I N D O N E S I A

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CRISIS BULLETIN

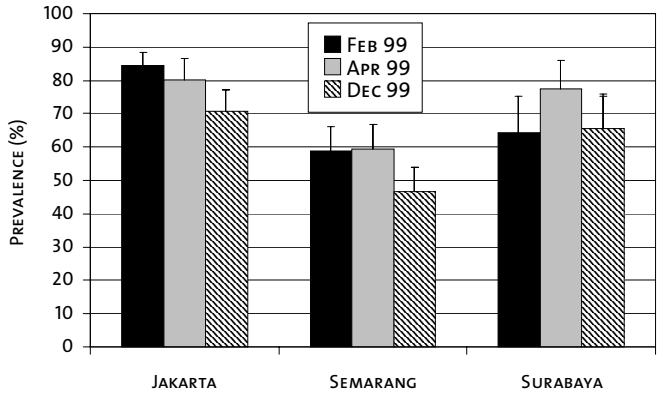
# Decreasing prevalence of anemia among urban children: Does it indicate increased access to micronutrient-rich foods?

**Indonesia's economic crisis, which started in July 1997, caused an increase in the prevalence and severity of micronutrient deficiencies such as iron and vitamin A deficiency. This increase was mainly due to the fact that a large proportion of the population could no longer afford to purchase micronutrient-rich foods such as animal products and fortified foods. The prevalence of anemia among young children (aged 12-23 months), which is a very sensitive indicator for changes in the quality of the diet, has decreased in urban slum areas between January 1999 and January 2000, from 55-85% to 45-70%. While this prevalence is still very high, it indicates that the nutrition situation is improving.**

For nearly three years, Indonesia has been battling an economic crisis. The crisis reduced household real income and, subsequently, food and non-food consumption. The HKI/GOI Nutrition Surveillance System (NSS) has been monitoring the impact of the crisis in rural Indonesia throughout this period. Data collection was initiated in urban slums of Jakarta, Semarang and Surabaya in early 1999 (see Crisis Bulletin Yr 2, Iss 2 for information on sampling and data collection methods).

The data on anemia from these urban slum areas in Jan-Mar 1999, Apr-May 1999 and Nov 1999-Feb 2000 are shown in Figures 1 and 2. Figure 1 shows anemia prevalence among children aged 12-23 months. Between Jan-Mar and Apr-May 1999, the prevalence had decreased in Jakarta, remained the same in Semarang, and increased in Surabaya. However, between Apr-May 1999 and Nov 1999-Feb 2000, it had decreased in all areas from 60-80% to 45-70%. A similar trend was observed among non-pregnant mothers (shown in Figure 2), except in Semarang, where the prevalence of anemia in Nov 1999-Feb 2000 was similar to that observed in Jan-Mar 1999.

**Figure 1.** Trends in the prevalence of anemia (Hb < 11.0 g/dL) among children aged 12-23 months in urban slum areas.[1,2,3]




[1] As assessed by *HemoCue* in blood obtained from fingertip
[2] Bars indicate 95%CI (Confidence Interval) corrected for design effect.
[3] Midpoints for the data collection rounds have been plotted: Feb 99 – Jan-Mar 99; Apr 99 – Apr-May 99; Dec 99 – Oct 99-Feb 00.

