Estimates of Global Prevalence of Childhood Underweight in 1990 and 2015

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At the Millennium Summit in 2000, representatives from 189 countries committed themselves toward a world in which sustaining development and eliminating poverty would have the highest priority.1

The increased recognition of the relevance of nutrition as a basic pillar for social and economic development placed childhood undernutrition among the targets of the first Millennium Development goal to “eradicate extreme poverty and hunger.”2 The specific target goal is to reduce by 50% the prevalence of being underweight among children younger than 5 years between 1990 and 2015. Childhood underweight is internationally recognized as an important public health problem and its devastating effects on human performance, health, and survival are well established.3–8 A recent study estimated that about 53% of all deaths in young children are attributable to underweight, varying from 45% for deaths due to measles to 61% for deaths due to diarrheain.8

Monitoring progress toward the goal requires reliable data sources based on agreed on international standards and best practices, and standardized data collection systems that enable comparison over time. The World Health Organization (WHO) Global Database on Child Growth and Malnutrition was established in the late 1980s with the objective to collect, standardize, and disseminate anthropometric data on children using a standard format.9 With 419 national population-based surveys, the database covers more than 90% of children younger than 5 years worldwide. An earlier analysis of trends from 1980 to 2005 based on 241 national surveys indicated that childhood malnutrition (as measured by stunting or low height for age) remains a public health problem worldwide, with stunting rates declining in the majority of countries at about 1%

Context One key target of the United Nations Millennium Development goals is to reduce the prevalence of underweight among children younger than 5 years by half between 1990 and 2015.

Objective To estimate trends in childhood underweight by geographic regions of the world.

Design, Setting, and Participants Time series study of prevalence of underweight, defined as weight 2 SDs below the mean weight for age of the National Center for Health Statistics and World Health Organization (WHO) reference population. National prevalence rates derived from the WHO Global Database on Child Growth and Malnutrition, which includes data on approximately 31 million children younger than 5 years who participated in 419 national nutritional surveys in 139 countries from 1965 through 2002.

Main Outcome Measures Linear mixed-effects modeling was used to estimate prevalence rates and numbers of underweight children by region in 1990 and 2015 and to calculate the changes (ie, increase or decrease) to these values between 1990 and 2015.

Results Worldwide, underweight prevalence was projected to decline from 26.5% in 1990 to 17.6% in 2015, a change of –34% (95% confidence interval [CI], –43% to –23%). In developed countries, the prevalence was estimated to decrease from 1.6% to 0.9%, a change of –41% (95% CI, –92% to 343%). In developing regions, the prevalence was forecasted to decline from 30.2% to 19.3%, a change of –36% (95% CI, –45% to –26%). In Africa, the prevalence of underweight was forecasted to increase from 24.0% to 26.8%, a change of 12% (95% CI, 8%-16%). In Asia, the prevalence was estimated to decrease from 35.1% to 18.5%, a change of –47% (95% CI, –58% to –34%). Worldwide, the number of underweight children was projected to decline from 163.8 million in 1990 to 113.4 million in 2015, a change of –31% (95% CI, –40% to –20%). Numbers are projected to decrease in all subregions except the subregions of sub-Saharan, Eastern, Middle, and Western Africa, which are expected to experience substantial increases in the number of underweight children.

Conclusions An overall improvement in the global situation is anticipated; however, neither the world as a whole, nor the developing regions, are expected to achieve the Millennium Development goals. This is largely due to the deteriorating situation in Africa where all subregions, except Northern Africa, are expected to fail to meet the goal.

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per year or less. Moreover, in some countries, rates of stunting were ris-
ing while in many others they re-
maind high.10 The aims of the cur-
rent analysis are to (1) quantify the
magnitude of the problem and de-
scribe where malnourished children live
and (2) to identify geographical re-
gions that based on projected esti-
mates are unlikely to achieve the goal
of a 50% decrease in the 1990 preva-
ience of underweight by 2015.

