.2 examined in Iraq.

Findings

Among all refugees aged 6–59 months examined in Baghdad, the prevalence level of wasting was very high (32.2%; 95% CI: 27.5-37) while that of stunting was low (12.0%; 95% CI: 8.7-15.4).

Figure 4: Prevalence of wasting among refugees aged 6–59 months (n=366), Iraq, 2012

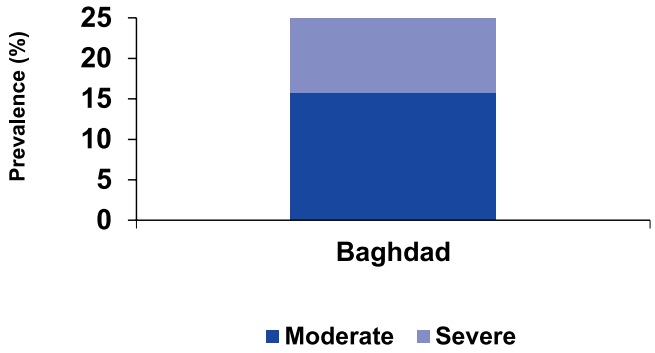
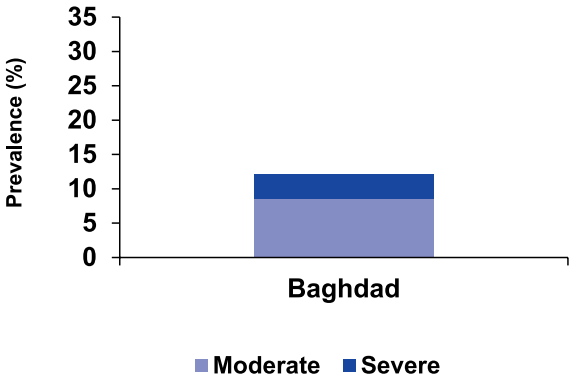
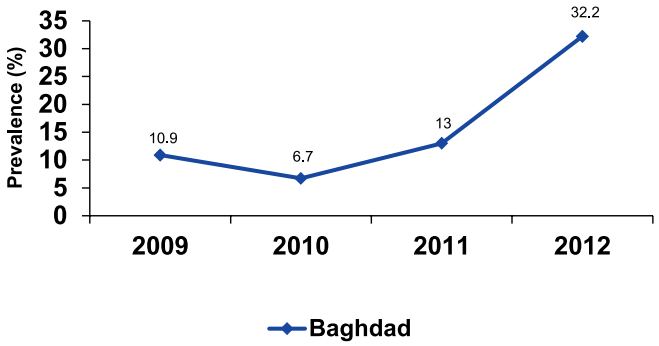


Figure 5: Prevalence of stunting among refugees aged 6–59 months (n=366), Iraq, 2012



Nutrition data for refugee children in Baghdad over the past four years are shown. From 2011 to 2012, the prevalence of wasting more than doubled among refugee children in Baghdad, and this increase is found to be statistically significant.

Figure 6: Trends in prevalence of wasting, Iraq, 2009–2012



Demographic characteristics

There were a total of 644 children aged 6–59 months (10% of a total of 6,692 refugees), with a mean age of 32.8 months and a sex ratio of 1.1, assessed in Jordan. Almost all the children examined in Amman were from Iraq (9%), while a small proportion came from Jordan (2%) and Sudan (2%).

Findings

Overall, among refugees aged 6–59 months, the prevalence levels of wasting (4.4%; 95% CI: 2.8–5.9) and stunting (4.8; 95% CI: 3.2–6.5) in Jordan (Amman) were low.

