

Anemia

What underlies anemia?

- Dietary iron insufficiency
- Other deficiencies (vitamin A, folate, B12)
- Malaria
- Hookworm and other helminths
- Hemoglobinopathies (sickle cell disease)
- Other infections (bacterial, HIV/AIDS)
- Menstrual blood loss
- Pregnancy, lactation increase needs

What are the consequences?

- Mortality
 - maternal (8 to 20% of maternal deaths)
 - child (severe anemia)
- Low birth weight
- Lowered resistance to disease
- Poor cognitive development
- Poor school performance

“...over 30% of the world’s population is anemic, mainly due to iron deficiency...”

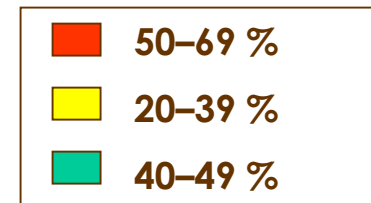
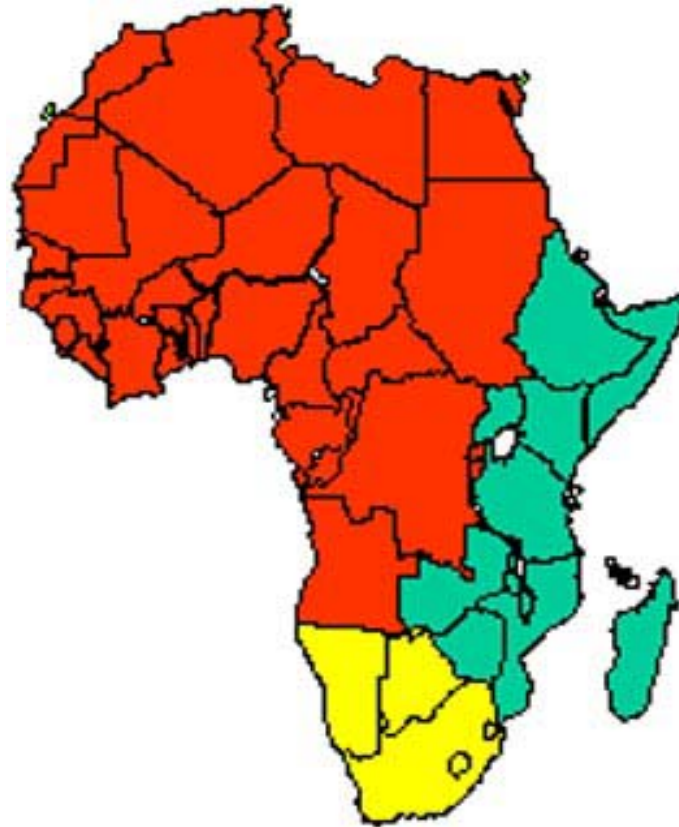