METHODS

Data

To estimate trends in childhood un-
derweight, national prevalence of low
weight for age, which was defined as
weight 2 SDs below the mean weight for
age of the National Center for Health
Statistics and WHO international refer-
ence population, were derived from the WHO
Global Database on Child Growth and
Malnutrition.9 A total of 419 nation-
ally representative surveys, which in-
cluded about 31 million children, were
available from 139 countries. Of the 419
surveys, 398 were conducted in devel-
oping countries and 21 in developed
countries. For 42 countries, national
survey data were available from only 1
survey, 36 countries had 2 surveys, and
61 countries had 3 or more surveys.
More than half of the surveys (227)
were conducted between 1991 and
1999, 33% (137) dated back to 1990
and earlier, and 13% (55) were per-
formed in 2000 or later (Table 1). The
earliest survey dates back to 1965 (from
Colombia), while the most recent sur-
veys were conducted in 2002 (Eritrea,
Jordan, and Romania). All surveys in-
cluded boys and girls, and the age
groups ranged from birth to 5 years.
The complete set of surveys included in
the analysis is available from the authors
on request.

A data file was constructed and con-
sisted of region, subregion, country,
survey year, sample size, prevalence of
underweight, and population of chil-
dren younger than 5 years during the
survey year. To obtain comparable
prevalences of underweight children
across countries, surveys were ana-
lyzed following a standard format us-
ing the National Center for Health Sta-
tistics and WHO international refer-
ce population, the same cut-off point (ie,
2 SDs below the mean weight for age),
and the same reporting system (ie, z
score). The steps followed to analyze
the surveys in a standard way have been
described elsewhere.9

Statistical Analysis

For this analysis, all available child-
hood underweight prevalence esti-
mates from national surveys were used.
Countries providing data were re-
garded as a representative sample of all
countries within their subregions (ie,
covering at least 80% of the popula-
tion younger than 5 years), which were
nested within regions. For example, the
region of Asia comprised Eastern, South
Central, Southeastern, and Western
Asia. Trends were also derived for larger
units. The group of developing re-
gions included Africa, Asia, Latin
America (including the Caribbean), and
Oceania. The developed countries were
grouped in 1 unit. We obtained global
estimates by combining the develop-
ing regions and developed countries.
Country groupings followed the United
Nations (UN) country classification.11

The method of linear mixed-effect
models, as described by Laird and
Ware,12 was applied to model the data
set at subregional levels with the coun-
try’s effect being defined as random. By
using this model, the fact that not all
countries had available underweight
prevalence data was incorporated
assuming countries without data
were missing at random. This also
allowed all data points for each country
to be included in the estimates for sub-
regions.

Using the surveys’ underweight
prevalence estimates, a linear mixed-
effect model was considered for each
group of subregions belonging to the
same region. The dependent vari-
able was the logit of the prevalence
(ln [prevalence/(1−prevalence)]). The
basic model contained subregion, year
of survey, and the interaction between
year and the subregion as fixed effects
and country as a random effect. This
model is part of a more general class of
models—the multilevel models. In mul-
tilevel modelling literature, notably in
Goldstein,13 the same model is called
a 2-level model, counting the levels of
variation (ie, level 1 being the survey
and level 2 being the country). Conse-
quently, we obtained from each model
an estimate of the change in preva-
ience for every subregion between the
years 1990 and 2015. Subregion preva-
ience estimates and their respective con-
fidence intervals (CIs) were derived by
back-transformation.

To account for the population dif-
erences among countries and to en-
sure that the influence on the regional
trend analysis of a country’s survey es-
timate was proportional to the coun-
try’s population, we performed
weighted analysis. The population
weights were derived from the UN
Population Prospects.11 For each data
point, we obtained the respective popu-
lation estimate of children younger than
5 years for the specific survey year. If
a survey was performed over an ex-
tended period, for example 1995-
1997, the mean year (ie, 1996) was used
as the year from which to choose the
respective population estimate. For
countries with multiple data points, the
weights were calculated by dividing the
mean of the country’s population of
children younger than 5 years (over the
observed years) by the sum of the popu-
lation means for countries in the en-
tire region. Weights of countries with
single data points were derived by di-
viding the population of children
younger than 5 years at the time of the
survey by the sum of the countries’
population means in the whole
region.

We considered 3 different structures
for modeling the covariance: com-
pound symmetric, unstructured, and au-
toregressive.14 The compound
symmetric model for a region allowed
the country to have its own intercept (in-
fluencing prevalence estimate) and
forced all countries to have a common
slope in prevalence over time. The un-
structured model for a region allowed

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each country to have its own intercept and slope. The autoregressive model allowed for correlations between observations within the same country to weaken as the time between them increased. Year was centered at 1995, around which there was a high concentration of available survey data points. Models were fitted using restricted maximum likelihood. We used the sandwich variance estimator to obtain SEs of estimates. The decision on how to choose the best model among different covariance structures was based on the Akaike information criterion, which penalizes the log likelihood values for the number of parameters in the model. In parallel, we examined the graphed display of the fitted trend line against the survey data points and discarded models that did not present a reasonable fit with respect to the empirical data.

