

# CHILDHOOD DISEASES

In developing countries, about half of all childhood deaths – 4.9 million – are caused by no more than four conditions: pneumonia, diarrhoeal diseases, malaria and measles. Every day, almost 13 500 children die from them. Malnutrition is associated with many of these deaths and is the underlying cause of half of all child deaths in developing countries.

## Integrated Management of Childhood Illness (IMCI)

This low-cost strategy has been developed to improve child health through ensuring the prompt recognition and treatment of the five most common causes of childhood deaths: pneumonia, diarrhoeal diseases, malaria, measles, and malnutrition. IMCI treatment guidelines have been developed to help health workers recognize the signs of illness and take prompt action – even if the child is suffering from more than one condition at the same time. Working through health services and communities, IMCI builds on the experience of best practice and provides a holistic approach to the major childhood diseases.

### The IMCI strategy involves:

- prompt recognition of all co-existing conditions
- rapid and effective treatment through standard case management
- prevention of illness through improved immunization and improved nutrition (including breastfeeding)
- promotion of family practices to protect child health, including improved feeding practices, use of insecticide-treated bednets, and appropriate care seeking for illness.

## Prevention & Treatment

WHO and UNICEF have drawn up a list of essential drugs to treat the most common diseases of childhood. The average cost for a full course of treatment with one of these drugs is about US\$ 0.15. They include: oral antibiotics, an antimalarial drug, oral rehydration salts, vitamin A, treatment for intestinal worms, and treatments for eye and skin infections and mouth ulcers. In addition, immunization with measles vaccine – costing US\$ 0.26 for both the vaccine and injection equipment – could prevent most of the almost one million deaths from measles every year.

Many more lives could be saved through ensuring that mothers can recognize the onset of childhood diseases and that they have access to rapid treatment – ideally in the home. Meanwhile improved training of health workers would help ensure rapid diagnosis of life-threatening diseases – especially where children are suffering from more than one condition.

## Mexico reduces childhood deaths from diarrhoeal disease

**In Mexico, determined efforts by the government to promote the use of oral rehydration therapy, immunize children against measles, and improve access to safe water and sanitation have succeeded in reducing childhood deaths from diarrhoeal diseases by 60% in less than a decade. Other key factors include an increase in education levels among women, investment of adequate resources, and the widespread use of case management guidelines.**