Regional Prevalence

Source: TIME Europe

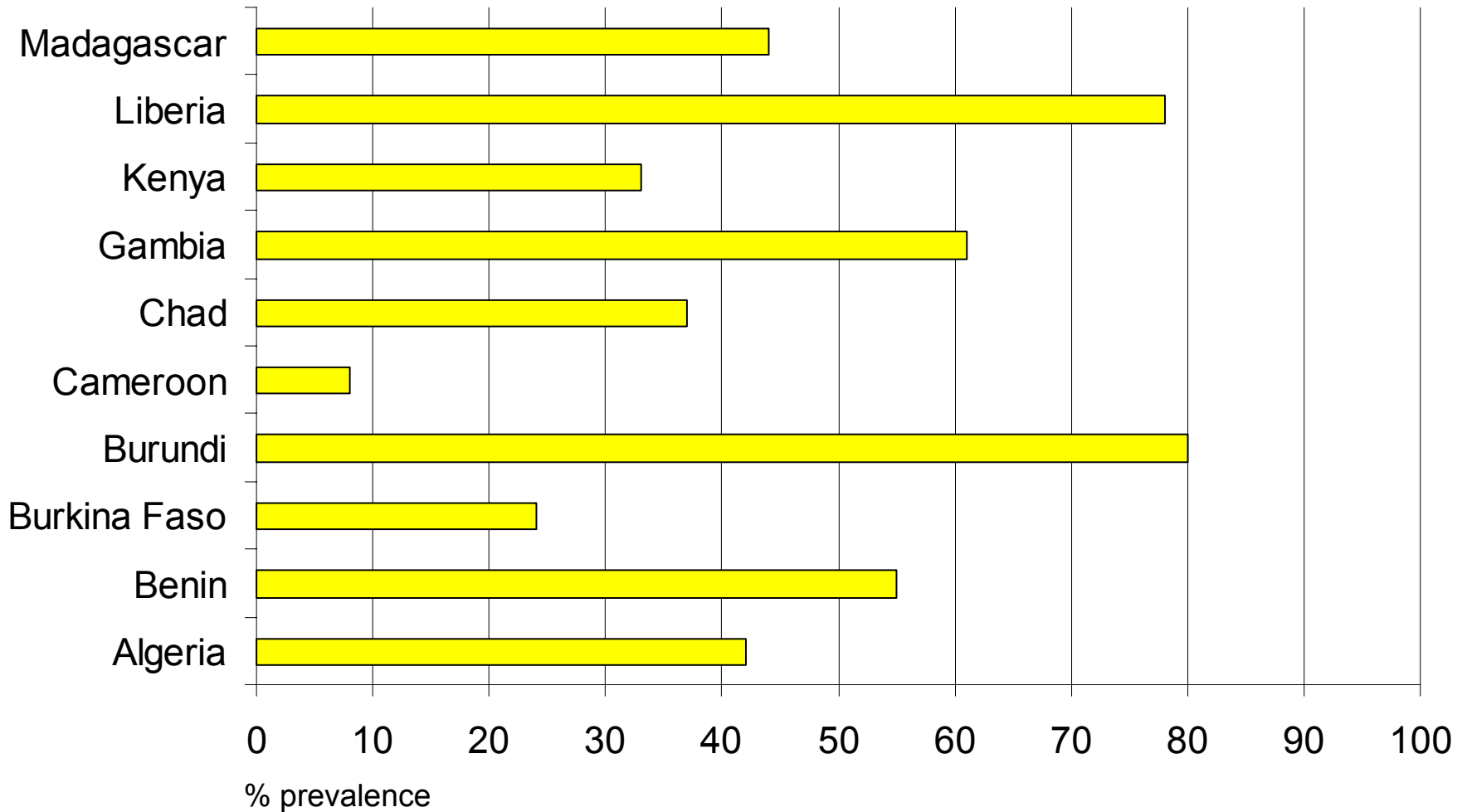
AFRICA

Anemia in Pregnant Women



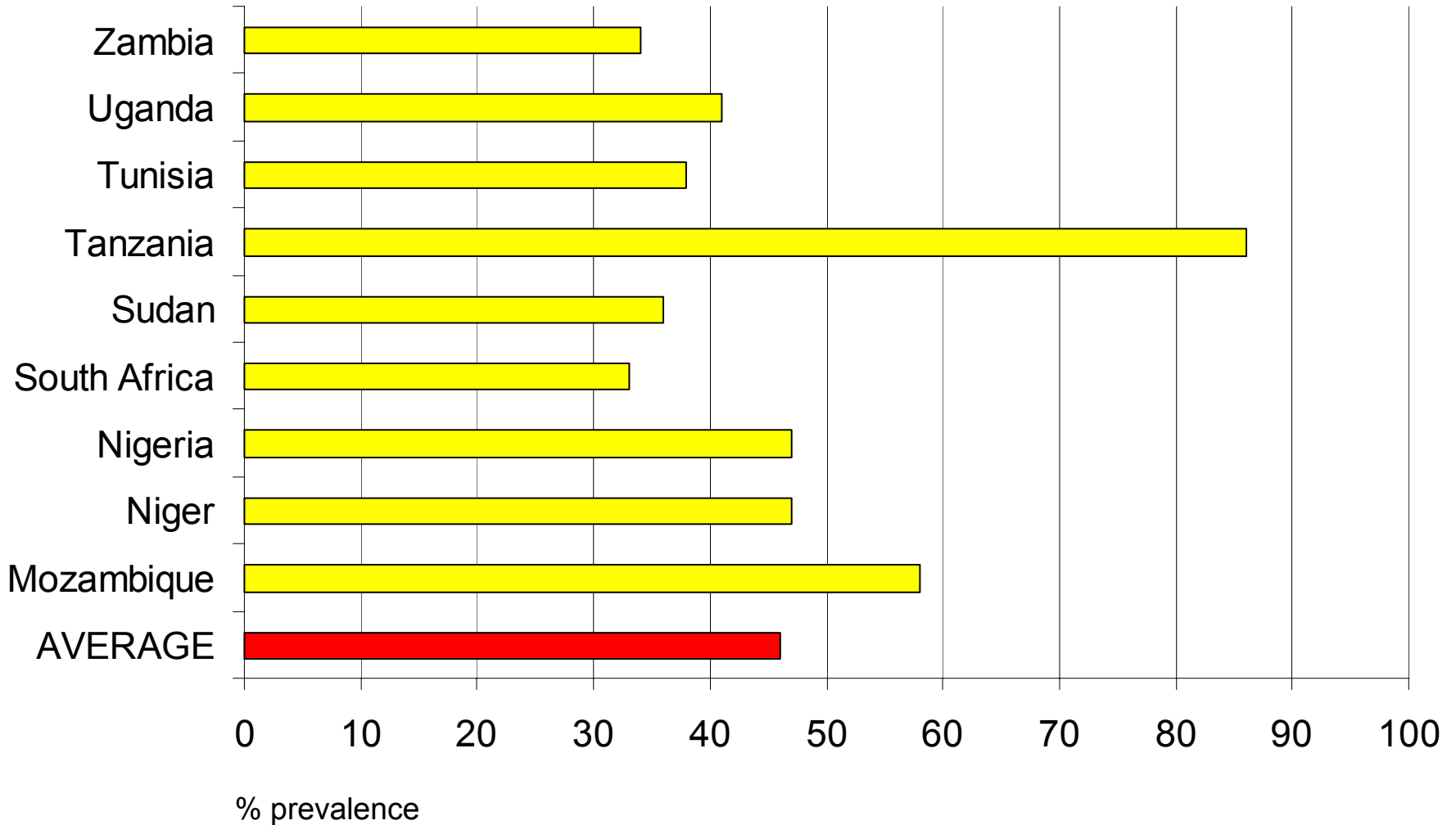
Source: WHO, 1992

Anemia in Pregnant Women (slide 1)



