

CRISIS BULLETIN

– INDONESIA IN TRANSITION –

Nutrition and Health Surveillance in
rural West Sumatra

Key results for the period: Aug 1999 – Aug 2001

In 1995, the HKI/GOI Nutrition and Health 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 primarily monitor the impact of the crisis on the health and nutrition of the population. As such, it 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. As of early 2001, Indonesia began a rapid process of decentralization and NSS data have been made available to each of the participating provinces in order to facilitate the identification of priority areas and problems and to enable independent monitoring of programs conducted. This bulletin reports findings for rural West Sumatra in the period August 1999 – August 2001.

Wide use of NSS data

In addition to the use of the NSS data for planning and monitoring programs, they are now also being made available for comparisons between countries and for other kinds of analyses, such as analyses of correlations with economic or climate trends in order to learn more about health and nutrition in relation to such regional and global changes.

Data collection in West Sumatra

For each round of NSS data collection, a new sample of households is selected, as follows. The whole of West Sumatra was divided into five zones for the first three rounds of data collection (until September 2000) and then into four zones. Per zone, 30 villages are selected by PPS sampling (probability proportional to size). Per village, 40 households with at least one underfive child are randomly selected by systematic sampling. For the latter, each village is asked to prepare a list of all households with underfive children. From this list, households are selected based on an interval that is determined by the size of the village. Per round of data collection in rural West Sumatra, 6,000 households were selected up until September 2000, and 4,800 households from October 2000 onwards (5

and 4 zones, respectively, x 30 villages x 40 households).

Data are collected using a questionnaire with precoded answers, from mothers and their underfive children. Weight, height and mid-upper-arm circumference are measured, and from a random subsample, blood is collected by finger prick for assessment of hemoglobin concentration.

Findings presented

In this bulletin data are presented on a selection of indicators of performance of national programs (salt iodization, vitamin A capsule distribution, immunization, *posyandu* [integrated community health post] attendance), feeding practices (exclusive breastfeeding and vitamin A intake from retinol-rich foods), nutritional status (anemia and anthropometry), and morbidity (diarrhea). For each indicator, its meaning, the way the information was collected, and the findings, both in general as well as in West Sumatra, are described. While the scope of this series is limited to presenting the findings, they serve to facilitate a discussion on the immediate and underlying causes of problems and ways to address these.