Figure 7: Prevalence of wasting among refugees aged 6–59 months (n=644), Jordan, 2012

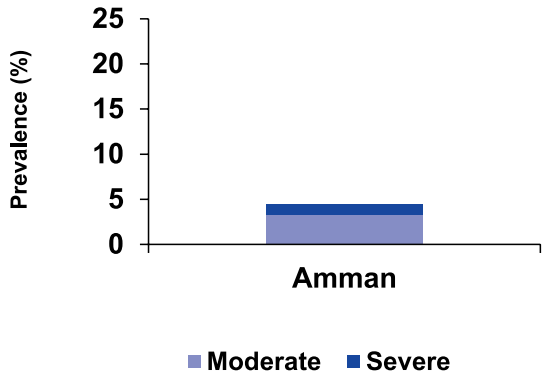
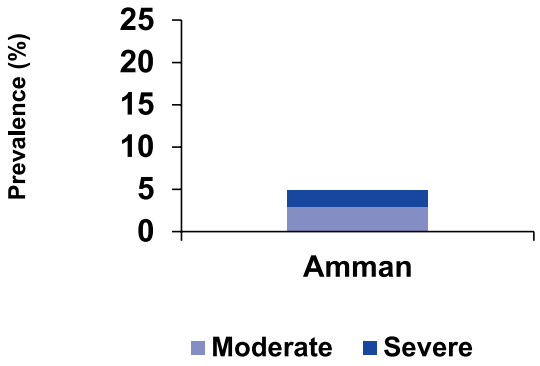
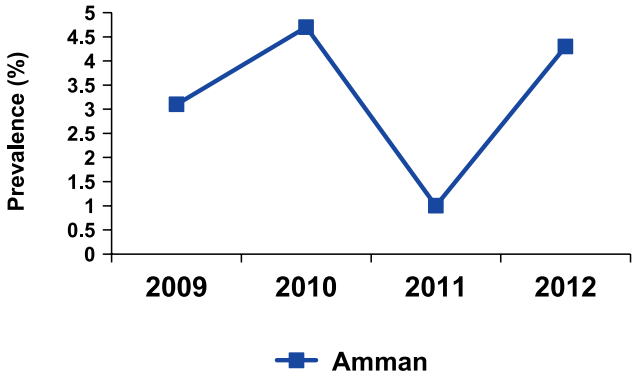


Figure 8: Prevalence of stunting among refugees aged 6–59 months (n=644), Jordan, 2012



From 2011 to 2012, the prevalence of wasting among refugees aged 6–59 months increased by 3.3%, as shown in Figure 9.

Figure 9: Trends in prevalence of wasting, Jordan, 2009–2012



Demographic characteristics

There were a total of 1,108 children aged 6–59 months (12% of the 8,924 refugees in total), with a mean age of 32.7 months, screened in 2012. The sex ratio of the examined children ranged from 0.9 for Nairobi to 1.2 for Kakuma. All the children assisted in Dadaab were of Somali origin. In Kakuma, about 79 per cent of the children were from Somalia, and the rest were from Ethiopia (13%) and Sudan (8%). In Nairobi, 25 per cent of the examined children were from Ethiopia, 27 per cent from Somalia, 39 percent were Kenya and the rest from the Democratic Republic of Congo (9%).

Findings

Overall, among refugees aged 6–59 months in Kenya, the prevalence level of wasting was medium (5.8%; 95% CI: 4.4–7.1), while that of stunting was low (16.7%; 95% CI: 14.5–18.9). The prevalence level of wasting was medium in Dadaab (8.2% ; 95% CI: 5.2–11.1) and low in Kakuma (5.8% ; 95% CI: 3.6-8) and Nairobi (3.6% ; 95% CI: 1.5–5.6), respectively. In terms of stunting, prevalence levels were medium in Dadaab (22.7%; 95% CI: 18.2–27.2), low in Kakuma (17.6%; 95% CI: 14.1–21.1) and very low in Nairobi (9.1%; 95% CI: 5.9–12.3).