The prevalence estimates for 1990 and 2015 for each subregion were derived using the final regression model chosen according to the criteria described above. For the subregions of Africa and Latin America, the unstructured covariance model with random intercept and slope at country level was used. The compound symmetric covariance structure was chosen to model the subregions of Asia, imposing a common slope for all countries in that region. The estimates on the log scale were back-transformed to provide the prevalence estimates.

Using the resulting prevalence estimates, the total number of affected children was calculated by multiplying the prevalence estimates and respective CIs by the subregional population of children younger than 5 years. The UN population estimates and projections are derived incorporating all new and relevant information regarding the past demographic dynamics of the population of each country or area of the world; and formulating detailed assumptions about the future paths of fertility, mortality, and migration.

For the regional level, the prevalence was derived by using the sum of the numbers of affected estimates in the subregions divided by the total population of children younger than 5 years in that region. To construct a CI for the overall regional prevalence estimate, we obtained approximate SEs associated with the subregions’ prevalence estimates using the delta method and summarized them to compute SEs corresponding to the overall weighted prevalence estimates.

For the developed countries, 21 observations were available. Considering the relative homogeneity of the group, we fitted a linear mixed-effects model with year being a fixed effect and country being a random effect.

The relative change in prevalence was calculated as the 2015 prevalence minus the 1990 prevalence divided by the 1990 prevalence. The CIs for the change in prevalence were constructed using the ratio between the 2015 and the 1990 prevalences on the log scale.

Table 1. Description of 419 Surveys Included in the Analysis

<table>
<thead>
<tr>
<th>Region</th>
<th>No. of Surveys</th>
<th>Total Sample Size</th>
<th>Countries With Surveys/Total No. of Countries</th>
<th>No. of Surveys by Survey Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entire region</td>
<td>145</td>
<td>1 583 202</td>
<td>52/53</td>
<td>41</td>
</tr>
<tr>
<td>Northern</td>
<td>19</td>
<td>84 844</td>
<td>5/5</td>
<td>7</td>
</tr>
<tr>
<td>Sub-Saharan*</td>
<td>126</td>
<td>1 498 358</td>
<td>47/48</td>
<td>34</td>
</tr>
<tr>
<td>Eastern</td>
<td>49</td>
<td>1 190 759</td>
<td>17/17</td>
<td>12</td>
</tr>
<tr>
<td>Middle</td>
<td>16</td>
<td>67 020</td>
<td>8/9</td>
<td>3</td>
</tr>
<tr>
<td>Southern</td>
<td>11</td>
<td>35 598</td>
<td>5/5</td>
<td>2</td>
</tr>
<tr>
<td>Western</td>
<td>48</td>
<td>182 353</td>
<td>16/16</td>
<td>17</td>
</tr>
<tr>
<td>Asia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entire region</td>
<td>122</td>
<td>3 103 847</td>
<td>39/47</td>
<td>31</td>
</tr>
<tr>
<td>Eastern</td>
<td>8</td>
<td>128 277</td>
<td>3/4</td>
<td>1</td>
</tr>
<tr>
<td>South Central</td>
<td>42</td>
<td>251 222</td>
<td>13/14</td>
<td>13</td>
</tr>
<tr>
<td>Southeastern</td>
<td>45</td>
<td>2 637 338</td>
<td>9/11</td>
<td>14</td>
</tr>
<tr>
<td>Western</td>
<td>27</td>
<td>87 010</td>
<td>14/18</td>
<td>3</td>
</tr>
<tr>
<td>Latin America</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entire region</td>
<td>125</td>
<td>24 886 979</td>
<td>27/33</td>
<td>53</td>
</tr>
<tr>
<td>Caribbean</td>
<td>25</td>
<td>43 931</td>
<td>7/13</td>
<td>9</td>
</tr>
<tr>
<td>Central</td>
<td>30</td>
<td>1 187 241</td>
<td>8/8</td>
<td>11</td>
</tr>
<tr>
<td>South</td>
<td>70</td>
<td>23 655 807</td>
<td>12/12</td>
<td>33</td>
</tr>
<tr>
<td>Oceania†</td>
<td>6</td>
<td>36 965</td>
<td>5/15</td>
<td>5</td>
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<tr>
<td>Developing regions</td>
<td>398</td>
<td>29 611 013</td>
<td>123/148</td>
<td>130</td>
</tr>
<tr>
<td>Developed countries‡</td>
<td>21</td>
<td>1 297 422</td>
<td>16/45</td>
<td>7</td>
</tr>
<tr>
<td>Entire world</td>
<td>419</td>
<td>30 908 435</td>
<td>139/193</td>
<td>137</td>
</tr>
</tbody>
</table>