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

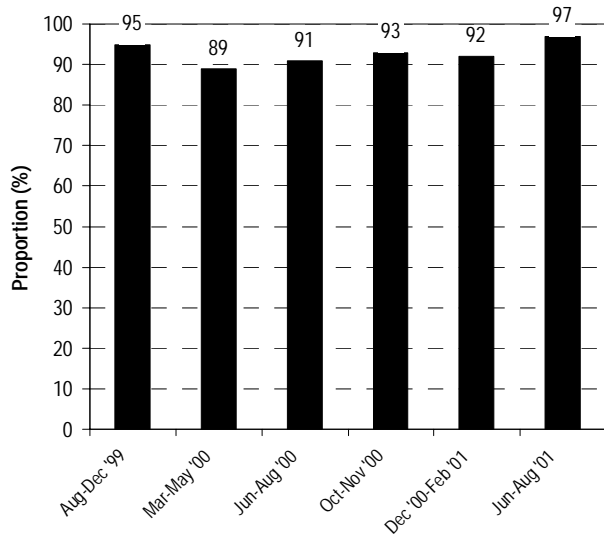


Fig 2. Children aged 0-5 mo exclusively breastfed

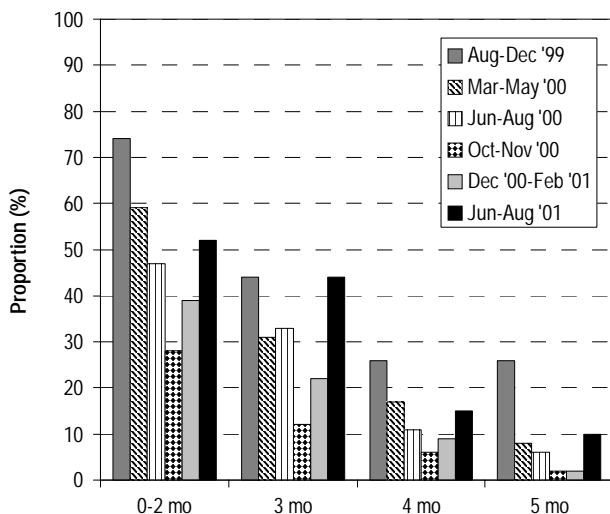
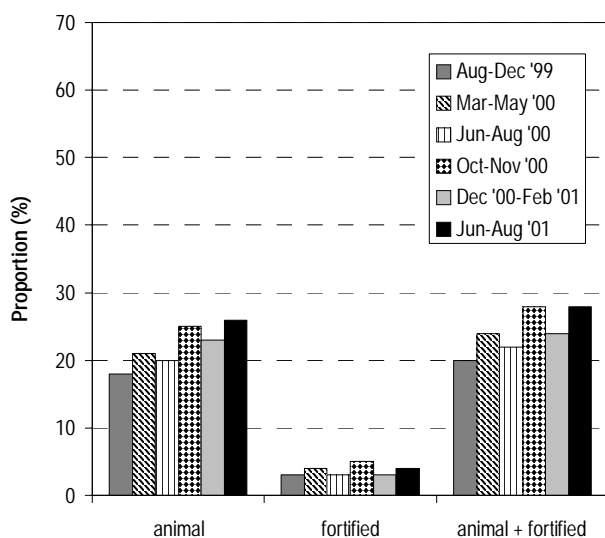


Fig 3. Mothers' preformed vitamin A intake >110 RE/d



Salt iodization (SEE FIG. 1)

What is indicated. Iodine deficiency has severe consequences. It reduces intellectual development and can even cause cretinism. The most prevalent clinical sign of iodine deficiency is goiter. The preferred way to prevent iodine deficiency is by iodizing salt.

Data collection method. A rapid-test kit was used to examine whether the cooking salt available in the household was adequately iodized (>30 ppm).

Findings. *General* – The availability of adequately iodized salt increased between 1999 and 2001 and, in some sites, >95% of households use adequately iodized salt. *West Sumatra* – The proportion of households with adequately iodized salt is among the highest observed.

Exclusive breastfeeding of infants aged <6 months (SEE FIG. 2)

What is indicated. Infants should be exclusively breastfed until the age of 6 months because of the nutritional and health benefits. However, many mothers introduce their infants to other liquids and/or solids before the age of 6 months for various reasons.

Data collection method. The mother was asked whether her child was still breastfed, and if so, whether he/she already received other liquids or foods.

Findings. *General* – Throughout the country, infants are introduced to other liquids and food at a very early age. At 4 months of age, <40% was exclusively breastfed. This proportion was lower in urban than in rural areas, and the general trend is for a further decline. *West Sumatra* – The rates of exclusive breastfeeding are relatively high and seem to be increasing again.

Preformed vitamin A intake, mothers (SEE FIG. 3)

What is indicated. Vitamin A deficiency increases morbidity and mortality and can cause night blindness and xerophthalmia. Food sources of vitamin A are green, red and orange vegetables and fruits, animal foods such as egg, butter, liver and milk, and fortified foods such as margarine, fortified noodles and complementary foods. Vitamin A is more readily available from animal foods and fortified foods and therefore their consumption should increase.

Data collection method. Mothers were asked what they ate during the previous day and vitamin A intake was estimated semi-quantitatively (24-VASQ method). We calculated the proportion of mothers that consumed more than 110 RE/d from retinol-rich foods (animal foods and fortified foods), which

is equivalent to one chicken egg, and is approximately 1/5 of the recommended daily allowance (RDA) for vitamin A for (non-breastfeeding) women.

Findings. General – Among mothers, retinol came mainly from animal foods (eggs, fish, chicken, liver) rather than from fortified foods and 10-45% of mothers consumed at least the equivalent of one egg/day. **West Sumatra** – The proportion of mothers that consumes at least 110 RE/d from animal foods is increasing.

Preformed vitamin A intake, children aged 12-23 months (SEE FIG. 4)

What is indicated. See above.

