

Fatal neglect

How health systems are failing to comprehensively address child mortality



Contents

Executive summary	1
Introduction	2
1. The aid system and child mortality	4
2. Overlooking the second biggest killer of children	7
3. The reduced effectiveness of health systems	10
4. National case study: Zambia	13
5. Examples of good practice	16
6. Conclusion	19
7. Recommendations	19
References	20

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Executive summary

The aid system is not responding to the causes of child mortality in a targeted manner. The Millennium Development Goal to reduce by two-thirds the number of children dying before their fifth birthday by 2015 (MDG 4) is seriously off-track. In Sub-Saharan Africa, on current trends, it will not be met until 2064.

The international health agenda is failing to mobilise the required response to critical causes of child deaths. This paper assesses how and why the international aid system is overlooking diarrhoea, the second biggest killer of under-fives after Acute Respiratory Infections.

Poor sanitation is a major cause of diarrhoea, yet remains seriously neglected, attracting low priority from donor governments and developing country governments alike. The World Health Organization estimates that 28% of under-five deaths are attributable to poor sanitation and unsafe water. The neglect of these environmental determinants of child health is having a profound effect.

The recent and positive focus on ‘health systems strengthening’ has been largely confined to addressing the challenges that exist in the delivery of health services. To meet MDG 4, however, the agenda must now go further.

Long-standing commitments made by the health community must be met. These include the Declaration of Alma-Ata which underlined the importance of primary health care, of which sanitation and safe water is one of the eight key elements.

Until all determinants of child health are adequately addressed, particularly environmental determinants such as sanitation and water, MDG 4 will remain beyond our reach.

Developing country governments and donors should adhere to these general principles:

1. In health planning, the under-five disease burden and all its determinants should be comprehensively addressed.
2. In health policy, strengthening health systems should continue to be a priority, but sufficient focus should also be given to the wider determinants of poor health, particularly poor sanitation.

Three concrete steps must urgently be taken:

1. All national health plans should confirm clear links between country health information systems, particularly disease prevalence data, and the process of planning and budgeting.
2. All countries should have a mechanism for inter-ministry coordination on reducing child mortality, with a joint agenda to deliver relevant strategies.
3. All national health plans should contain an adequate and costed strategy for environmental health.

Introduction

In research for this paper, financial allocations were taken as a proxy for political priority and it is argued that, in spite of disease burden data, diarrhoeal diseases are failing to mobilise the required political and financial response. It must be made clear that this paper considers the neglect of diarrhoea as a symptom of a wider problem: the failure of the aid system to respond to evidence.

A new consensus on tackling child mortality must seek to identify national priorities and appropriate national responses. This would prevent the neglect of major killers like diarrhoea.

This paper assesses the problem at the global level, and uses a case study from Zambia to do the same at the national level. Two broad points are made throughout:

- First, the aid system needs to respond better to the disease burden by targeting resources at where that burden is greatest, including diarrhoea caused by poor sanitation.
- Second, tackling MDG 4 requires comprehensive strengthening of health systems to address sanitation and other environmental determinants of child health. (see box 1)

Addressing these will require strong cross-sectoral working and joint analysis of data between relevant ministries. Crucially, it must be followed by joint action.

Our analysis does not imply that targeting resources at tackling diarrhoeal diseases should come at the expense of vital investments in tackling malaria or HIV and AIDS. Furthermore, this is not an attempt to detract from the huge adult morbidity and mortality burden of these diseases, which must be addressed.

Box 1

Definitions of sanitation and environmental health

Sanitation is the collection, transport, treatment and disposal or reuse of human excreta, domestic wastewater and solid waste, **and associated hygiene promotion.**¹

Environmental health addresses all the physical, chemical, and biological factors external to a person, and all the related factors impacting behaviours.² Diarrhoea caused by unsafe water and poor sanitation is the single biggest portion of the environmental burden of disease by a long way.³

As well as sanitation, other key **environmental determinants of child health** include unsafe water and indoor air pollution.



1. The aid system and child mortality

Poor sanitation may be linked to as many as a quarter of all child deaths through Acute Respiratory Infections (ARIs) and diarrhoea, and yet the sanitation MDG target is even more off-track than MDG 4. The aid system is not responding to the causes of child mortality in a targeted or proportionate manner.

1.1 Global efforts on child mortality

A country's under-five mortality rate is not only a 'golden indicator' of its development, it is also a key driver of broader poverty reduction efforts.⁴ Recent approaches to tackling child mortality in the developing world have had some success in reducing child deaths significantly: there has

been a 27% reduction in annual under-five deaths since 1990.⁵ This is due in large part to reducing deaths from certain diseases through targeted investments, for example in areas such as immunisation and malaria prevention.⁶

However, every year 9.2 million children still die before their fifth birthday⁷ and the Millennium Development Goal⁸ which seeks to reduce child mortality by two thirds (MDG 4) is seriously off-track. On current rates of progress, the world is not due to meet it until 2037; while sub-Saharan Africa will not meet it until 2064, some 50 years too late.⁹ There is an emerging child health agenda that seeks to mobilise international and national efforts around this issue.¹⁰



Child health is important because the first few years of a child's life are a window of opportunity. Research has consistently shown that if a child is malnourished or regularly ill during this stage, there are consequential negative effects on future cognitive development, education and productivity.

This paper asserts that the aid system is not responding to the causes of child mortality in a targeted and proportionate manner. This uneven response to the disease burden is undermining efforts and investments in the health sector. Despite an emerging child health agenda, some critical determinants of child health, particularly poor sanitation, remain neglected.

