

Child survival IV

Applying an equity lens to child health and mortality: more of the same is not enough

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Gaps in child mortality between rich and poor countries are unacceptably wide and in some areas are becoming wider, as are the gaps between wealthy and poor children within most countries. Poor children are more likely than their better-off peers to be exposed to health risks, and they have less resistance to disease because of undernutrition and other hazards typical in poor communities. These inequities are compounded by reduced access to preventive and curative interventions. Even public subsidies for health frequently benefit rich people more than poor people. Experience and evidence about how to reach poor populations are growing, albeit largely through small-scale case studies. Successful approaches include those that improve geographic access to health interventions in poor communities, subsidised health care and health inputs, and social marketing. Targeting of health interventions to poor people and ensuring universal coverage are promising approaches for improvement of equity, but both have limitations that necessitate planning for child survival and effective delivery at national level and below. Regular monitoring of inequities and use of the resulting information for education, advocacy, and increased accountability among the general public and decision makers is urgently needed, but will not be sufficient. Equity must be a priority in the design of child survival interventions and delivery strategies, and mechanisms to ensure accountability at national and international levels must be developed.

The survival prospects of poor children are not as good as those of their better-off peers, often strikingly so. Worse still, these gaps show signs of widening, both between and within countries (panels 1 and 2).¹⁻⁷ They exist despite the availability of an impressive array of effective interventions,⁸ and despite initiatives such as GOBI (growth monitoring, oral rehydration, breastfeeding, and immunisations)⁹ and Health for All 2000,¹⁰ both of which combined focus on interventions aimed at diseases that disproportionately affect poor children with a strategy to make them available free of charge through primary-care facilities. Of course, the gaps might have been even greater in the absence of these strategies, but it is clear that present initiatives have come nowhere close to eliminating them.

Socioeconomic status gaps in child mortality are not simply inequalities, they are also inequities—inequalities that are unjust and unfair. These inequities, similar to those related to sex (panel 3),¹¹⁻¹⁴ are increasingly recognised by the international community. Bilateral donors—such as the UK's Department for International Development—have put improvement of the health of poor people as their top priority in the health sector,¹⁵ as have WHO¹⁶ and the World Bank.¹⁷ Although this commitment is welcome, far too little attention has been paid to how international agencies and national and

subnational governments can combat inequities in child survival. One thing is clear: more of the same is simply not enough.

Why do poor children die earlier?

The breakdown of national household survey data by socioeconomic status (panel 4)¹⁸⁻²¹ has contributed greatly to our understanding of why poor children are less likely to survive than their better-off peers. Results of systematic analyses of demographic and health surveys show consistent inequities in child health across dozens of countries.^{6,7}

By contrast with children born to better-off families, poor children are more exposed to risks for disease through inadequate water and sanitation, indoor air pollution, crowding, poor housing conditions, and high exposure to disease vectors.^{22,23} They are also more likely to have lower resistance to infectious diseases because they are undernourished (an underlying cause of about 50% of deaths in children younger than 5 years),²⁴ to have

Search strategy

On inequalities in proximate determinants, we aimed to reflect medical and social scientific published work on: (a) the proximate determinants; and (b) their socioeconomic distribution. On the role of policy makers, we aimed to reflect medical and social scientific published work on: (a) the underlying determinants of child-health outcomes; (b) their socioeconomic distribution; and (c) the effect and socioeconomic aspects of child health and related programmes—eg, maternal and child-health programmes, health insurance for children, etc. We pooled our extensive knowledge of these areas, based on research and programme work at various institutions. Searches were then done in a targeted way in MEDLINE, EconLit, and the World Bank's catalogue of documents and reports (<http://www-wds.worldbank.org>). We searched English language articles with the keywords "inequality" and "socioeconomic factors".

Lancet 2003; **362**: 233–41

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Panel 1: Child mortality gaps between rich and poor countries are wide and growing

In high-income countries, six of every 1000 children die before their 5th birthday (figure 1). In the developing world, the rate is 88 per 1000, and in the world's poorest countries, the rate is a staggering 120 per 1000. Seen in terms of deaths, the inequality is even starker: 99% of childhood deaths arise in less-developed countries.¹ Worse still, these gaps are becoming wider: between 1970 and 2000, under-5 mortality fell by more than 71% in high-income countries (figure 2). In low-income countries, the reduction during the same period was only 40%.

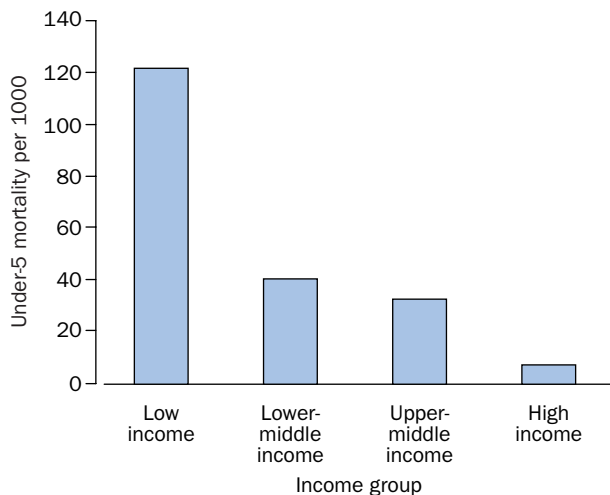


Figure 1: **Under-5 mortality rates by income groups of countries**
Based on data taken from UNICEF¹ and the World Bank.²

diets deficient in one or more essential micronutrients (eg, vitamin A, iron, zinc), to have a low birthweight as a result of poor maternal nutrition, infections during pregnancy, and short birth intervals, and to have recurrent disease episodes.^{22,23} Poverty thus increases exposure and reduces resistance to disease, a synergy that contributes to the wide inequities in child survival described above.