Figure 10: Prevalence of wasting among refugees aged 6–59 months (n=1,108), Kenya, 2012

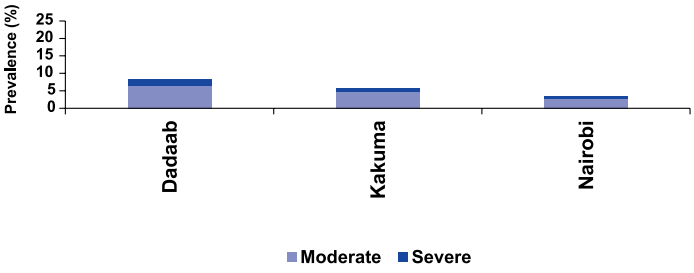


Figure 11: Prevalence of stunting among refugees aged 6–59 months (n=1,108), Kenya, 2012

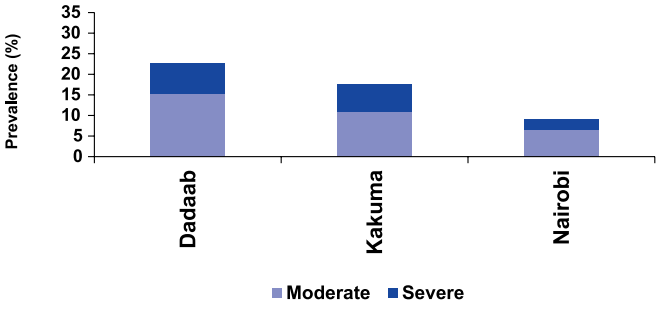
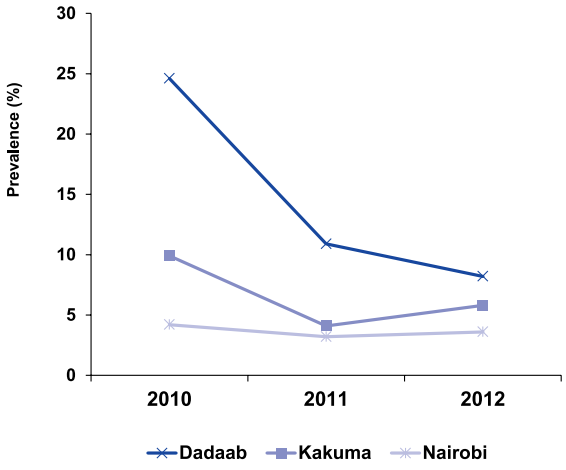


Figure 12 shows the prevalence of wasting in the last three years at all sites in Kenya. Overall, the prevalence of wasting in Kenya was reduced by 1.3% from 2011 to 2012.

Figure 12: Trends in prevalence of wasting, Kenya, 2010–2012



Demographic characteristics

There was a total of 1,836 children aged 6–59 months (14% of a total of 13,539 refugees), with a mean age of 26.4 months and a sex ratio of 1.0, examined in Kuala Lumpur. All children were from Myanmar.

Findings

Overall, among refugees aged 6–59 months in Malaysia, the prevalence level of wasting (6.7%; 95% CI: 5.6–7.8) was medium and stunting (11.2%; 95% CI: 9.7–12.6) was low.

Figure 13: Prevalence of wasting among refugees aged 6–59 months (n=1,836), Malaysia, 2012

