

**CRISIS BULLETIN**

– I N D O N E S I A I N T R A N S I T I O N –

**Nutrition Surveillance in Semarang  
Key results for the period: Feb – Oct 1999**

**In 1995, the HKI/GOI Nutrition Surveillance System (NSS) was started in Central Java. After the economic crisis hit Indonesia, it was expanded to other rural as well as urban areas of the country in order to monitor the impact of the crisis on the health and nutrition of the population. The results have been very valuable for identifying important nutritional and health problems, population groups and areas worst affected, and immediate, underlying and basic causes. This has enabled the Government of Indonesia and its international, national and local partners to prioritize and design actions for limiting the potentially severe impact of the crisis on the population. This bulletin reports the main findings for urban slums in Semarang as collected in the period Feb-Oct 1999.**

*Selection of households*

For each round of data collection, a new sample of households was selected. In Semarang and Makassar, the following steps were taken for the selection of households from slum areas. *RWs* (or hamlet/subvillage-level administrative unit) with slums were identified, from which 80 were then randomly selected. An *RW* is the smallest administrative area for which census data are available and has an average population of 3,000-5,000. Then, from each *RW*, 30 households were selected by systematic sampling. For the latter, each *RW* was asked to prepare a list of all households with underfive children situated in a slum area (often, only part of the *RW* is a slum area), from which households were then selected based on an interval that was determined by the size of the *RW*. The total number of households selected from Semarang per round of data collection was 2,400 (80 *RWs* x 30 households).

*Period of data collection*

Data reported here were collected in Semarang in Feb 1999, Apr 1999, and Sept-Oct 1999.

*Data collected*

Data collected included information on household composition, parental education and occupation, sanitary conditions, land and

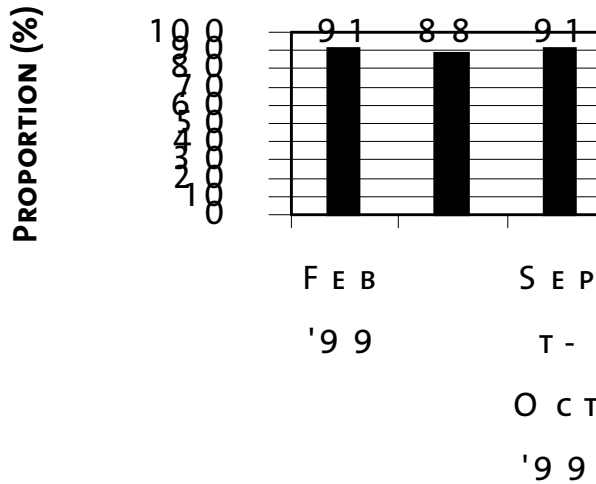
livestock ownership, food production and consumption, vitamin A capsule receipt, child and maternal morbidity, and nutritional knowledge. Weight, height and mid-upper-arm circumference of mothers and their underfive children were measured, and blood was collected by finger prick from a random subsample for assessment of hemoglobin concentration.

*Findings presented*

In this crisis bulletin, a selection of data is presented, including parental education, use of family planning, use of adequately iodized salt, receipt of vitamin A capsules, maternal and children's health and exclusive breastfeeding. Data are given per period of data collection. The other areas where data were collected by the NSS between early 1999 and early 2000 were the following rural areas: West Java, Central Java, East Java, West Sumatra, South Sulawesi, Lampung, and Lombok, and slums of the following urban areas: Jakarta, Surabaya, Makassar, and the four largest cities in West Sumatra. For each indicator, its meaning, the way the information was collected, and the findings, both in general as well as in Semarang, are described.