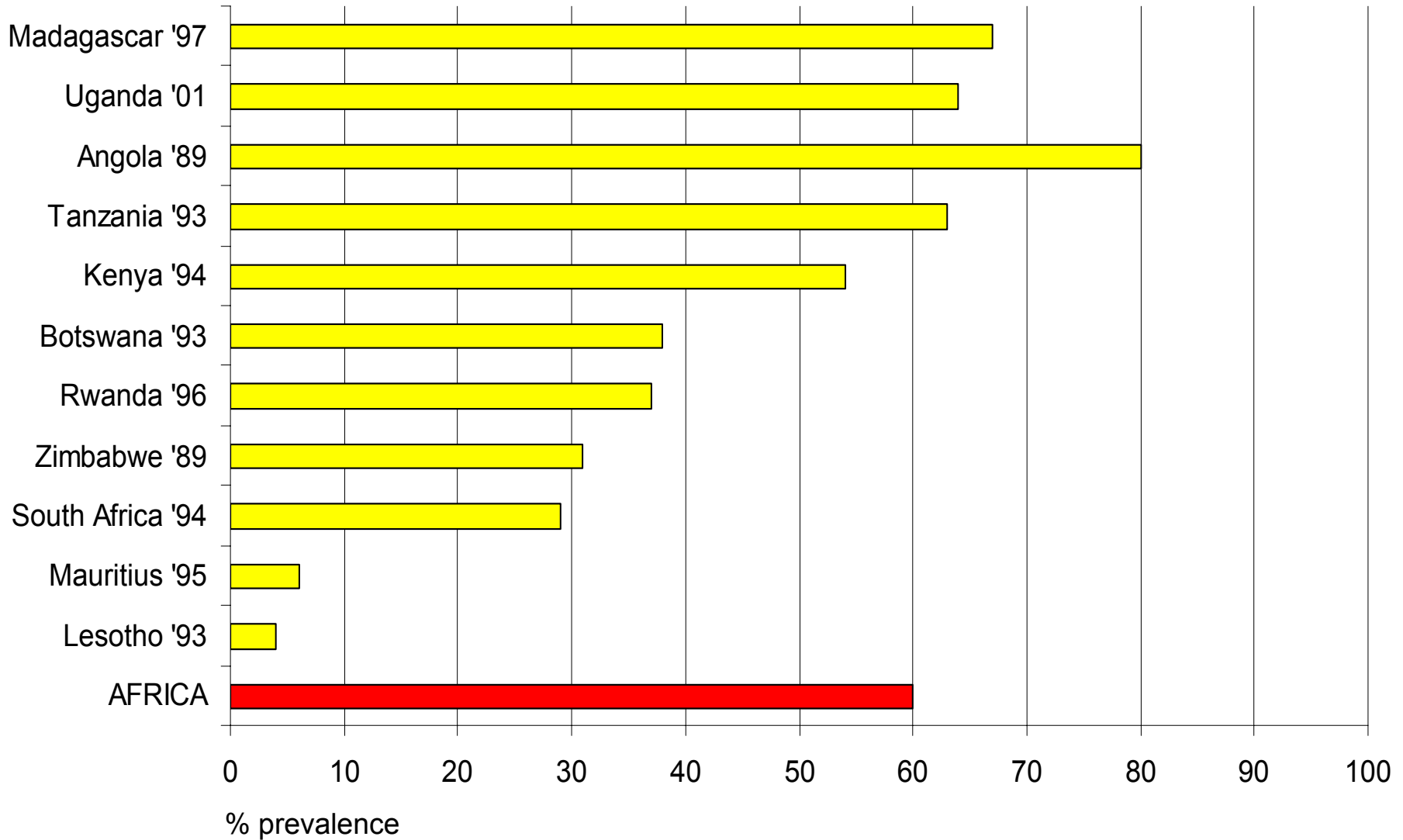
Source: WHO, 1992. Madagascar data from DHS 1997.

Anemia in Pregnant Women (slide 2)



Source: WHO, 1992. Uganda data from DHS 2000-01.