In view of these differences in exposure and resistance, poor children are more likely to become sick. In an ideal

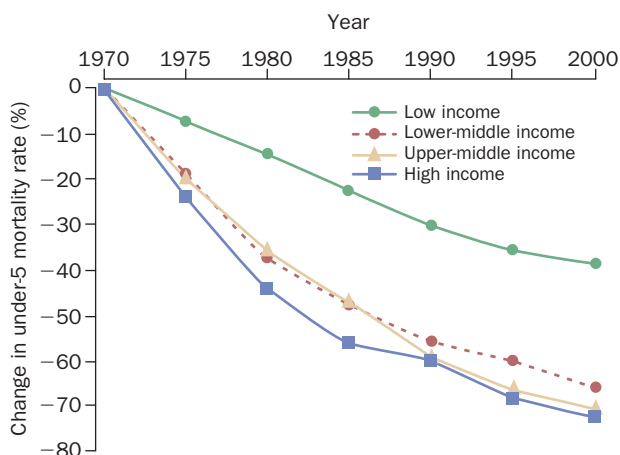


Figure 2: **Rates of change in under-5 mortality by income groups**

Based on data taken from UNICEF¹ and the World Bank.²

Panel 2: Inequities are great within countries

Gaps in survival prospects between poor and better-off children are evident not only across but also within countries.³ In Indonesia, under-5 mortality is nearly four times higher in the poorest fifth of the population than in the richest fifth (figure 3). These gaps exist within all regions. A policy intervention that eliminated these inequities—eg, by bringing rates in the poorest 80% of the population down to those prevailing in the richest 20%—would have a major effect on the under-5 mortality rate for the country as a whole, even in low-inequality regions (figure 4). Worldwide, about 40% of all under-5 deaths could be prevented in this way.

For several countries, mortality gaps between rich and poor children are getting worse. In Bolivia, under-5 mortality fell during the 1990s by 34% in the richest quintile but by only 8% among the poorest quintile.³ In Vietnam, poor children saw no appreciable improvement in their survival prospects during the late 1980s and early 1990s.⁴ The pattern is repeated across many, but not all, developing countries. In several African countries, mortality rates in poor children actually rose during the 1990s, even though they fell in better-off children.⁵

world, coverage levels for preventive interventions such as vaccination, vitamin A supplementation, and insecticide-treated mosquito nets would be highest in the poorest households to offset these higher risks. The reality is the opposite. The poorest children are the least likely to be vaccinated, to receive vitamin A, or to sleep under a treated net.^{7,25} Inequities in exposure and resistance are therefore compounded by inequities in coverage for preventive interventions, making poor children even more likely to become sick and in need of curative care compared with their better-off peers (figure 7).

Once they become sick, poor children are not as likely as their better-off peers to be taken to an appropriate health-care provider, such as a village health worker, a dispensary, a health centre, a hospital, or a private doctor.^{6,26} Once there, they are less likely to receive appropriate care because facilities serving poor communities are not as likely to have well-trained staff or to be stocked with drugs as facilities serving wealthier communities.^{27,28} The multicountry evaluation of the

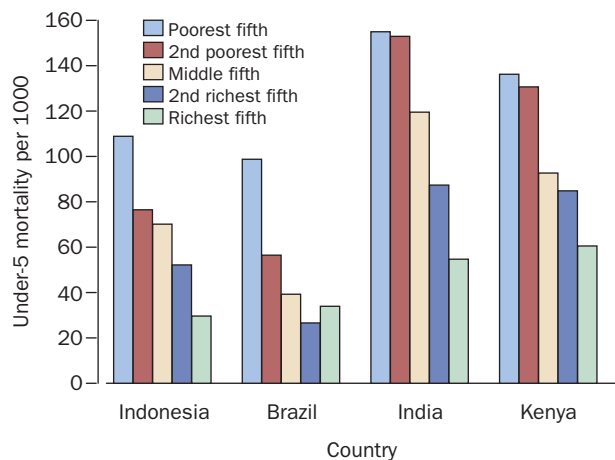


Figure 3: **Under-5 mortality rates by socioeconomic quintile of the household for selected countries**