Data collection method. Mothers were asked what their child ate during the previous day, excluding breast milk, and a semi-quantitative estimate of vitamin A intake was made. For children, 110 RE is nearly 1/3 of their RDA.

Findings. General – Among children in urban areas, fortified foods were a more important source of retinol than animal foods. And in all areas, fortified foods were a much more important source of retinol for children than for their mothers. The main vitamin A-fortified foods consumed by children are milk (powdered milk and infant formula), complementary foods (porridges) and fortified noodles. **West Sumatra** – The proportion of children that obtains at least 1/3 of their RDA from retinol-rich foods is increasing.

Monthly posyandu attendance (SEE FIG. 5)

What is indicated. The *posyandu* is the integrated health post at sub-village level that is conducted every month and which provides a number of services including growth monitoring, immunization, vitamin A capsule distribution and family planning services. Mothers are encouraged to bring their child every month for weighing.

Data collection method. Mothers were asked when their child had last been to the *posyandu*. The proportion that had visited a *posyandu* <4 weeks before the interview was calculated for children aged 0-11, 12-23, and 24-35 months.

Findings. General – The lowest attendance in the last month was 30-50%, while in some sites, it was as high as 80-90%. **West Sumatra** – Monthly attendance is relatively low.

Vitamin A capsule receipt, children aged 6-59 months (SEE FIG. 6)

What is indicated. Vitamin A deficiency increases morbidity and mortality and can cause night blindness and xerophthalmia. As long as the diet