Anemia in Children Under 5

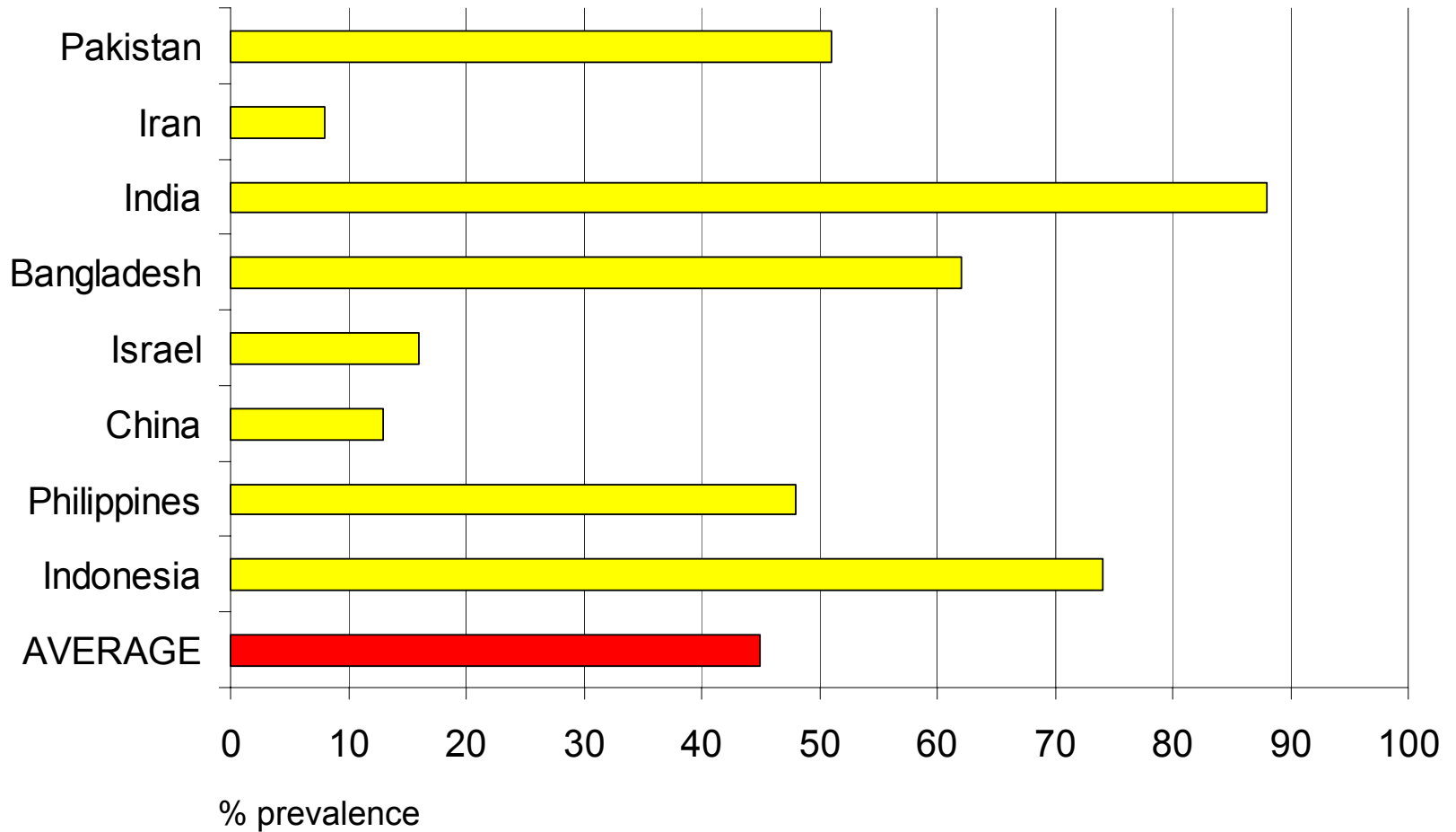




Regional Prevalence

ASIA AND MIDDLE/NEAR EAST

Anemia in Pregnant Women



Source: WHO, 1992

Anemia in Children Under 5¹

- 63% in Southeast Asia
- 46% in Eastern Mediterranean

Sources:

1. UN-SCN/ACC and IFPRI, 1999

2. DeMaeyer E, and M. Aaiels-Tegman. 1985. "The Prevalence of Anemia in the World." *World Health Statistics Quarterly* 38: 302-316. 1985.