**Fig 1. Households with adequately iodized salt (>30 ppm, using test kit)**



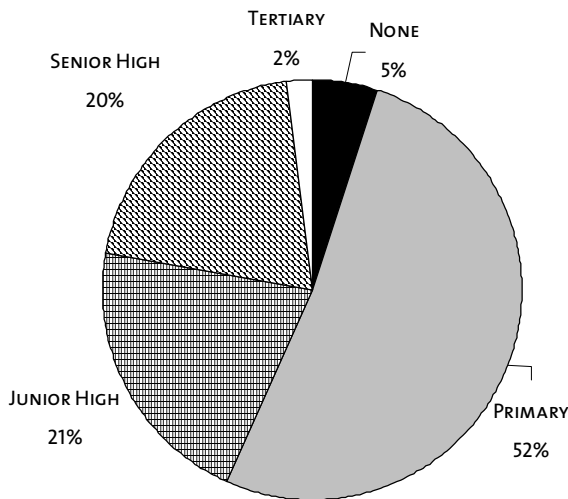
**Salt iodization (see Fig 1)**

What is indicated. Iodine deficiency has serious consequences, even when the clinical sign of deficiency, goiter, has not appeared yet. It reduces intellectual development and can even cause cretinism. The preferred way to prevent iodine deficiency is by consumption of iodized salt, which should now be available throughout Indonesia.

Data collection method. The cooking salt available in the household was tested for its iodine content (more or less than 30 ppm) using a rapid test-kit.

Findings. General – In most NSS sites, the availability of adequately iodized salt increased between Jan 1999 and Feb 2000 (lowest proportion found: 4%, highest found: 95%). *Semarang* – The proportion of households with adequately iodized salt was very high and stable throughout 1999.

**Fig 2. Mothers without formal education**



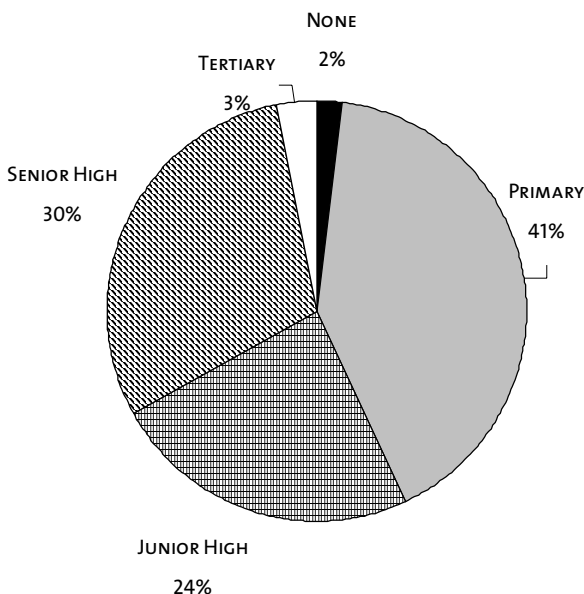
**Mothers without formal education (see Fig 2)**

What is indicated. Education provides information, teaches skills and encourages individuals to make their own decisions. In Indonesia, a low level of maternal education is often associated with poor household socioeconomic status.

Data collection method. All mothers were asked how many years of education they had completed. For analysis, data from all rounds were pooled together.

Findings. General – In all NSS sites, except Lombok, the proportion of mothers without formal education was below 10%. *Semarang* – The proportion of mothers without education was among the lowest observed.

**Fig 3. Fathers without formal education**



**Fathers without formal education (see Fig 3)**

What is indicated. See the explanation on maternal education above. The proportion without formal education mainly reflects the availability of education 10-20 years before the data were collected.

Data collection method. All mothers were asked how many years of education their husbands had completed. For analysis, data from all rounds were pooled together.

Findings. General – In all NSS sites, except Lombok, the proportion of fathers without formal education was below 8%. *Semarang* – The proportion of fathers without education was the lowest observed.

**Family planning (see Fig 4)**

What is indicated. Indonesia's family planning program is a few decades old and its success in terms of coverage and reducing the number of pregnancies is well-known. The proportion of couples that practices family planning is an indicator both of the success of the program as well as of its reach.

Data collection method. Respondents were asked whether she and her husband were currently practicing family planning.

**Findings. General** – In all NSS sites, except West Sumatra and Makassar, more than 65% of couples practiced family planning and this proportion remained the same between Jan '99 and Feb '00. **Semarang** – The proportion of couples in Semarang that practiced family planning was among the highest observed.

**Exclusive breastfeeding of infants younger than 4 months old (see Fig 5)**

**What is indicated.** It is recommended that babies should be exclusively breastfed until the age of 4-6 months. However, many already receive other food before they are 4 months old, perhaps because the mother assumes that her breastmilk is not sufficient or that she cannot feed her baby at all times because of work.