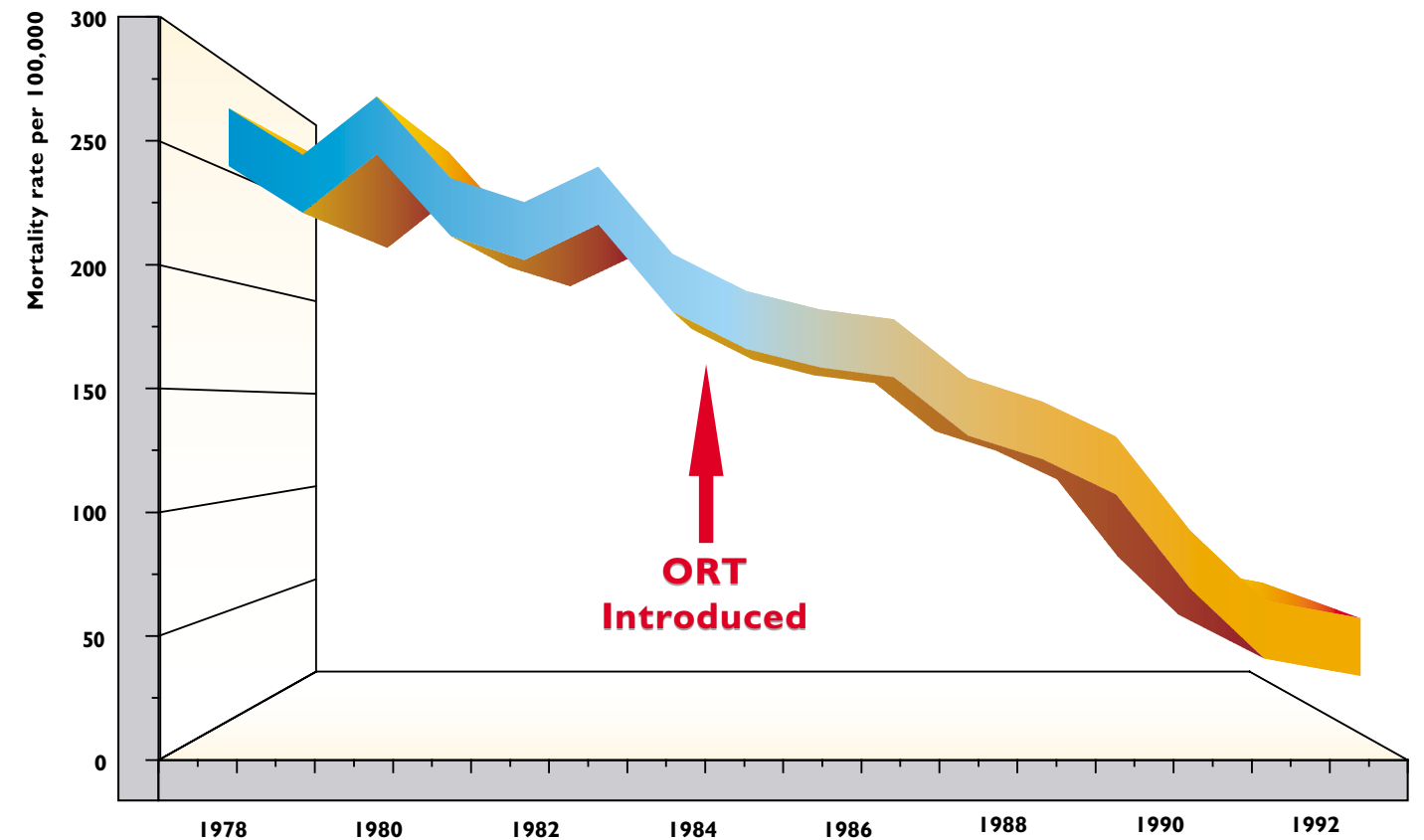


IN DEVELOPING COUNTRIES, diarrhoeal diseases are a major cause of death among children under five – accounting for about 1.5 million deaths every year. Children die because their bodies are weakened through rapid loss of fluids and undernourished through lack of food. And parents often fail to recognize the danger signals before it is too late. Yet most of these child deaths could be prevented. Up to 90% of diarrhoeal deaths can be prevented through the use of low-cost oral rehydration therapy (ORT) and continued feeding.

Before the introduction of ORT in 1979, and its gradual take-up by developing countries, diarrhoeal diseases were the number one childhood killer – accounting for 4.6 million deaths a year among children under five. Since then, diarrhoeal deaths have been reduced by over two-thirds. Other interventions which have also helped in preventing diarrhoeal deaths are improved access to safe water and sanitation, promotion of exclusive breastfeeding, immunization against measles (a risk factor for diarrhoeal disease), better nutrition (including administration of vitamin A), and improvements in the education of women.

In Mexico, the widespread promotion of ORT for home case management – coupled with efforts to improve access to safe water and sanitation – has had a major impact in reducing the number of diarrhoeal deaths among children under five. Since the introduction of ORT in Mexico in

## ORT\* reduces diarrhoeal deaths among children in Mexico



\*ORT: Oral Rehydration Therapy  
Source: Gutiérrez et al, 1996

1984, mortality rates have fallen by 60% in less than a decade – from over 212 deaths per 100 000 children in 1984 to under 63 by 1993.

What is remarkable about this achievement is that the most significant declines in death rates occurred during the early 1990s – at a time when a cholera epidemic was sweeping through the Americas – adding to the overall burden of disease and threatening to reverse hard won gains.

In response, mass media campaigns were launched throughout Mexico to promote the use of ORT. Supplies of oral rehydration salts skyrocketed from 7.6 million packets a year to almost 80 million packets a year. As a result, ORT use increased from zero in the early 1980s to over 80% of cases by 1993, surpassing the mid-decade target set by the 1990 World Summit for Children of 80% ORT use by 1995. In addition, the government intensified efforts to immunize children against measles and stepped up efforts to improve sanitation and provide safe water.



The proportion of mothers reporting correct home-based case management increased rapidly and ORT was also widely available in health facilities. As a result, the proportion of under-fives deaths due to diarrhoeal diseases fell from over 26% in 1983 to 11% in 1993.

Other factors widely believed to have contributed to Mexico’s success in reducing diarrhoeal deaths are the increase in education levels among women, strong political commitment, adequate resources, and the existence of a solid base of trained health professionals in the diarrhoeal control programme with extensive experience of the case management strategy. The Mexican Government is now building on the success of the ORT treatment to make use of the broader IMCI strategy to further reduce deaths among children under five.



## Pakistan acts to reduce child deaths from pneumonia

In Pakistan, the government has introduced WHO's guidelines for acute respiratory infections (ARI) nationwide after training doctors and community health workers to use the technique. In Islamabad, use of these guidelines to improve the diagnosis and treatment of ARI among hospital outpatients under the age of five has halved pneumonia death rates among children admitted to hospital, reduced the inappropriate use of antibiotics, and led to major savings in health care costs.

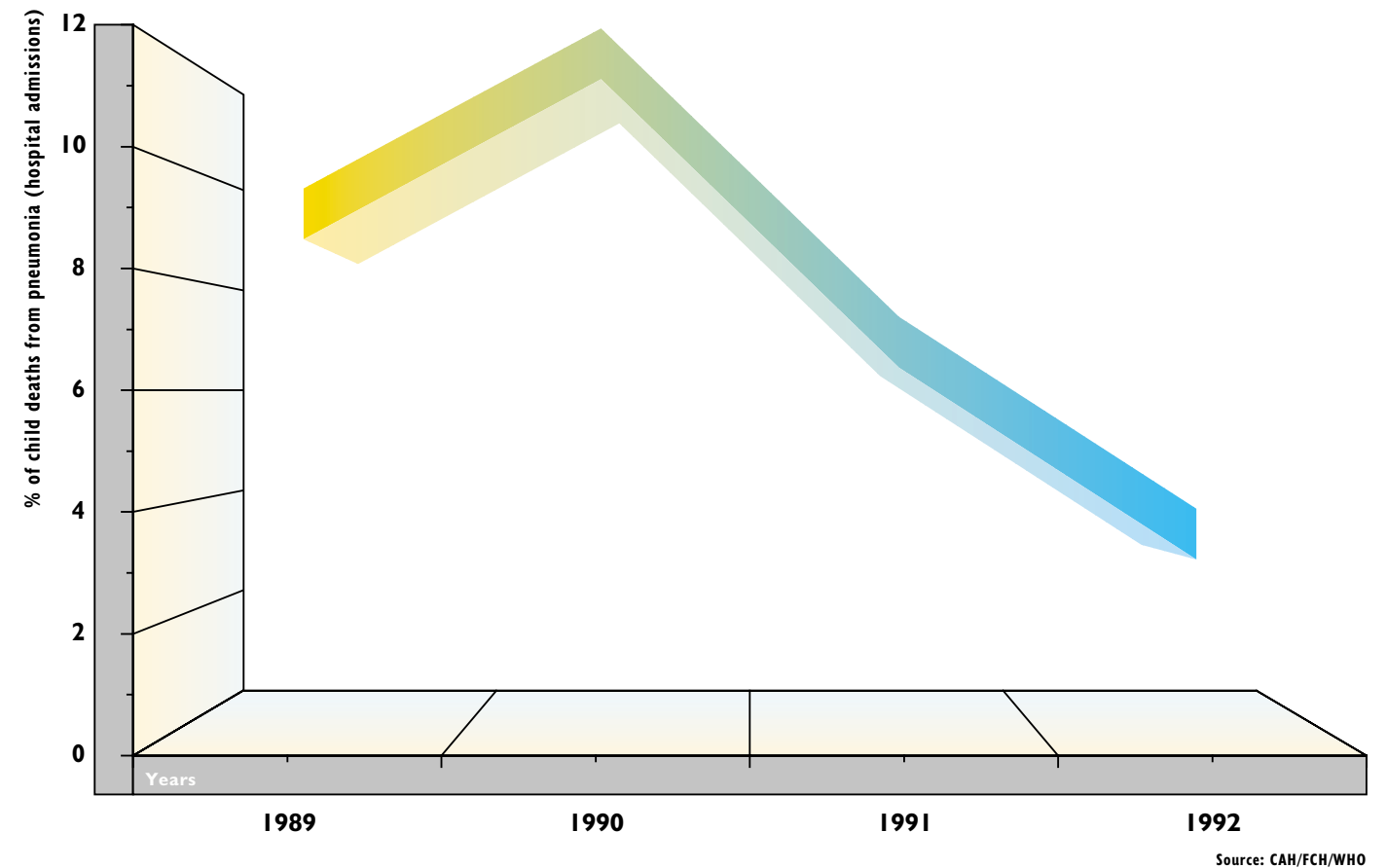
ACUTE RESPIRATORY INFECTIONS (ARI) kill more children under five than any other infectious disease – accounting for almost 2 million deaths a year among this age group. Most of these deaths (99%) occur in developing countries. ARI – mainly pneumonia – are also a major cause of childhood illness.