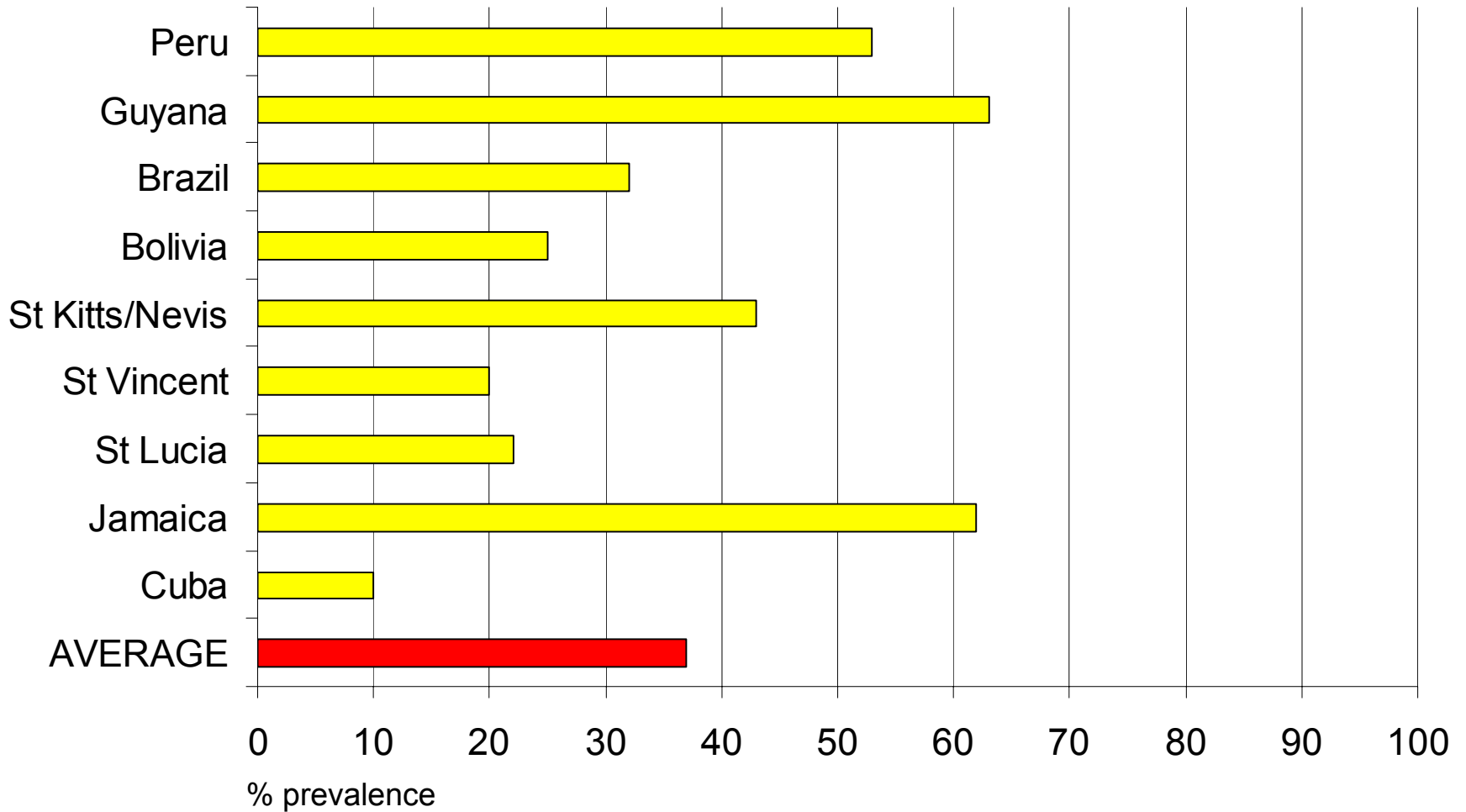


Source: FAO

Prevalence

LATIN AMERICA/ CARIBBEAN

Anemia in Pregnant Women



Source: WHO, 1992

Anemia in Children Under 5¹

- 18% in the Americas

Sources:

1. UN-SCN/ACC and IFPRI, 1999

2. DeMaeyer E, and M. Aaiels-Tegman. 1985. "The Prevalence of Anemia in the World." *World Health Statistics Quarterly* 38: 302-316. 1985.

Vitamin A Deficiency

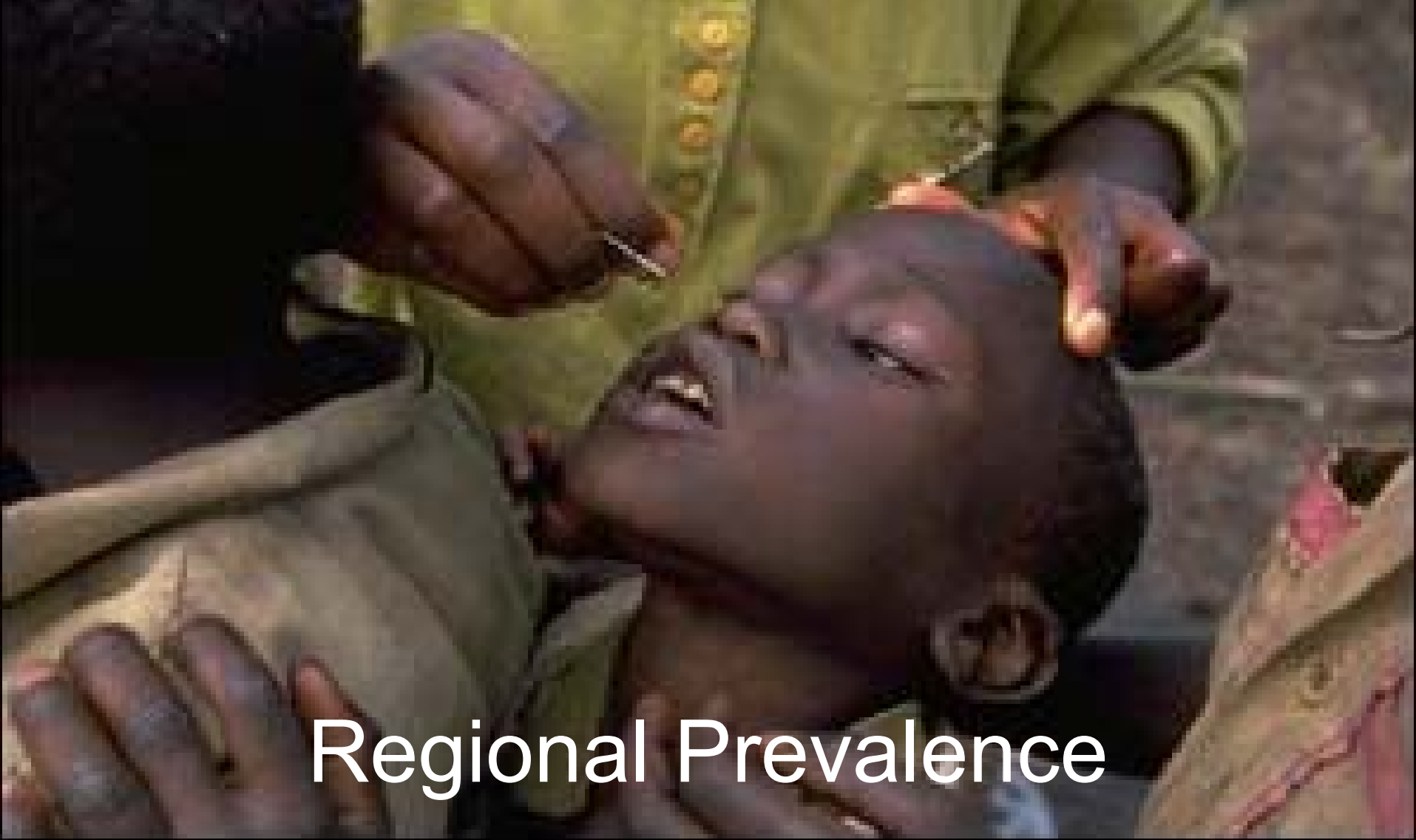
What underlies vitamin A deficiency?