**Data collection method.** The mother was asked whether the underfive child was still breastfed and if so whether he/she already received other foods or liquids. Data are presented for children younger than 4 months.

**Findings. General** – In all the NSS sites, exclusive breastfeeding of children younger than 4 months of age was very low and it even decreased slightly between Jan '99-Feb '00 (lowest proportion found: 27%, highest found: 78%). Because of the nutritional and health risks, reasons for the early cessation of exclusive breastfeeding need to be explored urgently. **Semarang** – The proportion of infants younger than 4 months of age that was exclusively breastfed was among the lowest observed.

**Vitamin A capsule receipt among children 6-11 months old (see Fig 6)**

**What is indicated.** Vitamin A deficiency increases morbidity and mortality and can cause night blindness and xerophthalmia. In 1999, the target group for vitamin A capsule distribution was expanded to include infants aged 6-11 months, who should receive 100,000 IU of vitamin A.

**Data collection method.** Mothers were asked whether the child received a vitamin A capsule in the last vitamin A distribution month (Feb/Aug) and the child's age at that time was calculated based on birth date.

**Findings. General** – The coverage of vitamin A capsule distribution increased, particularly between Feb '99 and Aug '99, in all NSS sites. This is the opposite of what was observed among older children, and means that special efforts are being undertaken to reach this younger target group. However, coverage was still relatively low (13-49%). **Semarang** – Coverage was low, but nearly doubled between Feb and Aug 99.

