The global distribution of risk factors by poverty level

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Objective To estimate the individual-level association of income poverty with being underweight, using tobacco, drinking alcohol, having access only to unsafe water and sanitation, being exposed to indoor air pollution and being obese.

Methods Using survey data for as many countries as possible, we estimated the relative risk association between income or assets and risk factors at the individual level within 11 medium- and low-income subregions of WHO. WHO and The World Bank data on the prevalence of risk factors and income poverty (defined as living on < US$ 1.00 per day, US$ 1–2.00 per day and > US$ 2.00 per day) were analysed to impute the association between poverty and risk factors for each subregion. The possible effect of poverty reduction on the prevalence of risk factors was estimated using population-attributable risk percentages.

Findings There were strong associations between poverty and malnutrition among children, having access only to unsafe water and sanitation, and being exposed to indoor air pollution within each subregion (relative risks were twofold to threefold greater for those living on < US$ 1.00 per day compared with those living on > US$ 2.00 per day). Associations between poverty and obesity, tobacco use and alcohol use varied across subregions. If everyone living on < US$ 2.00 per day had the risk factor profile of those living on > US$ 2.00 per day, 51% of exposures to unimproved water and sanitation could be avoided as could 37% of malnutrition among children and 38% of exposure to indoor air pollution. The more realistic, but still challenging, Millennium Development Goal of halving the number of people living on < US$ 1.00 per day would achieve much smaller reductions.

Conclusion To achieve large gains in global health requires both poverty eradication and public health action. The methods used in this study may be useful for monitoring pro-equity progress towards Millennium Development Goals.

Keywords Poverty; Health status; Socioeconomic factors; Child nutrition disorders/epidemiology/economics; Water supply/economics; Sanitation/economics; Air pollution, Indoor/economics; Smoking/epidemiology/economics; Alcohol drinking/epidemiology/economics; Obesity/epidemiology/economics; World health; Risk factors (*source: MeSH, NLM*).

Mots clés Pauvreté; Etat sanitaire; Facteur socioéconomique; Troubles nutrition enfant/économie; Alimentation eau/économie; Assainissement/économie; Pollution air ambiant/économie; Tabagisme/économie; Consommation alcool/économie; Obésité/économie; Santé mondiale; Facteur risque (*source: MeSH, INSERM*).

Palabras clave Pobreza; Estado de salud; Factores socioeconómicos; Trastornos de la nutrición del niño/economía; Abastecimiento de agua/economía; Saneamiento/economía; Contaminación del aire interior/economía; Tabaquismo/economía; Consumo de bebidas alcohólicas/economía; Obesidad/economía; Salud mundial; Factores de riesgo (*fuente: DeCS, BIREME*).

الكلمات المفتاحية: الفقر، الوضع الصحي، العوامل الاقتصادية والاجتماعية، اضطرابات التغذية لدى الأطفال، وبائيات (إبيديميولوجيا)، اقتصاديات اضطرابات التغذية لدى الأطفال، الإمداد بالمياه، اقتصاديات الإمداد بالمياه، الإصحاح، اقتصاديات الإصحاح، تلوث الهواء، تلوث الهواء داخل المنازل، اقتصاديات تلوث الهواء داخل المنازل، التدخين، وبائيات (إبيديميولوجيا) التدخين، اقتصاديات التدخين، معاقرة الكحول، وبائيات (إبيديميولوجيا) معاقرة الكحول، اقتصاديات معاقرة الكحول، البدانة، وبائيات (إبيديميولوجيا) البدانة، اقتصاديات البدانة، الصحة في العالم، عوامل الخطر. (المصدر: رؤوس الموضوعات الطبية، المكتب الإقليمي لشرق المتوسط)

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Voir page 125 le résumé en français. En la página 125 figura un resumen en español.

يمكن الاطلاع على الملخص بالعربية في صفحة 126.

Introduction

There is a large body of research conducted in richer countries on the socioeconomic determinants of health that contrasts health and disease status among individuals of varying socioeconomic positions (*1–7*). The same is not true of poorer regions of the world, although research is starting to map the distribution of health by socioeconomic status at the individual level within poorer countries (see, for example, http://www.worldbank.org/poverty/health/data) (*8–11*). It is important that this gap continues to be filled since ecological data may give a misleading picture of what is happening at the level of individuals (*12*, *13*). Individual-level data are also required to set targets and monitor progress towards reducing health inequalities (*14*), and these targets have been identified as a priority by WHO in relation to monitoring and ensuring pro-equity progress towards achieving the Millennium Development Goals (*15*).

The association between socioeconomic position and health risk factors varies over time and between regions of the world (*8*, *16*). Relationships observed in high-income countries

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may not hold in the middle- and low-income countries that account for about 80% of the world's population.

The aim of this paper is to describe the association between poverty and the prevalence of major risk factors for ill-health at the individual level among the 5 billion people living in low- and middle-income regions. The study was conducted as part of the WHO Comparative Risk Assessment project (*17*, *18*). Poverty was defined in absolute terms. We sought survey data for individuals that included both risk factors and a measure of socioeconomic position from as many countries and regions as possible. Data were obtained for six major risk factors that have also been included in the WHO Comparative Risk Assessment project. They are: being underweight; using tobacco; drinking alcohol; having access only to unsafe water, sanitation and hygiene; being exposed to indoor air pollution from solid fuels; and being overweight or obese (which were combined).

Methods

Estimates of the association of income poverty with risk factors were conducted separately for up to 11 of the 14 WHO subregions. WHO divides the world into six general regions: Africa, the Americas, the Eastern Mediterranean, Europe, South-East Asia and the Western Pacific. Countries within each of these regions are then divided into subregions based on levels of child and adult mortality (*18*). In those countries in stratum A there is very low child mortality and very low adult mortality; in stratum B there is low child mortality and very low adult mortality; in stratum C there is low child mortality and high adult mortality; in stratum D there is high child mortality and high adult mortality; and in stratum E there is high child mortality and very high adult mortality.

The three richest regions have low child mortality and low adult mortality and are classified as the Americas, stratum A; Europe, stratum A; and Western Pacific, stratum A. These subregions are excluded from our analyses because they have negligible levels of absolute poverty (Fig. 1, web version only, available at: http://www.who.int/bulletin).

To arrive at our aim of estimating the prevalence of risk factors by income poverty level for WHO subregions, we used four steps. First, we determined the association between socioeconomic factors (i.e. asset score or income) and risk factors within each WHO subregion. To unify the results, our second step generalized the results found in step 1 to relative risks by level of income poverty. Our third step estimated the prevalence of each risk factor within the levels of income poverty by WHO subregion. The fourth and final step estimated population-attributable risk percentages for various counterfactual changes in income poverty. Box 1 summarizes these steps, and they are described further below. A more detailed description is available elsewhere (*19*).

Step 1: associating asset score or income with risk factor

We determined the association between socioeconomic status and risk factors using Demographic and Health Survey data (or DHS, available from http://www.measuredhs.com/) for malnutrition among children, access only to unsafe water and sanitation, and risk of maternal obesity. We used data from the Living Standards Measurement Study (or LSMS, available from http://www.worldbank.org/lsms) for indoor air pollution (the use of smoke-producing fuels in cooking, such as wood, coal, and charcoal) and alcohol and tobacco use.

The DHS covers 53 countries with an average sample size of about 5000 (Table 1, web version only, available at: http://www.who.int/bulletin). The most recent survey in each country was used if the country had been surveyed more than once during the period 1986–2000. A child was defined as malnourished if his or her weight-for-age Z-score was less than -2 using the National Centre for Health Statistics or Harvard reference populations. The availability of water and sanitation was defined as in Prüss et al. (20). Data on body weight were available only for mothers of children aged 0–4 years. Being overweight or obese was defined as having a body mass index > 25 kg/m².