- Dietary vitamin A insufficiency
- Inadequate fat, protein intake
- Conditions: celiac disease, sprue, cystic fibrosis, cirrhosis
- Infections: diarrhea, measles, chicken pox, pertussis, tuberculosis, hookworm
- Poor breastfeeding and infant feeding practices
- Low maternal reserves lead to deficiency in breastfed infants

What are the consequences?

- Child mortality
- Lowered resistance to disease
- Ocular: night blindness, xerosis, corneal ulceration and scarring

“Between 100 and 140 million children are vitamin A deficient...250,000 to 500,000 become blind every year...”

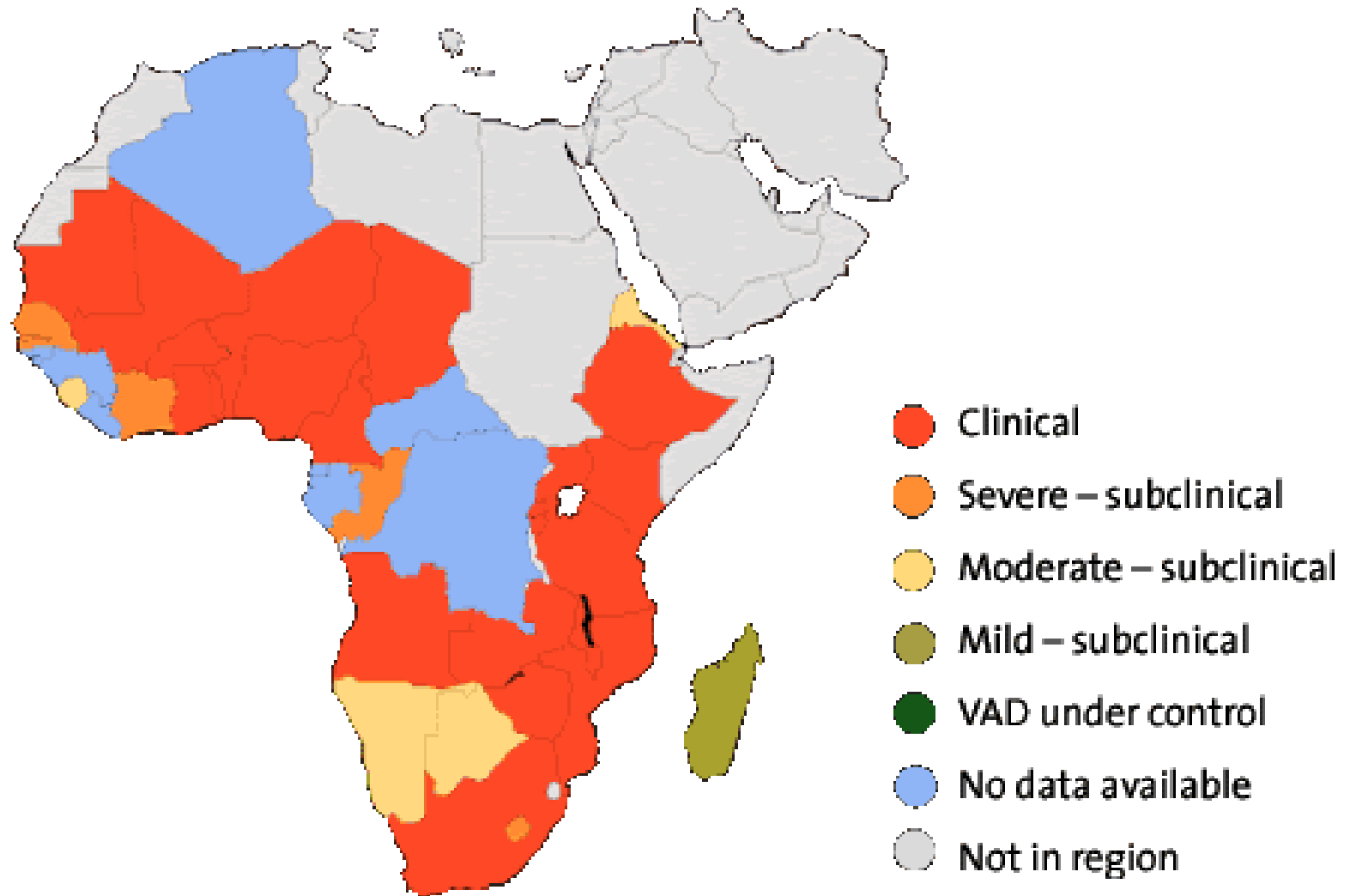


Regional Prevalence

Source: UNICEF

AFRICA

Public Health Importance of VAD Africa



GHANA

The VAD prevalence rate among children under 5 was 65% in the Northern regions; 70% in the Southern regions.