Fig 4. Couples who practice family planning

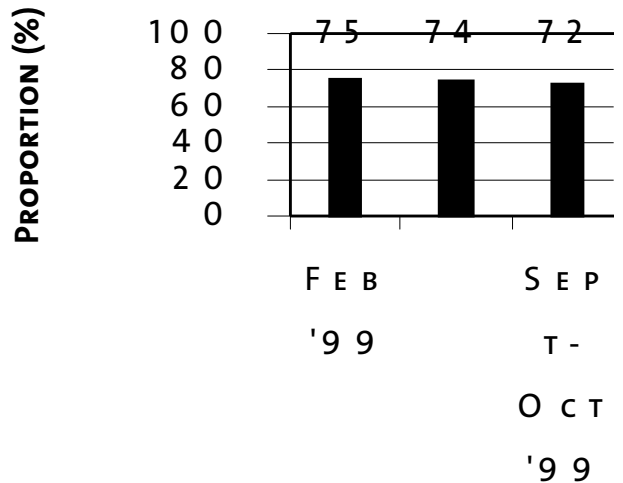


Fig 5. Children younger than 4 months old exclusively breastfed

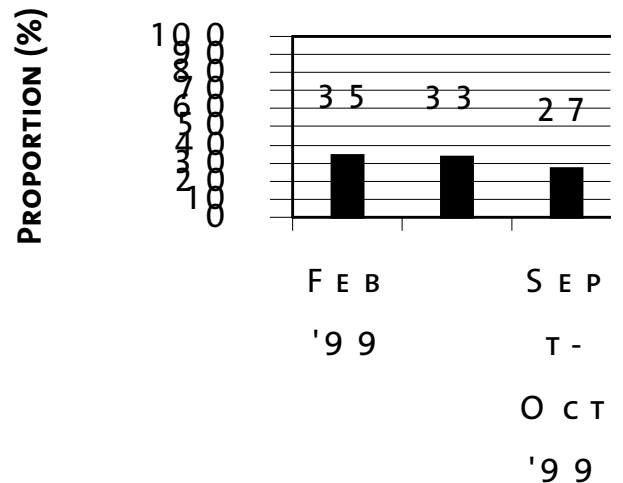


Fig 6. VAC coverage among children aged 6-11 months, by distribution month

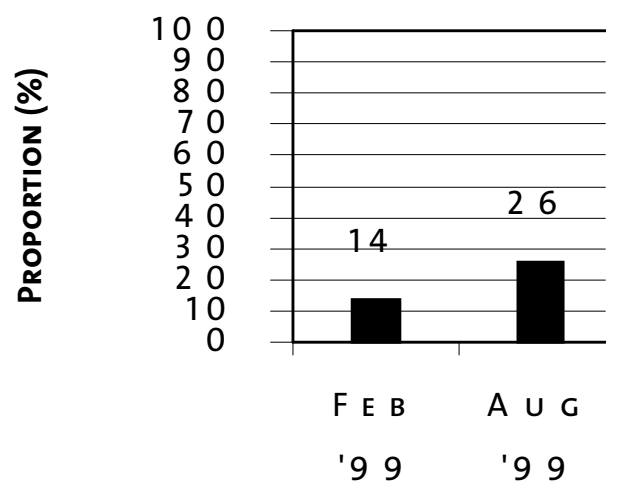
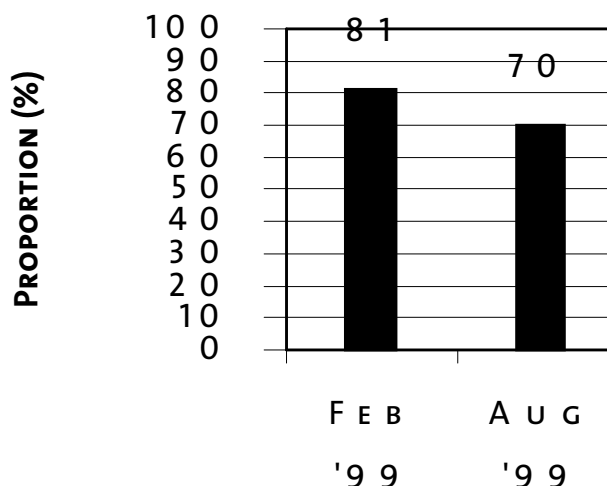


Fig 7. VAC coverage among children aged 12-59 months, by distribution month



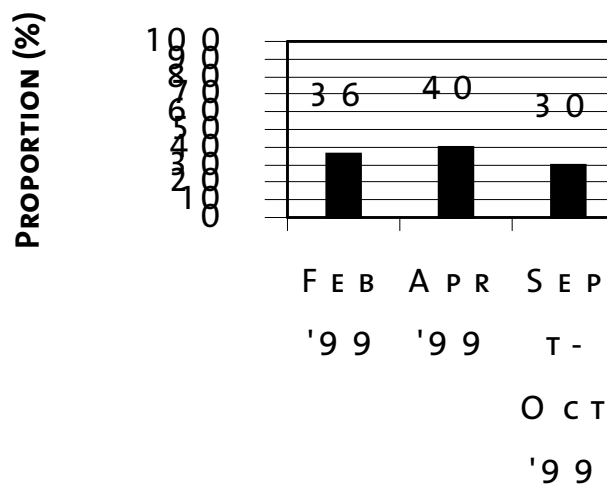
**Vitamin A capsule receipt among children aged 12-59 months (see Fig 7)**

What is indicated. Since the early 1970s, high-dose vitamin A capsules (200,000 IU) have been distributed every six months to children aged 12-59 mo. Since the capsule distribution months (February and August) were introduced in 1991, coverage has increased to 60-80%.

Data collection method. Same as for children aged 6-11 months (see above).

Findings. General – In most NSS sites, coverage of vitamin A capsule distribution declined between Aug '98/feb '99 and Aug '99, except in West Java, Surabaya and Lombok, where it increased. Coverage ranged from 36 to 81%. *Semarang* – In Feb '99, coverage was the highest observed, but it was much lower in Aug '99.

Fig 8. Mothers who received VAC after delivery (birth in previous 12 months)



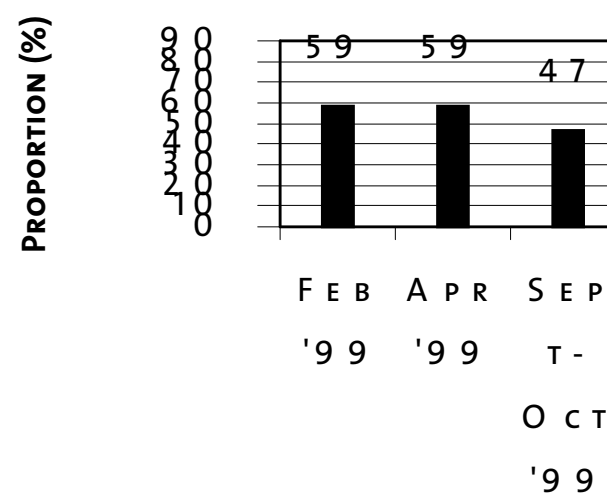
**Vitamin A capsule receipt among women within one month after delivery (see Fig 8)**

What is indicated. Vitamin A deficiency is also highly prevalent among breastfeeding mothers, which has consequences both for herself as well as for her child. Since 1991, all women should receive a vitamin A capsule (200,000 IU) within one month after delivery. However, the constraint is that they have to be reached within one month after delivery.