Fig 4. Children's (12-23 mo) preformed vitamin A intake > 110 RE/d

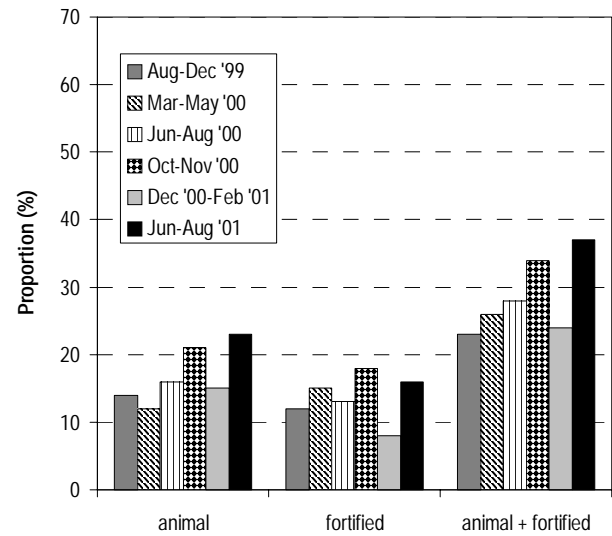


Fig 5. Children's (0-35 mo) monthly attendance of posyandu

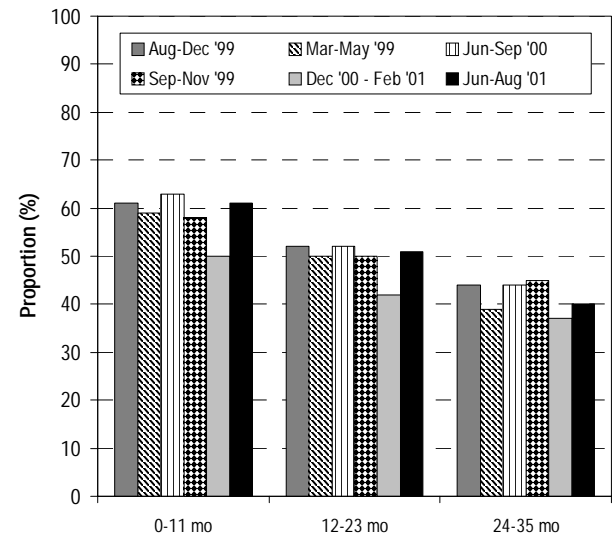


Fig 6. VAC coverage among 6-59 mo old children

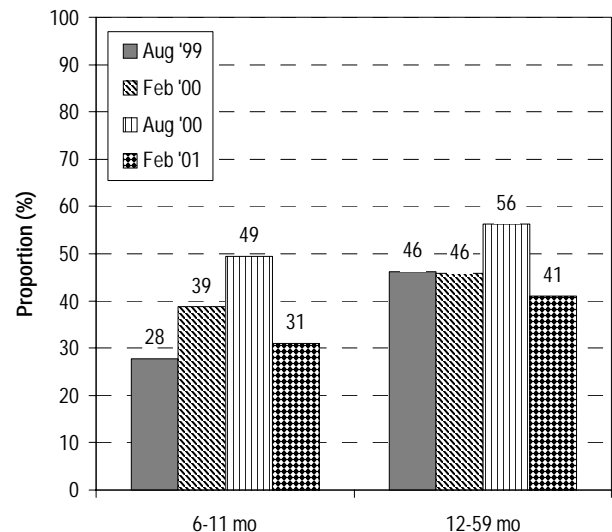


Fig 7. VAC coverage among mothers after delivery in 12 months prior to interview

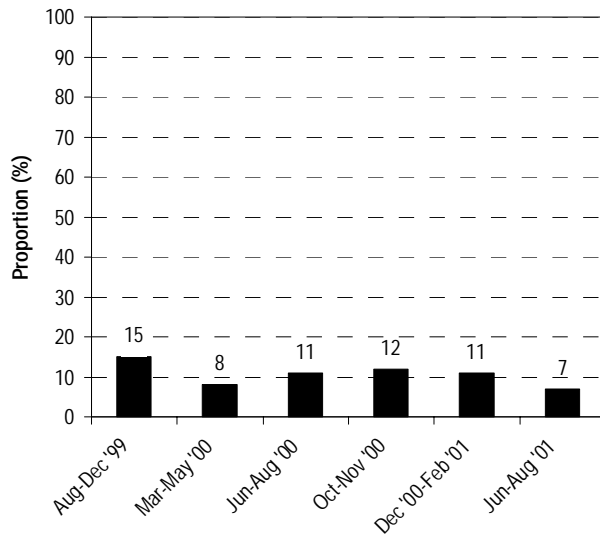


Fig 8. Children 12-17 mo old fully immunized

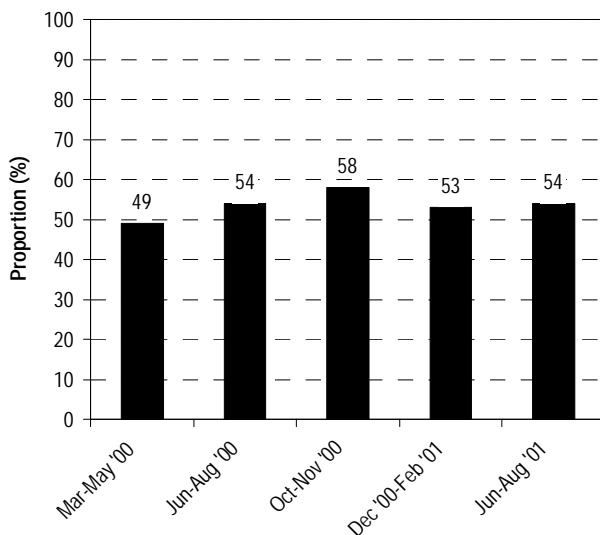
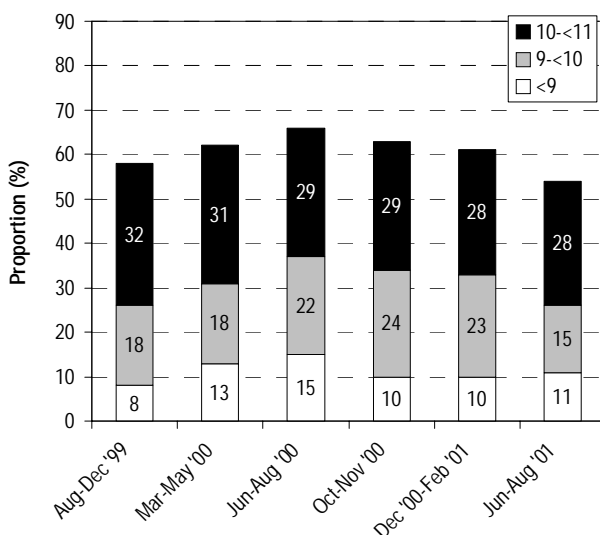


Fig 9. Anemia among children aged 12-23 mo by Hb-level (g/dL)



does not supply enough vitamin A, high-dose vitamin A capsules need to be distributed. Since the 1970s, children aged 12-59 months should receive 200,000 IU twice per year. And since 1999, infants aged 6-11 months should receive 100,000 IU. The minimum target for coverage is 80%.