*Comprises the regions of Eastern, Middle, Southern, and Western Africa and Sudan.
†Includes Fiji, Papua New Guinea, Solomon Islands, Vanuatu, Kiribati, and Samoa.
‡Europe, Japan, Australia, Canada, and United States.
RESULTS
Trends and Percentage Change in Prevalence of Underweight Children, 1990-2015

TABLE 1 presents the surveys included in the analysis and TABLE 2 presents estimates of underweight children for 1990 and projections for 2015 with 95% CIs of the prevalence and the relative percentage change. Worldwide, prevalence of childhood underweight was projected to decline from 26.5% in 1990 to 17.6% in 2015, a change of −34% (95% CI, −43% to −23%). In developed countries, the prevalence was estimated to decrease from 1.6% to 0.9%, a change of −41% (95% CI, −92% to 343%). In developing regions, the prevalence was forecasted to decline from 30.2% to 19.3%, a change of −36% (95% CI, −45% to −26%).

In Africa, the prevalence of underweight was forecasted to increase from 24.0% in 1990 to 26.8% in 2015, a change of 12% (95% CI, 8%-16%). The prevalence of childhood underweight was estimated to increase in Sub-Saharan Africa by 9% (from 26.8% to 29.2%) and in Eastern Africa by 25% (from 26.7% to 33.3%). The prevalence of childhood underweight was projected to be reduced by 15% for Middle Africa; 5%, Southern Africa; and 6%, Western Africa. Only Northern Africa, with a forecasted reduction in the prevalence of childhood underweight from 9.5% to 4.2%, was estimated to reach the Millennium Development goal. Figure 1 presents the 2015 projections of the prevalence of underweight children for the African subregions compared with the Millennium Development goal for those subregions.

In Asia, between 1990 and 2015 the prevalence was estimated to decrease from 35.1% to 18.5%, a change of −47% (95% CI, −58% to −34%). The largest decline was estimated in Eastern Asia, where the prevalence of underweight children was forecasted to decrease by 84% in the same period. Southeastern and South Central Asia were also forecasted to experience substantial improvements, with reductions in the prevalence of underweight of 49% and 42%, respectively. However, both subregions are projected to still have high levels of childhood underweight in 2015. Western Asia was estimated to be the Asian subregion with the lowest reduction in the prevalence of child- hood underweight (29%).

In Latin America, the prevalence of underweight children was forecasted to decrease from 8.7% in 1990 to 3.4% in 2015, a change of −61% (95% CI, −77% to −35%). All subregions in Latin America were estimated to experience decreasing trends with changes of −72%...
for the Caribbean, −54% for Central America, and −65% for South America. There were no sufficient data to derive estimates for the region of Oceania.