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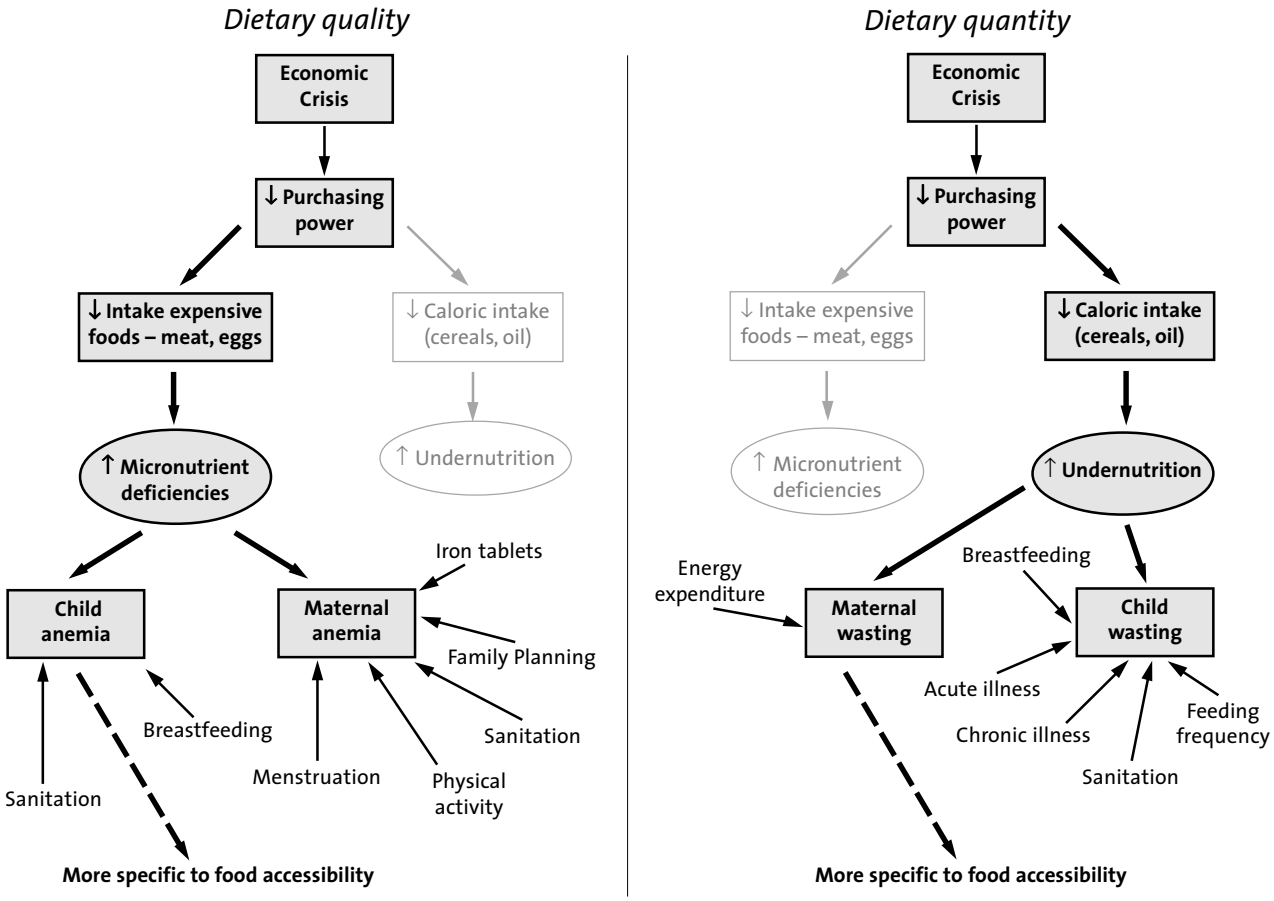
## Box 1. Childhood anemia and maternal BMI are sensitive indicators for assessing the impact of accessibility to food

During the economic crisis, the rupiah was dramatically devalued and prices of a great number of consumer goods increased. These events reduced the purchasing power of households in Indonesia. For many households, this resulted in reduced overall food consumption. As shown in many studies, changes in household income and purchasing power influence the share of total food expenditure allocated to more expensive foods, such as meat, eggs, fruit and commercial foods. We hypothesized that both quality and quantity of the diet might be negatively affected by the crisis. In line with the UNICEF conceptual model for malnutrition (Figure 3), a decline in dietary intake would likely precipitate increases in malnutrition. Similarly, if food intake begins to improve (through economic improvement and/or programs such as the social safety net program that are implemented to limit the impact of the crisis on the poorest in the population), the nutritional status would be expected to improve. Anemia is increasingly recognized as a good indicator of micronutrient deficiency. Low weight-for-height (measured as body mass index, or BMI, in adults) is a responsive indicator to acute changes in the immediate causes of malnutrition. The HKI/GOI Nutrition Surveillance System (NSS) has collected data on anemia prevalence among and taken weight and height measurements from women and underfive children since it was first established in 1995. Based on the surveillance of the nutritional situation since the crisis (both the rapid deterioration and the gradual improvements over the past year), evidence is growing to support the use and interpretation of data on childhood anemia and maternal BMI as sensitive, responsive indicators to monitor the nutrition situation in times of crisis.

In the Indonesian situation, the most important immediate cause of anemia (an outcome indicator of undernutrition) is inadequate intake of iron. Disease is much less important as an immediate cause, because the most important diseases that cause anemia – hookworm infestation and malaria – both have a low prevalence in most areas of Indonesia.

For children, as opposed to mothers, the main source of iron is the diet. The best sources of iron in the diet are animal foods and fortified foods, not only because of a relatively high content of iron but also because of the relatively high bioavailability of their iron. Thus, because the economic crisis reduces purchasing power, which will particularly impact on the consumption of relatively luxurious foods such as animal products and industrially-produced fortified foods, one of the first nutritional consequences of the crisis will be an increase in the prevalence of anemia among children.