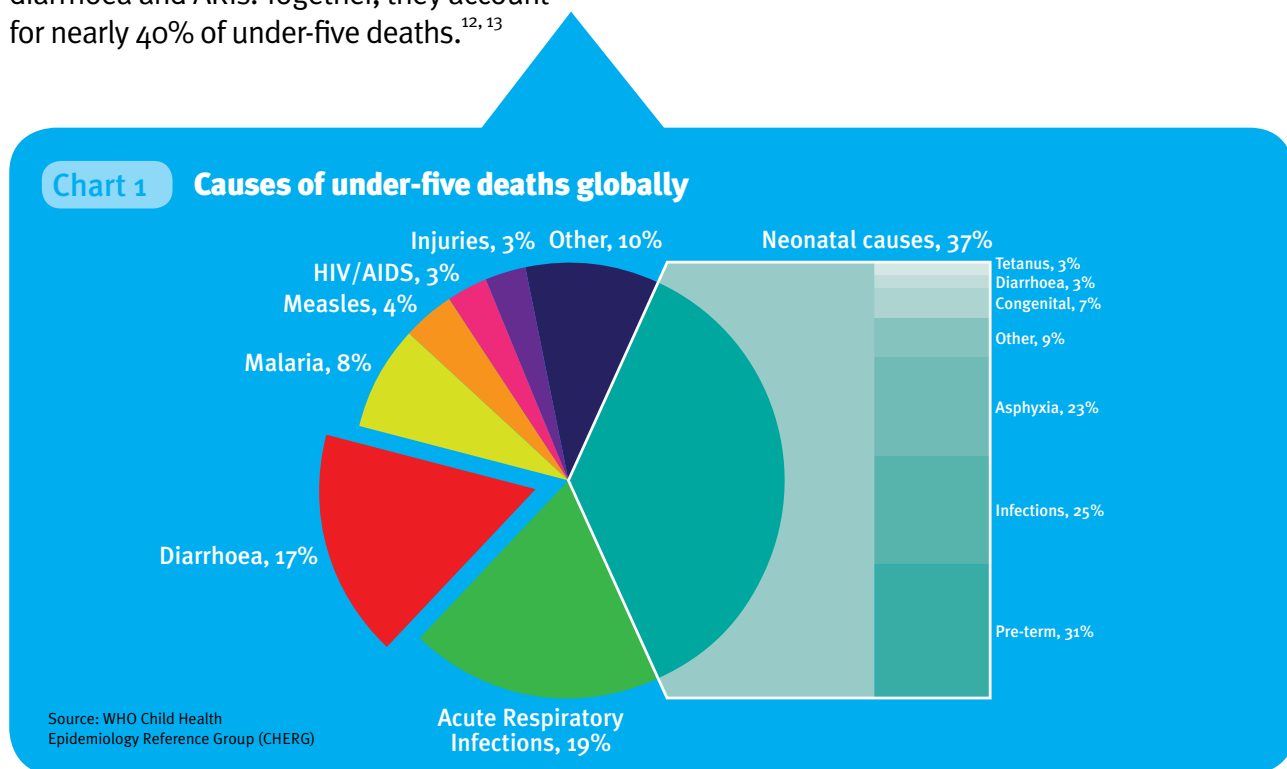
1.2 The causes of child mortality

Chart 1 shows the causes of child mortality worldwide.¹¹ This paper focuses on one of the major blindspots: diarrhoea. The two biggest causes of under-five deaths are diarrhoea and ARIs. Together, they account for nearly 40% of under-five deaths.^{12, 13}

Both diarrhoea and ARIs are intrinsically linked to poor sanitation in particular and environmental health in general. Last year, WHO reported that globally, improving water, sanitation and hygiene (WASH) could prevent:

- 25% of the overall under-five disease burden (morbidity and mortality).^{14, 15}
- 28% of under-five deaths (mortality only).¹⁶

An assessment of the existing evidence suggests that poor sanitation in particular may be linked to as much as a quarter of all under-five deaths.¹⁷ And yet, the sanitation MDG target¹⁸ is even more off-track than MDG 4; on current rates of progress, it will not be met until the 22nd century in Sub-Saharan Africa.¹⁹



1.3 How does sanitation affect health?

In assessing the level of financing for sanitation, this research has only taken account of the associated diarrhoeal disease burden. The likely health impacts of sanitation interventions exceed diarrhoea alone, as table 1 shows.

The table includes figures from WHO showing the portion of the overall burden of disease that is attributable to each factor, for both children and adults. The standard unit for measuring and comparing burden of disease is the disability-adjusted life year (DALY). This is a time-based measure that combines years of life lost due to premature mortality and years of productive life lost due to time lived in states of less than full health. When assessing the impact of sanitation across these four areas, it is worth considering that the total

number of DALYs attributable to malaria is 34 million, and to HIV and AIDS is 59 million.²⁰

This paper considers progress on MDG 4, and therefore focuses primarily on mortality. But, as with all diseases, the costs of the associated morbidity of diarrhoea are arguably just as important. Some of the associated costs have been estimated to include:

- The avoidable costs of treating the sick, which equate to about 12% of public health spending in Sub-Saharan Africa.²¹
- The 443 million school days lost each year due to WASH-related diseases.²²
- The significant negative effects that soil-transmitted helminths (ie worms) have been shown to have on learning and cognitive development among children.²³

Table 1: The health impacts of sanitation interventions

Total disease-attributable DALYs²⁴ in all age groups

Diarrhoea	A systematic review of studies estimated that the safe disposal of excreta can reduce diarrhoea by 36%. ²⁵ Another review found that hand washing with soap can reduce diarrhoea by 45%. ²⁶	73 million
Acute Respiratory Infections	A systematic review of studies estimated that hand washing with soap reduced the incidence of respiratory infections by a mean of 23%. ²⁷ Of these studies, however, the only one conducted in a developing country found that hand washing with soap brought about a 50% reduction. ²⁸	95 million
Malnutrition	Malnutrition has been estimated as an underlying cause in between 35% and 53% of all child deaths globally. ²⁹ Over half of this malnutrition-associated mortality is attributable to diarrhoea and nematode infections caused by poor sanitation. ³⁰ Malnutrition is also a factor in stunted growth.	39 million
Neglected Tropical Diseases	Neglected Tropical Diseases such as trachoma, schistosomiasis and nematode infections are all intrinsically linked to sanitation, as they are transmitted by faecal contamination and poor hygiene. These diseases affect over one billion people. ³¹	19 million

2. Overlooking the second biggest killer of children

This section shows how the international aid system is overlooking one of the biggest killers of children: diarrhoea. This neglect highlights systemic weaknesses in the international response to child mortality.

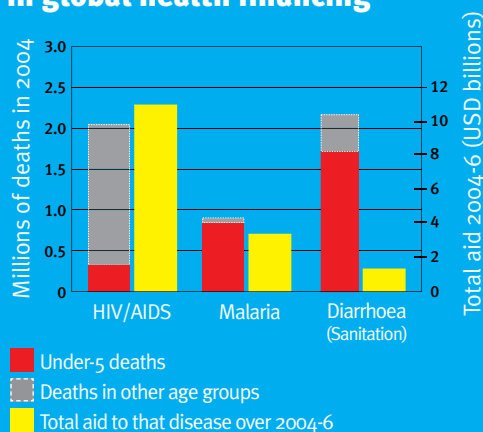
2.1 At the global level, aid for child health does not reflect the disease burden

Diarrhoea, malaria and HIV and AIDS are three of the biggest child killers. Chart 2 compares child deaths from each disease³² alongside total aid allocations³³ to each disease, based on an analysis of aid to all sectors.

This chart shows how financing for the diseases that kill children currently bears little relation to the number of child deaths caused by those diseases. When adult deaths are taken into account, allocations to HIV and AIDS and malaria seem balanced, whereas diarrhoea receives significantly less. If aid was allocated on a more rational basis, these allocations would be more balanced, and would better reflect the mortality burden.³⁴ In summary, chart 2 raises serious questions about whether diarrhoea is receiving adequate priority, given its huge impact on MDG 4.

Chart 2

The relative neglect of sanitation in global health financing



Sources: OECD DAC database, WHO (2008), and WHO (2005)

This paper acknowledges the difficulty in linking levels of aid and particular interventions using the Creditor Reporting System (CRS) on the OECD DAC database. It is reasonable to assume that not all investments for these diseases have been captured. However, given available data on the CRS database, these are the best estimates attainable.

The conclusion that diarrhoea is neglected does not imply that resources targeted at tackling it should come at the expense of vital investments in tackling malaria or HIV and AIDS. Furthermore, this is not an attempt to detract from the huge adult morbidity and mortality burden of these diseases, which must be addressed. Rather, this paper questions how and why the international aid system is overlooking one of the biggest killers of children.

WaterAid/Jane Scobie



2.2 In Zambia, aid for child health does not reflect the disease burden

As this information from Zambia shows, the imbalance in global aggregates of aid allocations is reflected in national contexts.

Chart 3 shows the breakdown of causes of under-five mortality in Zambia, which differs somewhat from the global average.