The DHS does not include data on poverty or income. We therefore constructed an asset score using approximately 500 000 DHS observations for all countries combined, following the general method developed by The World Bank (*21*), and using the first factor from a factor analysis of four variables that were most consistently available across countries. These were electricity supply, educational status, housing construction material and urban–rural status. (If we had used more than four asset variables per country, many countries would have been excluded from the analysis.) Given that only four variables (each with relatively few values) were available for the factor analysis, only 96 discrete asset score values were generated. We calculated the prevalence of malnutrition, unsafe water and sanitation and mothers being overweight by WHO subregion for each discrete value of the asset score.

We then fitted non-parametric linear weighted regressions separately by WHO subregion using the data aggregated to unique values of the asset score to allow for non-linear associations, using the Proc Loess procedure in SAS. (Proc Loess conducts a series of automated linear regressions at each x value, where the data considered include a bandwidth of data on either side. Each observation within this bandwidth is assigned a local weight that decreases the further away it is from the central x value.)

The proportion of people with the given risk factor at each unique value of the asset score variable was the response variable, and the asset score rank was the predictor variable. (The datasets were too large to run the models on unit-level DHS data. However, given that the data were aggregated by discrete value of the asset score, the results would be similar to the regression on the unit-level data.) The asset score rank (range = 0–1) was calculated separately for each subregion using DHS survey weights and data on population counts within each subregion to ensure representativeness of all people in all countries for whom we had data in each subregion. (See reference *19* for more details.) The actual weighting in the regression was by the number of DHS observations represented by each datapoint. Fig. 2 shows an example of a fitted curve for child malnutrition on asset scores in the subregion Africa, stratum D (a region with high child mortality and high adult mortality). Each circle plots the proportion of malnourished children by each unique value of the ranked asset score, and the size of each circle is proportional to the number of DHS observations. The fitted regression line is also shown.

We were able to access data from the LSMS for 11 of about 25 countries with these data (Table 1, web version only, available at: http://www.who.int/bulletin) from surveys conducted between 1991 and 1999. Data on alcohol and tobacco use in Bulgaria, Ghana, South Africa and Tajikistan were available only in the form of household expenditure data (not individual consumption); for Azerbaijan there was a composite

Box 1. **Steps in the analysis**

Steps	Survey and risk factor	
	Demographic and Health Survey (DHS) includes information on child malnutrition, overweight, unsafe water and sanitation	Living Standards Measurement Study includes information on indoor air pollution, alcohol use, tobacco use
Step 1: Calculate survey-based association of asset score or income with risk factor	Global asset score created Asset score transformed to rank variable by WHO subregion (range = 0–1) for all respondents Prevalence of risk factor at each value of asset score calculated separately by WHO subregion Non-parametric locally weighted linear regression of prevalence of risk factor on rank asset score calculated separately by WHO subregion	Household income equivalized for number of people in household Income variable rank transformed separately by country (range = 0–1) for all respondents Non-parametric locally weighted linear regression of risk factor on income rank using individual-level data calculated separately by country
Step 2: Determine relative risk of risk factor by income poverty	Prevalence of people living on <US$ 1.00, US$ 1–2.00 and >US$ 2.00 per day by country obtained from The World Bank WHO subregion poverty prevalences estimated Risk factor prevalence for each of three income poverty groups estimated by assuming the risk factor prevalence among, say, the 20% of people living on <US$1.00 per day is equal to the prevalence of the risk factor for respondents ranked from 0–0.2 in the non-parametric regression described above. These are estimated separately by WHO subregion Relative risks of risk factor calculated for those living on <US$1.00 per day and those living on US$1–2.00 per day. The reference group is those living on US$ 2.00	First two steps are the same as for the DHS except that prevalences are estimated by country Country risk factor prevalences aggregated to give WHO subregion prevalences Last step is the same
Step 3: Calculate prevalence of risk factors by income poverty	"Actual" prevalence of each risk factor for each WHO subregion is obtained from other comparative risk assessment teams working within WHO Relative risks from Step 2 and risk factor prevalences from Step 3 are combined to re-estimate the risk factor prevalence for people living on <US$ 1.00, US$ 1–2.00 and >US$ 2.00 per day	
Step 4: Determine population-attributable risks	Population-attributable risks of income poverty on each risk factor are calculated for three counterfactual scenarios: • everyone in each subregion living on <US$2.00 per day adopts the risk factor prevalences of those living on >US$ 2.00 per day; • everyone in each subregion living on <US$2.00 per day adopts the risk factor prevalences of those living on US$2.00 per day; • half of the people in each subregion living on <US$ 1.00 per day adopt the risk factor prevalences of those living on >US$ 1.00 per day	

variable of combined alcohol and tobacco consumption. The analyses of the LSMS data varied from the DHS analyses as follows. First, these data included an income variable that we equivalized for household economies of scale by dividing by the square root of the number of people in the household and then ranking households from 0 to 1. Second, we undertook the regression analyses by country to avoid the problem of varying purchasing power parity between countries. Third, because these datasets were smaller we undertook a locally weighted linear regression using Stata software for the unit-level data, modelling the dependent variables as the logit.

Neither DHS data nor LSMS data were available for China, the country that dominates the Western Pacific Region, stratum B (an area of low child and low adult mortality). Instead we used data from the 1993 China Health and Nutrition Survey (available at http://www.cpc.unc.edu/china), and analysed these data in a manner comparable to the LSMS analyses.

Step 2: relative risk of risk factor by poverty

We used data from The World Bank on income poverty in 76 countries to estimate the distribution of poverty within countries and WHO subregions (Table 1, web version only, available at: http://www.who.int/bulletin); these data were the World Development Indicators and data from Chen & Ravallion (*22*) and Ravallion et al. (*23*). The World Bank income poverty estimates used consumption data where possible, adjusted all dollar estimates to one point in time (1993), and adjusted for purchasing power parity. We used the trichotomous poverty variable: living on < US$ 1.00 per day, US$ 1–2.00 per day and > US$ 2.00 per day. Altogether, 89% of the population in the Eastern Mediterranean stratum B (low child and low adult mortality) resided in countries that did not have country-level estimates of absolute poverty, therefore all estimates in this paper for this region must be treated with particular caution. However, at least 70% of the population in each of the remaining 10 subregions resided in countries with poverty estimates.