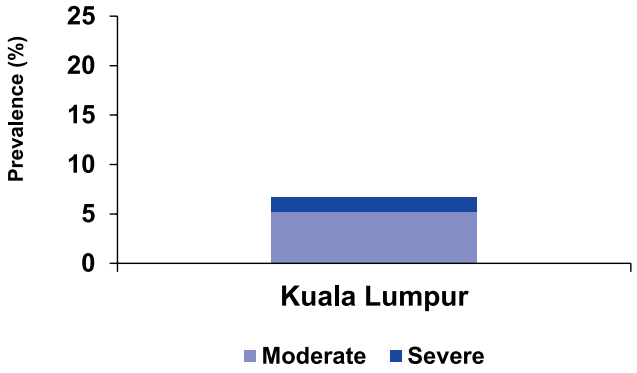
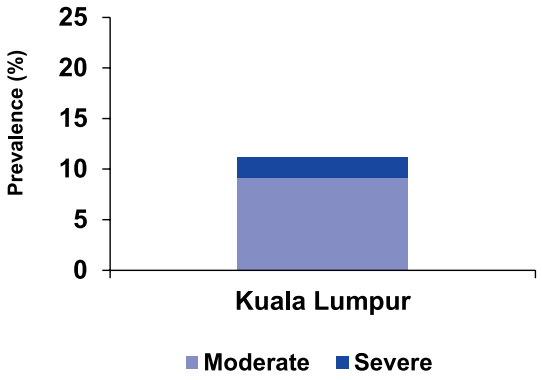
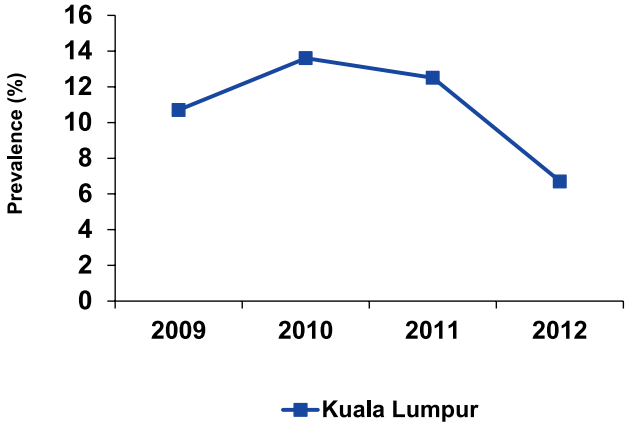


Figure 14: Prevalence of stunting among refugees aged 6–59 months (n=1,836), Malaysia, 2012



From 2011 to 2012, Figure 15 shows that the prevalence of wasting among refugee children decreased, and this decrease is found to be statistically significant.

Figure 15: Trends in prevalence of wasting, Malaysia, 2009–2012



Demographic characteristics

There was a total of 1,447 children aged 6–59 months (8% of the 17,207 refugees) with a mean age of 30 months screened at all sites in Nepal. The sex ratio of the examined children, all of whom were from Bhutan, ranged from 0.6 in Khudunabari to 1.2 in Beldangi I.

Findings

For refugees aged 6–59 months examined at various sites in Nepal, both the prevalence levels of wasting (6.1%; 95% CI: 4.9–7.3) and stunting were medium (23.5%; 95% CI: 21.3–25.7).

Wasting prevalence levels were low in Beldangi I (4.6%; 95% CI: 2.3–7) and Khudunabari (3.67%; 95% CI: 0–10.4). In Beldangi II (5.9%; 95% CI: 4.2–7.6) and Sanichare (7.7%; 95% CI: 5–10.4), wasting prevalence level was medium. Stunting prevalence level was medium in most sites, except Khudunabari where it was low (17.9%, 95% CI: 3.7–32).

Figure 16: Prevalence of wasting among refugees aged 6–59 months (n=1,447), Nepal, 2012

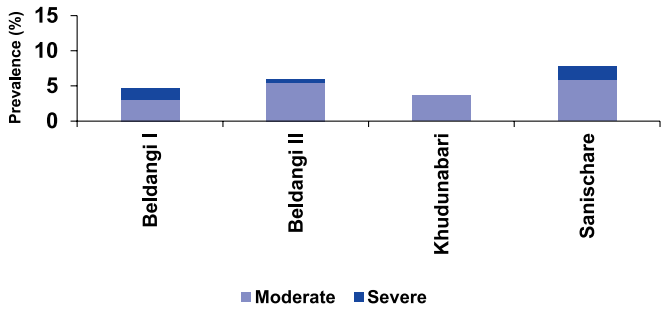


Figure 17: Prevalence of stunting among refugees aged 6–59 months (n=1,447), Nepal, 2012