Among those most vulnerable to infection are children with low birthweight or those whose immune systems have been weakened by malnutrition or other diseases. Without early treatment for ARI, children can die very rapidly. Many deaths are the result of failure to take the child to a health centre in time or of misdiagnosis by a health care worker. The problems are compounded by the indiscriminate use of antibiotics and increasing microbial resistance.

In Pakistan, efforts to improve the diagnosis and treatment of ARI in children under five and prevent the misuse of antibiotics have led to a major reduction in child death rates at a children's hospital in the capital Islamabad. The breakthrough followed the launch in 1990 of new treatment guidelines for ARI at the hospital. Within three years, ARI death rates among children under five had been halved and efforts to increase rational drug use led to a reduction of almost 50% in the inappropriate use of antibiotics as well as major reductions in health care costs.

The treatment guidelines – WHO's standardized case management guidelines for ARI – were introduced in the outpatients and emergency departments at the children's hospital in early 1990 after doctors had been trained in

## ARI guidelines in Pakistan reduce child pneumonia deaths in hospital by 50%





the new technique. Children found to be suffering from severe pneumonia were admitted to the hospital and given antibiotics and other treatment if required. Children with non-severe pneumonia were given oral antibiotics and sent home. Children with upper respiratory infections – mainly coughs and colds – were sent home with oral medication, and advice on home care (including the use of fluids, feeding, clearing the nose, and soothing the throat).

The ARI guidelines – a key component of WHO's Integrated Management of Childhood Illness (IMCI) – are designed to help the health worker identify the signs of pneumonia: fast breathing, chest indrawing, and other danger signs. The aim is to ensure that children with pneumonia (and other appropriate conditions) receive urgent treatment with antibiotics and that children with upper respiratory infections (mainly coughs and colds) are not prescribed unnecessary antibiotics. The use of commercial cough remedies containing ineffective or harmful ingredients is also discouraged.

A study on the impact of the new treatment guidelines at the Islamabad Children's Hospital from 1990-92 revealed that death rates among children admitted to hospital with severe pneumonia fell from about 10% in 1989 to about 5% in 1992. Meanwhile the rational use of drugs, a key strategy in preventing the overuse of antibiotics and curbing microbial resistance, led to a major reduction in the use of antibiotics (from 56% of cases in 1989 to only 30% in 1992).

The study found that eight out of ten ARI cases were acute upper respiratory infections – mainly coughs and colds. The majority of these were viral infections which did not need antibiotics. Only a small proportion, including inner ear infections, were bacterial infections that needed treatment with antibiotics.

If appropriate ARI case management guidelines were adopted throughout Pakistan, it is estimated that there would be a major reduction in pneumonia deaths among children under five as well as considerable financial savings through minimizing the use of antibiotics and other unnecessary drugs. The researchers involved in the study estimated that government savings on antibiotics would amount to US\$ 1.2 million a year, while a reduction in the indiscriminate use of cough medicines would save an additional US\$ 8.5 million a year.



The Pakistan Government has introduced the standard ARI management guidelines in first-level health facilities after training doctors in the technique. In addition, 34 000 community health workers in villages throughout Pakistan have been trained to use the guidelines at community level.

The Islamabad study shows how effective use of the ARI treatment guidelines can have a rapid impact in reducing pneumonia deaths among children. The challenge now for the Pakistan Government is to ensure that these guidelines are used in health facilities country-wide and to monitor the impact.