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

Findings. General – Coverage among children aged 6-11 months has markedly increased, but in most sites, it is still lower than among children aged 12-59 months. Coverage among children aged 12-59 months has generally remained stable. *West Sumatra* – Coverage is among the lowest observed and was particularly low in Feb 2001.

Vitamin A capsule receipt, women within one month after delivery (SEE FIG. 7)

What is indicated. Vitamin A deficiency is also highly prevalent among breastfeeding mothers, which has consequences for herself and her child. Since 1991, all women should receive a vitamin A capsule (200,000 IU) within six weeks 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 of age.

Findings. General – Achieving and maintaining good coverage proves very difficult. The high coverage that had been achieved in Central Java and Semarang in 1996-1997 decreased markedly between 1999 and 2001. By early 2001, the highest coverage among all sites was approximately 30% and the lowest, 10%. *West Sumatra* – Vitamin A capsule coverage among mothers is very low.

Immunization status, children aged 12-17 months (SEE FIG. 8)

What is indicated. During their first year of life, children should be immunized against tuberculosis (BCG); diphtheria, tetanus and pertussis (DTP, 3 times); polio (3 times); hepatitis; and measles. Measles is the last immunization to be received and should be given between 9-12 months of age.

Data collection method. From 2000, the mother was asked whether each immunization had been received for each child.

Findings. General – In some sites, only 50-60% had been completely immunized by the age of 12-17 months, while in other areas, 90-95% was fully immunized. The minimum coverage target is 80%. *West Sumatra* – The proportion of fully immunized children is among the lowest observed.

Child anemia, 12-23 months old

(SEE FIG. 9, P4, BOTTOM)

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. The main cause of anemia in most of Indonesia is iron deficiency. The consequences of iron deficiency include reduced psychomotor and mental development, reduced immunity, and lethargy.

Data collection method. Blood was obtained by finger prick and its hemoglobin concentration (Hb, g/dL) was assessed using a HemoCue®.

Findings. *General* – Anemia prevalence among young children is alarmingly high both in urban and rural areas. This calls for immediate action by means of fortified complementary foods and iron/multi-micronutrient supplements. Prevalence of Hb<9 g/dL was relatively low (5-15%) in Central Java and West Sumatra, and high (15-25%) in Jakarta, East Java and Lombok. *West Sumatra* – The prevalence of child anemia increased until mid-2000 and has since been decreasing.

Maternal anemia, non-pregnant mothers

(SEE FIG. 10)

What is indicated. Anemia increases lethargy, reduces productivity and is an important cause of maternal mortality. While anemia among women is also largely due to iron deficiency, dietary intake is not the only cause. Other factors, such as receipt of iron tablets during pregnancy and family planning method used, also affect their Hb.

Data collection method. Same as among children.

Findings. *General* – Anemia levels in rural areas have not changed very much, while in Jakarta and Surabaya, a steady decline has been observed since early 1999. *West Sumatra* – Maternal anemia prevalence increased until mid-2000 and has since been decreasing.

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 changes in food availability. The latter can be affected by crises as well as by seasonal changes.

Data collection method. Maternal wasting is defined as a Body Mass Index (BMI) below 18.5 kg/m² (<17 is severely wasted), which is calculated by dividing bodyweight by height-squared.

Findings. *General* – Prevalence of maternal wasting was highest in urban slum areas in early 1999 (5%<17, and 15% between 17-<18.5) and has since declined, which indicates a process of recovery from the crisis. *West Sumatra* – Maternal wasting appears stable at 10-13%.