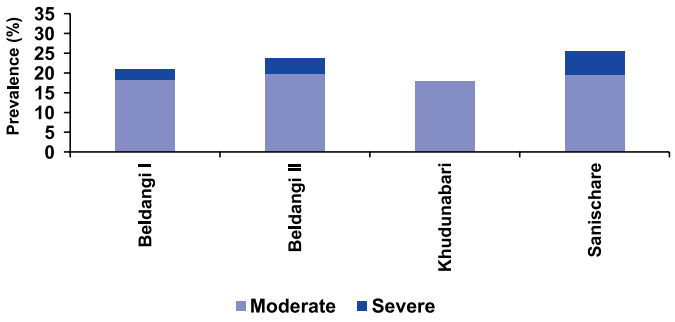
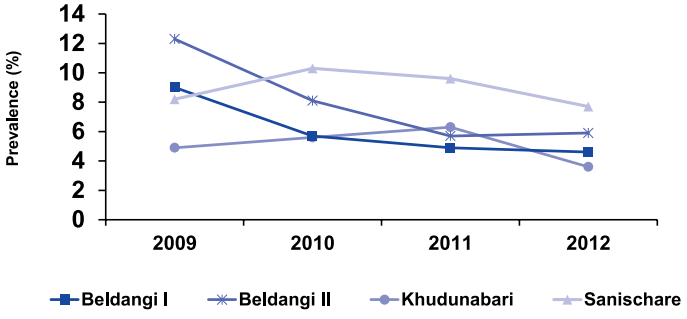


Figure 18 shows the prevalence of wasting in the last four years among 6–59 month old refugees examined in Nepal. A general decline from previous years is observed across most sites, except for Beldangi II from 2011 to 2012.

Figure 18: Trends in prevalence of wasting, Nepal, 2009–2012



Demographic characteristics

There was a total of 1,236 children from Myanmar, aged 6–59 months (14% of 8,770 refugees in total), with a mean age of 32 months, examined across all sites in Thailand. The sex ratio of the examined children ranged from 0.8 in Mae Hong Son to 2.0 in Ban Mae Surin Camp.

Findings

Overall, the assessment of malnutrition among refugees aged 6–59 months in Thailand showed low prevalence level of wasting (4.8%; 95% CI: 3.7–6.1.), with a high level of stunting (37.2%; 95% CI: 34.5–39.9). The prevalence level of wasting among refugees aged 6–59 months in Thailand was medium in Ban Don Yang, Mae Ra Ma Luang, Mae La Oon and Ban Mae Surin (5.6%–8.3%) and low among the rest of the camps. A very high prevalence level of stunting was seen in Mae Ra Ma Luang (45.8%) and Mae La Oon (45.7%). High prevalence levels of stunting were also observed in Ban Don Yang, Maesot, Umpiem, Nupo, Mae La, and Ban Mae Surin camps (33.3%–38.9%). Mae Hong Son (20.0%; 95% CI: 6.7–33.3) and Ban Mai Nai Soi, on the other hand, showed low prevalence level (27.3%,: 95% CI: 204–34.2).

Figure 19: Prevalence of wasting among refugees aged 6–59 months (n=1,236), Thailand, 2012

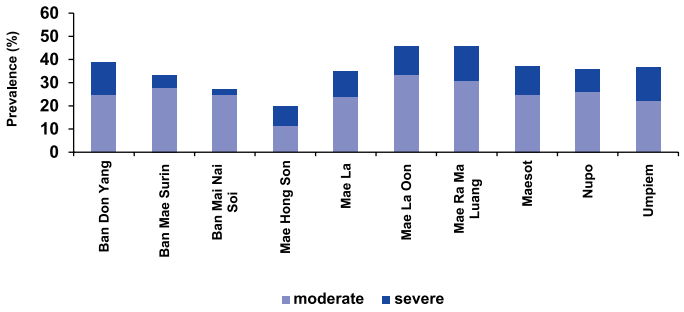
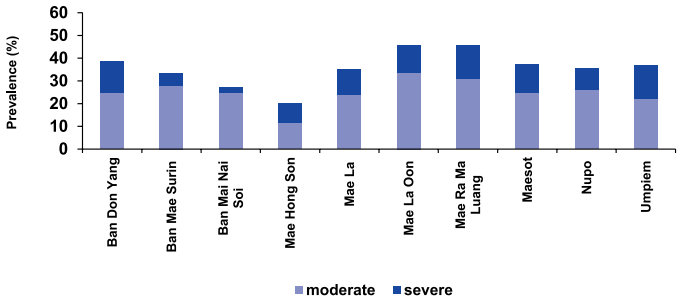
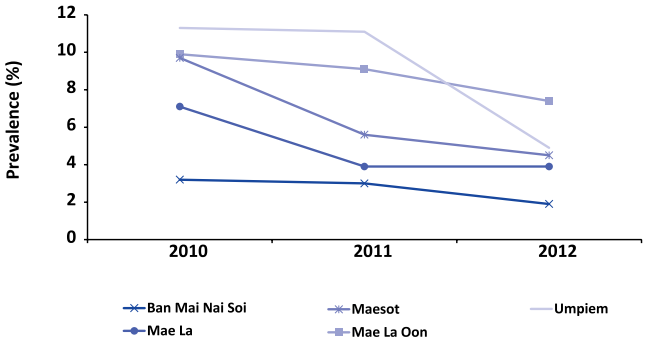