## Malawi on course to eliminate measles

**In Malawi, government commitment to eliminate measles has led to a dramatic reduction in measles cases and deaths. This achievement has involved support from community volunteers and concerted efforts to train health workers, improve immunization safety, strengthen disease reporting systems, and mobilize parents to immunize their children against measles.**



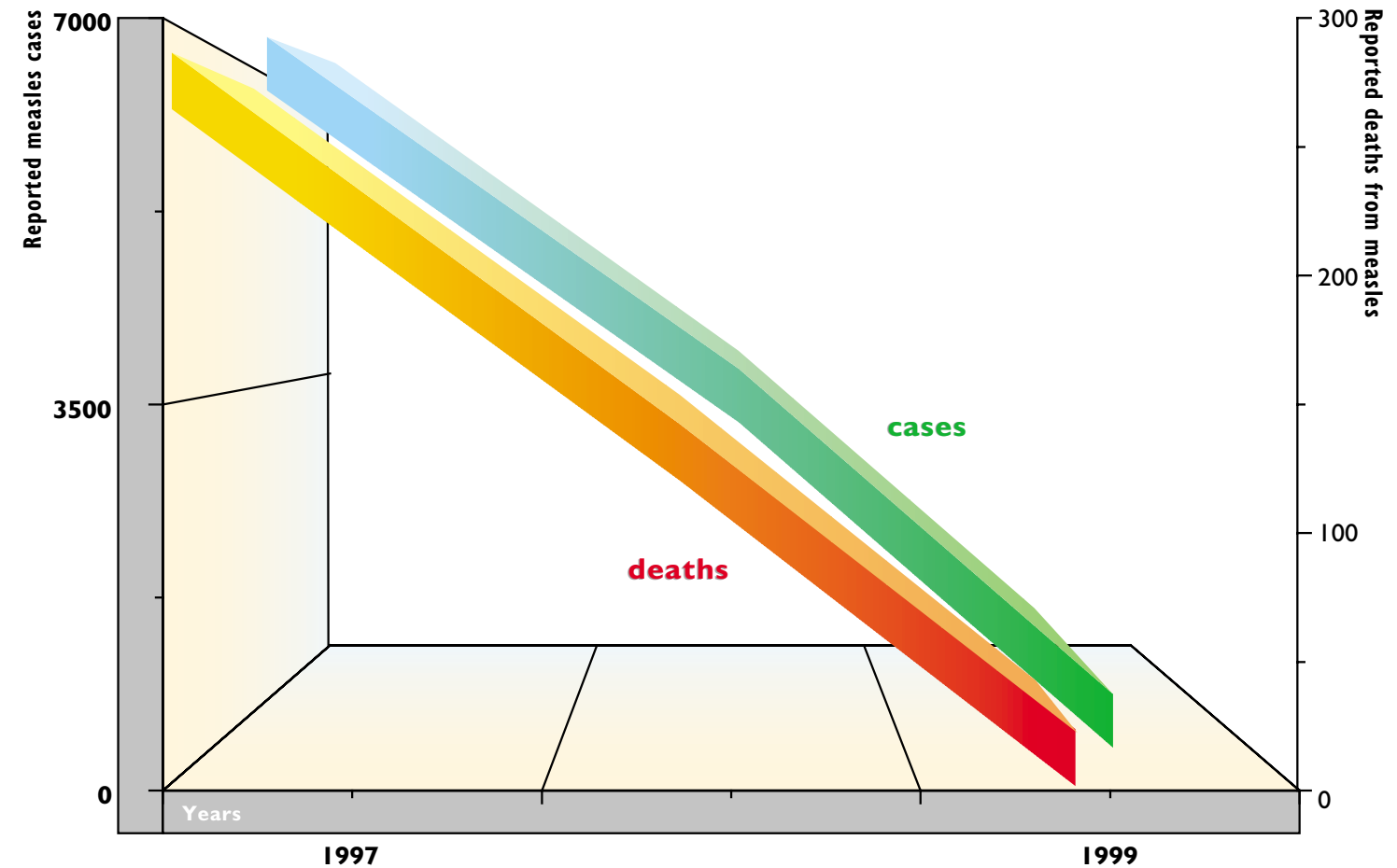
**MEASLES KILLS MORE CHILDREN** than any other vaccine-preventable disease – most of them in developing countries. The highly contagious disease accounts for almost one in ten of all deaths among children under five – half of them in children less than a year old. In 1998, there were an estimated 30 million cases of measles worldwide and about 900 000 deaths.

Measles can also lead to lifelong disabilities, including brain damage, blindness, and deafness, especially in developing countries. The disease thrives in cities – especially in deprived urban areas where overcrowding ensures the continued circulation of the measles virus.

Yet measles deaths and disability can be prevented. A vaccine against measles has been available for over three decades. It is safe, effective, and costs only US\$ 0.26 for the single dose needed to immunize a child. But in 1998, one in five of the world’s children were not immunized against measles during their first year of life. And in Africa, which accounts for more than half of the world’s measles cases, less than 50% of children were immunized. Meanwhile, in six African countries, only one in three – or less – were protected against measles.

Against this backdrop of low immunization coverage in Africa, Malawi has succeeded in boosting immunization coverage against measles from only 50% in 1980 to almost 90% today. As a result, the number of reported cases and deaths has fallen dramatically. During 1999, only two

# Measles immunization campaign reduces measles cases and deaths in Malawi



Source: EPI/WHO

laboratory-confirmed cases were reported. And, for the first time ever, no measles deaths. Yet only two years earlier, almost 7000 measles cases were reported and 267 deaths (although most cases go unreported and WHO estimates that nine times as many cases and almost five times as many deaths actually occurred).

This turnaround has been achieved in one of the world's poorest countries. One in five of the population do not have access to health services, less than 50% have access to safe water, and only 3% have access to adequate sanitation. In 1998, life expectancy hovered at just below 40.