Based on data taken from the World Bank.⁶

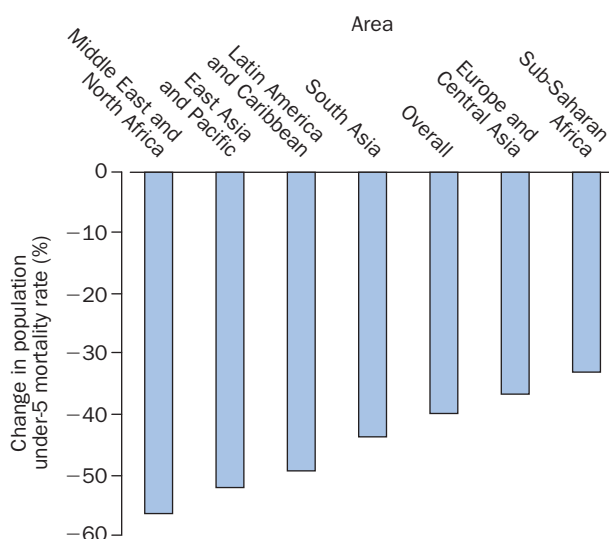


Figure 4: **Changes in under-5 mortality rates achieved by eliminating within-country inequalities**

Based on data analysed by the World Bank,^{6,7} which show how population under-5 mortality rate would change if the rate in the poorest 80% of the population were reduced to that in the richest 20%.

Panel 3: Sex and child survival in India

Sex disparities in health and education are higher in south Asia than anywhere else in the world. A girl in India is greater than 40% more likely to die between her 1st and 5th birthdays than is a boy (figure 5).¹¹ Child mortality would drop by 20% if girls had the same mortality rate as boys between the ages of 1 month and 5 years.

The reasons for this inequity in sex are both environmental and behavioural. Girls are often brought to health facilities in more advanced states of illness than boys, and taken to less qualified doctors when ill. Less money is spent on medicines for girls compared with boys.¹² Girls are less likely to receive treatment than boys.¹³ In Punjab state, results of one study showed that expenditure on health care during the first two years of life was 2-3 times greater for sons than for daughters.¹⁴

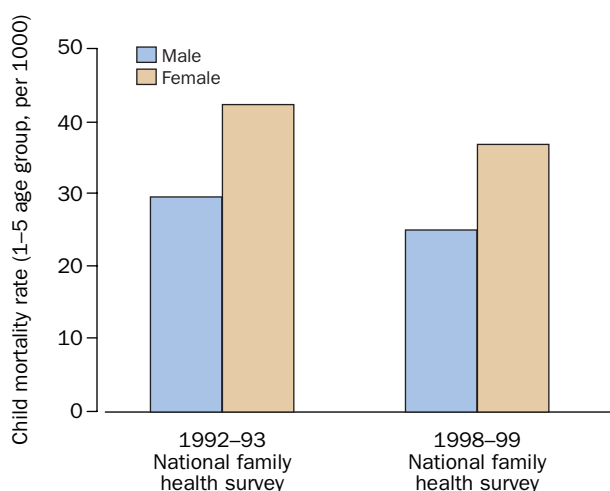


Figure 5: **Child mortality rates in males and females in India**

Based on data taken from M Claeson and colleagues.¹¹ Data are the average rate for 10 years before the survey.

integrated management of childhood illness has used the asset indices described in panel 4 to provide many examples of how—even within poor rural areas—use of appropriate health care varies with wealth. In a poor rural area of Tanzania, the poorest children were 27% less likely to seek care from an appropriate provider than the least poor, and children from the poorest families were not as likely as their better-off peers to have received antimalarials for fever or antibiotics for pneumonia (figure 8).²⁹

Socioeconomic inequities in child survival thus exist at every step along the path from exposure and resistance to infectious disease, through careseeking, to the probability that the child will receive prompt treatment with effective therapeutic agents. The odds are stacked against the poorest children at every one of these steps. As a result, they are more likely than their better-off peers to die in childhood.

Can policy makers reduce child survival gaps?

Poor countries—and poor people within countries—have multiple deprivations. These, in turn, account for the high levels of exposure, low levels of resistance, inadequate careseeking, and low probabilities of receiving prompt and effective treatment described in the preceding section. For a start, poor people tend to have less money than those better off. They are the least able to afford water connection and usage charges, non-polluting heating and cooking fuels, and houses of appropriate size. Low income enhances the chances of hunger and malnutrition, thereby reducing resistance to disease. Absence of income also constrains use of appropriate medical care both directly—because user fees cannot be paid—and indirectly because the other costs associated with using health services, such as transport costs, are not affordable.

The deprivations of poverty go beyond low income. Low income is associated with lower levels of education, and

Panel 4: Use of household possessions to identify the poor

Investigation of socioeconomic inequalities in child survival and use of child-health interventions needs information on household economic status. Because income and expenditure data are difficult and time-consuming to obtain, an alternative is to use information on household possessions and characteristics of a family's house (figure 6).¹⁸ For example, households that own a car, can be judged wealthier than those that own only a motorcycle, and these households can in turn be deemed wealthier than those that own only a bicycle. A tin roof suggests greater wealth than a bamboo or straw roof. A paved floor suggests a higher standard of living than a mud floor. Electricity implies wealth, as does ownership of a television rather than just a radio. Such information, which is available in the demographic and health and other surveys, can be combined into one index of wealth by various means.¹⁸⁻²⁰ One of these is principal components analysis, which was used to construct the wealth quintiles in the study from which many of the charts in this report are derived.⁶ The appropriate items to be included in a wealth index will depend on the distribution of household items by wealth, which will change in different settings. For instance in Latin America, lack of a machete in a poor rural household identifies the poorest in those communities, but in communities with a wider range of socioeconomic status it does not, because rich families do not need a machete. In the former situation, scale development²⁰ will identify possession of a machete as a useful scale item, whereas in the second situation it will not.