For mothers, there is another important source of iron in addition to the diet – the iron supplements that are provided, as prescribed by the government, during pregnancy. Due to the contribution of supplements to the iron intake of pregnant women, iron status among mothers may not only be affected by changes in dietary quality, but could also reflect the performance of the health care system. During Indonesia's crisis, the health care services were relatively well maintained. Therefore, anemia prevalence is not exclusively an indicator of the nutritional impact of the crisis among women, which it is among children, whose iron status depends mainly on dietary intake.




Adapted from: Bendich A, Deckelbaum RJ (ed.). *Preventive Nutrition Vol II*. Humana Press, New Jersey, 2000. In press.

Among mothers, the prevalence of anemia is now almost the same as it was before the onset of the crisis when it ranged from 20-30%.[1] Among young children however, the prevalence is still considerably higher than the prevalence among underfives of 40% that was documented before the onset of the crisis.[1]

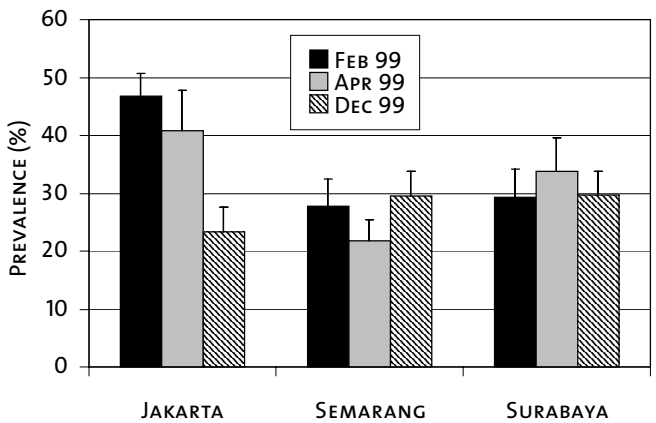
There is considerable evidence that anemia has negative consequences on social and economic development. Iron deficiency anemia reduces immunity, causes lethargy and limits a child's psychomotor and mental development and can therefore result in reduced intellectual capabilities. In women, iron deficiency anemia reduces productivity and immunity, and in pregnancy it is an important cause of maternal mortality and leaves the newborn with low iron stores. The fact that a very large proportion of Indonesia's population suffers from anemia, which is mainly due to iron deficiency, has serious consequences for the nation, at present as well as in the future.

Based on the experience in Indonesia since the crisis, global recognition to use child anemia to monitor the nutritional consequences of the crisis is growing. The 4th Report on the World Nutrition Situation (Jan 2000) by the United Nations Administrative Committee on Coordination, Sub-Committee on Nutrition (ACC/SCN) reports that 'Indicators of diet diversity and micronutrient status should be considered leading or early indicators for monitoring the impact of crises on nutrition status.'[2] The data presented in this Crisis Bulletin provide evidence that anemia among young children is indeed a very good indicator for monitoring the impact of a crisis on the nutrition situation.

[1] Ministry of Health, Republic of Indonesia. *Survei kesehatan rumah tangga (SKRT) 1995, survei morbiditas maternal* (Household survey, survey of maternal morbidity). Jakarta: National Institute for Health Research and Development, MOH/RI, 1995.

[2] ACC/SCN (2000). *Fourth Report on the World Nutrition Situation*. Geneva: ACC/SCN in collaboration with International Food Policy Research Institute (IFPRI)