The first key step in reducing measles deaths in Malawi was a sustained increase in routine immunization coverage. This led to an encouraging sharp drop in measles cases and deaths. However, while epidemics have become less frequent, they still occur every 3-5 years – triggered by a build-up in the number of children who have not been immunized and by the vaccine's inherent 15% failure rate. In an epidemic in 1992, for example, 11 000 cases were reported.

Then in 1998, Malawi launched a campaign to eliminate measles. The strategy, developed in the Americas, where measles has almost been eliminated, involves a 3-pronged attack to halt transmission of the virus: a nationwide immunization campaign usually targeting every child from nine months to 14 years (“catch-up”); sustained routine immunization coverage of at least 95% of children during the first year of life (“keep-up”); and nationwide campaigns every 2-5 years usually targeting children born after the initial catch-up campaign (“follow-up”). The aim is to ensure that few if any children slip through the immunization net.

In June 1998, a nationwide immunization campaign in Malawi targeting 4.7 million children from 9 months to 14 years succeeded in reaching over 90% of the target population. In addition, vitamin A supplements – which can prevent one in four child deaths from infec-



tious diseases – were given to all children aged six months to five years. The cost of the campaign – including delivery costs – was US\$ 0.78 for every child vaccinated.

Malawi's success in reducing the death toll from measles has involved concerted efforts to train health workers, improve immunization safety (including vaccine quality assurance and injection safety), and strengthen disease surveillance and monitoring skills. A key factor has been the success of social mobilization campaigns in encouraging parents to immunize their children against measles. In some cases, community volunteers have helped organize door-to-door immunization or set up vaccination posts nearby to ensure that previously unreached children could be immunized.

Today, in an effort to prevent epidemics of measles, Malawi is continuing efforts to ensure that at least 95% of children are immunized during the first year of life and to identify populations where children are unimmunized and at high risk of continued transmission of the measles virus. These children will be targeted in the follow-up phase of the campaign.



## Tanzania prevents iron-deficiency anaemia in mothers and children in Zanzibar

**In Zanzibar, Tanzania, a school-based de-worming programme has had a dramatic impact on children's health and development. Among the children involved, regular low-cost treatment has led to an increase in height and weight, a reduction in the prevalence of severe anaemia, and improved nutritional status.**



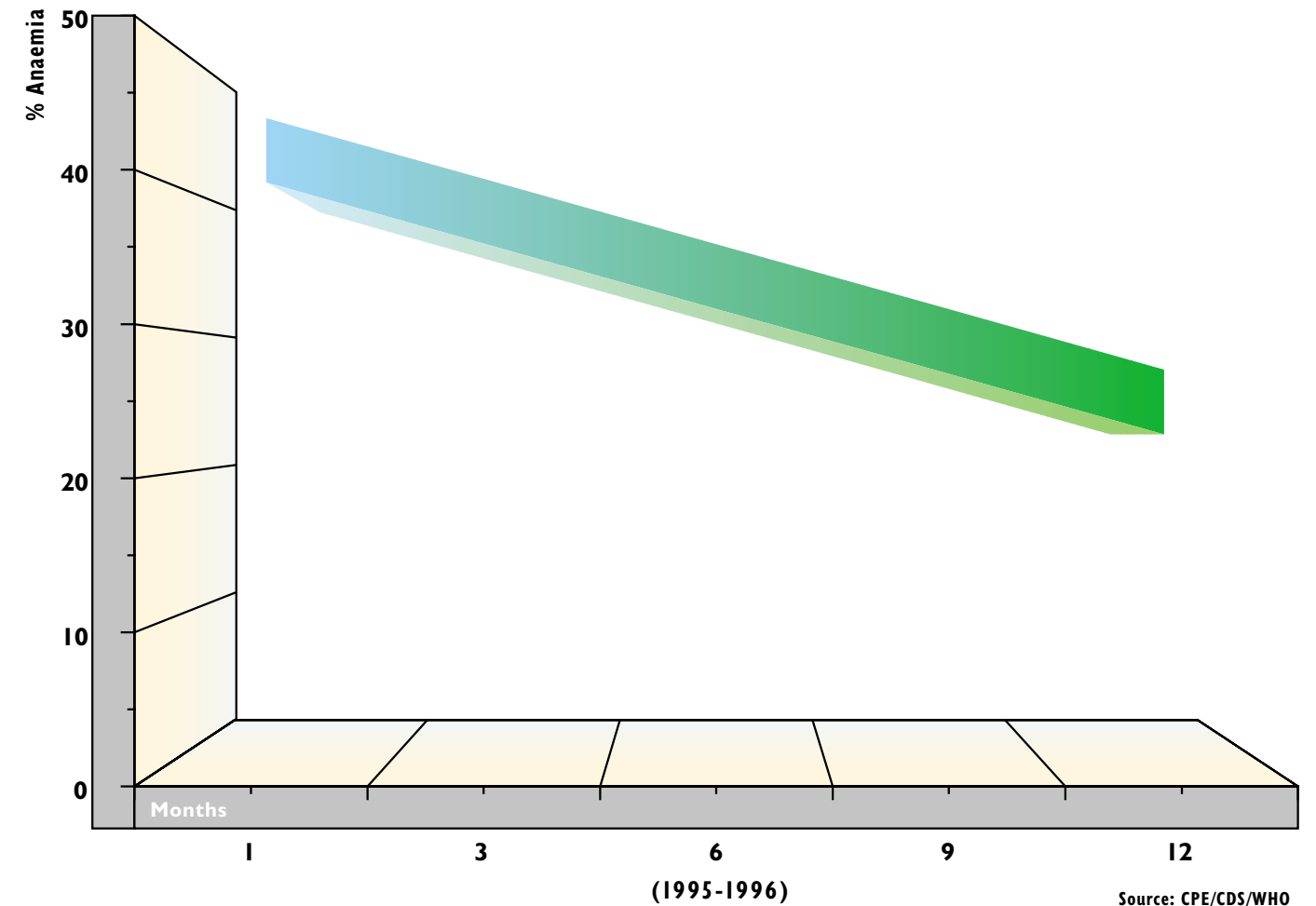
**INTESTINAL WORMS (HELMINTHS)** are one of the most common infections on earth. Over a billion people are infected and twice as many are at risk. But the devastating impact of intestinal worms on health – especially among pregnant women and school-age children – is often underestimated. At least 400 million children of school-age are chronically infected with intestinal worms – mainly roundworms, hookworms, and whipworms. Infection leads to malnutrition, iron-deficiency anaemia, stunted growth, and increased vulnerability to other infections. And it has a serious impact on children's cognitive development – affecting concentration and work capacity and increasing absenteeism from school.