Fig 10. Anemia among non-pregnant women (Hb<12 g/dL)

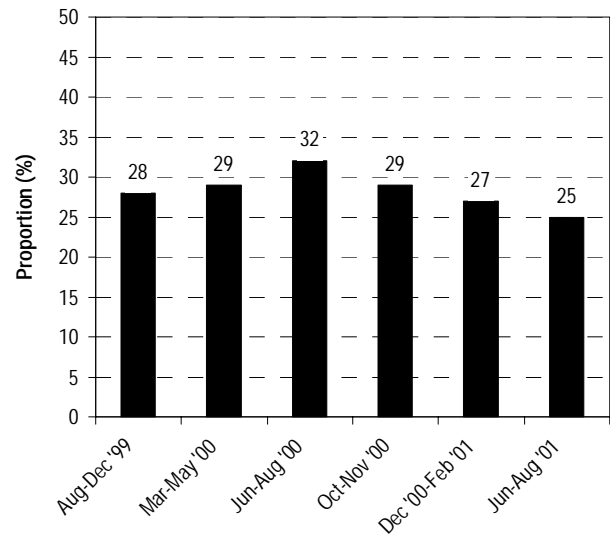


Fig 11. Wasting among mothers (BMI <18.5 kg/m²)

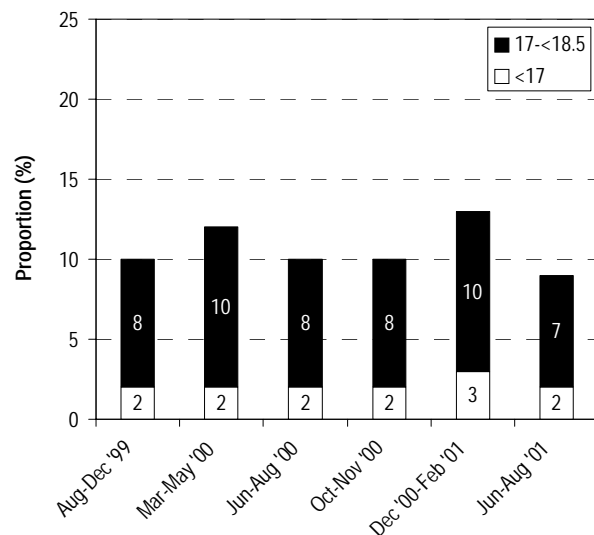


Fig 12. Wasting among children aged 12-23 mo (WHZ<-2 SD)

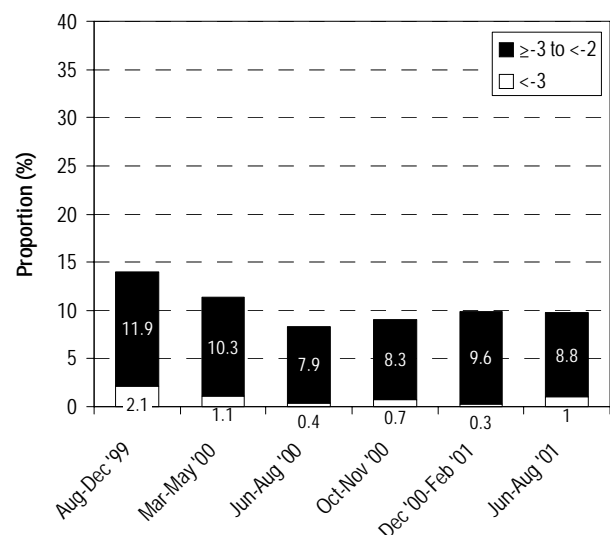


Fig 13. Stunting among children aged 12-23 mo (HAZ<-2 SD)