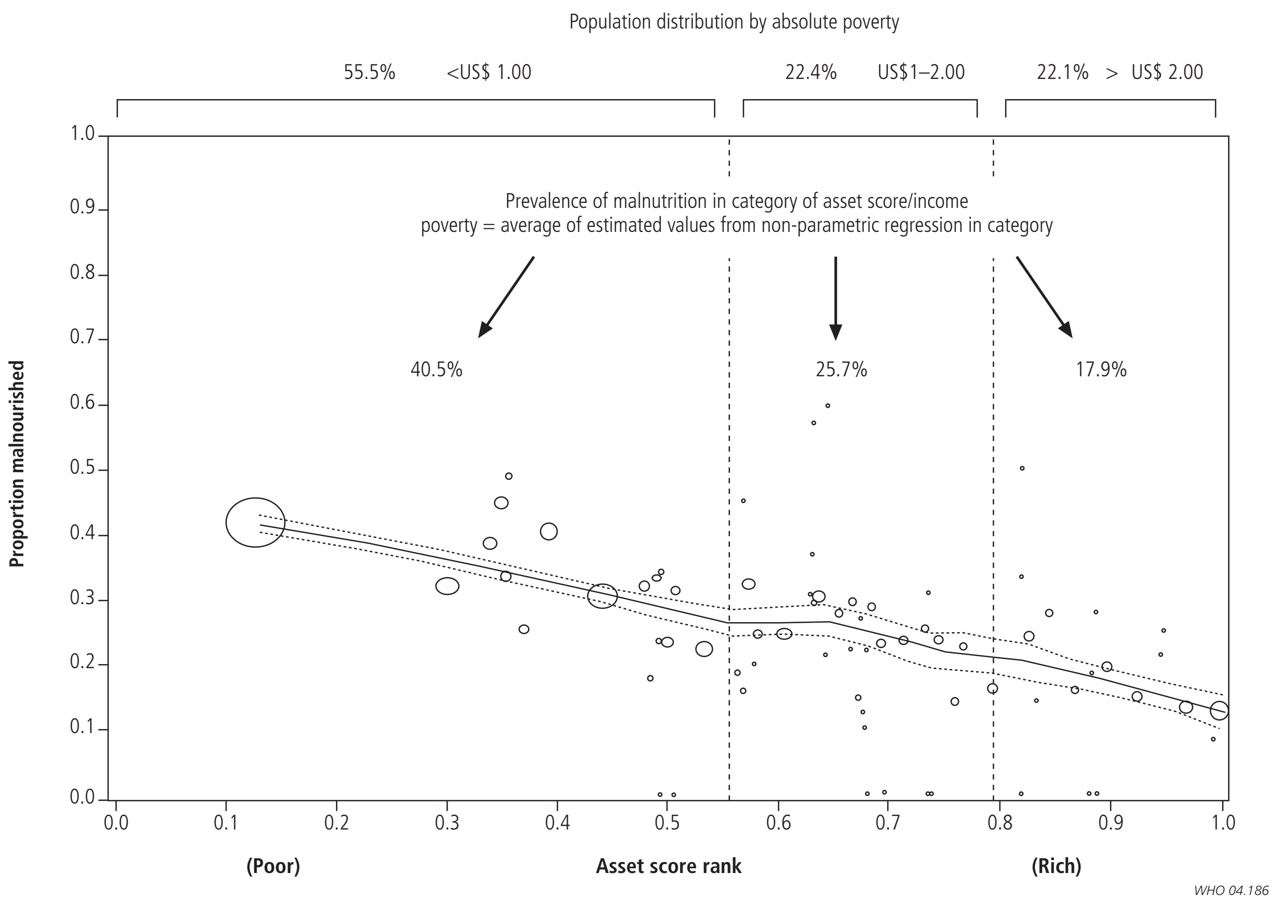
Next, we overlaid these poverty estimates onto the results of the non-parametric regression. For example, in Africa, stratum D (high child and high adult mortality) where 55.5% of the population live on < US$ 1.00 per day, we assumed that the prevalence of malnutrition among children in this socioeconomic position was equivalent to the average of that predicted by the non-parametric regression (from step 1) for rank score values of asset scores ranging from 0 to 0.555. This is shown diagrammatically in Fig. 2; for rank scores up to 0.555 the average proportion of malnutrition using the extrapolated regression line of best fit is 0.405 (or a prevalence of 40.5%). That is, we assumed that a group's ranking by income poverty and asset score (at the level of three categories) was equivalent. (Elsewhere, we have demonstrated a strong, but not perfect, association between asset scores and income in Pakistan, a country where we could calculate both an asset score and household income (*19*)).

Having calculated the prevalence of each risk factor by band of income poverty, we calculated the relative risks by comparing those living on < US$ 1.00 per day and those living on US$ 1–2.00 per day. For example, in the countries in Africa, stratum D the relative risk for those living on < US$ 1.00 per day was 2.26 (40.5%/17.9%) and for those living on US$ 1–2.00 per day it was 1.44 (25.7%/17.9%) (Fig. 2). We were also able to estimate the relative risks for people living on exactly US$ 2.00 per day relative to those living on > US$ 2.00 per day using the predicted prevalence at US$ 2.00 per day.

Step 3: prevalence of risk factors by income poverty

Step 2 produced our best estimates of the associations of relative risks in each subregion. However, the best estimate of the overall prevalence of a risk factor for each subregion (i.e. not stratified by income poverty) was provided by other comparative risk assessment teams working on the wider WHO-sponsored project. It may be that the survey data we used to estimate the associations of relative risks were not the best that could be used to estimate overall prevalence. We therefore incorporated the external best estimates of overall prevalence and algebraically back-calculated the prevalence of each risk factor by income poverty using these estimates of overall risk factors, our relative risks derived from step 2, and The World Bank-based estimates of income poverty for each subregion.

Fig. 2. **Example of fitted non-parametric locally weighted linear regression line for proportion of child malnutrition on asset score in the subregion Africa, stratum D, with population distribution and estimated prevalence of malnutrition for those living on <US$ 1.00 per day, US$ 1.00–2.00 and >US$ 2.00 per day superimposed**



Step 4: population-attributable risk percentages

We calculated population-attributable risk percentages for three counterfactual scenarios:

- everyone in each subregion living on < US$ 2.00 per day adopts the prevalence of risk factors of those living on > US$ 2.00 per day;
- everyone in each subregion living on < US$ 2.00 per day adopts the prevalence of risk factors of those living on exactly US$ 2.00 per day; and
- half of the people in each subregion who are living on < US$ 1.00 per day adopt the prevalence of risk factors of those living on > US$ 1.00 per day.

The third scenario is based on the Millennium Development Goal of eradicating extreme poverty and hunger and its accompanying target to "halve, between 1990 and 2015, the proportion of people whose income is less than $1 a day" (see http://www.unmillenniumproject.org for more information). In this scenario we calculated only the risks of malnutrition among children, unsafe water and sanitation, and indoor air pollution.

Results

Fig. 3 shows the estimated prevalence of each risk factor by level of income poverty within each of the WHO subregions. The comparable relative risks of each risk factor by income poverty (using >US$ 2.00 per day as the reference group) are shown in Table 2 (web version only, available at: http://www.who.int/bulletin).

Several patterns are evident. First, there are strong associations across all WHO subregions between absolute income poverty and increasing malnutrition among children, access only to unsafe water and sanitation, and exposure to indoor air pollution. The prevalence of malnutrition among children for a given level of income poverty varies across subregions (Fig. 3) but the relative risks are remarkably similar (Table 2) except for the Western Pacific Region in stratum B (low child mortality and low adult mortality) which is strongly influenced by China and the China Health and Nutrition Survey. Regarding access to improved water and sanitation, there are marked differences by level of income poverty in the regions of Africa, the Americas and South-East Asia. Again, there is relatively little variation in access to improved water and sanitation in the Western Pacific Region for those in stratum B. Our results suggest that in the African Region in stratum D and the Western Pacific Region, in stratum B a high percentage of people are exposed to indoor air pollution regardless of their level of income poverty; however, strong patterning by poverty is present in other subregions.

A mixed pattern was evident for using tobacco and alcohol and being overweight (Fig. 3 and Table 2). No data were available for countries in the South-East Asia Region in stratum B or for countries in the Eastern Mediterranean Region in stratum B; only data on the prevalence of being overweight were available for countries in South-East Asia Region, stratum D. There was no apparent association between tobacco use and income poverty in countries in the African Region in stratum D, countries in the Americas in stratum B, countries in the European Region in strata B and C, and in the Western Pacific Region in stratum B, but consumption was more common among non-impoverished individuals in the African Region in stratum E and in the Americas in stratum D. Only in the Eastern Mediterranean Region in stratum D was tobacco consumption more common among those living on < US$ 1.00 or US$ 2.00 per day.

Alcohol consumption was lower among those living on < US$ 1.00 or US$ 2.00 per day in all subregions. A similar pattern was observed for being overweight, except for those countries in Western Pacific Region, stratum B. However, there was a strong association between being overweight and having a higher income only in the three poorest subregions in which being overweight or obese were least common (in the African Region in mortality strata D and E, and in the South-East Asia Region in mortality strata D, Table 2).