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Figure 6: Families and their possessions in Mali (A), Ethiopia (B), and South Africa (C)

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low education is associated with exposure. For example, in a poor household, knowledge can make the difference between taking advantage of piped water to wash hands and not doing so.³⁰ Knowledge also has a role in such things as securing a nutritious diet and making appropriate use of health-care services.²⁹ In India, for example, 30% of mothers of children who had not been vaccinated did not know that immunisation was important for the health of their child, and a further 33% did not know where to go to have their child vaccinated.³¹ Poor people are less likely than their wealthier counterparts to be covered by public or private health insurance, and therefore often face higher health-care prices.²² They tend to live in underserved areas and therefore incur high time

costs when seeking health care.²² The facilities serving poor people are typically less well organised than are those for people who are better off, with inconvenient opening hours and providers who are insensitive to their needs.³² The care delivered in the facilities serving poor communities is also generally of lower quality than that delivered in better-off areas, because health-care workers are reluctant to serve in areas in which poor people live, and drugs and other inputs are more likely to be in short supply.²²

These damaging effects of poverty on child health can be reduced by well designed policies. Various options have been reviewed by some of us.²² Table 1 summarises approaches used in different countries to improve health inputs and services in poor populations, with emphasis on those related to child health. Several different—and generally complementary—approaches are possible. Improvement of knowledge and changing of behaviour among poor mothers has been achieved in many settings, in areas as diverse as handwashing for diarrhoea prevention and nutrition counselling. Social marketing entails commercial-sector marketing approaches being adapted for a public-health gain, and has been effective for various items, including provision of soap and mosquito nets. Microcredit—programmes that provide small loans to poor people for self-employment projects that generate income—has helped to empower women. In some countries, diseases in poor communities have been given priority in budget allocations. Health care has been made affordable to poor people through cash transfers, fee-waiver schemes, and health insurance, and more accessible through road improvements, outreach, or deployment of services in poor areas. Interventions in water and sanitation can be designed to help poor people.

The quality and quantity of evidence available to lend support to all the approaches presented in table 1 are variable. Ideally, one would like to know how well every programme is targeted to poor people, and how large the health effect is for poor communities (as distinct from the effect in the population as a whole). In some cases, both pieces of information are available. In Egypt, for example, the school health insurance programme resulted in larger increases in insurance coverage in poor people than in those who were better off, and that insurance had a larger effect on use of services in poor communities.³³ By contrast, we know that Mexico's *progres*a scheme was used more by poor groups than by wealthy groups, and that on average the programme had an effect on child health and nutrition, but we do not know if the effect was larger among poor than wealthy children.^{34–36} We know that similar programmes operating in Honduras and Nicaragua are reaching poor communities, but not whether they are having the intended effect on health status.³⁶ There is an urgent need to improve the evidence base on child health and poverty, and to build capacity in measurement of equity indicators.

Despite the need for more and better evidence, we know enough now to move ahead to reduce health inequities in children. Complacency is not an option. The fact that policy makers have the choice to improve equity is illustrated by experience with the use of government subsidies to health services. As shown in figure 9, countries such as Sri Lanka, Nicaragua, and Costa Rica have been able to deliver subsidised care to poor people, whereas in many other countries, government subsidies to health services have benefited rich people.^{37–41}