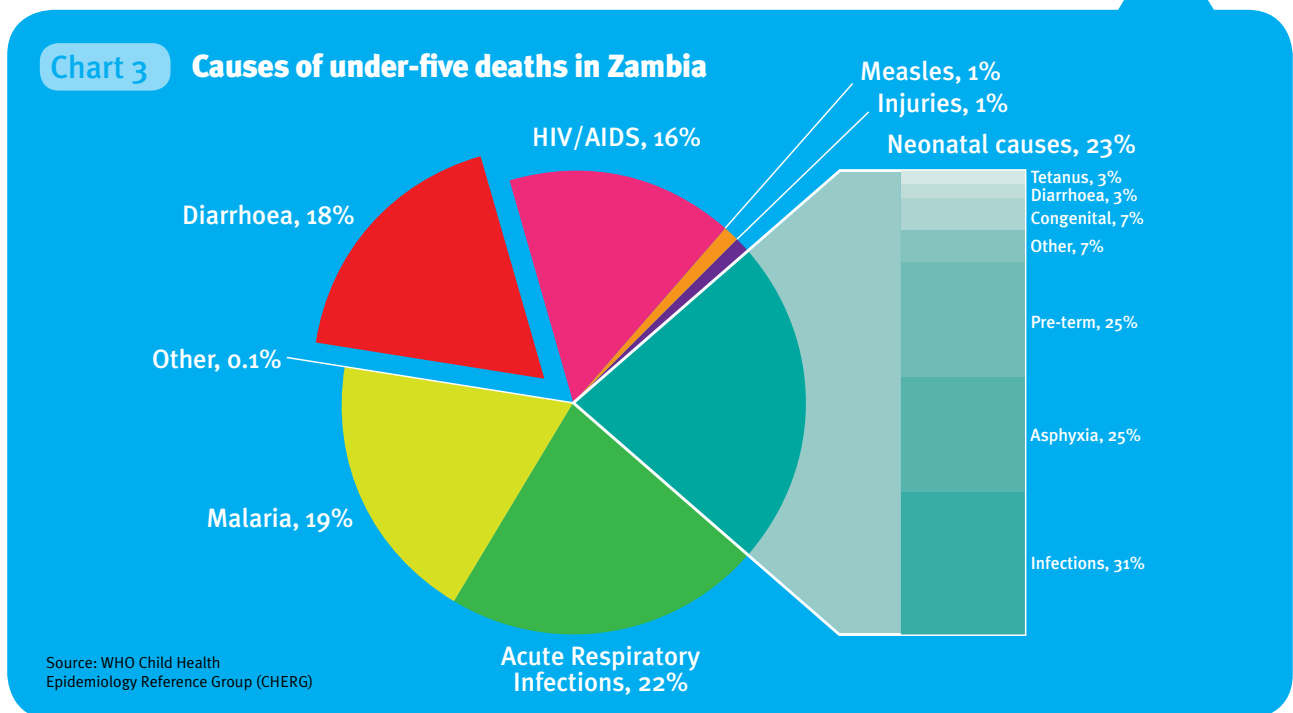
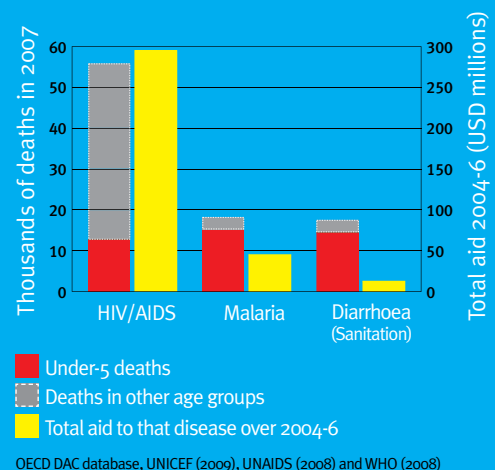


Chart 4 compares under-five deaths from each disease³⁵ alongside total aid allocations.³⁶ In a similar way as was done with international aid, it compares aid investments at the national level to the national mortality burden. Again, aid allocations would be more balanced, and would better reflect the mortality burden, if financing were allocated on a more rational basis.

Chart 4

The relative neglect of sanitation in health financing in Zambia



2.3 The narrow focus on specific diseases

Financing mechanisms that focus on individual diseases can, in certain circumstances, distort national health priorities. For example, in Madagascar, less than 0.1% of the population is infected with HIV and AIDS, and UNAIDS found there were too few deaths to estimate,³⁷ whereas diarrhoeal diseases kill 14,000 children every year.³⁸ Nevertheless, HIV and AIDS received five times more aid than sanitation over 2004-6.³⁹ Similarly, Rwanda has only 3% HIV prevalence, but in 2005 almost 75% of donor assistance for health was for HIV and AIDS, and only 2% for health care services for childhood illnesses.⁴⁰

However, it is not a matter of choosing between one disease and another, and different diseases are not in competition for financing. Developing countries could be financing a range of interventions if the 2005 G8 commitments to increase aid volumes were met. At issue is the ability of the aid system, and national health sectors, to deliver resources at targets and volumes proportionate to needs at the **national level**.

When initiatives explicitly tackle specific diseases, they often implicitly bypass an assessment of a country's disease burden, and therefore risk neglecting other areas of the burden. This paper does not call for a disease-specific mechanism to tackle diarrhoea. Rather, it calls for the health system to be strengthened in such a way that no critical determinant of child health can be neglected.



Kate Eshelby

3. The reduced effectiveness of health systems

Interventions that prevent diarrhoea, such as sanitation, are being marginalised, despite being highly cost-effective. The consequences include the reduced effectiveness of health systems and poor global progress on MDG4.

3.1 Not allowing health workers to prevent as well as cure

In recent years, the health community has increasingly focused on strengthening health systems as a priority. This includes staffing, information systems, and supply chains.

The G8 endorsed this approach in 2008 when the Toyako Framework for Action on Global

Health was agreed. WHO's definition of a health system includes "efforts to influence determinants of health as well as more direct health-improving activities", and refers to the need for "inter-sectoral action by health staff".⁴²

Integrated Management of Childhood Illness (IMCI) is a health systems initiative that has made significant progress in the field of child health (see box 2). UNICEF notes that "key factors in the child's immediate environment... are as important as medical treatment in improving health," and one of the 16 key family practices promoted within IMCI is to "dispose of faeces safely, and wash hands with soap after defecation and before preparing meals and feeding children."⁴³ In principle therefore, sanitation should be adequately addressed within IMCI.

However, in a resource-poor context "integrated management of childhood illness" can often become treatment-based and dependent on clinical interventions. The preventive health elements of IMCI are often the most cost-effective (see box 4). However, they can be marginalised as over-stretched and under-resourced health workers are faced with long queues of sick patients outside their health centre, as shown by the example from Zambia on p.15.

This is reinforced by a review of IMCI carried out by WHO, which found that its "improving family and community practices" element, which includes sanitation, was lagging behind others, and there was "consensus on the need to improve the link between first-level health facilities and the communities they serve."⁴⁴

Box 2

History of Integrated Management of Childhood Illness

IMCI was first developed in the early 1990s after research indicated that children under-five were often being brought into health centres suffering from several diseases at once. More than 80 countries have now taken it up within their health planning. The IMCI strategy is, as described by UNICEF, "an integrated approach to child health that focuses on the well-being of the whole child." IMCI includes both preventive and curative elements that are implemented by families and communities as well as by health facilities."⁴¹ IMCI aims to improve case management skills of health-care staff, overall health systems, and community health practices.