Meanwhile, intestinal worm infections can be life-threatening for pregnant women and babies. Over 44 million women are infected with hookworms, which cause intestinal blood loss and iron-deficiency anaemia – increasing the risk of premature birth and low birthweight babies.

Chronic infection with intestinal worms holds back child development and limits educational achievement. It endangers reproductive health and affects adult productivity. And it undermines social and economic development.

Intestinal worm infections are most frequent among the poor. The soil-transmitted infections occur wherever

## School-based de-worming in Tanzania reduces severe anaemia





living conditions and hygiene are poor and where access to clean water and sanitation is inadequate. Yet treatment is easy to administer and highly cost-effective, even in the poorest countries. Regular treatment two or three times a year with one of several recommended drugs from the WHO essential drugs list costs as little as US\$ 0.09 (9 cents) a year.

In Zanzibar, Tanzania, a school-based treatment programme for intestinal worms has shown that regular de-worming of schoolchildren can increase their height and weight, improve iron stores, and reduce iron-deficiency anaemia.

Before the National Helminth Control Programme was started in 1994, almost every child in Zanzibar (99.7%) was infected with intestinal worms and malnutrition was widespread. By early puberty, over 60% of children showed signs of stunted growth and over 50% had iron-deficiency anaemia.

In 1994, a new de-worming programme was launched by the National Helminth Control Programme for about 30 000 primary school children on the island of Pemba, the smaller of the two islands that make up Zanzibar. The children were treated at school three times a year with mebendazole



(an anthelmintic drug) in the form of chewable orange-flavoured tablets.

Throughout the first year, the children had regular check-ups to monitor changes in the intensity of infection and to study the impact of treatment on their health status.

The results were impressive. Although roundworm infections responded best to the treatment, the intensity of all worm infections was reduced. By the end of the first year, the programme had prevented over 1200 cases of moderate to severe anaemia, and over 270 cases of severe anaemia.

By 1996, the prevalence of severe anaemia had been reduced by almost 40%, iron deficiency fell by 20%, and there was a marked improvement in the nutritional status of the children.

The programme has since been extended throughout Zanzibar and now also targets pre-school children, and women of childbearing age, as well as school-aged children outside the formal education sector. Meanwhile, efforts are still under way to measure the impact the school-based programme has had on improving the cognitive development of the children involved.



## Brazil widens access to health care

**In Brazil, the launch of a community-based family health programme has led to a sharp drop in infant mortality rates in several of the states involved. In one city, infant death rates fell by almost 75% over a 6-year period. Elsewhere, the number of cases of diarrhoeal disease was halved within a year – a drop that was helped by an increase of almost 100% in the number of mothers who exclusively breastfed their babies. In some of the municipalities involved, attendance at antenatal clinics has almost doubled.**