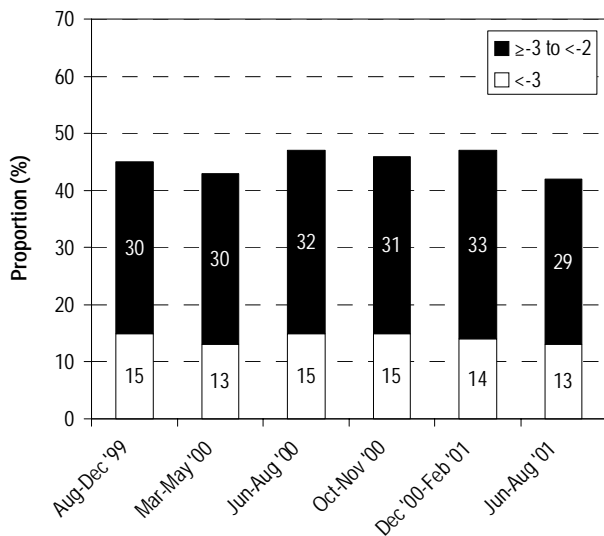


Fig 14. Underweight among children aged 12-23 mo (WAZ<-2 SD)

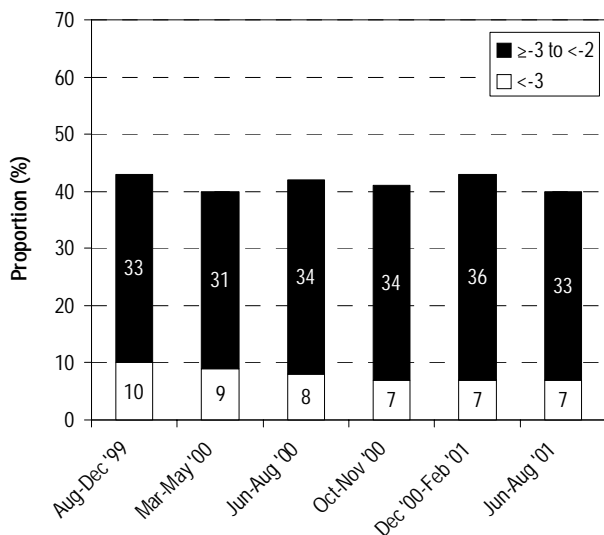
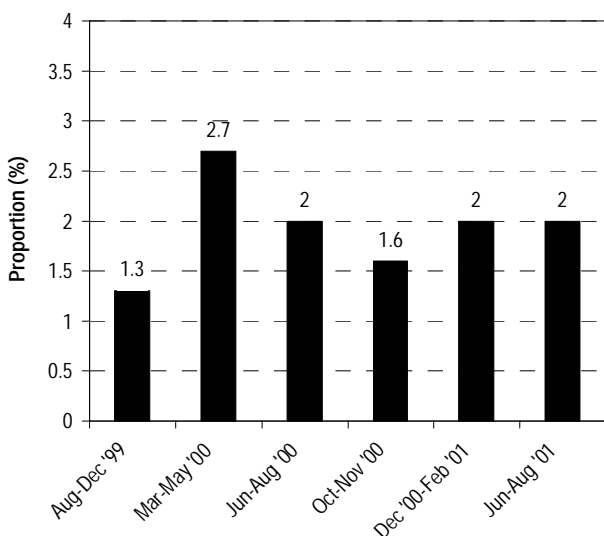


Fig 15. Maternal diarrhea in week prior to interview



Child wasting, 12-23 months old

(SEE FIG. 12, P5, BOTTOM)

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 disease. A prevalence of wasting of 10-15% calls for immediate attention.

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

Findings. *General* – In early 1999, the prevalence of childhood wasting was very high, but since then, it has decreased in most areas. In most places, the prevalence of Z-scores <-3 SD is now <2% and <-2 SD is <18%. *West Sumatra* – The prevalence of wasting is relatively low.

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 and it takes a long time to reverse a worsening trend. A prevalence of 30-39% is classified as high and of more than 40%, as very high.

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

Findings. *General* – The prevalence of stunting was lowest in Jakarta, Surabaya, West Java, Lampung and South Sulawesi; highest in Lombok; decreased in Central Java and Semarang; and increased in Makassar. *West Sumatra* – The prevalence of stunting is average compared to other sites.

Child underweight, 12-23 months old

(SEE FIG. 14)

What is indicated. Underweight (too low weight-for-age) can be the result of wasting (sudden low weight), the cause of which is usually recent and fairly clear, as well as stunting (low weight because of short stature), which takes much longer to address. The growth charts on the Indonesian health card for underfive children 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 <-2 SD of the median of the reference population (NCHS).