While the stated objectives of IMCI are around securing health outcomes for children, and its terms of reference acknowledge that this requires improvement of sanitation, this is clearly failing to mobilise an effective response. To remedy this situation, this paper suggests that:

- Where health workers' job descriptions include promotion of sanitation and hygiene, this should be given the priority it deserves.
- Health strategies should clarify roles and responsibilities around sanitation promotion, whether it is addressed within the health sector or not.

3.2 Slower global progress on reducing diarrhoeal diseases

There are various interventions that reduce diarrhoeal diseases, and all have their part to play in addressing diarrhoea and other associated diseases in children (see box 3). This paper focuses on sanitation because there has been little or no progress on the sanitation MDG target, despite its pivotal role in reducing diarrhoeal diseases and tackling child mortality.⁴⁵

Sanitation and hygiene are both essential barriers that prevent the transmission of disease by the faecal-oral route. Sanitation in particular has not been given adequate consideration by health policy makers despite evidence of its cost-effectiveness (see box 4). Currently, there are almost one billion people without safe water and a staggering 2.5 billion without adequate sanitation. Faster and more cost-effective reductions in child mortality would be achieved in the long-term by promoting sanitation alongside safe drinking water **as well as** expanding ORT coverage and the other interventions listed in box 3.

Box 3

Interventions to tackle diarrhoeal diseases in children

1. Sanitation promotion
2. Hygiene promotion
3. Water supply
4. Water treatment
5. Oral rehydration therapy (ORT)
6. Zinc tablets
7. Rotavirus vaccination
8. Breastfeeding

Box 4

Cost-effectiveness of sanitation

The World Bank finds that sanitation promotion and hygiene promotion are the most cost-effective of **any** health intervention, costing \$11 and \$3 per DALY⁴⁶ averted respectively.⁴⁷ This is nearly 100 times more cost-effective than ORT, which costs \$1062 per DALY averted. The main interventions against AIDS and malaria respectively are antiretroviral therapy (\$922 per DALY) and insecticide-treated nets (\$17 per DALY).

Oral rehydration therapy (ORT) was instrumental in reducing annual child diarrhoeal deaths from 4.6 million to 1.8 million between 1980 and 2000.⁴⁸ Household surveys show that its use has increased significantly in developing countries over that time, though there is still some way to go.⁴⁹

However, it would be difficult to cost-effectively reduce diarrhoeal deaths using only ORT, because “significant reductions in mortality ... have already been achieved and further gains are likely to be more expensive.”⁵⁰ Universal coverage of ORT for treating diarrhoea should still be sought. However, ORT is a curative intervention, and does not prevent diarrhoea and

the long and repeated periods of ill-health that result from it. Furthermore, it does not prevent the associated costs in children’s missed education, adults’ lost productive time, stunting of growth, or the expense of treating diarrhoea.



4. National case study: Zambia

The lack of targeting at the global level recurs at the national level. While Zambia has made significant reductions in child mortality over the last 10 years,⁵¹ financial flows are not addressing child survival priorities adequately. The Ministry of Health notes that “over 80% of the health conditions presented at health institutions in Zambia are diseases related to poor environmental sanitation”,⁵² yet environmental health is given little priority in its budgeting.

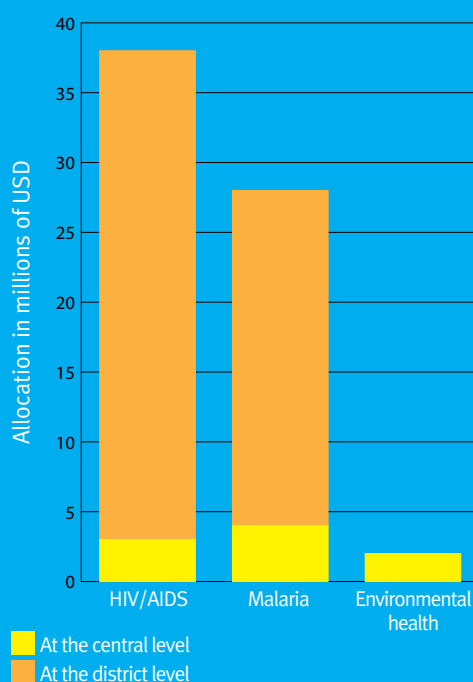
4.1 Environmental health – key to child health but neglected in national planning

Environmental health has been dwindling in priority within Zambia’s Ministry of Health over the last decade,⁵³ and this is reflected in budget allocations over the last few years.⁵⁴ In theory, this has been addressed by recognition of environmental health as key to the National Health Strategic Plan (NHSP) but allocations in the 2008 budget suggest otherwise, as chart 5 shows.

In chart 5, the orange bar shows the central ministry budget, and the yellow bar shows the total allocations to all the 72 districts.⁵⁵ It is clear that there are massive investments in malaria and HIV and AIDS centrally, but almost zero support for environmental health at that level. Box 5 overleaf shows how Zambia had a big push on malaria in particular which led to these high levels of financing and resulted in reductions in malaria incidence.

Chart 5

Environmental health is neglected at the central level in Zambia’s Ministry of Health