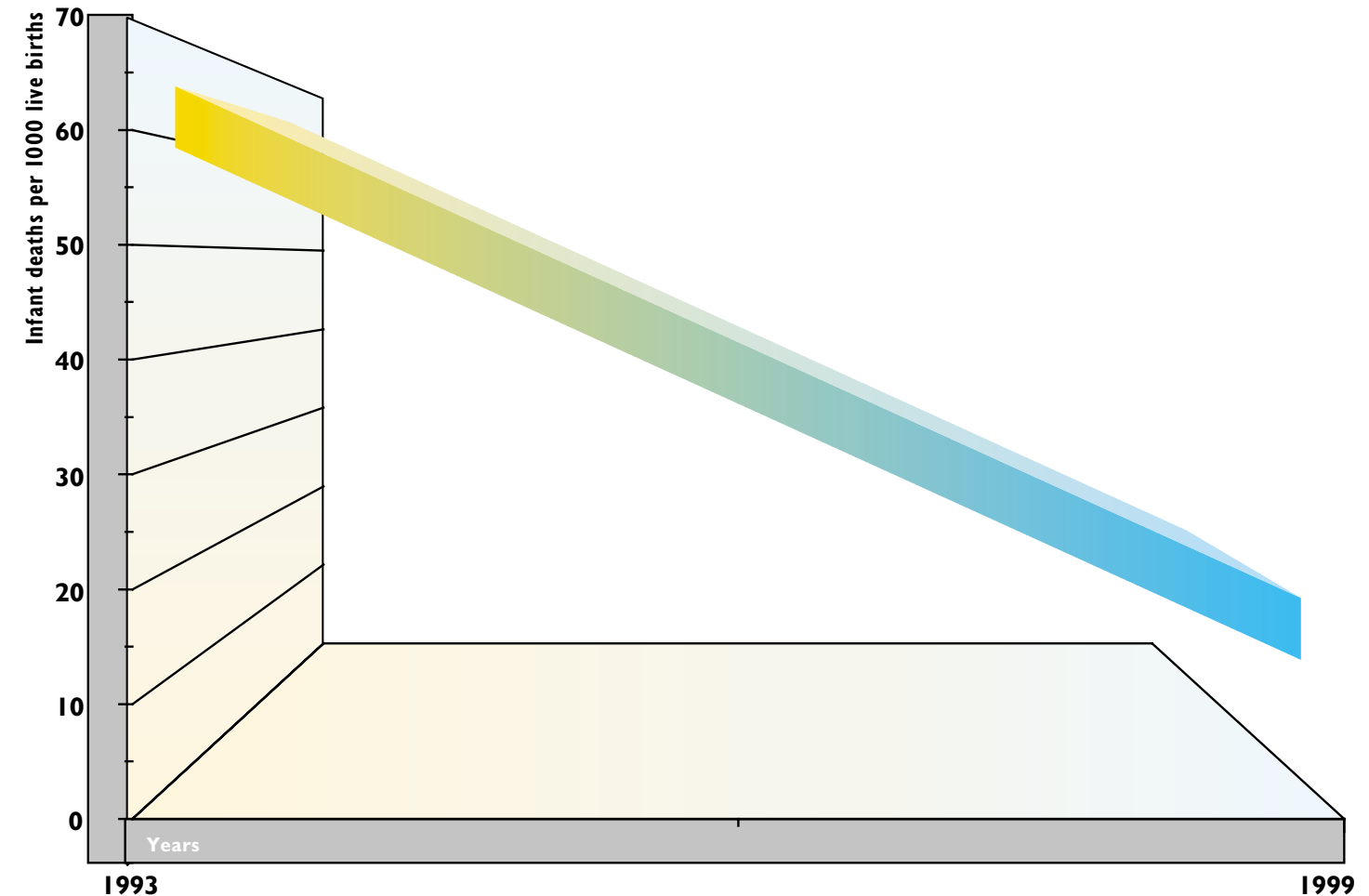


**IN BRAZIL**, the launch of a community-based family health programme has led to a sharp drop in infant mortality rates in several of the states involved. In one city, infant death rates fell by almost 75% over a 6-year period. Elsewhere, the number of cases of diarrhoeal disease was halved within a year, a drop that was helped by an increase of almost 100% in the number of mothers who exclusively breastfed their babies. In some of the municipalities involved, attendance at antenatal clinics has almost doubled.

Before the programme started in 1994, Brazil relied almost exclusively on a specialized, hospital-based system of medical care which failed to meet the needs of many families who either could not afford or could not access these services. Today, 20% of the population of 160 million have access to primary health care.

Launched as a partnership involving the Ministry of Health, UNICEF, and communities, the Family Health Programme is based on a network of teams who work with communities to ensure that families know when and where to seek help or advice on health issues such as antenatal care, immunization, and child nutrition, or treatment for diseases such as malaria and diarrhoeal diseases. Dental care is now being added to the list of services available. Where necessary, people are helped to gain access to specialized care and hospital treatment.

## Family health programme lowers child death rates in Camarigabe, Brazil



Source: UNICEF

The teams comprise a doctor, a nurse, a nurse's aide, and five or six health agents who live in the community.

Each team covers about 800 families. They respond to the needs of the whole population, particularly those who could not easily access the hospital-based medical system. With federal government financing and political commitment at all levels, Brazil's Family Health Programme has grown from 328 teams in 1994 to over 10 000 today, serving more than 3000 municipalities. The aim is to create another 10 000 teams by the end of 2002. Since 1998, the family health team is being trained in the IMCI approach in some states in the north-east. The use of nutrition counselling has helped improve the nutritional status of children under five.

The results have been dramatic. In Camarigabe, in the poor north-eastern state of Pernambuco, infant mortality dropped from 65 per 1000 live births in 1993 to 17 per 1000 live births in 1999. Elsewhere, in Palmas, the capital of the state of Tocantins, the rate of exclusive breastfeeding increased from 38% in 1999 to 73% in 2000. This increase is believed to have contributed to a re-



duction in cases of diarrhoea, which dropped by 50% in the city between 1997 and 1998. Meanwhile, the number of pregnant women receiving antenatal care in Palmas almost doubled, from 43% in 1997 to 80% by 1998.

The programme has helped steer families away from a reliance on expensive specialized care. In the city of Sobral, for example, the once high demand for specialized care has dropped in direct proportion to the increase in demand for primary care since the programme began in 1997. And this change has found its way into general medical training in the country, since the programme's 21 training centres for family health are linked to 58 medical schools and 62 nursing schools in 16 of the country's 27 states. The programme has also contributed to a profound shift in the concept of health care in Brazil. Today, health professionals and community members alike place high value on general community practice in preference to expensive, specialized care that only a few can afford.



## Bamako Initiative revitalizes primary health care in Benin

Community involvement in primary health care in Benin has helped reduce child death rates, boost immunization coverage, and increase access to antenatal care.