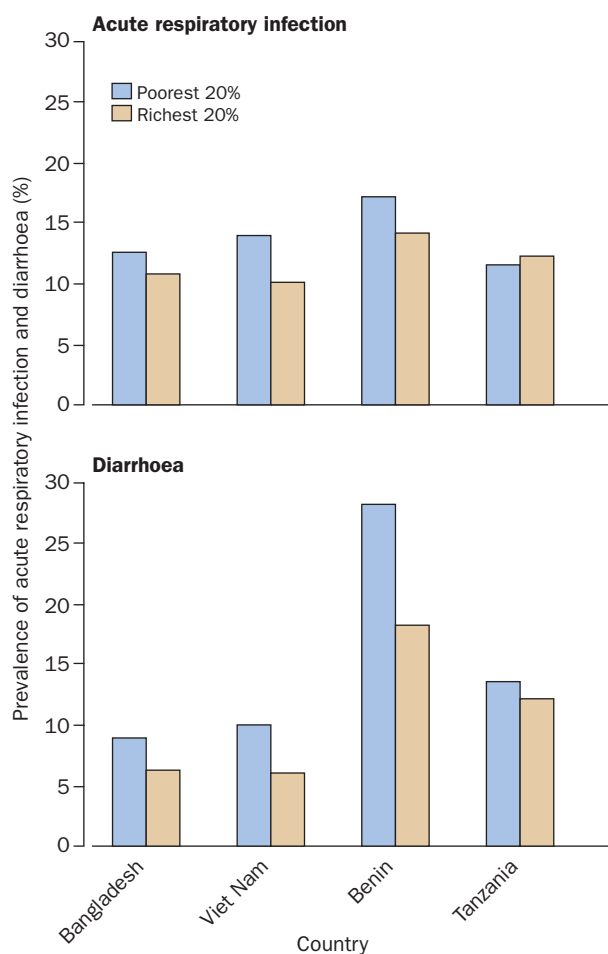


Figure 7: Acute respiratory infection and diarrhoea prevalence in under-5 children by socioeconomic status in selected countries. Based on data taken from the World Bank.⁶

Translating knowledge into action at national and subnational levels

The preceding sections show that several approaches have been proposed for improvement of health conditions in poor people. Yet few, if any, of these approaches have been implemented on a large scale. Effective large-scale implementation is the next challenge.

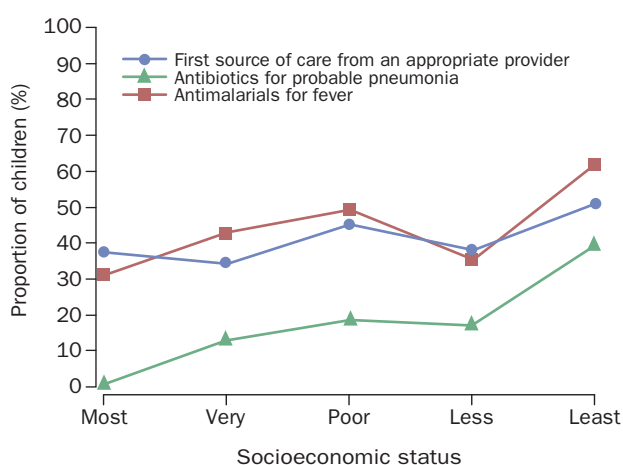


Figure 8: Socioeconomic differentials in careseeking and treatment in rural Tanzania. Based on data taken from J A Schellenberg and colleagues.²⁹

Approach	Examples
Improve knowledge and change behaviour in poor mothers	Improvements in female education in general Nutrition counselling (Brazil) Social marketing for soap (Central America) Social marketing for mosquito nets (Tanzania)
Improve access to water and sanitation for poor people	Expansion in water supply favouring poor communities, by regulated privatisation (Argentina) and social investment funds (Bolivia)
Empowering poor women	Microcredit (Bangladesh, Ghana)
Make health care affordable to poor households	Cash transfers to poor families linked to utilisation of preventive services (Mexico, Honduras, Nicaragua) Subsidised health care for reaching the poorest populations (Sri Lanka, Costa Rica, Malaysia) Bias to poor people in specific child-health interventions (Bangladesh, India) School health insurance programme (Egypt)
Making health facilities more accessible to poor households	Road improvements to facilitate access (Viet Nam) Use of outreach facilities (Benin, Guinea) Deployment of health teams in poor municipalities (Brazil) Extend services through community health workers and non-governmental organisations (Bangladesh, Thailand) Partnership with, and some subsidisation of non-governmental organisations in underserved areas (Bolivia, Uganda)
Enhancing human and other resources in facilities serving poor people	Use of community organisations and volunteer health workers (Thailand) Building housing for rural staff and providing other incentives to practise in rural areas (Uganda)
Improving the user-friendliness of providers and facilities serving the poor	Using providers who speak language of poor indigenous groups and understand their culture and customs
Making budget allocations more relevant to the burden of disease suffered by the poor	Allocation of resources at district level according to burden of disease (Tanzania) Making simple interventions a priority against major causes of child mortality (Brazil)

Table 1: Review of potential approaches for improving equity in child health²²

Surmounting that challenge will require adoption of suitable health strategies and creation of a conducive policy environment.

Child survival interventions do not take place in a vacuum, but rather are implemented in societies in which social stratification is the rule. Therefore, new resources usually go initially to rich people.⁴² Programming of new interventions has to counteract this usual evolution. Even when interventions are equitably targeted, rich people take advantage of them more rapidly than do poor people, so that inequity ratios could widen initially when a new effective intervention becomes available (panel 5).^{42,43} Thus, more than equitable targeting is needed. Other complementary interventions are needed to enhance utilisation by poor people, which are discussed in the next section.