Source: Zambia National Budget 2008

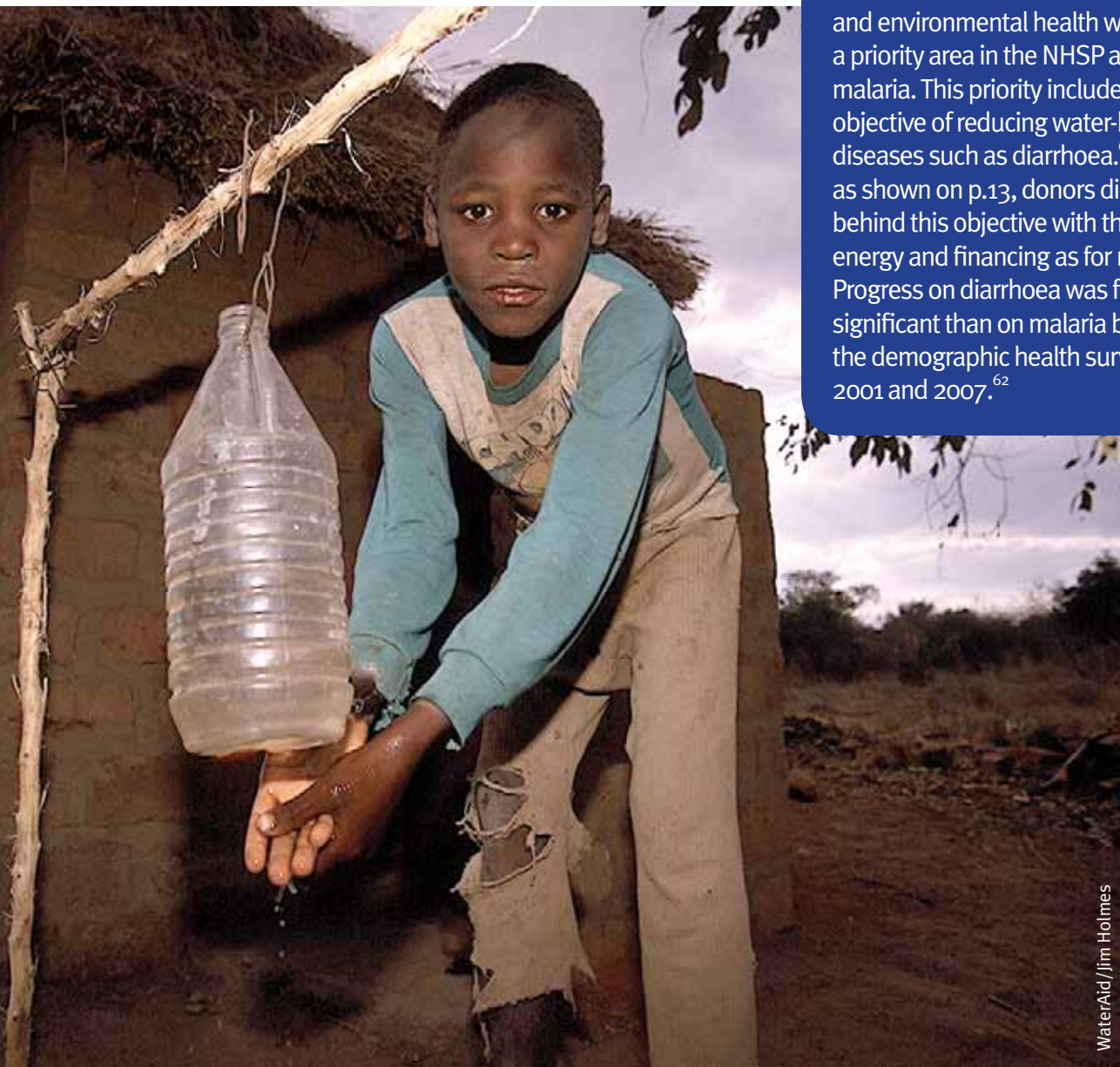
The focus of this case study is the Ministry of Health's role in environmental health, and the mandated role of its environmental health technicians to promote sanitation. It therefore only looks at the Ministry of Health's budget for environmental health. The Ministry of Local Government and Housing does have a budget for water and sanitation but as this is 91% funded by donors it is taken into account in the aid figures in chart 4 on p.8.⁵⁶

Box 5

Zambia's big push on malaria

In 2004, Zambia budgeted \$9 million for malaria at a central level.⁵⁷ By 2008 this figure had risen to \$60 million. One reason for this big push was that tackling malaria was made one of the 12 health priorities in the five-year NHSP,⁵⁸ and donors rallied behind this. Under-five in-patient cases of malaria fell by 29% between 2002 and 2007.⁵⁹

Every year, malaria and diarrhoea kill a similar number of children in Zambia,⁶⁰ and environmental health was also a priority area in the NHSP alongside malaria. This priority included an objective of reducing water-borne diseases such as diarrhoea.⁶¹ However, as shown on p.13, donors did not rally behind this objective with the same energy and financing as for malaria. Progress on diarrhoea was far less significant than on malaria between the demographic health surveys in 2001 and 2007.⁶²



WaterAid/Jim Holmes

4.2 Environmental health technicians are not able to do their job properly

The Ministry of Health employs environmental health technicians (EHTs) at a health-post level, whose key responsibility is outreach work, including hygiene education, sanitation promotion, and water point use. EHTs are therefore at the frontline of diarrhoeal disease prevention in Zambia. However, they are unfortunately sometimes unable to fulfil their roles, as box 6 shows.

In contrast to the Zambian situation, recent experience in Ethiopia has shown that when allocated sufficient resources, front-line health workers can be best placed to drive sanitation promotion in the community. The sanitation strategy in Ethiopia's Southern Nations, Nationalities, and People's Region has been highly successful in achieving increases in latrine use and coverage.⁶³ A key element of the strategy was that sanitation was made part of a basic community health package. Hardware subsidies were not provided, with efforts focused instead on promotion of sanitation to households via employed health extension workers supporting volunteer community health promoters.

This paper does not set out to prescribe one-size-fits-all solutions. There are differences in the roles of health workers in Zambia and Ethiopia. However, it is clear that a cadre of front-line health workers with a mandated role for improving environmental health can play an instrumental role in tackling poor sanitation.

Box 6

EHTs are often tied up treating illnesses in health centres

The comments of one EHT in a rural area of Siavonga district are typical: "There are staff shortages in this health centre, and there is always a long queue of people waiting for treatment. I have no time to do my outreach work in the villages." He estimated that he spent 70% of his time in the health centre diagnosing and treating patients instead.

5. Examples of good practice

5.1 An evidence-based policy for targeting of aid resources

National health challenges rather than global causes need to inform the allocation of aid. When deciding on how to target financing for reducing child mortality, governments and donors should consider three parameters:

1. National child mortality burden by cause estimates.⁶⁴
2. National disease prevalence data from demographic health surveys.⁶⁵
3. In-patient and out-patient statistics from national health management information systems.

These three sources provide different yet complementary information about the childhood disease problems facing a country and its various regions. There should be a rational policy formulation process which assesses the impact of each disease using the above data, the available interventions, and the cost-effectiveness of those interventions.

Successful attempts have been made to better use this kind of disease burden data to formulate evidence-based responses to public health challenges. For example, several agencies have recently worked together to develop the Marginal Budgeting for Bottlenecks tool.⁶⁶ It works by the user choosing an input intervention, as well as epidemiological evidence data and the funding they have available. The system estimates the effect that intervention would have in terms of reduced morbidity and mortality, and allows the policy-maker to base their investment decisions on cost-effectiveness data. An example of the successful use of this tool is outlined in box 7.

Donors need to rally behind such systems and ensure they are a part of policy-making.⁶⁸ Further donor support for the process of analysing the disease burden is also critical. After plans have been made, aid must be aligned and harmonised to support national policy, as agreed at Paris in 2005 and reaffirmed in Accra in 2008, where a commitment was made to a greater focus on delivering results.⁶⁹

Box 7

Marginal Budgeting for Bottlenecks in Guinea

In Guinea in 2000, 50% of families owned a mosquito net, 25% of pregnant women slept under a net, but only 5% of individuals slept under a recently treated mosquito net. This bottleneck was addressed through the free treatment of all existing nets, combined with subsidised distribution of new treated nets, to pregnant women who were utilising antenatal care and had completely immunised their children. By 2004, this integrated approach had increased the coverage of insecticide-treated nets by 40%, as well as child immunisation and antenatal care coverage by 30%.⁶⁷

5.2 Coordination of ministries for health outcomes

The challenges of addressing poor sanitation inherently transcend the responsibility or capacity of a single ministry.⁷⁰ However, some countries have made inroads towards solving this. Both Ethiopia and Uganda have a memorandum of understanding which clarifies responsibilities of the three relevant ministries regarding sanitation. Typically, relevant ministries include those with responsibilities around water, health and environment. However, despite sound principles on paper, this has not always resulted in better coordination at the regional or local levels. Success in coordination requires serious effort, and there should always be clarity on who is ultimately to be held to account for progress on a given issue.

Senegal is an example of a country that has got it right. It has advanced mechanisms within its Millennium Water and Sanitation Programme, including a coordination unit and a national office for sanitation. The distribution of tasks and responsibilities between these structures was decided by an inter-ministerial decree, and the system is functioning well.