**Trends and Percentage Change in Numbers of Underweight Children, 1990-2015**

**Table 3. Estimates of Underweight Children in 1990 and 2015**

<table>
<thead>
<tr>
<th>Region</th>
<th>1990 (95% CI) in millions</th>
<th>2015 (95% CI) in millions</th>
<th>Percentage of Relative Change (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entire region</td>
<td>25.8 (25.2 to 26.3)</td>
<td>43.5 (42.2 to 44.4)</td>
<td>68.3 (62.7 to 74.1)</td>
</tr>
<tr>
<td>Northern</td>
<td>1.6 (1.4 to 2.0)</td>
<td>0.7 (0.3 to 1.3)</td>
<td>−59.3 (−80.2 to −16.5)</td>
</tr>
<tr>
<td>Sub-Saharan*</td>
<td>24.1 (21.5 to 26.7)</td>
<td>42.7 (37.9 to 47.5)</td>
<td>76.9 (51.5 to 106.6)</td>
</tr>
<tr>
<td>Eastern</td>
<td>9.5 (7.8 to 11.4)</td>
<td>19.1 (15.8 to 22.7)</td>
<td>101.6 (66.2 to 160.0)</td>
</tr>
<tr>
<td>Middle</td>
<td>3.7 (2.6 to 5.0)</td>
<td>6.3 (4.7 to 8.2)</td>
<td>71.5 (13.4 to 199.4)</td>
</tr>
<tr>
<td>Southern</td>
<td>0.8 (0.6 to 1.1)</td>
<td>0.7 (0.5 to 1.0)</td>
<td>−13.9 (−46.5 to 38.4)</td>
</tr>
<tr>
<td>Western</td>
<td>8.8 (7.4 to 10.2)</td>
<td>13.5 (10.9 to 16.4)</td>
<td>53.6 (19.4 to 97.6)</td>
</tr>
<tr>
<td>Asia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entire region</td>
<td>131.9 (119.2 to 144.7)</td>
<td>67.6 (53.4 to 81.7)</td>
<td>−48.8 (−59.3 to −35.6)</td>
</tr>
<tr>
<td>Eastern</td>
<td>23.1 (22.0 to 24.2)</td>
<td>3.0 (2.8 to 3.2)</td>
<td>−86.9 (−88.0 to −85.8)</td>
</tr>
<tr>
<td>South Central</td>
<td>86.0 (73.5 to 98.5)</td>
<td>52.1 (39.9 to 66.3)</td>
<td>−39.4 (−54.7 to −19.0)</td>
</tr>
<tr>
<td>Southeastern</td>
<td>20.2 (17.6 to 22.9)</td>
<td>9.7 (7.5 to 12.4)</td>
<td>−51.8 (−63.6 to −36.0)</td>
</tr>
<tr>
<td>Western</td>
<td>2.7 (2.1 to 3.5)</td>
<td>2.7 (0.4 to 1.21)</td>
<td>0.4 (−82.7 to 483.3)</td>
</tr>
<tr>
<td>Latin America</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entire region</td>
<td>4.8 (3.4 to 6.2)</td>
<td>1.9 (1.1 to 2.7)</td>
<td>−60.2 (−76.1 to −33.8)</td>
</tr>
<tr>
<td>Caribbean</td>
<td>0.4 (0.2 to 0.7)</td>
<td>0.1 (0.05 to 0.20)</td>
<td>−74.2 (−89.3 to −37.4)</td>
</tr>
<tr>
<td>Central</td>
<td>1.9 (1.2 to 3.1)</td>
<td>0.9 (0.5 to 1.8)</td>
<td>−51.9 (−79.0 to 10.3)</td>
</tr>
<tr>
<td>South</td>
<td>2.5 (1.6 to 3.8)</td>
<td>0.9 (0.5 to 1.5)</td>
<td>−64.4 (−82.2 to −28.8)</td>
</tr>
<tr>
<td>Developing regions</td>
<td>162.6 (149.8 to 175.5)</td>
<td>112.8 (98.6 to 127.1)</td>
<td>−50.6 (−40.2 to −19.5)</td>
</tr>
<tr>
<td>Developed countries†</td>
<td>1.2 (0.6 to 2.4)</td>
<td>0.6 (0.1 to 2.6)</td>
<td>−54.1 (−93.9 to 244.4)</td>
</tr>
<tr>
<td>Entire world</td>
<td>163.8 (151.0 to 176.7)</td>
<td>113.4 (99.2 to 127.6)</td>
<td>−30.8 (−40.3 to −19.7)</td>
</tr>
</tbody>
</table>

Abbreviation: CI, confidence interval.
*Comprises the regions of Eastern, Middle, Southern, and Western Africa and Sudan.
†Europe, Japan, Australia, Canada, and United States.

million in 2015, a change of 68% (95% CI, 63%-74%). The subregions of sub-Saharan, Eastern, Middle, and Western Africa were all forecasted to experience substantial increases in the number of underweight children (77%, 102%, 72%, and 54%, respectively). Only Southern and Northern Africa were estimated to reduce the number of underweight children by 14% and 59%, respectively.