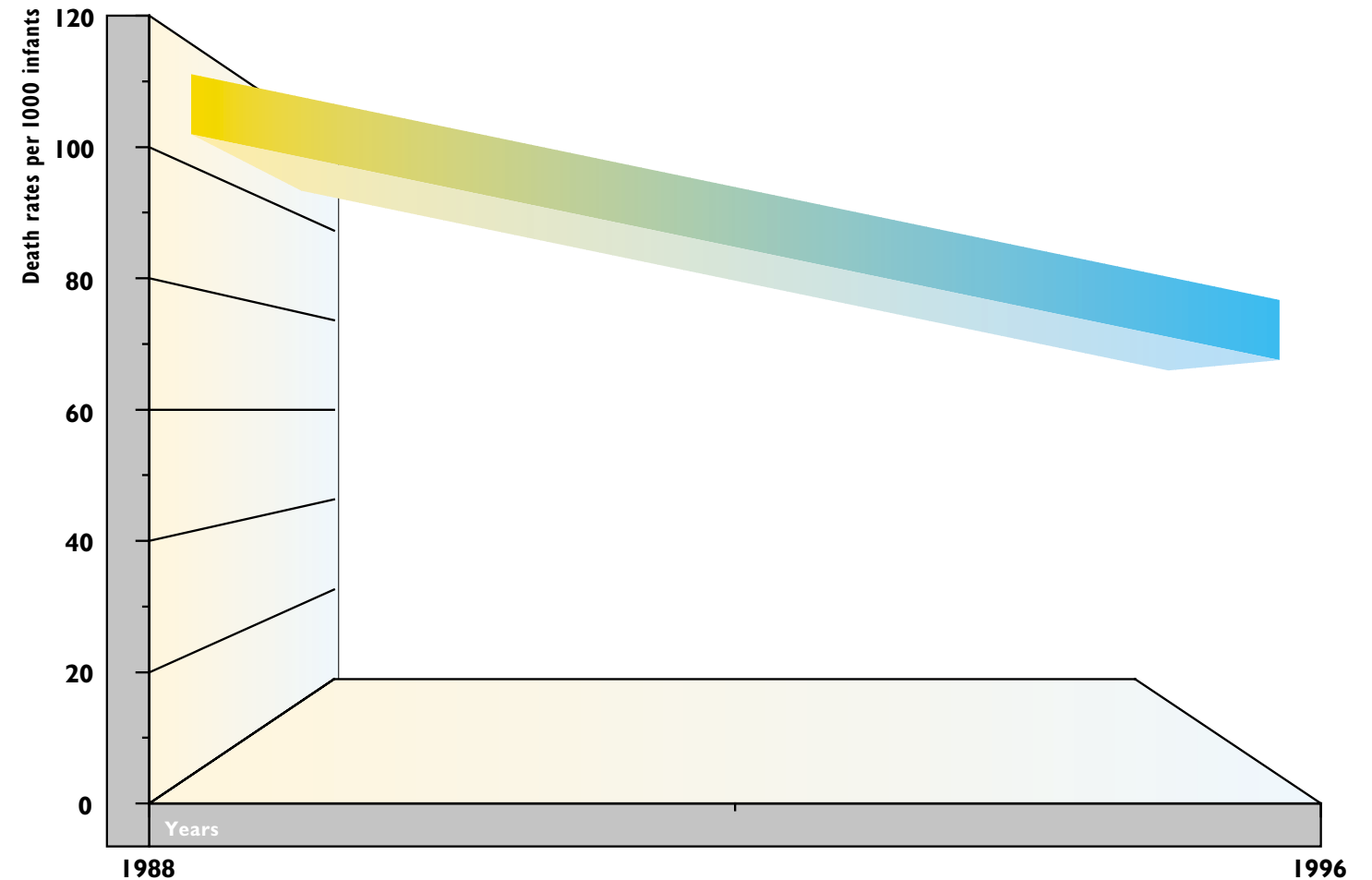
IN THE EARLY 1980s IN BENIN, a child had a slim chance of survival and good health. At the time, Benin had one of the highest under-five death rates in the world: 203 deaths for every 1000 live births. And only one-third of women had access to antenatal care.

Less than 30% of the population had access to functioning primary health care (PHC) services and the government spent only about US\$ 1.50 per capita a year on health.

What changed the situation dramatically was the introduction of a series of community-based health system reform strategies, which helped make primary health care more effective and equitable. Innovations included the reliable supply of affordable essential drugs combined with community co-management, cost-sharing and community-based monitoring of an integrated minimum package of PHC services. These include immunization, health and hygiene education, treatment of minor illnesses, and maternal and child health care.

When UNICEF provided substantial funding for the Expanded Programme on Immunization (EPI) in 1985 to help achieve the objective of Universal Child Immunization by 1990, Benin used the funds not only to improve immunization but also to revitalize their PHC systems.

## Community involvement reduces infant deaths in Benin



Source: Benin Demographic & Health Survey



The health system reform strategies were subsequently formally adopted in 1987 in Bamako by African Ministers of Health, UNICEF and WHO, as the Bamako Initiative. By 1990, the strategies had helped revitalize the entire existing primary health care network in Benin and the country achieved the objective of reaching 75% of children through the national immunization programme.

When a combined economic and political crisis hit West Africa in the early 1990s and undermined the gains made in EPI, Benin – thanks to the Bamako community-based initiative – continued to achieve high immunization rates and significant reductions in death rates among the under-fives.

As a result, by 1998, death rates among infants and children under five were down by nearly 20%, immunization coverage was being sustained at around 80%, and about 65% of women were using antenatal services.

Within a few years of its inception, the Bamako Initiative was adopted widely throughout West and Central Africa, but not always as successfully as in Benin. The remaining challenge in Benin is to build on the Bamako Initiative experience in order to accelerate large scale implementation of other health initiatives such as Roll Back Malaria, Stop TB, and the International Partnership Against AIDS in Africa.



# Bamako Initiative

## A recent analysis of the results achieved through the Bamako Initiative highlights the key conditions for success:

- A health system reform approach that addresses service delivery, drug supply, financing, and management in an integrated and coherent way.
- Strong community involvement in planning, managing, monitoring, and problem-solving, especially regarding supply and demand of an integrated package of PHC services.
- Broad-based partnerships that include government, communities, researchers, and donors relying on frequent and frank dialogue and building on the comparative advantage of each.
- Flexibility in approach and regular adaptation of strategies to meet changing needs.
- Strong networking among public health professionals and community leaders, both within and between countries, in a cooperative spirit that facilitates learning from experience, peer review, mutual support, and positive competition.