Incentives must be in place for collaboration and coordination at all levels, and greater efforts must be made to strengthen mechanisms for joint planning and monitoring. In Zambia, there are cross-sectoral working groups called sector advisory groups (SAGs), which exist to monitor the implementation of the Fifth National Development Plan. Similar mechanisms exist in other countries. There are SAGs for WASH, health and education, and they contain representatives of relevant ministries, donors and civil society organisations. However, their full potential for cross-sectoral coordination has not been realised, and their role should be strengthened.

Both donors and civil society – national and international – have an important role to play in supporting and investing in these processes. Cross-sectoral working groups should provide authority and focus for this dialogue at the national level. A single coordinating body involving all stakeholders is one of the commitments in both the AfricaSan eThekweni Declaration⁷¹ and the SACOSAN Delhi Declaration.⁷² Similar coordinating bodies would be relevant for other cross-sectoral issues in health.

An important point is that health sector professionals can be advocates for issues such as sanitation, by arguing for increased finance for the relevant bodies, as well as raising awareness of the issue in general. By acting as a catalyst in this way, health advocates can achieve positive health outcomes with little additional contribution from health sector budgets.

5.3 Financing for health outcomes not diseases

Aid allocations for health and the underlying rationale must be as transparent as possible. UNICEF notes that in child health, tackling environmental risk factors is **as important as** medical treatment (see p.10). However, WHO notes that these issues fall by the wayside in a resource-poor context.⁷³ If financing was untied from diseases and focused more on systems, health planners would be able to direct resources to where they are most needed. This would need a framework to guide spending according to disease burden, and would not preclude reporting on levels of financing for individual diseases. Rather, greater transparency around financing for specific diseases would bring greater accountability – these are two key themes of the Paris and Accra agendas.

To overcome the deficit in tackling environmental risk factors in child health, donors need to work with governments to plan the best role for community-based health workers to have. This will differ from country to country.⁷⁴

Zambia's progress in reducing malaria shows that when donors rally behind specific elements of country plans, huge gains can be made. Now, that same energy should be directed at ensuring health systems can deliver for all diseases. Donors therefore need to support developing countries to build up an accurate profile of the disease burden and to target resources at areas where the burden is greatest.

The International Health Partnership offers an opportunity to address this by encompassing a range of health stakeholders, including governments, donor agencies, and civil society. It aims to accelerate action to scale-up health services, by encouraging mutual accountability through country compacts.⁷⁵ These commit development partners and governments to support one results-based national health plan, in line with the Paris/Accra aid effectiveness agenda

In order to respond to the problem identified in this paper, national health plans, which the International Health Partnership seeks to support through compacts, must clearly reflect the national disease burden and adequately address the broad determinants of health. This can only be achieved when environmental health concerns are better represented in health sector reform processes.

The current focus on strengthening health systems has been confined to things like supply chains and delivery mechanisms. But, in order to meet MDG 4, health systems strengthening should be comprehensive. WHO now estimates that 25% of under-five DALYs and 28% of under-five deaths are attributable to poor sanitation and unsafe water.⁷⁶ If any child health strategy is to be effective it cannot overlook these critical determinants. Until all determinants of health are adequately addressed, MDG 4 will remain beyond our reach.



WaterAid/Juhiika Howlader

6. Conclusion

Environmental determinants of child health must be addressed. Otherwise, investments in health systems stand to see ever-diminishing returns. This view echoes recent calls for revisiting the Declaration of Alma-Ata and the primary health care approach,⁷⁷ also reflected in the 2008 World Health Report. Sanitation and safe water make up one of the eight elements of primary health care.⁷⁸

Policy for targeting of aid resources must be evidence-based. National health challenges rather than global causes need to inform the allocation of aid. When deciding on financial allocations for reducing child mortality, governments and donors should use three data sources: the causes of child mortality, and disease prevalence data from both demographic health surveys and health management information systems. There should be a rational policy formulation process which assesses the impact of each disease, the available interventions, and the cost-effectiveness of those interventions.

In conclusion, two broad points can be made:

- First, the aid system needs to respond better to the disease burden by targeting resources at where that burden is greatest, including diarrhoea caused by poor sanitation.
- Second, tackling MDG 4 requires comprehensive strengthening of health systems to address sanitation and other environmental determinants of child health.

7. Recommendations

Developing country governments and donors should adhere to these general principles:

1. In health planning, the under-five disease burden and all its determinants should be comprehensively addressed.
2. In health policy, strengthening health systems should continue to be a priority, but sufficient focus should also be given to the wider determinants of poor health, particularly poor sanitation.

Three concrete steps must urgently be taken:

1. All national health plans should confirm clear links between country health information systems, particularly disease prevalence data, and the process of planning and budgeting.
2. All countries should have a mechanism for inter-ministry coordination on reducing child mortality, with a joint agenda to deliver relevant strategies.
3. All national health plans should contain an adequate and costed strategy for environmental health.