UGANDA

- The VAD prevalence rate among children under 5 was 28%**
- The VAD prevalence rate among women (15-49 years old) was 49%**

ZAMBIA

- **The VAD prevalence rate among children under 5 was 65.7%**
- **The VAD prevalence rate among women (15-49 years old) was 21.5%**

SOUTH AFRICA

The VAD prevalence rate among children under 5 was 30%

Sources: 1. MOST Project 2. Irene Roberts, Nutrition Information Centre, University of Stellenbosch, 1999, quoted by healthe.org

MADAGASCAR

- **The VAD prevalence rate among children under 5 was 42%**
- **The VAD Prevalence rate among women (15-49 years old) was 29%**

MOROCCO

The VAD prevalence rate among children under 5 was 40.9%

DR CONGO

The 1998 national survey revealed a 61% prevalence of VAD among children aged 6-36 months

Regional Prevalence



ASIA AND MIDDLE/ NEAR EAST

Prevalence of Clinical VAD

| <u>Country</u> | <u>Year</u> | <u>Ages</u> | <u>Sample size</u> | <u>% Prev.</u> |
|----------------|-------------|-------------|--------------------|----------------|
| Bangladesh | 1983 | 4-72 | 22,355 | 4.6 |
| India | 1988 | 0-60 | N/A | 1.4 |
| Indonesia | 1992 | 6-72 | 18,435 | 0.3 |
| Myanmar | 1994 | 6-60 | 14,059 | 0.8 |
| Nepal | 1996 | 6-35 | 3,386 | 1.5 |
| Philippines | 1993 | 6-60 | 5,049 | 0.4 |
| Sri Lanka | 1987 | 0-48 | 32,643 | 0.5 |
| Viet Nam | 1988 | 0-60 | 23,782 | 0.6 |

Source: MI/UNICEF/Tulane University (1998) Progress in Controlling Vitamin A Deficiency.

INDONESIA

Subclinical VAD widespread among young children and pregnant and lactating women

NEPAL

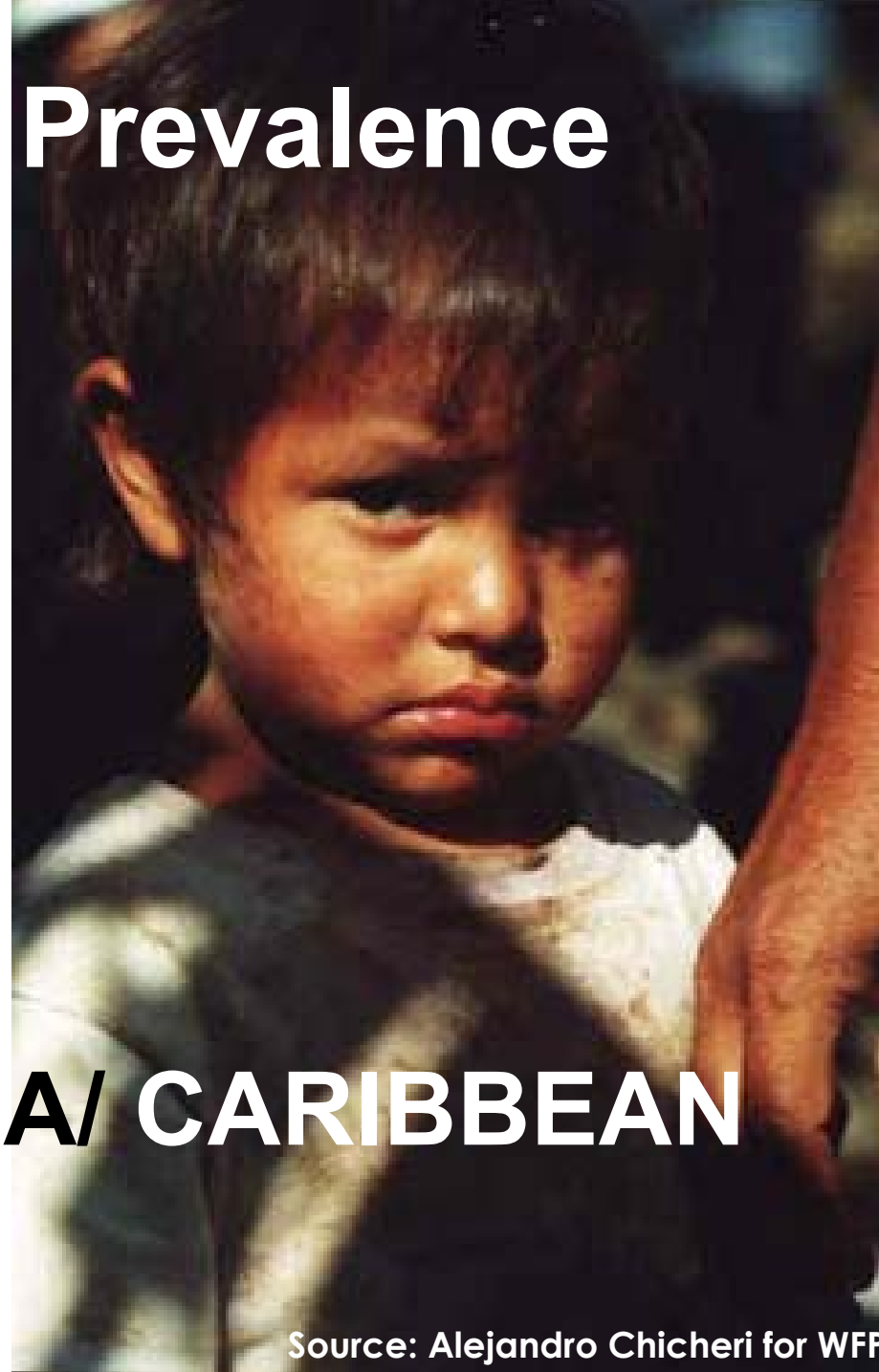
- **The VAD prevalence rate among children under 5 was 32%**
- **The VAD Prevalence rate among women (15-49 years old) was 17%**