**Figure 2.** Trends in the prevalence of anemia (Hb < 12.0 g/dl) among non-pregnant mothers[1,2,3]

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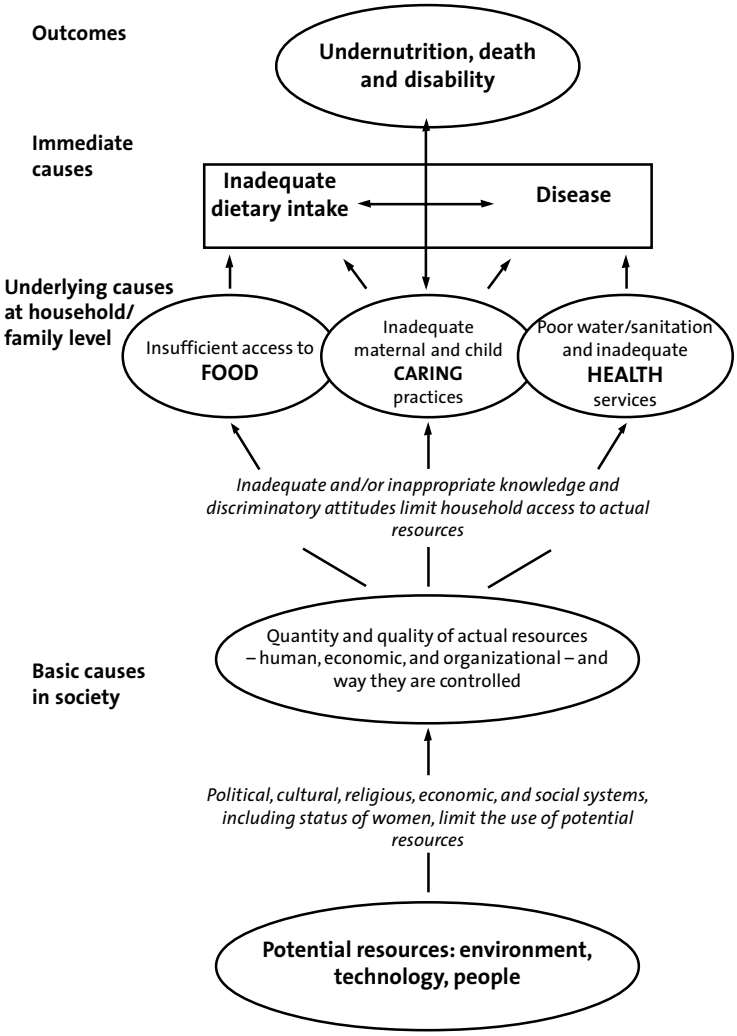
[3] Midpoints for the data collection rounds have been plotted: Feb 99 – Jan-Mar 99; Apr 99 – Apr-May 99; Dec 99 – Oct 99-Feb 00.

## Recommendations

Because of the high prevalence of anemia found, we recommend that:

- Subsidized, micronutrient-rich and energy-dense, weaning foods are provided to young children.
- Iron and/or multimicronutrient supplements are made available for pregnant and breastfeeding women in poor areas, as well as for particular groups of children.
- Monitoring of the prevalence of anemia among young children should continue because it is one of the best indicators for measuring the impact of the crisis on the nutrition situation, as well as for measuring recovery from the consequences of the economic crisis.

**Figure 3.** UNICEF conceptual framework outlining the causes of undernutrition.




Source: UNICEF. *The State of the World's Children 1998*. Oxford: Oxford University Press, 1998.

**Helen Keller International**
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Helen Keller Worldwide

FOR INFORMATION AND CORRESPONDENCE, CONTACT:

Dr. Dini Latief
Directorate of Community Nutrition
Ministry of Health
Jl. H.R. Rasuna Said
Blok X 5 Kav. 4-9
Jakarta 12950
Indonesia
Tel (62-21) 520-3883
Fax (62-21) 521-0176
E-mail: latieffs@centrin.net.id

Dr. Soewarta Kosen
National Institute for Health
Research & Development
Jl Percetakan Negara No. 23A
Jakarta 10560
Indonesia
Tel (62-21) 424-3314 / 426-1088 ext. 192
Fax (62-21) 421-1845
E-mail: kosen@centrin.net.id

- Dr. Martin W. Bloem
  Regional Director/Country Director
  E-mail: mwbloem@compuserve.com
- Dr. Regina Moench-Pfanner
  Regional Coordinator
  E-mail: remoench@cbn.net.id
- Dr. Saskia de Pee
  Regional Nutrition Research Advisor
  E-mail: sdepee@compuserve.com

Helen Keller International
Asia-Pacific Regional Office
P.O. Box 4338
Jakarta Pusat
Indonesia
Tel (62-21) 719-9163 / 719-8147
Fax (62-21) 719-8148

*For general enquiries:*
Federico Graciano
E-mail: fgraciano@hki-indonesia.org

- Lynnda Kiess
  Nutrition Surveillance System
  Program Director
  E-mail: lkiess@hki-indonesia.org
- Mayang Sari
  Head of Nutrition
  E-mail: msari@hki-indonesia.org
- Dr. Roy Tjiong
  Deputy Director
  E-mail: rtjiong@compuserve.com

Helen Keller International
Indonesia Country Office
P.O. Box 4338
Jakarta Pusat
Indonesia
Tel (62-21) 719-9163 / 719-8147
Fax (62-21) 719-8148

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