References

- 1 This is the definition developed for the International Year of Sanitation by the Water Supply and Sanitation Collaborative Council and approved by the UN-Water Task Force on Sanitation.
- 2 This is the WHO definition, from http://www.who.int/topics/environmental_health/en/
- 3 WHO (2006) *Preventing disease through healthy environments: Towards an estimate of the environmental burden of disease*
- 4 UNICEF (2000) *Poverty Reduction Begins with Children*.
- 5 UNICEF (2009), *State of the World's Children 2009* estimates 9.2 million under-five deaths in 2007, down from 13 million deaths in 1990.
- 6 UNICEF (2008) *Countdown to 2015 – Tracking Progress in Maternal, Newborn and Child Survival*.
- 7 UNICEF (2009), *State of the World's Children 2009* estimates 9.2 million under-five deaths in 2007.
- 8 The Millennium Development Goals (MDGs) are eight international development goals that 192 United Nations member states have agreed to achieve by the year 2015.
- 9 Based on a linear projection from data in UNICEF (2009), *State of the World's Children 2009*.
- 10 This is evidenced by new initiatives such as 'The Partnership for maternal, newborn and child health' (PMNCH) and the *Countdown to 2015* report. Save the Children UK has also begun a 'Saving children's lives' campaign.
- 11 WHO (2005) *World Health Report 2005* – showing the findings of the CHERG (Child Health Epidemiology Reference Group).
- 12 Interventions targeted at reducing diarrhoea are listed in box 3 on p.11. This report focuses on sanitation promotion specifically, for two reasons – first, because it is the most cost-effective health intervention available for any disease (see box 4 on p.11), and second, because the world is so off-track on the sanitation MDG target in particular. There are around 900 million people without safe water, but 2.5 billion without sanitation.
- 13 It should be noted that ARIs remain the biggest direct cause of child deaths, and may be similarly neglected. However, due to challenges in data collection, this research was not able to reach reliable estimates on financing for ARIs. For discussion of the potential neglect of ARIs, see Shiffman, J, (2006) 'Donor funding priorities for communicable disease control in the developing world', *Health Policy and Planning*, 2006 21(6):411-420.
- 14 ie. 25% of under-five DALYs (disability-adjusted life years), for which see p.x.
- 15 WHO (2008) *Safer Water, Better Health*. The figure given in this publication is for children aged 0-14, but in personal communication with the authors, datasets for children aged 0-5 were obtained.
- 16 WHO (2008) *Safer Water, Better Health*. The figure given in this publication is for children aged 0-14, but in personal communication with the authors, datasets for children aged 0-5 were obtained.
- 17 WaterAid (2008) *Tackling the silent killer: The case for sanitation*.
- 18 Millennium Development Goal (MDG) 7, Target 10, outlines the global ambition to halve the proportions of people without access to water and sanitation by 2015.
- 19 Based on projections from data in JMP (2008) *Progress on Drinking Water and Sanitation*.
- 20 WHO (2008) *The global burden of disease: 2004 update*.
- 21 UNDP (2006) *Human Development Report 2006*.
- 22 UNDP (2006) *Human Development Report 2006*.
- 23 Bhargava et al (2005), 'Modelling the effects of health status and the educational infrastructure on cognitive development of Tanzanian children', *American Journal of Human Biology*.
- 24 All figures are from WHO (2008) *The global burden of disease: 2004 update*.
- 25 Esrey et al. (1991), 'Effects of Improved Water Supply and Sanitation on Ascariasis, Diarrhea, Dracunculiasis, Hookworm Infection, Schistosomiasis, and Trachoma', *Bulletin of the World Health Organization* 69 (5): 609–21.
- 26 Curtis V and Cairncross S (2003) 'Effect of washing hands with soap on diarrhoea risk in the community: a systematic review', *The Lancet Infectious Diseases* 2003; 3:275-281.
- 27 Rabie T and Curtis V (2006) 'Handwashing and risk of respiratory infections: a quantitative systematic review', *Tropical Medicine and International Health*, 11(3), 258-267 (Updated with Luby, 2005 and Sandora, 2005).
- 28 Luby S et al. (2005) 'Effect of hand washing on child health: a randomised controlled trial', *The Lancet*, 366, 225-233.
- 29 UNICEF (2009) *State of the World's Children 2009*.
- 30 WHO (2008) *Safer Water, Better Health: Costs, Benefits and Sustainability of Interventions to Protect and Promote Health*.
- 31 WHO (2006) *Neglected tropical diseases: hidden successes, emerging opportunities*.
- 32 Numbers of child deaths were calculated by applying the CHERG's percentage of deaths due to each disease (see endnote 10) to the 10.5 million annual child deaths UNICEF estimates there were in 2004. Numbers of deaths in other age groups were calculated by subtracting this number from the number of all-age deaths from each disease, sourced from WHO (2008) *The global burden of disease: 2004 update*. These are the latest available burden of disease estimates which are comparable across diseases, so we have used 2004 figures across the graph for uniformity.
- 33 Aid refers to Official Development Assistance as defined by OECD. The aid data in chart 2 comes from the OECD DAC database, available at <http://stats.oecd.org>. In this database, each aid allocation is given a 5-digit code that indicates its main focus. Some financing for the below diseases cannot be captured in our analysis, because some interventions are provided through generic health funding, eg. ORT for diarrhoea. The following assumptions have been made.
 - (i) For diarrhoea, the aid to sanitation has been estimated, for the reasons outlined in endnote 12. The two relevant codes are 14020 (water supply and sanitation large systems) and 14030 (Basic water supply and sanitation). The final figure calculated for aid to diarrhoea is 14% of the total of these two codes. This is because the WHO/UNICEF Joint Monitoring Programme has estimated that, in Africa and Asia, for every dollar earmarked for **water and sanitation**, only US14 cents ends up being spent on sanitation. This tallies with findings from detailed research in Zambia for this report, which found this figure be 11% over 2004-6.
 - (ii) For malaria, code 12250 (Infectious Disease Control) was taken as a proxy, given that the specific code for malaria was not brought into use until 2007. The total for malaria is likely to be slightly less than this, as it includes aid for other infectious diseases too, mainly tuberculosis and polio. Investigation of 12250 in Zambia and Madagascar has shown that around 80% of projects listed under 12250 tend to be for malaria. Therefore, only 80% of the global total for 12250 is taken.
 - (iii) For AIDS, code 13040 was taken as a proxy, which is 'STD control including AIDS'.
- 34 It is not claimed that they should be equal, as other factors will come into play, such as social effects of different diseases, the unit costs of different interventions, and their cost-effectiveness.
- 35 The data for under-five deaths in chart 4 come from the CHERG's percentage of deaths due to each disease (see endnote 11) applied to the 80,000 under-five deaths UNICEF estimates there were in 2007. This gives **12,800 under-five AIDS deaths, 15,200 under-five malaria deaths and 14,400**

under-five diarrhoeal deaths. The data for deaths in other age groups are more complicated, due to multiple sources of conflicting data. In each case, the number of under-five deaths calculated above has been subtracted from the following numbers.

- **AIDS** – UNAIDS estimated there were **56,000 all-age deaths in Zambia in 2007.**
- **Malaria** – The World Malaria Report 2008 estimates there were 14,000 all-age malaria deaths, and 12,000 under-five malaria deaths in 2006. This conflicts with our estimate of 15,520 under-five deaths calculated from UNICEF and CHERG data. For comparison, we have kept using the CHERG numbers across all three diseases, and therefore applied the ratio between the World Malaria Report 2008 numbers which is 85%. It is therefore possible we are overestimating the number of malaria deaths in Zambia, This arrives at an estimate of **18,000 all-age malaria deaths in Zambia in 2007.**
- **Diarrhoea** – Due to paucity of evidence for all-age diarrhoeal deaths in Zambia, we have applied the worldwide percentage from the data used in chart 2, i.e. 83%. This implies an assumption that a similar percentage of diarrhoeal deaths are children in Zambia as they are worldwide, and comes up with a figure of **17,000 all-age diarrhoea deaths in Zambia in 2007.**

36 The aid data in chart 4 is similar to that used in chart 2, but it is more accurate. This is because an analysis of the **budgets of all CRS projects** listed under codes 12250, 14020 and 14030 was undertaken. This was done for all projects occurring under these three codes in Zambia for 2004-6.

37 UNAIDS (2008) *Report on the global AIDS epidemic 2008.*

38 See endnote 35.

39 This calculation uses the same methodology as the Zambia data, as explained in endnote 36, i.e. an analysis of individual project budgets in Madagascar.

40 DFID (2007), *Working together for better health*, p.30.

41 This quotation comes from UNICEF: http://www.unicef.org/health/index_imcd.html.

42 WHO (2007) *Everybody's business: strengthening health systems to improve health outcomes. WHO's framework for action.*

43 This quotation comes from UNICEF: http://www.unicef.org/health/index_imcd.html.

44 WHO (2003) *The Analytic Review of the IMCI strategy: Final Report.*

45 The sanitation MDG target is even more

off-track than MDG 4 – on current rates of progress, it will not be met until the 22nd century in sub-Saharan Africa.

46 DALY means Disability-Adjusted Life Year, see p.10. Dollars per DALY is the standard measure of cost-effectiveness of health interventions.

47 World Bank (2006) *Disease Control Priorities in Developing Countries* (second edition) – all cost-effectiveness figures are mean ratio for sub-Saharan Africa. The figure for insecticide-treated nets is for the WHO-recommended version, i.e. two treatments of permethrin per year.