Increasing coverage in poor communities with child survival interventions

Two basic approaches can raise coverage in poor population groups. One approach focuses on particular programmes or interventions that mainly benefit

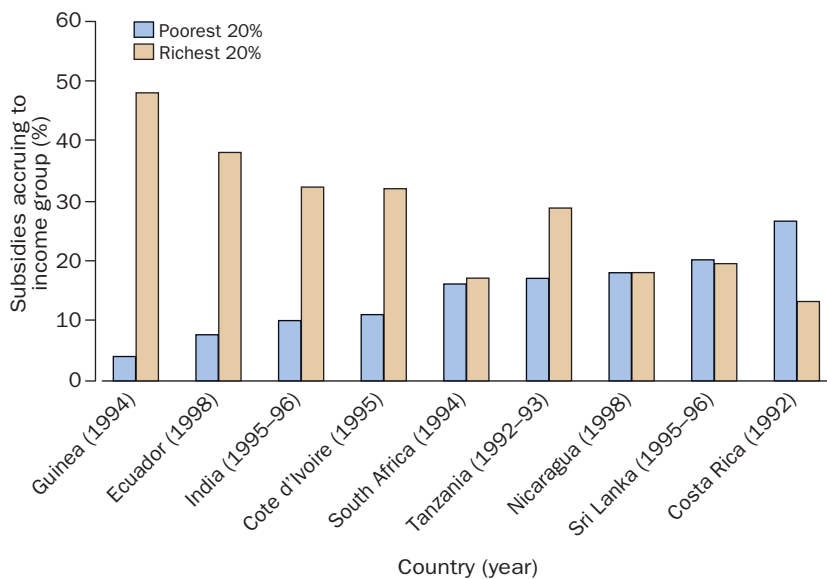


Figure 9: Proportion of government subsidies to the health sector that effectively reaches the poorest and richest 20% of families

Based on data taken from references 37–41.

poor people, usually referred to as targeting. The other approach achieves universal coverage with programmes or interventions that address conditions that are especially important for disadvantaged groups. Table 2 presents characteristics of situations that affect decisions about the choice of approach. Both targeting or universal coverage approaches are discussed in more detail below.

Targeting can take several forms. One—typically called direct targeting—is to identify poor households or individuals and ways of getting services specifically to them. An example would be distribution to poor families of vouchers that entitle them to free services for which others must pay. There are also less direct methods of targeting. For example, one can focus programme efforts on geographic areas that are especially poor, or on population subgroups in special need, such as deprived ethnic minorities. The government of Peru, for example, is introducing *Haemophilus influenzae* B vaccine in the poorest areas first, where under-5 mortality due to pneumonia and meningitis are highest (Lanata C, personal communication). A second form of indirect targeting is to

Panel 5: Closing the gap

Rogers⁴³ theory on the diffusion of innovations states that behavioural change will be adopted initially by a subset of the population. When a new and effective child-survival intervention is made available in a community, greater access and increased knowledge will usually result in more rapid uptake by children belonging to wealthy families (figure 10). This occurrence could widen the inequity gap in child survival in the short term.⁴²

This initial rise in the equity gap might be unavoidable, but reducing inequity will depend on whether effective measures are taken to close the gap. In hypothetical scenario A (figure 10), no such measures are taken. Coverage in poor children rises less rapidly and plateaus at a lower level. Under scenario B, policies favouring poor people—such as effective targeting or strong implementation of universal coverage—are introduced at time point 2, and contribute to closing the gap over time.

make the intervention available mainly to poor people. An example here would be the fortification of foods consumed by the poorest groups with micronutrients.

Targeted programmes have limitations: they are typically difficult to administer; they can be stigmatising, calling attention to the disadvantaged status of prospective beneficiaries; and there are situations in which they are inappropriate. For example, to vaccinate only children in poor households in a village, while ignoring better-off children, would be unethical.

Yet despite these limitations, targeted programmes are usually effective. For example, in a study of 30 Latin American initiatives in health and other areas, nearly three-quarters of benefits from carefully-targeted programmes were reported to have reached the poorest 40% of households, compared with only about a third of benefits from those that were untargeted.⁴⁴ Authors of another global review concluded that: “.

... well-designed and implemented targeting (in health) can make a noticeable difference.”⁴⁵

The second approach seeks rapid universal coverage, or programme saturation, without worrying unduly about which groups are covered first (panel 5). When universal coverage is achieved, poor people receive the same benefits as do those with more resources.

The main limitation of universal coverage is the possibility that initiatives lose momentum before reaching disadvantaged groups, resulting in a rise in coverage inequalities. This limitation is of particular concern in view of the fact that achieving and maintaining high levels of coverage for child-survival interventions presently lies far beyond the capacity of many health systems.⁴⁶

However, successful efforts to achieve universal coverage can improve health conditions in poor populations through provision of services that are the same for all social groups, thereby avoiding the pitfall of differential service quality. This effort is especially

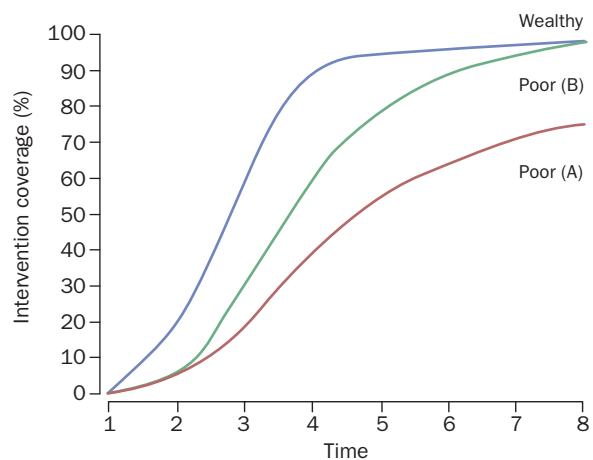


Figure 10: Hypothetical curves for adoption of child-health interventions in wealthy and poor families, in the absence (scenario A) or presence (scenario B) of policies for poor people