In Asia, where the largest number of underweight children live, the number was estimated to decrease from 131.9 to 67.6 million between 1990 and 2015, a change of −49% (95% CI, −59% to −36%). The largest decline was projected for Eastern Asia (−87%), followed by Southeastern Asia (−52%) and South Central Asia (−39%). Western Asia was estimated to remain stagnant.

In Latin America, the number of underweight children was forecasted to decline from 4.8 million in 1990 to 1.9 million in 2015, a change of −60% (95% CI, −76% to −34%). All subregions in Latin America were forecasted to experience decreases in childhood underweight (Caribbean, −74%; Central America, −52%; and South America, −64%).

**Geographical Patterns of Underweight Children**

FIGURE 2 shows the geographical distribution of the prevalence of underweight children based on the latest survey data. Prevalences were categorized as less than 10%, 10% to 19%, 20% to 29%, and 30% or more. Very high levels of childhood underweight were found in 12 African countries (Angola, Burkina Faso, Burundi, Democratic Republic of the Congo, Eritrea, Ethiopia, Madagascar, Mali, Mauritania, Niger, Nigeria, and Sudan) and 13 Asian countries (Afghanistan, Bangladesh, Cambodia, India, Lao People’s Democratic Republic, Maldives, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Vietnam, and Yemen). Prevalences of childhood underweight for each country were based on available information from the WHO Global Database on Child Growth and Malnutrition. Prevalence data by urban and rural residence, age groups, sex, and subnational level administrative regions can be found at the database’s Web site (http://www.who.int/nutgrowthdb).
driven by China), and Southeastern Asia are forecasted to reach the goal, while South Central and Western Asia are not. Moreover, our estimates project that in 2015, most subregions in Africa and South Central Asia will continue to have very high prevalences of underweight children. According to our projections, all subregions in Latin America will achieve the Millennium goal.

The vast majority of underweight children live in developing regions, mainly in Asia and Africa. The projected trends in the prevalence of underweight children combined with the different population growth these regions are experiencing (increasing in Africa, decreasing in Asia) \(^{11}\) will narrow the gap between their respective contributions to the total number of underweight children. While in 1990, of 100 underweight children, 80 were estimated to live in Asia and 16 in Africa; in 2015, these numbers are expected to change to 60 and 38, respectively, if recent trends continue.

Our study has a number of limitations. First, the availability of trend data is limited for a number of countries and some have not yet conducted national surveys. Second, surveys were not done randomly. Depending on where and when surveys were conducted, this may have biased our estimates of past and future prevalences. Third, although the surveys included in the WHO database undergo data quality control that results in the exclusion of surveys with obvious flawed data, \(^9\) there are variations in data quality between the different surveys included in the analysis. Fourth, when estimating prevalence trends we did not account for uncertainty in each survey’s prevalence estimate, that is, the estimate of the variance of each prevalence was not included in the regression analysis. As a result, our CIs are likely to be too narrow. Similarly, for constructing the CIs for the number of underweight children, the uncertainty around the population estimates was not considered. Lastly, the precision of the estimates of the prevalence and numbers of underweight children, as expressed by the 95% CIs, varies depending on the availability of data for each region. The developed countries and the subregion of Western Asia present large CIs for the 2015 projections, which result in wide CIs for the relative percentage change between 1990 and 2015. Despite these limitations and the inherent speculative nature of extrapolations to 2015, the present estimates provide a useful base for monitoring progress toward the achievement of the goal.

The deteriorating situation in Africa is likely to be partly due to the effect of the human immunodeficiency virus and AIDS epidemic, together with the political and social instability ex-
AIDS.19 The predictions of childhood nutritional status have been improving in these countries. The improvement in some areas has even moved beyond what is desirable and has lead to an increase in childhood overweight.20,22 An analysis of childhood overweight in developing countries reported that 16 of the 38 countries with more than 1 national survey showed a rising trend in overweight.23

The Millennium Development goals are intended to focus attention on the most critical problems and to maintain that focus by monitoring progress toward the achievement of specific goals. For childhood overweight, there are many countries for which national data are not still available. For this group, surveys would need to be conducted to have a baseline against which to assess progress. Moreover, because subnational differences in the prevalence of overweight children can be substantial, it is recommended to map underweight hot spots for better targeting of interventions aimed at preventing and treating childhood undernutrition. These interventions are particularly important during the period from birth to age 3 years—the critical time in which growth failure and malnutrition occur.24

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