Data collection method. Women were asked whether they had received a vitamin A capsule after the birth of their last child. Data were analyzed for women with a child younger than 12 months at the time of data collection.

Findings. General – In each NSS site, the pattern of coverage was different. Coverage was highest in rural Central Java and Semarang, where special efforts to increase coverage have been undertaken since 1996. Coverage ranged from 5 to 40%. *Semarang* – Coverage was among the highest observed, but seems to be declining.

Fig 9. Anemia among children aged 12-23 months (Hb <110 g/L)



**Child anemia, 12-23 months old (see Fig 9)**

What is indicated. Anemia prevalence among young children is a very sensitive indicator for changes in the quality of the diet, because diet is the only factor that really affects their hemoglobin concentration. Before Indonesia's crisis, 40% of underfive children suffered from anemia. Thus, over 50% of children suffered the consequences of iron deficiency, including reduced psychomotor and mental development, reduced immunity, and lethargy.

Data collection method. Blood was obtained by finger prick and its hemoglobin concentration was assessed using a HemoCue®.

Findings. General – Anemia prevalence among young children was alarmingly high, both in urban and rural NSS sites. In most NSS sites, it increased in early 1999 and decreased later in the year.

However, the still very high prevalence (47-80%) calls for immediate action by means of fortified complementary foods and/or iron (or micronutrient) supplements. *Semarang* – Although prevalence was among the lowest observed, it was still very high.

**Maternal anemia (see Fig 10)**

What is indicated. Anemia prevalence among mothers is a less sensitive indicator for changes in the quality of the diet, because many factors affect their hemoglobin concentration, including diet, receipt of iron tablets and family planning method used. Before the onset of the crisis, anemia prevalence among mothers was 20-30%. Anemia increases lethargy, reduces productivity and is an important cause of maternal mortality.

Data collection method. Same as for children.

Findings. General – Anemia prevalence was higher after the onset of the crisis than before but, by the end of 1999, it had almost returned to pre-crisis levels. Prevalence had been highest in the slums of Jakarta where the decline was also most dramatic. Range of prevalences found: 20-47%. *Semarang* – Prevalence was relatively low, but contrary to what was observed in other NSS sites, it increased between mid and late 1999.

**Maternal wasting (see Fig 11)**

What is indicated. Among mothers, the prevalence of a low bodyweight compared to height (wasting) is a good indicator for shortage of food and is sensitive to changes in food availability.

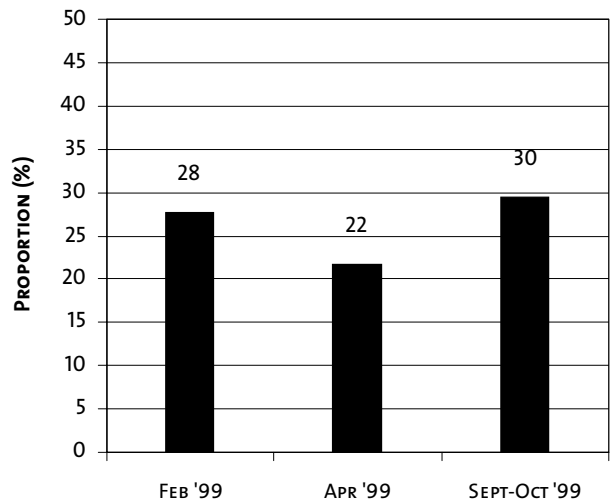
Data collection method. Maternal wasting is defined as a Body Mass Index below 18.5 kg/m<sup>2</sup>, which is calculated by dividing bodyweight (in kilograms) by height (in meters), squared.