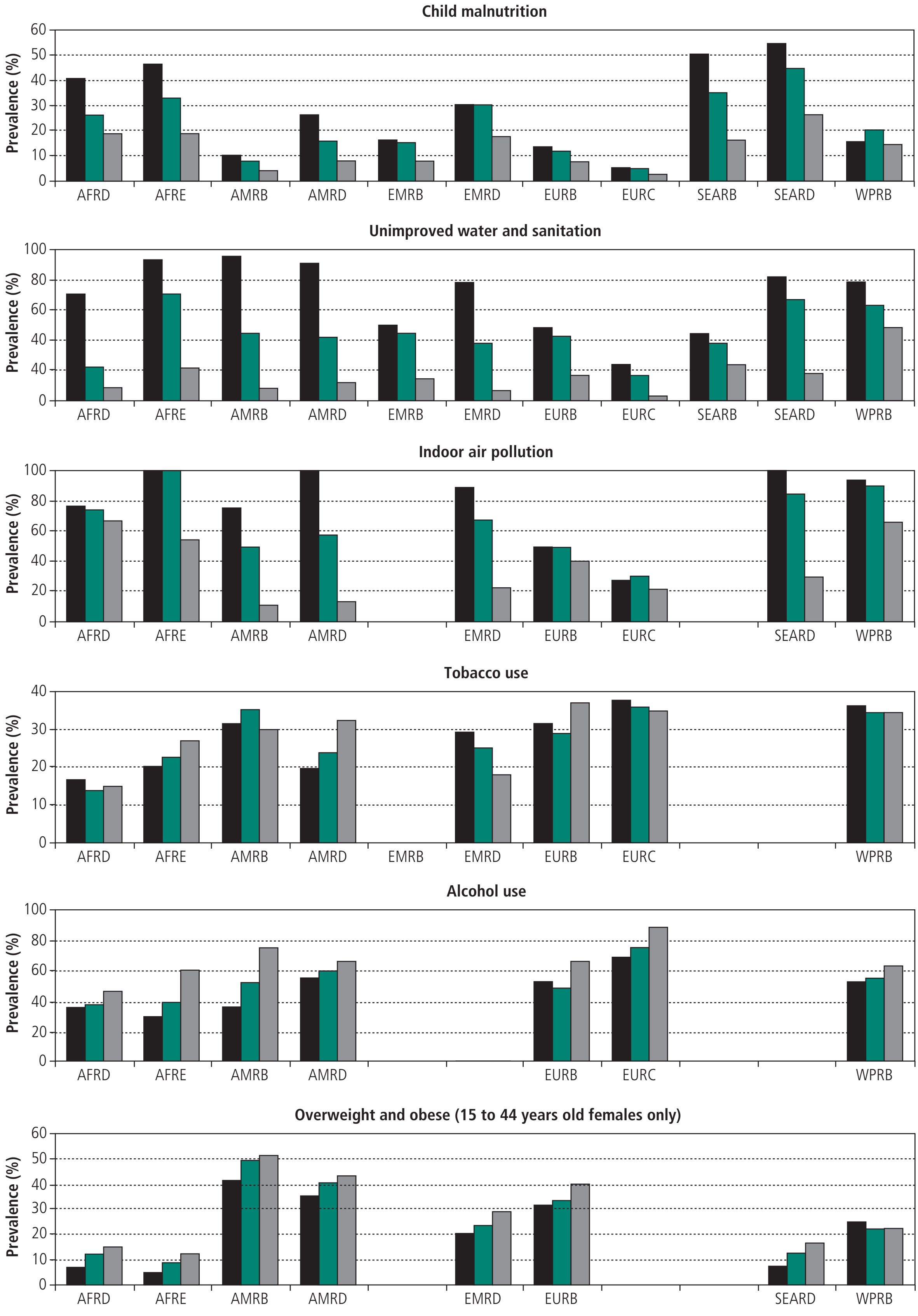
Fig. 4 shows the population-attributable risk percentage of poverty summed across all WHO subregions for which we had data. For example, if impoverished children had the same prevalence of malnutrition as children living on > US$ 2.00 per day, the overall prevalence of malnutrition would be 37% lower. The attributable risk estimates for indoor air pollution were of a similar magnitude and were greater for unimproved water and sanitation. Due to their much weaker and more variable associations with poverty, the attributable risks for tobacco use were smaller and fluctuated across regions.

The final counterfactual scenario illustrates what might happen for those risk factors of particular relevance to the Millennium Development Goals if the proportion of people who had an income of < US$ 1.00 a day was halved. Table 3 shows the estimates of the population-attributable risk percentage for malnutrition, unimproved water and sanitation, and indoor air pollution under this scenario assuming that those moving out of poverty gain the risk factor prevalences of those living on > US$ 1.00 a day and that those remaining on < US$ 1.00 per day retain the same risk factor prevalence. Overall, in the 11 subregions the prevalence of malnutrition among children is estimated to decrease by 6%, the prevalence of unimproved water and sanitation would decrease by 11% and the prevalence of exposure to indoor air pollution would drop by 5%. However, there was considerable heterogeneity in these results by risk factor and subregion.

Discussion

These results provide an approximate measure of the global burden of risk factors by absolute poverty. Our attempt to be as comprehensive as possible has some unavoidable limitations. First, the availability and quality of data for each risk factor and region were limited: a concern that is well recognized in this field (*24*, *25*). We searched for, but did not find, adequate data on blood pressure and cholesterol by socioeconomic status for low- and middle-income regions. Tobacco and alcohol use were estimated from data on household economic consumption. Improved data should become available through the World Health Survey. (For additional information see http://www3.who.int/whs/.) We support WHO's recommendation for "improved surveillance systems and better access to global information" (*26*). Second, the assumption that the ranking of asset scores provides a good proxy for income rank is reasonable but deserves further study. Third, the relationship between poverty and health status is almost certainly bidirectional (*10*, *27*): being healthy contributes to one's capability to escape poverty (*28*) and health service fees may tip people into poverty (*16*). Fourth, in deriving attributable risk estimates by poverty we have not attempted to control for confounding. Therefore, our results are better seen as an attempt at globally mapping risk factors by absolute poverty than as quantitative estimates of causal associations.

Fig. 3. **Prevalence of risk factors by level of absolute poverty**



AFRD = Africa, stratum D
AFRE = Africa, stratum E
AMRB = Americas, stratum B
AMRD = Americas, stratum D
EMRB = Eastern Mediterranean, stratum B
EMRD = Eastern Mediterranean, stratum D
EURB = Europe, stratum B
EURC = Europe, stratum C
SEARB = South-East Asia, stratum B
SEARD = South-East Asia, stratum D
WPRB = Western Pacific, stratum B

Absent regional labels indicates no available data for risk factor.

■ <US$ 1.00/day ■ US$ 1–2.00/day ■ >US$ 2.00/day

WHO 04.200

Table 3. **Population-attributable risk percentages by WHO subregion for selected risk factors relevant to the Millennium Development Goals (child protein–energy malnutrition, unimproved water and sanitation and indoor air pollution).[a] The counterfactual scenario is the target of halving the proportion of people living on < US$ 1.00 per day**

WHO subregion	Risk factor[b]		
	Child protein-energy malnutrition	Unimproved water and sanitation	Exposure to indoor air pollution
Africa, stratum D	15	32	2
Africa, stratum E	8	10	7
Americas, stratum B	5	18	14
Americas, stratum D	11	19	23
Eastern Mediterranean, stratum B	1	2	–
Eastern Mediterranean, stratum D	2	16	5
Europe, stratum B	1	2	0
Europe, stratum C	3	10	1
South-East Asia, stratum B	3	2	5
South-East Asia, stratum D	7	9	8
Western Pacific, stratum B	-1	10	2
Total	**6**	**11**	**5**

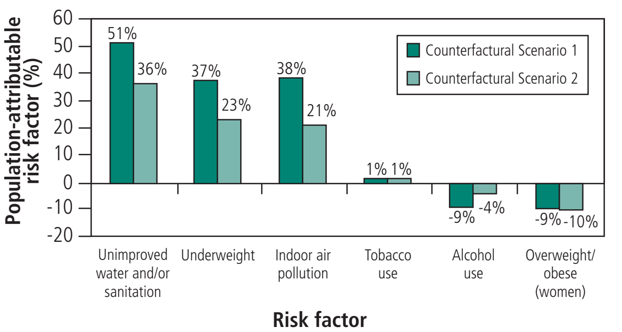
[a] The estimates of percentage-attributable risk assume that the halving of the proportion of people living on < US$ 1.00 per day applies to all subregions; those people moving out of poverty adopt the risk factor prevalence of those living on > US$ 1.00 per day; those continuing to live on < US$ 1.00 per day retain the same risk factor prevalence.
[b] Values are percentages.