PHILIPPINES

- **The VAD prevalence rate among children under 5 was 38%**
- **The VAD prevalence rate among pregnant women was 22%**
- **The VAD prevalence rate among lactating women 17%**

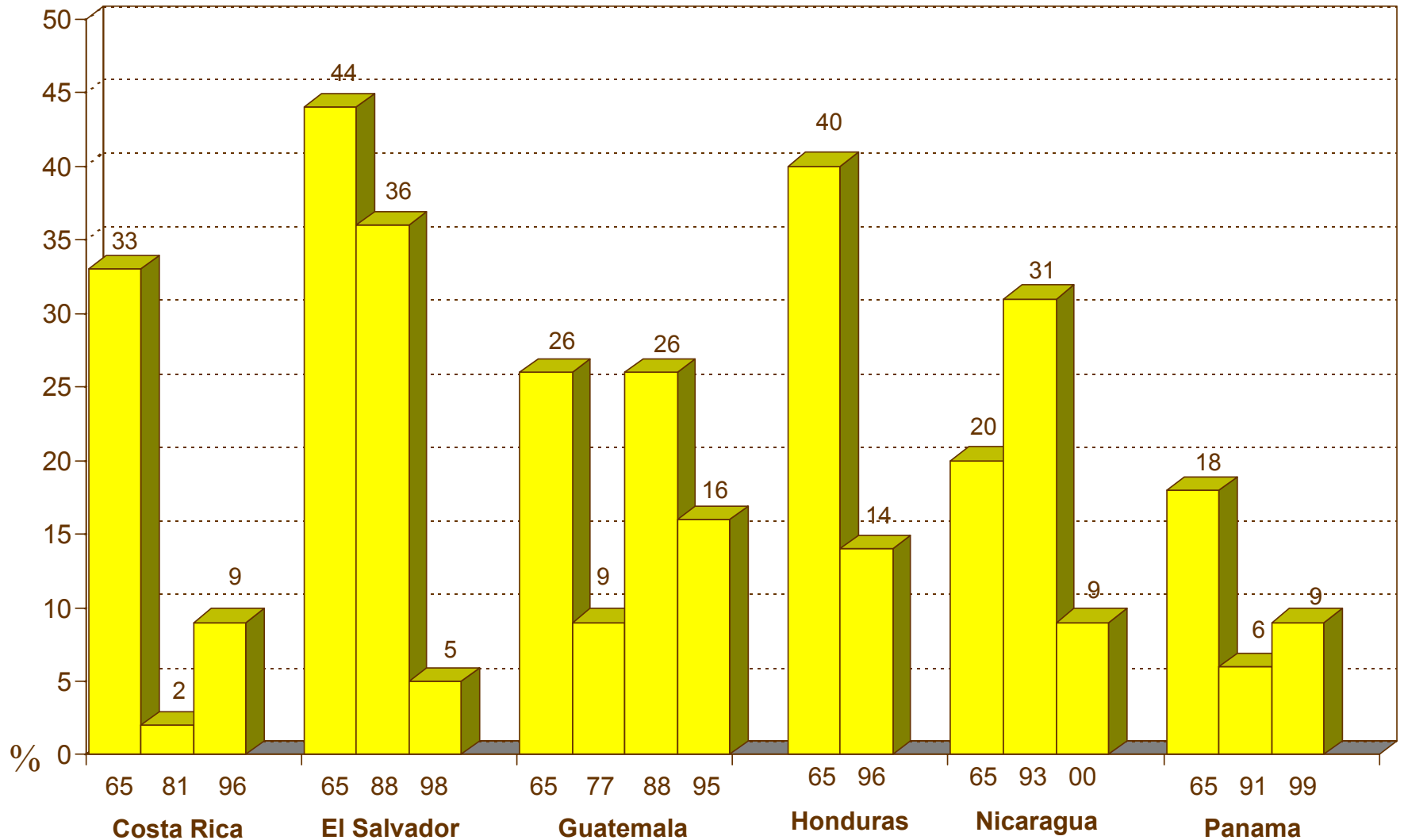
Regional Prevalence

LATIN AMERICA/ CARIBBEAN



Source: Alejandro Chicheri for WFP

Vitamin A Deficiency in Central American Children Aged 1-4 Years, 1960-2000



Promising methods to evaluate VAD

- **Retinol Binding Protein (RBP):** venous blood on ELISA.
- **Dry Blood Spot (DBS):** capillary blood analyzed on HPLC.