Based on data taken from C Victora and colleagues.⁴²

Targeting (individual or geographic)	Universal coverage
Children in need are easy to identify	High-risk groups are hard to identify
Disease or situation has a patchy distribution in the population—eg, micronutrient deficiency, disease due to confined risk behaviours	Intervention is needed by every child—eg, attended delivery, vaccinations
Intervention only protects those who receive it	Intervention has a spill-over effect—eg, vaccines, mosquito nets
Public sector has wide amount of control over intervention—eg, vitamin A capsules	Intervention is widely available in private sector—eg, mosquito nets, antibiotics
Spontaneous demand for the intervention is low—eg, vaccines, at least in some populations	Spontaneous demand is high—eg, antenatal care
Administration system must be well developed to target effectively	Administration system must be able to reach the whole population
Governmental health services are unable to cover the whole population	Governmental health services are widely accessible

Table 2: Situations in which targeting or universal coverage might be appropriate

important because in some countries the same children—and mostly those who are better off—tend to be reached by several child survival interventions whereas poor children are missed entirely.⁴⁶ Achievement of high coverage levels with a few interventions is more equitable, and may be administratively more simply, than achievement of mediocre coverage levels with several interventions.

Universal coverage approaches are clearly superior in some situations (table 2). One example is when the benefits of an intervention spill over to affect the whole community, such as vaccination against infectious disease. Under these conditions, to focus on the most readily accessible population groups makes most sense, irrespective of their socioeconomic status. Another strong argument for universal coverage is when people who are better off already have access to the intervention.

In brief, both targeting and universal coverage approaches have strengths and weaknesses (table 2), and neither can be preferable a-priori initiatives. Decisions must take into account the epidemiological profiles²⁴ and health-system characteristics⁴⁶ discussed earlier in this series. Policy makers designing child health initiatives should give serious consideration to both targeting and universal coverage as potentially effective approaches for improving equity in child health.

Improvement of accountability

Poverty-oriented approaches—like those just described—are much more likely to be accepted in environments characterised by a strong commitment to equity among policy makers and programme managers. Even in societies in which other inequalities are tolerated, health is usually seen as a basic human right meriting special attention. Development and maintenance of a commitment to equity is more likely if policy makers, programme managers, and communities have a role in policy formulation.

Information is a powerful and influential tool, and can be used to correct the gross underestimations of the magnitude of health inequities typical in most policy makers, even within health institutions. Several types of monitoring and reporting can provide useful information. One is simple measurement of health status and programme use disaggregated by socioeconomic

status, sex, or ethnic group. Another is establishment and monitoring of health objectives in terms of health status or service use in disadvantaged groups, rather than—or in addition to—the national averages that are current practice. A third is establishment of monitoring mechanisms to track progress in those groups. For example, with minimum extra effort the results from health surveys can be broken down by socioeconomic status, with information on household assets, income, or education (panel 4).

At the national level, several potential audiences exist for such information. One audience, of course, is the general public, and especially poor populations who are most affected. A second audience is the community of non-governmental organisations, who are typically highly motivated and well placed to use the information to advocate for equity. A third audience is health professionals and decision makers, many of whom are still ignorant of or oblivious to equity matters.

The most appropriate mechanisms for obtaining and disseminating information on equity will vary from setting to setting. By documenting inequities and using this information for advocacy, to shape the policy environment and hold decision makers accountable for failing to address inequities will be possible.

The challenge at international level

We have shown that inequities in child health are unacceptably wide, both between and within countries. In many cases, they are rising. Health and other services that could lessen these inequities are generally reinforcing them instead, by reaching upper-income children more effectively than disadvantaged ones. This targeting is happening despite avowed commitments of international agencies, and despite repeated attempts to make diseases of the poor a priority.

This occurrence is why more of the same is not enough: we must change trends and present conditions, rather than simply perpetuate them. This goal is achievable. Approaches are available to reduce inequities; the challenge is to ensure that they are implemented.

International agencies such as WHO and UNICEF must build on present efforts to address equity by building knowledge and competency among their staff on poverty and equity issues, by advising governments on what they can do to tackle child health inequities, and by systematically presenting health data not only as national averages but also stratified by socioeconomic, sex, and geographic categories. Multilateral agencies must ensure that equity considerations are an essential part of the design of all new projects, must address equity issues in dialogue with countries, and must ensure that impact evaluations provide data on equity. International foundations involved in child health must build on initiatives such as the Rockefeller Foundation's equity gauge.⁴⁷

International momentum towards achieving the millennium development goals must be tapped to address equity issues. The first goal, on poverty reduction, should be brought together with the goal of reducing child mortality. To make progress towards child health outcomes at a population level, but to leave poor people behind in the process, is neither sufficient nor fair. Special efforts based on the approaches mentioned here must be made to reach the poorest populations, and progress towards the goals should be monitored by socioeconomic strata.