Findings. General – Prevalence of maternal wasting was highest in urban slum NSS sites in early 1999 and has since declined. This indicates that access to food has increased, which means that recovery from the crisis has started. In the rural NSS sites, there has been less of a decline, but the increase due to the crisis is also likely to have been less, because of better mechanisms to cope with increased food prices. Range of prevalences found: 10-21%. *Semarang* – In late 1998 and early 1999 prevalence was relatively high, but it decreased towards the end of 1999.

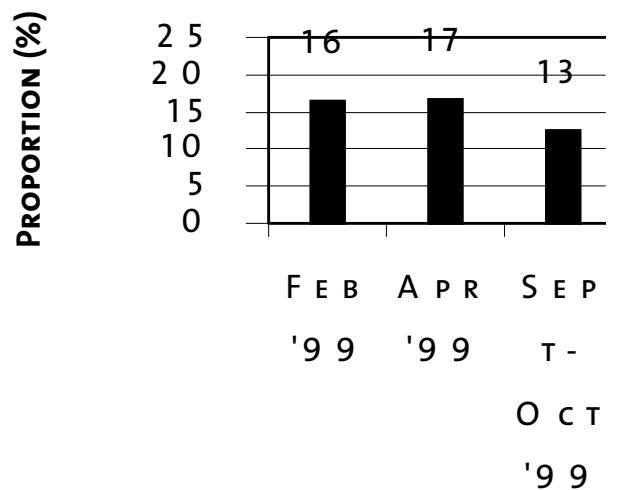
**Child wasting, 12-23 months old (see Fig 12)**

What is indicated. Among young children, wasting (low weight for height) can result from both a decrease in the quantity of food consumed as well as from an increase in the incidence or severity of illness. A prevalence of wasting above 20% is usually found only in emergency or disaster situations.

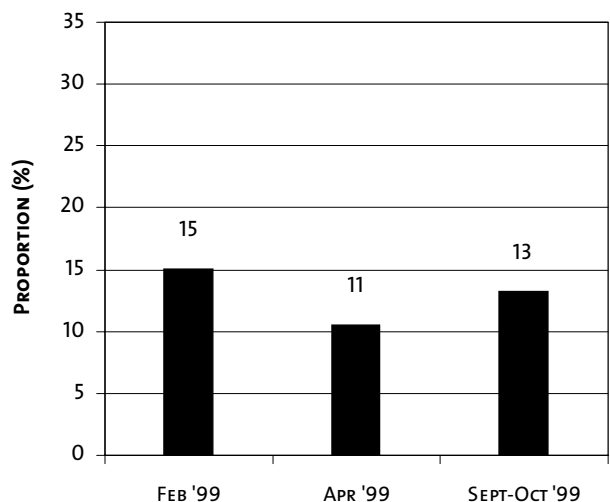
**Fig 10. Anemia among non-pregnant women (Hb <120 g/L)**



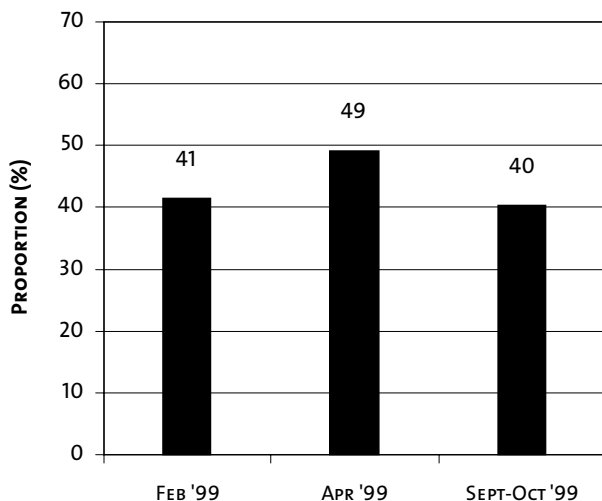
**Fig 11. Wasting among mothers (BMI <18.5 kg/m<sup>2</sup>)**