With these caveats in mind, our findings are consistent with patterns evident in other studies that have found poverty to be associated with multiple risks to health (*26*, *27*, *29*, *30*). Importantly, the association of individual-level income poverty with a given risk factor often varies by subregion and would not necessarily be inferred correctly by an ecological analysis of regional poverty and the prevalence risk factors. For example, in some subregions exposure to indoor air pollution appears to be high for everyone whereas elsewhere there is more individual-level variation by income poverty.

If poverty is defined as living on < US$ 2.00 per day, and the associations reported here are regarded as mostly causal, then the percentages of malnutrition among children, of having access to only unsafe water and sanitation and of exposure to indoor air pollution that are attributable to poverty are substantial (Fig. 2). Halving the proportion of the world's population living on < US$ 1.00 per day (as in the target for the year 2015 specified in the Millennium Development Goal on poverty eradication) might reduce the prevalence of these risks by up to one-third in the African and American subregions (Table 3). This falls far short of the 50% reduction in prevalence required to achieve the Millennium Development Goal targets. The implication is that on its own economic development (at least of a magnitude to be achieved by 2015), is unlikely to be sufficient to reach the Millennium Development Goals on reducing malnutrition and improving unsafe water and sanitation. Rather we need public health programmes to be implemented in parallel with poverty reduction strategies and indeed these would support each other (*15*, *27*, *28*).

The patterns of tobacco use and obesity in our results are consistent with historical trends in the industrialized world. People in higher socioeconomic strata have tended to adopt new behaviours (e.g. cigarette smoking) early and discard them relatively quickly on learning of the health consequences, and people in lower socioeconomic strata tended to take up these behaviours later. These transitions have occurred at different times in low- and middle-income countries, and this may explain the lack of a consistent pattern in Table 2. However, the tobacco results must be interpreted cautiously as the data used in our analyses were sparse and based on household consumption data.

Fig. 4. **Population-attributable risk percentages for each risk factor by poverty level for middle- and low-income WHO regions combined under two counterfactual scenarios.**
In Scenario 1 people living on < US$ 2.00 per day adopt the risk factor prevalence of those living on >US$ 2.00 per day. In Scenario 2 people living on < US$ 2.00 per day adopt the risk factor prevalence of those living on exactly US$ 2.00 per day[a]



[a] The population impact fractions are totals for the WHO subregions with a population-attributable risk factor percentage estimate. For example, the total percentage of the estimate of the population-attributable risk factor for indoor air pollution applies to 10 WHO subregions and does not include the Eastern Mediterranean, stratum B. This makes it technically incorrect to compare total population-attributable risk factor percentages between risk factors that have different subsets of WHO subregions available for analysis.

WHO 04.183

The term "double burden of disease" has been used to describe populations afflicted by both old-world communicable diseases and nutritional diseases and new-world chronic diseases (*9*, *25*, *31*). This double burden arises due to "a protracted epidemiological transition" (*32*) whereby chronic noncommunicable diseases increase in incidence (usually among the rich within the population) and communicable and nutritional diseases persist (usually among the poor within the population). During the 21st century many adverse risk factors, such as tobacco use, excessive alcohol use, and obesity, may become most prevalent among poor individuals within poor regions. There is a risk that the scourge of communicable and nutritional diseases may also persist, resulting in a double burden of disease that is concentrated not only among poor regions but also among poor individuals in poor regions. ■

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Résumé

Répartition mondiale des facteurs de risque par niveau de pauvreté

Objectif Estimer l'association au niveau individuel entre pauvreté des revenus d'une part et maigreur, tabagisme, alcoolisme, absence d'accès à une eau saine et à des équipements sanitaires convenables, exposition à la pollution de l'air intérieur et obésité, d'autre part.

Méthodes A l'aide de données d'enquête relatives au plus grand nombre possible de pays, les auteurs ont estimé l'association correspondant au risque relatif entre le revenu ou les ressources et les facteurs de risque au niveau individuel dans 11 sous-régions de l'OMS à revenus moyens et faibles. Ils ont analysé les données de l'OMS et de la Banque mondiale sur la prévalence des facteurs de risque et du niveau de pauvreté (défini comme le fait de disposer pour vivre de moins de US $ 1,00 par jour, de US $ 1 à 2,00 par jour ou de plus de US $ 2,00 par jour) pour évaluer l'association entre pauvreté et facteurs de risque pour chaque sous-région. Ils ont estimé l'effet éventuel d'une réduction de la pauvreté sur la prévalence des facteurs de risque à l'aide des pourcentages de risque attribuable des populations.

Résultats Il existait de fortes associations entre pauvreté et malnutrition chez les enfants n'ayant accès qu'à de l'eau et à des équipements sanitaires insalubres et exposés à la pollution de l'air intérieur dans chaque sous-région (les risques relatifs étaient deux à trois fois plus élevés pour ceux vivant avec moins de US $ 1 par jour que pour ceux vivant avec plus de US $ 2 par jour). Les associations entre pauvreté d'une part et obésité, tabagisme ou alcoolisme d'autre part étaient variables d'une sous-région à l'autre. Si toutes les personnes disposant de moins de US $ 2,00 par jour présentaient le profil de facteurs de risque de celles vivant avec plus de US $ 2,00 par jour, 51 % des expositions à de l'eau et à un réseau sanitaire non traités, 37 % des cas de malnutrition infantile et 38 % des expositions à la pollution de l'air intérieur pourraient être évités. L'objectif de développement du Millénaire, certes plus réaliste, mais encore difficile à atteindre, consistant à réduire d'un facteur deux le nombre de personnes vivant avec moins de US $ 1,00 par jour, permettrait d'obtenir des diminutions plus faibles de ces nombres de cas.

Conclusion L'obtention d'améliorations conséquentes de la santé dans le monde exige à la fois l'éradication de la pauvreté et des mesures de santé publique. Les méthodes employées dans cette étude peuvent être utiles à la surveillance des progrès en faveur de l'équité dans la réalisation des objectifs de développement du Millénaire.

Resumen

Distribución mundial de los factores de riesgo por nivel de pobreza

Objetivo Estimar la relación individual existente entre la pobreza de ingresos y la insuficiencia ponderal, el consumo de tabaco, el consumo de alcohol, el hecho de no disponer más que de agua y saneamiento insalubres, la exposición a aire contaminado en interiores y la obesidad.

Métodos Usando datos encuestales para el máximo número de países posible, estimamos el riesgo relativo de asociación de los ingresos o el patrimonio a factores de riesgo particulares en 11 subregiones de la OMS de ingresos bajos y medios. Se analizaron datos de la OMS y del Banco Mundial sobre la prevalencia de los factores de riesgo y la pobreza de ingresos (definida distinguiendo la subsistencia con menos de US$ 1,00 diarios, con US$ 1,00-2,00 diarios y con más de US$ 2,00 diarios) a fin de determinar la relación entre pobreza y factores de riesgo para cada subregión. El posible efecto de la reducción de la pobreza en la prevalencia de los factores de riesgo se estimó a partir de los porcentajes de riesgo atribuible poblacionales.