Findings. *General* – The prevalence of underweight was lowest in Central Java; highest in Jakarta, Lombok and Makassar; and decreased most in Jakarta, Surabaya and Central Java. *West Sumatra* – Prevalence of underweight is average compared to other sites.

Maternal diarrhea (SEE FIG. 15, P6, BOTTOM)

What is indicated. Diarrhea is a form of morbidity that is relatively easy to monitor, because it occurs relatively frequently and its definition is easily understood by respondents. Diarrhea prevalence primarily reflects hygiene conditions both inside the house as well as in the neighborhood and of (street) food consumed.

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

Findings. *General* – The prevalence of diarrhea among mothers ranged from <0.5% to 3%, decreased in some sites, but remained the same in most. *West Sumatra* – The prevalence of diarrhea among mothers is relatively high.

Child diarrhea, 12-23 months old (SEE FIG. 16)

What is indicated. See maternal diarrhea above. Diarrhea is generally more prevalent among young children and generally 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. Mothers 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; was lowest in Central Java (<10%); and highest in West Sumatra, Lombok and Makassar (15-25%). *West Sumatra* – The prevalence of diarrhea among children is among the highest observed.

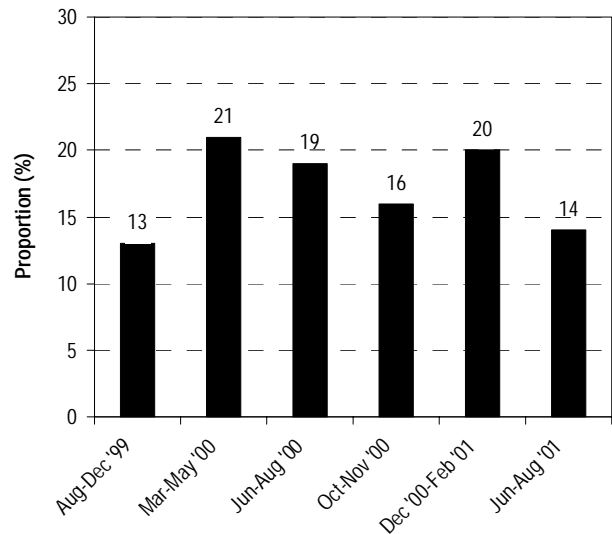
CONCLUSIONS

General

The impact of the crisis on nutrition and health has been severe, as shown by the high prevalence of wasting and very high prevalence of anemia among both mothers and young children. From mid-1999, the prevalence of these problems has started to decrease in most areas, indicating that recovery from the crisis has commenced, but special programs are still necessary. And it is important to realize what number of people is affected, depending on the size of the population of a province or urban slums.

Programs for limiting micronutrient deficiencies, such as vitamin A capsule (VAC) distribution, have been relatively well maintained. VAC coverage has markedly increased among the new target group of children aged 6-11 months, but needs to be much higher among mothers within one month after delivery. In some areas, the proportion of fully

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



immunized children is still well below the minimum target of 80%. The use of iodized salt is still increasing. The very high prevalence of anemia, particularly among young children, needs to be combated with supplements and fortified foods, because foods naturally rich in iron cannot bridge the current gap between needs and intake. And reasons for the very early introduction of liquids and/or complementary foods to breastfeeding infants need to be explored urgently in order to reverse the trend towards less and less exclusive breastfeeding of infants younger than 6 months of age.

The wide range of data available from the NSS should be exploited to the benefit of Indonesia's population and its use is therefore facilitated by making its data available on CDROM. Workshops are needed to stimulate and increase the capacity for using these data, and discussing and interpreting the findings presented in this bulletin series.

West Sumatra

In some respects, West Sumatra is doing very well. This includes the relatively high rates of exclusive breastfeeding and the very high proportion of households that use adequately iodized salt. In other respects, West Sumatra's performance is among the poorest observed. This includes *posyandu* attendance, vitamin A capsule and immunization coverage, and the prevalence of diarrhea. Anemia among mothers and young children needs to be combated urgently.



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