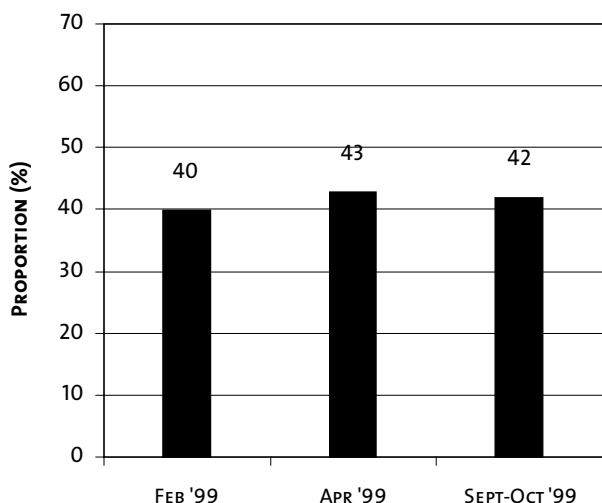
**Fig 12. Wasting among children aged 12-23 months (WHZ <-2 SD)**



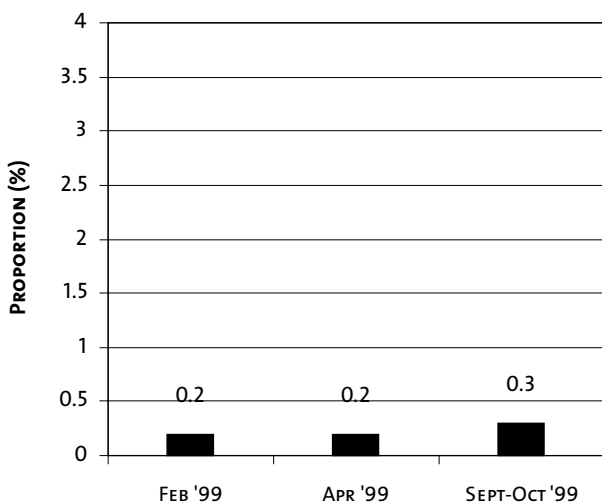
**Fig 13. Stunting among children aged 12-23 months (HAZ <-2 SD)**



**Fig 14. Underweight children aged 12-23 months (WAZ <-2 SD)**



**Fig 15. Maternal diarrhea in week prior to interview**



Data collection method. Here, wasting is defined as a Z-score for weight-for-height that is below 2 standard deviations of that of the reference population (NCHS).

Findings. General – In early 1999, the prevalence of childhood wasting was alarmingly high. Since then, it has decreased in most NSS sites, except in Semarang and Lombok. The decrease is most likely due to an increase in access to food, but overall the prevalence is still very high (8-32%). *Semarang* – The prevalence of wasting among children was relatively low, but it increased in the second half of 1999.

**Child stunting, 12-23 months old (see Fig 13)**

What is indicated. Stunting (too short stature for age) results from consumption of a diet of inadequate quality for a prolonged period of time. A prevalence of 30-39% is classified as high and of more than 40% as very high. A different prevalence of stunting among NSS sites indicates a difference of dietary quality for a relatively long period of time (at least a few years).

Data collection method. Here, stunting is defined as a Z-score for height-for-age that is below 2 standard deviations of that of the reference population (NCHS).

Findings. General – The prevalence of stunting was lowest in the urban slums on Java. Range of prevalences found: 30-59%. *Semarang* – The prevalence of stunting was relatively high, especially when compared to that in the slums of Jakarta and Surabaya, but might be declining.

**Child underweight, 12-23 months old (see Fig 14)**

What is indicated. Underweight (too low weight-for-age) can be the result of both wasting (sudden low weight) as well as stunting (low weight because of short stature). The growth charts shown on the Indonesian health card for underfives monitor the weight-for-age changes of the individual child over time.

Data collection method. Here, underweight was defined as a Z-score for weight-for-age that is below 2 standard deviations of that of the reference population (NCHS).

Findings. General – In most NSS sites, the prevalence of underweight had increased slightly between early and mid-1999 and decreased thereafter. Only in Lombok did the prevalence increase between early and late 1999. Range of prevalences found: 32-60%. *Semarang* – The prevalence of underweight was relatively low when compared to other NSS sites, but in absolute terms it was high.

**Maternal diarrhea (see Fig 15)**

What is indicated. Diarrhea is a form of morbidity that is relatively easy to monitor, because it occurs relatively frequently and its definition (3 or more loose stools in 24 hours) is commonly shared and easily understood by respondents. Diarrhea prevalence primarily reflects hygiene conditions.

Data collection method. Respondents were asked whether they suffered from diarrhea during the previous 7 days.