Resultados Se detectó una estrecha relación entre la pobreza y la malnutrición infantil, el hecho de no disponer más que de agua y saneamiento insalubres, y la exposición a aire contaminado en interiores dentro de cada subregión (los riesgos relativos fueron entre dos y tres veces mayores entre quienes vivían con menos de US$ 1,00 al día que en quienes subsistían con más de US$ 2,00 al día). El grado de asociación de la pobreza a la obesidad, el consumo de tabaco y el consumo de alcohol difería de una subregión a otra. Si todas las personas que viven con menos de US$ 2,00 al día tuvieran el mismo perfil de factores de riesgo que las que viven con más de US$ 2,00 diarios, se podrían evitar el 51% de los casos de exposición a sistemas de abastecimiento de agua y saneamiento no mejorados, así como el 37% de la malnutrición infantil y el 38% de la exposición a aire contaminado en locales cerrados. El más realista, pero con todo difícil, de los Objetivos de Desarrollo del Milenio de reducir a la mitad el número de personas con menos de US$ 1,00 al día se traduciría en disminuciones mucho menores.

Conclusión Para conseguir grandes avances en el terreno de la salud mundial se requieren medidas tanto de erradicación de la pobreza como de salud pública. Los métodos empleados en este estudio podrían ayudar a vigilar los progresos en equidad hacia los Objetivos de Desarrollo del Milenio.

ملخص

توزع عوامل الخطر بسبب الفقر على الصعيد العالمي

الهدف: تقدير الترابط بين الفقر مقدَّراً بنقص دخل الفرد مع إصابة الأفراد بنقص الوزن، وبين تعاطي التبغ والكحول، والبدانة، واستعمال المياه غير الآمنة، والتعرُّض للملوثات داخل المترل.

الطريقة: باستخدام معطيات التحرِّي لعدد كبير من البلدان تم تقدير الخطر النسبي للترابط بين مقدار الدخل أو الممتلكات من جهة وبين عوامل الخطر على المستوى الفردي في 11 مجموعة من الأقاليم الفرعية المنخفضة والمتوسطة الدخل في منظمة الصحة العالمية. وقد أُجري تحليل للمعطيات التي قدَّمتها منظمة الصحة العالمية والبنك الدولي حول معدلات انتشار عوامل الخطر وحول الفقر مقدَّراً بنقصٍ الدخل (وفقا للتعريفات التالية: الحياة بأقل من دولار أمريكي واحد يومياً، والحياة بما يتراوح بين دولار واحد ودولارين يوميا، والحياة بأكثر من دولارين يومياً)، وذلك لمعرفة الترابط بين الفقر وعوامل الخطر في كل إقليم من الأقاليم الفرعية. وتم تقدير التأثير المحتمل لتقليص وطأة الفقر على معدلات انتشار عوامل الخطر باستخدام نسب مئوية لمعدلات الخطر المقررة للسكان.

الموجودات: لوحظ ترابط قوي بين الفقر وسوء التغذية لدى الأطفال ولدى من يفتقدون الحصول على ماء مأمون وإصحاح مأمون، ولدى المعرضين للتلوث داخل المترل في كل إقليم من الأقاليم الفرعية (وقد كانت الأخطار النسبية تزيد بمقدار ضعفين إلى ثلاثة أضعاف لدى من يعيشون بأقل من دولار أمريكي واحد مقارنة بمن يعيشون بأكثر من دولارين يومياً)، أما الترابط بين الفقر والبدانة وتعاطي التدخين والكحول فقد كان متفاوتاً بين الأقاليم الفرعية، وإذا قدر لكل من يعيش على أكثر من دولارين يومياً أن يكون لديه نفس مرتسم الأخطار لدى من يعيش على أقل من دولارين يومياً فإن من الممكن تجنُّب الأخطار لدى 51% من المتعرضين للماء غير المحسن والإصحاح غير المحسن و37% من الذين يعانون من سوء التغذية من الأطفال و38% من المعرَّضين للتلوث داخل المترل. وإن المرمى الإنمائي للألفية الأكثر واقعية، ولكنه الأكثر تحدِّياً، هو الإقلال من عدد الناس الذين يعيشون بأقل من دولار واحد يومياً إلى نصف عددهم، فذلك لن يؤدي إلا إلى تقليص طفيف للفقر.

الاستنتاج: للحصول على فوائد صحية كبيرة على الصعيد العالمي لابد من استئصال شأفة الفقر واتخاذ إجراءات عملية في الصحة العمومية. والطريقة التي استخدمت في هذه الدراسة قد تكون مفيدة لرصد التقدُّم الـمُحْرَز نحو بلوغ المرامي الإنمائية للألفية، ولاسيما في مجال الإنصاف.

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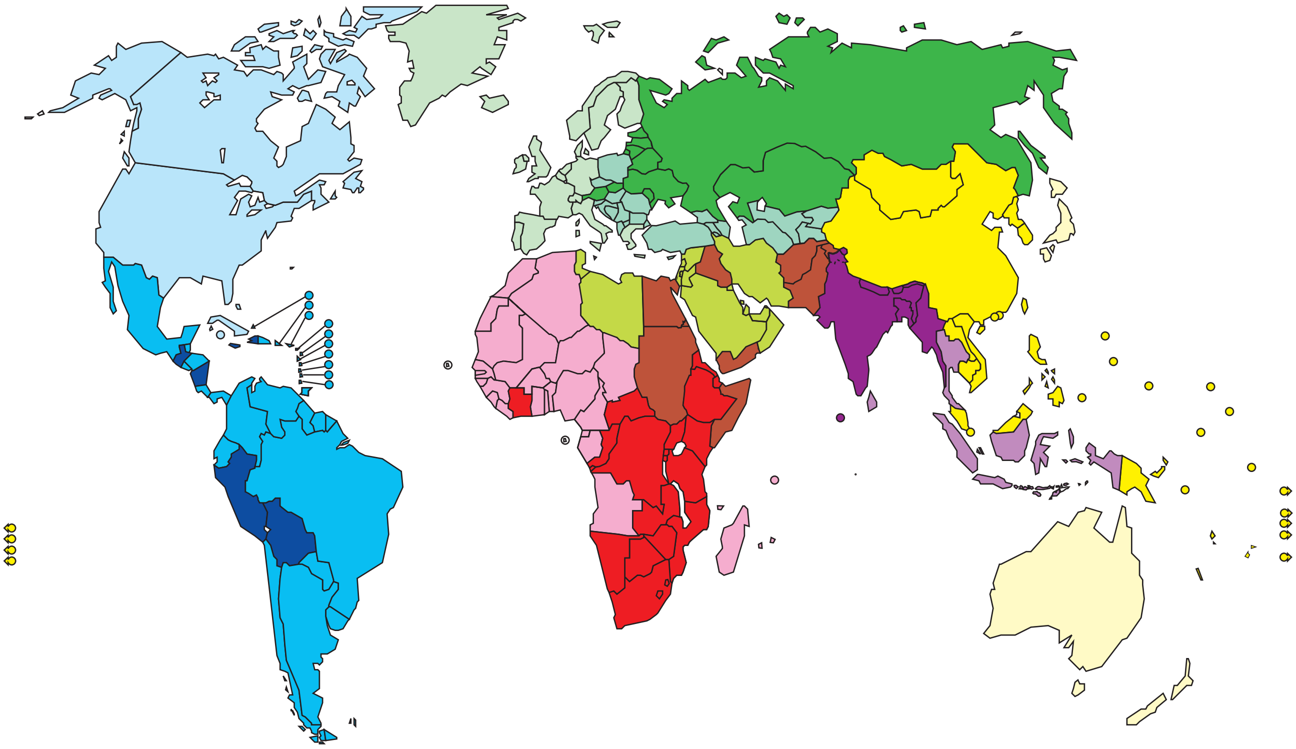
Fig. 1. **WHO subregions and mortality strata**