48 WHO (2000) *Bulletin of the World Health Organization*, 2000, 78: 1246–1255.

49 UNICEF (2008) *Countdown to 2015 – Tracking Progress in Maternal, Newborn and Child Survival.*

50 Quotation from World Bank (2006) *Disease Control Priorities in Developing Countries* (second edition), p.45, when discussing diarrhoea and ORT. This suggests that the majority of the lives that can be saved by ORT have now been saved: “an important reason for the relatively unfavorable cost-effectiveness ratios for diarrheal disease is that significant reductions in mortality from this condition have already been achieved and further gains are likely to be more expensive.”

51 The under-five mortality ratio (deaths per 1000 live births) dropping from 168 to 119 between 2001 and 2007 – Zambia Demographic Health Survey (DHS) 2007.

52 Government of Zambia (2005) *National Health Strategic Plan 2006-2010*, p.40.

53 Several people interviewed for this research were quick to lament this fact.

54 Zambia National Budgets (Yellow Book) 2004-2008.

55 The ‘central level’ bar contains the allocations to that disease within the Public Health Services directorate in the Zambian 2008 Budget, as well as the procurement of antiretrovirals under the Clinical Care directorate. The same budget lines are used for specific allocations to each district, and these vary in proportion between districts.

56 Zambia's Fifth National Development Plan outlines a Medium Term Expenditure Framework including anticipated amounts from donor sources. For water supply and sanitation donor finances make up 91% of the total.

57 These figure comes from Zambia's “Yellow Book 2008”, under the “Public health services” element of the Ministry of Health central budget. Including the budgeted amounts for each province would increase the amount by about another 10%.

58 Zambia Ministry of Health (2005) *National Health Strategic Plan 2006-2010* – This

included an objective to reduce malaria incidence by 75% by 2010, and under-five malaria mortality by 20%.

59 WHO Global Malaria Program (2008), *Impact of long-lasting insecticidal-treated nets (LLINs) and artemisinin-based combination therapies measured using surveillance data, in four African countries.*

60 See endnote 35.

61 The objective on Environmental Health and Food Safety is “to promote and improve hygiene and universal access to safe and adequate water, food safety and acceptable sanitation, with the aim of reducing the incidence of water and food borne diseases.”

62 Zambia Demographic Health Surveys, 2001 and 2007.

63 RiPPLE (2008) *Promoting Sanitation and Hygiene to rural households: The experience of the Southern Nations region, Ethiopia.*

64 National breakdowns of child mortality by cause, which are the findings of the WHO Child Health Epidemiology Reference Group (CHERG), are available at www.who.int/whosis.

65 DHS surveys for most countries can be found at www.measuredhs.com.

66 UNICEF (2008) *State of the World's Children 2008*, p.91.

67 UNICEF (2008) *State of the World's Children 2008*, p.71.

68 A recent development in Zambia is that the MBB tool has been used over the last year, and is currently being used to conduct a mid-term review of the NHSP. The aim is to roll it out across Zambia.

69 Accra Agenda for Action, agreed at the High Level Forum on Aid Effectiveness in September 2008.

70 WaterAid (2008) *Giving sanitation the green light.*

71 The Second African Conference on Sanitation and Hygiene (AfricaSan 2008) ‘The eThekweni Declaration’.

72 The Third South Asian Conference on Sanitation (SACOSAN 2008) ‘The Delhi Declaration’.

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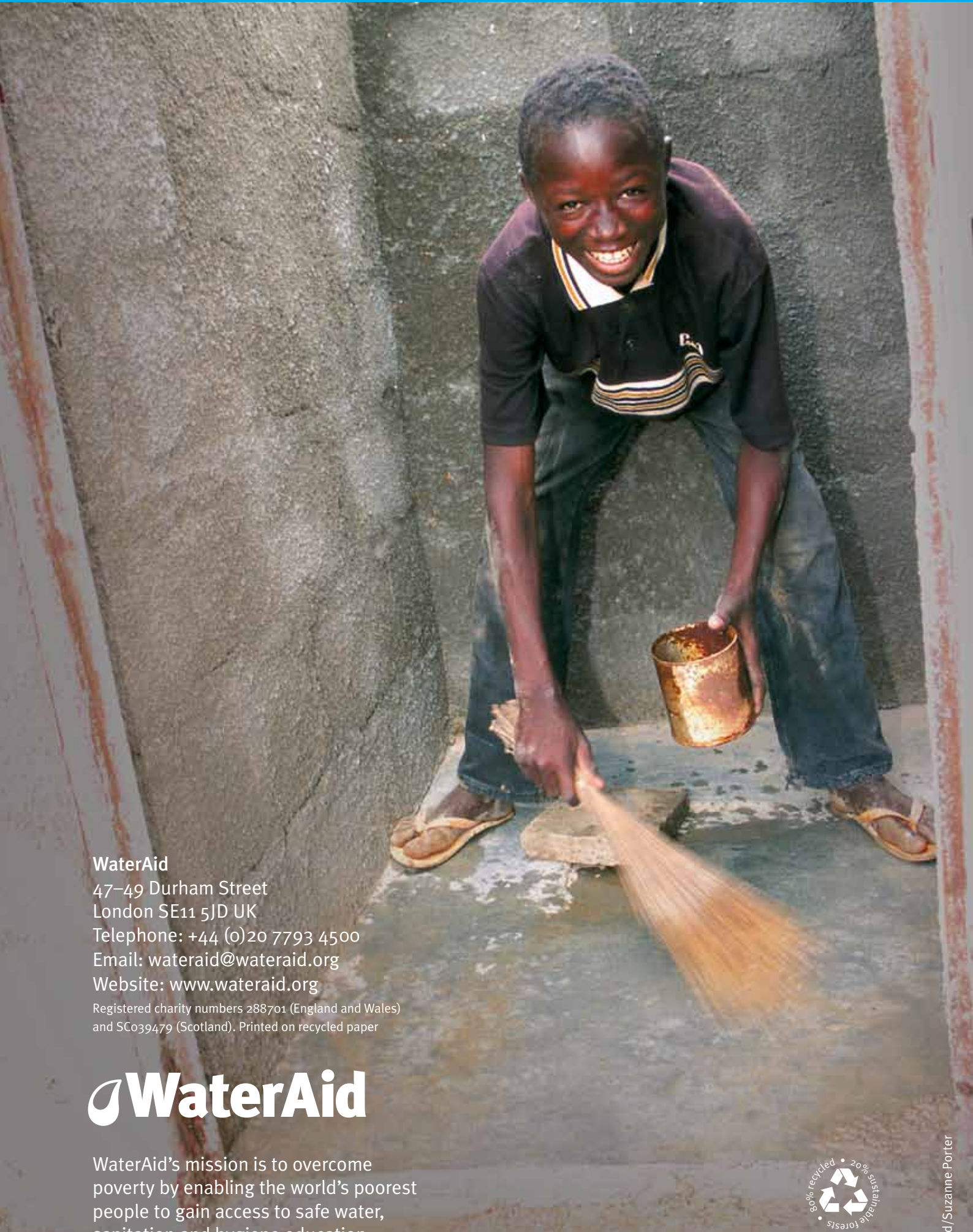
75 For more information, see http://www.internationalhealthpartnership.net/ihp_plus_about.html.

76 See endnotes 15 and 16.

77 Chan, M., ‘Return to Alma-Ata’, *Lancet*, 13 September 2008.

78 WHO (2008), *World Health Report 2008.*

These endnotes are available in a larger format on request.



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WaterAid's mission is to overcome poverty by enabling the world's poorest people to gain access to safe water, sanitation and hygiene education.