Findings. General – The prevalence of diarrhea among mothers remained the same or decreased slightly between Jan 1999 and Feb 2000, except in West Java and the slums of Jakarta where it increased. Range of prevalences found: 0.1-3.5%. *Semarang* – The prevalence of diarrhea was among the lowest observed.

**Child diarrhea, 12-23 months old (see Fig 16)**

What is indicated. See maternal diarrhea above. Diarrhea is generally more prevalent among young children, because they put more contaminated items in their mouths. And, it is likely to be higher in urban slums than in rural areas because of the higher concentration of people and poorer conditions for waste disposal, including open sewage.

Data collection method. Respondents were asked whether their child suffered from diarrhea during the previous 7 days.

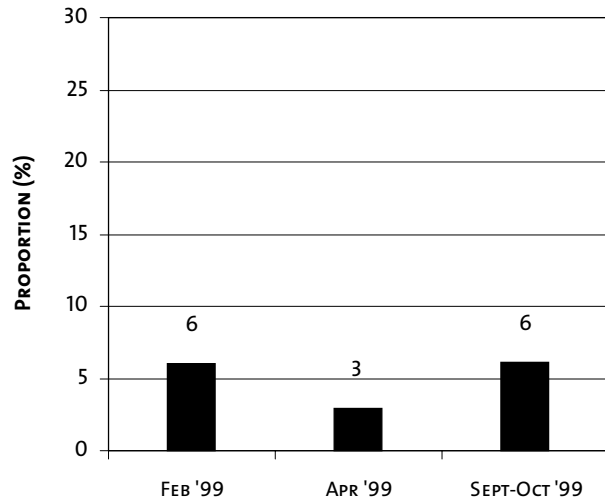
Findings. General – The prevalence of diarrhea among children aged 12-23 months was approximately six times higher than among mothers (2-27%), and between Jan 1999 and Feb 2000, it decreased in urban NSS sites and remained the same or increased in rural NSS sites. *Semarang* – The prevalence of child diarrhea was low.

**Conclusions**

*General*

The impact of the economic crisis on nutrition and health has been severe, as shown by the very high prevalence of wasting and anemia among both mothers and young children. From mid-1999, the prevalence of these problems started to decrease in most areas, indicating that recovery from the crisis has started, but there is still a long way to go and special programs are therefore necessary. Programs for limiting micronutrient deficiencies, such as vitamin A capsule (VAC) distribution, have been relatively well maintained. VAC coverage among the new target group of children aged 6-11 months has increased, while good coverage among older children (aged 12-59 months) should be maintained in most

**Fig 16. Diarrhea among children aged 12-23 months in week prior to interview**



areas and increased in particular areas such as urban slums. VAC coverage among mothers within one month after delivery needs to be increased in all areas. The use of iodized salt is still increasing. The prevalence of anemia, which is still very high particularly among young children, calls for efforts to increase iron intake, particularly from supplements and fortified foods, because foods naturally rich in iron are unlikely to be able to bridge the gap between needs and current intake levels. One of the best ways to protect young children from morbidity and to ensure that their nutritional requirements are met in the best possible way is by giving them nothing else but breast milk for the first 4-6 months of life. However, the proportion of children younger than 4 months of age that was still exclusively breastfed was very low in most areas. Because the consequences of introducing complementary foods too early can be devastating, urgent attention should be given to finding out why many mothers introduce other foods to their children too early and how that could best be prevented.

*Semarang*

In Semarang, the impact of the crisis has been limited, especially when compared to other urban slum areas. There was a slight increase of wasting among children and anemia among mothers between mid and late 1999 and data collected in 2000 should show whether that was just temporary or whether it has continued. The main areas that need attention are the maintenance of good coverage of high-dose vitamin A capsules among all target groups, reducing the prevalence of anemia among underfives, and encouraging and enabling mothers to exclusively breastfed infants up to the age of 4-6 months.



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Projects carried out by HKI-Indonesia in collaboration with the above organizations are funded by the United States Agency for International Development (USAID).

This publication was made possible through support by the Office of Population, Health and Nutrition, USAID/Indonesia Mission, under the terms of Award No. 497-A-00-99-00033-00. The opinions expressed herein are those of the author(s) and do not necessarily reflect the views of the US Agency for International Development.