The great number of child deaths due to easily preventable diseases, and the huge mortality reductions that might be expected to arise if inequities were eliminated (figure 4), suggest that the lifesaving potential of improving equity is far greater than that of any new technology or combination of technologies that could be introduced in the future.

Contributors

C Victora, A Wagstaff, J Schellenberg, and J-P Habicht had the idea for the article and were responsible for data analysis, writing, and discussion. D R Gwatkin participated in the writing and discussion of the article. M Claeson helped with the idea for the article and participated in the writing and discussion of the article.

Conflict of interest statement

All authors are employed by organisations that could potentially represent a conflict of interest relative to the material presented in this report. CV presently works as a consultant to WHO on child health and nutrition issues. He has also served as a technical adviser to UNICEF in these topic areas. AW and MC are presently employed by the World Bank. JS is a staff member in the Gates Malaria Partnership at the London School of Hygiene and Tropical Medicine and works closely with the multicountry evaluation of IMCI (WHO) as both a principal investigator and a technical adviser, as does J-PH. DG was employed by the World Bank until May, 2003.

Acknowledgments

S Morris (London School of Hygiene and Tropical Medicine), T Evans (Rockefeller Foundation), and J Bryce (WHO) provided important inputs in the idea for and writing up of this report. Parts of this report draw heavily on earlier work done by the WHO-World Bank Child Health and Poverty Working Group, especially Flavia Bustreo (World Bank) and Niklas Danielsson (WHO). Comments on this and earlier versions of the report were provided by Robert Black (Johns Hopkins), Venkatraman Chandra-Mouli (WHO), Jack Langenbrunner (World Bank), Milla McLachlan (World Bank), Saul Morris (London School of Hygiene and Tropical Medicine), Alex Preker (World Bank), and Eva Rehfuss (WHO). Parts of this work were funded by the Bill and Melinda Gates Foundation through their support of the multicountry evaluation of IMCI effectiveness, cost, and impact based at WHO. DFID also provided support for a workshop organised by the Department of Child and Adolescent Health and Development in Gex, France, at which many of the ideas presented here were discussed. The sponsors of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report. The views represented in this article are those of the individual authors and do not represent the views of their institutions.

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Uses of error

Precious adults: a lesson in grown-up congenital heart disease

Fiona Walker

My error is not new. I failed to make a correct diagnosis and the stakes were high. I was the medical registrar on-call for the weekend and reviewed a 19 year old in her 32nd week of pregnancy. She had a 3-day history of coryzal symptoms and complained she was breathless. She'd been seen by my SHO, who'd diagnosed a viral upper respiratory tract infection. As a first-time single mother to-be, her parents were with her. They explained, that apart from heart surgery as a young child—"a hole in the heart closed", she'd been well. She had been discharged from cardiac follow-up. I remember feeling mildly irritated at her apparent lack of being able to speak or give a history for herself and her parents over-zealous responses. She looked well. There was an old median sternotomy scar but otherwise no abnormal clinical findings, no murmurs and her chest was clear. She had normal arterial gases and a normal ECG. I therefore concurred with my SHO and discharged her. She re-presented 2 days later with haemodynamic collapse and cardiogenic shock. She had a severe puerperal cardiomyopathy. There was no fetal heartbeat. She was transferred to the regional cardiac unit. Her dead baby was delivered and she survived. I believe several errors led to this tragedy. I was obliged to believe the accuracy of the history given by this young woman's parents in the absence of any previous records. I was reassured by the fact that her obstetric team were aware of her cardiac diagnosis and had probably had access to any previous cardiac records. I was influenced by my SHO, who was competent and thorough and had spent some time with the patient and family. He inferred she was immature and somewhat attention seeking. I was reassured by her normal examination.

I now specialise in adult congenital heart disease and appreciate how challenging these patients can be to manage. Often the complexity of their congenital defect and their past surgical history overwhelms them, so patient and family have a tendency to focus on the simplest explanation of their problem and use this as their diagnosis for life. Although this young woman did indeed have a secundum ASD closed, her post-operative recovery was complicated by myocarditis and cardiomyopathy. She had been discharged from cardiac follow-up at the regional centre but had received no further medical review to date. Although her demeanour and interaction with adults may have appeared immature and attention-seeking, I now appreciate that "precious" babies with heart defects, become "precious" adults. Many attend outpatients with their parents when they are in their 20's and 30's. It is also the experience of managing these patients that means I appreciate that even though there may be no abnormal chest findings there can be marked radiological pulmonary oedema.

This case has made me change my practice. As an admitting physician the history is often all we have to go on, but I no longer accept lay diagnoses given by patients and endeavour to obtain past medical records as a matter of priority and urgency. Similarly, I am no longer reassured if another clinician has already seen a patient. It may have been equally arduous for them to pursue the facts and then act upon them. And clearly when assessing young adults with congenital heart disease my threshold for performing a CXR is low. As the standards of medical care continue to be raised and our practice is scrutinised there is less room for error, but errors when recognised and rationalised can mean invaluable lessons.

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