AFRD	EMRB	SEARB
AFRE	EMRD	SEARD
AMRA	EURA	WPRA
AMRB	EURB	WPRB
AMRD	EURC	Not attributed

WHO divides the world into six general regions: Africa (AFR), the Americas (AMR), the Eastern Mediterranean (EMR), Europe (EUR), South-East Asia (SEAR) and the Western Pacific (WPR). Countries within each of these regions are then divided into subregions on the basis of child and adult mortality (18). Stratum A = very low child mortality and very low adult mortality; B = low child mortality and very low adult mortality; C = low child mortality and high adult mortality; D = high child mortality and high adult mortality; E = high child mortality and very high adult mortality

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Table 1. **Population, estimates of level of poverty and availability of survey data by country within WHO region[a]**

Subregion and country	1999 Population[b]	% living on < US$ 1.00 per day[c]	% living on US$ 1–2.00 per day[c]	% living on > US$ 2.00 per day[c]	DHS data[d]	LSMS data[e]
Africa, stratum D						
Algeria	29 950.0	2.0	13.1	84.9		
Benin	614.0				Yes	
Burkina Faso	10 995.7	61.2	24.6	14.2	Yes	
Cameroon	14 691.0				Yes	
Chad	7 486.0				Yes	
Comoros	544.0				Yes	
Gambia, the	1 251.0	53.7	30.4	16.0		
Ghana	18 784.5	38.8	35.8	25.4	Yes	Yes[f]
Guinea	7 251.0				Yes	
Liberia	3 044.0				Yes	
Madagascar	15 050.5	63.4	25.7	11.0	Yes	
Mali	10 583.7	72.8	17.8	9.5	Yes	
Mauritania	2 598.3	28.6	40.0	31.3		
Niger	10 495.6	61.4	23.9	14.7	Yes	
Nigeria	123 896.5	70.2	20.6	9.2	Yes	
Senegal	9 285.3	26.3	41.5	32.2	Yes	
Sierra Leone	4 949.3	57.0	17.4	25.5		
Togo	4 567.0				Yes	
Total (for all in region)[g]	**286 129.7**	**55.5**	**22.4**	**22.1**		
Africa, stratum E						
Botswana	1 588.1	33.3	28.1	38.7		
Burundi	6 678.0				Yes	
Central African Republic	3 539.8	66.6	17.4	16.0	Yes	
Côte d'Ivoire	15 545.5	12.3	37.1	50.6	Yes	Yes
Ethiopia	62 782.0	31.3	45.2	23.6	Yes	
Kenya	29 410.0	26.5	35.8	37.7	Yes	
Lesotho	2 105.0	43.1	22.6	34.3		
Malawi	10 788.0				Yes	
Mozambique	17 299.0	37.9	40.5	21.6	Yes	
Namibia	1 701.3	34.9	20.9	44.2	Yes	
Rwanda	8 310.0	35.7	48.8	15.5	Yes	
South Africa	42 106.2	11.5	24.3	64.2		Yes[f]
United Republic of Tanzania	32 922.6	19.9	39.8	40.4	Yes	
Zambia	9 881.2	63.7	23.8	12.6	Yes	
Zimbabwe	11 903.7	36.0	28.3	35.8	Yes	
Total (for all in region)[g]	**330 084.7**	**27.3**	**36.2**	**36.5**		
Americas, stratum B						
Brazil	167 966.7	9.0	16.4	74.7	Yes	
Chile	15 017.8	2.0	16.4	81.6		
Colombia	41 539.0	11.0	17.7	71.3	Yes	
Costa Rica	3 589.0	6.9	16.4	76.7		
Dominican Republic	8 404.4	3.2	12.8	84.0	Yes	
El Salvador	6 153.9	26.0	28.0	46.0		
Honduras	6 317.7	40.5	28.3	31.2		
Jamaica	2 598.0	3.2	22.1	74.8		
Mexico	96 585.7	12.2	22.6	65.2	Yes	
Panama	2 811.0	10.3	14.8	74.9		Yes
Paraguay	5 358.8	19.5	29.8	50.7	Yes	
Trinidad and Tobago	1 292.8	12.4	26.6	61.0	Yes	
Uruguay	3 313.0	2.0	4.6	93.4		
Venezuela	23 707.0	18.7	25.9	55.4		
Total (for all in region)[g]	**424 396.0**	**11.0**	**19.1**	**69.8**		

(Table 1, cont.)

Subregion and country	1999 Population[b]	% living on < US$ 1.00 per day[c]	% living on US$ 1–2.00 per day[c]	% living on > US$ 2.00 per day[c]	DHS data[d]	LSMS data[e]
Americas, stratum D						
Bolivia	8 138.0	29.4	22.0	48.6	Yes	
Ecuador	12 412.0	20.2	32.1	47.7	Yes	Yes
Guatemala	11 088.4	10.0	23.8	66.2		
Nicaragua	4 919.0				Yes	
Peru	25 230.0	15.5	25.9	58.6	Yes	
Total (for all in region)[g]	**69 897.5**	**17.4**	**26.3**	**56.3**		
Eastern Mediterranean, stratum B						
Jordan	4 739.9	2.0	5.4	92.6		
Tunisia	9 456.7	2.0	8.0	90.0	Yes	
Total (for all in region)[g]	**136 797.5**	**2.0**	**7.1**	**90.9**		
Eastern Mediterranean, stratum D						
Egypt	62 654.9	3.1	49.6	47.3	Yes	
Morocco	28 238.0	2.0	5.5	92.5	Yes	
Pakistan	134 790.0	31.0	53.7	15.4	Yes	Yes
Sudan	28 993.0				Yes	
Yemen	17 047.6	15.7	29.5	54.8	Yes	
Total (for all in region)[g]	**348 468.4**	**19.3**	**45.3**	**35.3**		
Europe, stratum B						
Armenia	3 808.9	7.8	26.2	66.0		
Azerbaijan	7 983.0	2.0	7.6	90.4		Yes[f]
Bulgaria	8 208.0	2.0	19.9	78.1		Yes[f]
Georgia	5 452.0	2.0	0.0	98.0		
Kyrgyzstan	4 865.0				Yes	
Poland	38 654.0	2.0	0.0	98.0		
Romania	22 458.0	2.8	24.7	72.5		
Tajikistan	6 237.0					Yes[f]
Turkey	64 385.0	2.4	15.7	82.0		
Turkmenistan	4 779.3	20.9	38.1	41.0		
Uzbekistan	24 406.3	3.3	23.2	73.5	Yes	
Total (for all in region)[g]	**215 275.9**	**3.0**	**14.6**	**82.3**		
Europe, stratum C						
Belarus	10 032.0	2.0	0.0	98.0		
Estonia	1 442.4	2.0	3.2	94.8		
Hungary	10 068.0	2.0	5.3	92.7		
Kazakhstan	14 927.0	1.5	13.8	84.7	Yes	Yes
Latvia	2 431.1	2.0	6.3	91.7		
Lithuania	3 699.0	2.0	5.8	92.2		
Moldova	4 281.0	11.3	27.2	61.6		
Russian Federation	146 200.0	7.1	18.0	74.9		Yes
Ukraine	49 950.0	2.9	42.7	54.4		
Total (for all in region)[g]	**246 335.9**	**5.4**	**21.3**	**73.3**		
South-East Asia, stratum B						
Indonesia	207 021.6	7.7	47.7	44.7	Yes	
Sri Lanka	18 985.0	6.6	38.8	54.7		
Thailand	60 245.8	2.0	26.2	71.9	Yes	
Total (for all in region)[g]	**288 750.3**	**6.4**	**42.5**	**51.0**		
South-East Asia, stratum D						
Bangladesh	127 668.8	29.1	48.8	22.2	Yes	
India	997 515.2	44.2	42.0	13.8	Yes	
Nepal	23 384.2	37.7	44.8	17.5	Yes	
Total (for all in region)[g]	**1 219 491.8**	**42.4**	**42.8**	**14.8**	**NA[h]**	**NA**

(Table 1, cont.)