Figure 20: Prevalence of stunting among refugees aged 6–59 months (n=1,236), Thailand, 2012



A decline in the prevalence of wasting is observed across sites in Thailand, except for Mae La camp, from 2011 to 2012, as shown in Figure 21.

Figure 21: Trends in prevalence of wasting, Thailand, 2010–2012



Comments on the interpretation of findings

The analysis included data from all IOM sites where 50 or more refugees aged 6–59 months were examined from January to December 2012. Where anthropometric exam data were available for one or more previous years, the prevalence of wasting from 2009–2012 was included. Since routine programme data were used for this nutrition surveillance report, prevalence estimates were subject to data quality, and any inferences regarding historical trends were subject to issues such as sample selection bias, data clustering and statistical power. Summary statistics on z-scores showed that for several locations, the SD values of the z-scores were over the expected values, indicating limitations in anthropometric measurement and/or inaccurate age reporting. Anthropometric measurements were typically taken only once without accounting for inter-observer variations and data entry errors. In order to improve the quality of the data for this and future reports, observations with the outlier values of nutrition indicators (z score >|5|) are being communicated on a monthly basis to IOM field programmes for verification of age, weight and height values. Age assessment is challenging in refugee settings where children and parents or guardians may not recall or be willing to report correct dates of birth. Further interpretations of acute malnutrition will require understanding of mortality, disease, seasonality and underlying causes (related to food, health interventions and social factors) in the respective refugee sites.[2] Finally, the resettlement populations across refugee settings in multiple sites, as well as in different years in the same sites featured in this report, are heterogeneous due to various factors, including origin, criteria for resettlement referrals and length of stay in refugee settings. This limits the generalization of findings to the overall refugee children populations in each country.

Recommendations

Ongoing nutrition surveillance, prompt referrals and further investigation at selected sites can reduce excess mortality and morbidity caused by malnutrition among refugee children. For individual referrals, IOM continues to strengthen the capacity of its health assessment programmes with tools and guidance for the prompt referral of moderately malnourished children to Targeted Supplementary Feeding Programmes and those with severe acute malnutrition to Therapeutic Feeding Programmes at the respective sites.[2] Based on the report findings and existing practices, provision of Targeted Selective Feeding Programmes (SFP) may be recommended for sites with serious prevalence level of global acute malnutrition (wasting prevalence ≥ 10%) namely, Jijiga in Ethiopia (12.3%) and Baghdad in Iraq (32.2%). Blanket SFP may be required in sites with aggravating factors such as high crude mortality rate, inadequate general food ration, epidemics of important communicable diseases, severe cold and inadequate shelter.[2,4] Sites with medium prevalence level of global acute malnutrition (wasting prevalence of 5–9%), located mostly in Thailand, Nepal, Malaysia, Kenya and Ethiopia, warrant close ongoing monitoring of refugee children's nutrition status, especially in the presence of aggravating factors. Additional surveys are recommended to identify and address underlying causes of malnutrition, the prevalence of anemia and micronutrient deficiencies, as well as the impact of nutrition interventions.

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