Subregion and country	1999 Population[b]	% living on < US$ 1.00 per day[c]	% living on US$ 1–2.00 per day[c]	% living on > US$ 2.00 per day[c]	DHS data[d]	LSMS data[e]
Western Pacific, stratum B						
China	1 253 595.0	18.5	35.2	46.3		
Republic of Korea	46 858.0	2.0	0.0	98.0		
Lao People's Democratic Republic	5 096.7	26.3	46.8	26.9		
Mongolia	2 378.3	13.9	36.0	50.0		
Papua New Guinea	4 705.0					
Philippines	74 259.0				Yes	
Total (for all in region)[g]	**1 520 272.9**	**17.9**	**34.0**	**48.1**		
Total in 11 WHO subregions[i]	**5 085 900.6**	**23.7**	**33.4**	**42.9**		

[a] Countries with either poverty estimates, Demographic and Health Survey data or Living Standards Measurement Study data are included in this table. Countries not included, by WHO region, are: Africa, stratum D – Angola, Cape Verde, Equatorial Guinea, Gabon, Guinea-Bissau, Mauritius, Sao Tome and Principe, Seychelles, Togo; Africa, stratum E – Burundi, Republic of the Congo, Democratic Republic of the Congo, Eritrea, Malawi, Swaziland, Uganda; Americas, stratum B – Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname; Americas, stratum D – Haiti; Eastern Mediterranean, stratum B – Bahrain, Cyprus, Iran, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates; Eastern Mediterranean, stratum D – Afghanistan, Djibouti, Iraq, Somalia; Europe, stratum B – Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Slovak Republic, Serbia and Montenegro; South-East Asia, stratum D – Bhutan, Democratic People's Republic of Korea, Maldives, Myanmar; and Western Pacific, stratum B – Cambodia, Cook Islands, Fiji, Kiribati, Malaysia, Marshall Islands, Micronesia (Federated States of), Nauru, Niue, Palau, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu, Viet Nam.

[b] Population counts given in thousands. Sources: World Bank Indicators (CD ROM) for country level (World Bank 2001, Quick Reference Tables, Population); WHO for regional level (WHO Comparative Risk Assessment Working Group 2000).

[c] Sources for poverty estimates: World Bank Indicators (CD ROM) (World Bank 2001, World Development Indicators, 2.6 Poverty).

[d] DHS = Demographic and Health Surveys.

[e] LSMS = Living Standards Measurement Study.

[f] Data on tobacco use available only at household level.

[g] Regional totals include countries not listed in the table. Poverty estimates are based on those countries in the WHO region for which estimates are available. See text for details.

[h] NA = not applicable.

[i] WHO regional totals are calculated using country-level poverty data and country-level population data from World Bank Indicators (CD ROM) and WHO regional population data from WHO (*33*).

Table 2. **Summary of relative risks by poverty. (Reference category is living on > US$ 2.00 per day)**

WHO subregion	Poverty level[a]	Risk factor					
		Malnutrition among children aged 0–4 years[b]	Access only to unimproved water and/or sanitation	Exposure to indoor air pollution	Tobacco use	Alcohol use	Being overweight (women)
Africa, stratum D	<$1.00	2.3	9.4	1.1	1.1	0.8	0.4
	$1–2.00	1.4	2.9	1.1	0.9	0.8	0.8
	$2.00	1.2	1.6	1.1	0.9	0.9	0.9
	>$2.00	1	1	1	1	1	1
Africa, stratum E	<$1.00	2.6	4.6	2.0	0.7	0.5	0.4
	$1–2.00	1.8	3.5	1.9	0.8	0.6	0.7
	$2.00	1.4	2.7	1.7	0.9	0.7	0.8
	>$2.00	1	1	1	1	1	1
Americas, stratum B	<$1.00	2.4	12.3	7.2	1.1	0.5	0.8
	$1–2.00	1.8	5.7	4.7	1.2	0.7	1.0
	$2.00	1.6	3.4	3.3	1.2	0.8	1.0
	>$2.00	1	1	1	1	1	1
Americas, stratum D	<$1.00	3.7	8.9	14.6	0.6	0.8	0.8
	$1–2.00	2.1	4.0	4.7	0.7	0.9	0.9
	$2.00	1.6	2.3	2.3	0.8	1.0	1.0
	>$2.00	1	1	1	1	1	1
Eastern Mediterranean, stratum B	<$1.00	2.1	3.6	–	–	–	–
	$1–2.00	1.9	3.2	–	–	–	–
	$2.00	1.8	2.9	–	–	–	–
	>$2.00	1	1	–	–	–	–
Eastern Mediterranean, stratum D	<$1.00	1.7	15.1	4.0	1.7	–	0.7
	$1–2.00	1.7	7.2	3.1	1.4	–	0.8
	$2.00	1.5	3.2	1.7	1.1	–	0.9
	>$2.00	1	1	1	1	–	1
Europe, stratum B	<$1.00	1.9	3.1	1.2	0.8	0.8	0.8
	$1–2.00	1.6	2.7	1.2	0.8	0.7	0.8
	$2.00	1.3	2.3	1.2	0.8	0.7	1.0
	>$2.00	1	1	1	1	1	1
Europe, stratum C	<$1.00	2.4	11.8	1.3	1.1	0.8	–
	$1–2.00	2.1	8.4	1.4	1.0	0.8	–
	$2.00	1.8	5.4	1.3	1.0	0.8	–
	>$2.00	1	1	1	1	1	–
South-East Asia, stratum B	<$1.00	3.3	2.0	–	–	–	–
	$1–2.00	2.2	1.7	–	–	–	–
	$2.00	1.7	1.4	–	–	–	–
	>$2.00	1	1	–	–	–	–
South-East Asia, stratum D	<$1.00	2.1	5.0	3.5	–	–	0.4
	$1–2.00	1.7	4.1	2.9	–	–	0.7
	$2.00	1.3	2.1	1.8	–	–	0.9
	>$2.00	1	1	1	–	–	1
Western Pacific, stratum B	<$1.00	1.1	1.7	1.4	1.0	0.8	1.1
	$1–2.00	1.4	1.3	1.4	1.0	0.9	1.0
	$2.00	1.3	1.0	1.3	1.0	0.9	1.1
	>$2.00	1	1	1	1	1	1

(Table 2, cont.)

WHO subregion	Poverty level[a]	Risk factor					
		Malnutrition among children aged 0–4 years[b]	Access only to unimproved water and/or sanitation	Exposure to indoor air pollution	Tobacco use	Alcohol use	Being overweight (women)
Total (crude)[c]	<$1.00	3.1	3.3	2.2	0.9	0.7	0.4
	$1–2.00	2.4	2.4	1.9	1.0	0.8	0.6
	$2.00	–	–	–	–	–	–
	>$2.00	1	1	1	1	1	1
Total (pooled)[d]	<$1.00	2.5	7.9	3.8	1.1	0.7	0.5
	$1–2.00	1.8	4.2	2.8	1.0	0.8	0.8
	$2.00	–	–	–	–	–	–
	>$2.00	1	1	1	1	1	1

[a] Amounts given in US$/day.
[b] Numbers are relative risks.
[c] Total refers to the 11 out of 14 WHO regions included in this report. The crude total estimate is derived by summing the estimated number of people in each WHO region with each risk factor within each poverty stratum then recalculating the relative risks at this total level. It is crude in so much as it does not allow for confounding at the regional level of the association of relative risks.
[d] Total refers to the 11 out of 14 WHO regions included in this report. Unlike the crude estimate, the pooled estimate uses Mantel–Haenszel weights to pool the relative risks across WHO regions. (The actual sample sizes of the Demographic and Health Survey or Living Standards Measurement Study are used to calculate the Mantel–Haenszel weights.)