

## Vitamin and mineral deficiencies harm one-third of the world's population, says new report

Micronutrient deficiencies are damaging the health of one-third of the world's population and hampering the economic development of nearly every country in the Southern Hemisphere says a new report released on 21 January at the 2004 World Economic Forum in Davos, Switzerland, by UNICEF and the Micronutrient Initiative, a Canadian-based non-profit organization.

*Vitamin and mineral deficiency: a global damage assessment* (available at [http://www.unicef.org/media/files/davos\\_micronutrient.pdf](http://www.unicef.org/media/files/davos_micronutrient.pdf)) concludes that current efforts to remedy micronutrient deficiencies in the world's poorer nations are inadequate and will remain so without new and more aggressive policies. According to the report, micronutrient deficiencies have left 2 billion people living below their physical and mental potential and are having devastating consequences on children. Worst affected countries include Afghanistan, Pakistan, Cambodia, Ethiopia and most West and Central African nations.

"It's no longer acceptable to simply identify symptoms of micronutrient deficiency in individuals and then treat them," said UNICEF Executive Director, Carol Bellamy. "We have to protect entire populations against the devastating consequences of vitamin and mineral deficiency, especially children."

The report summarizes results from nutritional status studies undertaken in 80 countries and identifies four target nutrients crucial to health and development both in utero and in childhood: iron, vitamin A, iodine and folate. Iron deficiency impairs mental development in young children and results in a lowering of national intelligence quotients. It also undermines adult productivity, with estimated losses of as much as 2% of gross national product while anaemia resulting from severe iron deficiency causes deaths during childbirth of an estimated 50 000 women each year.

Lack of vitamin A has left up to 40% of children less than 5 years old in the developing world with compromised

immune systems, leading to the early deaths of one million young children every year.

Iodine deficiencies cause up to 20 million babies to be born with mental defects every year whilst folate deficiency results in about 200 000 severe birth defects annually such as spina bifida, encephalocoele and anencephaly.

"There's no excuse for not reaching every human being with these simple but life-saving micronutrients," Bellamy said. "We know what needs doing, we just have to do it."

Ian Darnton-Hill, UNICEF's Senior Advisor for Micronutrients, said that fortification of food staples like flour, salt, sugar, cooking oil and margarine, and the distribution of vitamin supplements to at-risk groups, would be the most effective strategies.

Fortification — already used successfully for decades in the industrialized world — could have an immediate effect on micronutrient deficiencies, according

to the report. For example, if wheat flour were fortified with iron and folic acid, iron deficiency could be reduced by 10% and birth defects could be lowered by a third in the neediest countries in about five years, according to Ibrahim Daibes, Communications Manager at the Micronutrient Initiative. Such fortification would cost a total of about US\$ 85 million — only US\$ 0.4 per person.

"Our intent is to encourage individual countries to start tackling the micronutrient problem on their own, but we recognize they will need help," Daibes said.

The Global Alliance for Improved Nutrition, launched at a UN Special Session in May 2002, was created to pave the way. Chiefly funded by the Bill and Melinda Gates Foundation, the organization's mission is to help governments and food producers in needy countries start their own iron, iodine and folate fortification programmes. As to vitamin A, the Micronutrient Initiative will



A food market in Alem Kitmama, north-east of Addis Ababa, Ethiopia. The country is one of the worst affected by vitamin and mineral deficiencies.

WHO/P. Viot

work with governments and nongovernmental organizations to expand supplement distribution programmes in countries that already have them and develop new ones in those that don't.

The report also launches an information campaign that is targeted at government agencies, media outlets and food producers in at-risk countries, highlighting the damage caused by vitamin and mineral deficiencies and emphasizing the affordability of the solutions.

Whilst fortification and vitamin distribution would have a significant impact on micronutrient deficiencies in poor countries, most public health professionals agree that these strategies alone are not enough to eradicate the problem, said Bruno de Benoist, Acting Director of WHO's department of Nutrition for Health and Development. "Supplementation is important but it won't solve the problem without concurrent improvement of diet, sanitation and infectious disease control," he said. ■

Judith Mandelbaum-Schmid, *Zurich*

## US and Thai Governments defend HIV/AIDS vaccine trial in Thailand

Public health officials and scientists from the US and Thai Governments have countered accusations by a group of HIV/AIDS researchers who questioned the scientific rationale behind a Thai and US Government-backed trial of an HIV/AIDS vaccine in Thailand.

The phase III trial is testing a vaccine combination that critics say has no "reasonable prospect" of protecting anyone. In an article in *Science* magazine (2004;303:316), 22 HIV researchers contend that scientific evidence for the vaccine is "extremely weak," and they "doubt whether these immunogens have any prospect of stimulating immune responses anywhere near adequate for these purposes." They also argue that any new scientific knowledge that the trial might produce is not worth the US\$ 119 million cost and effort.

However, in a rebuttal published in *Science* (2004;303:961), John McNeil and other scientific officers from the sponsoring agencies argue that the decision to proceed with the trial is "scientifically justified, morally correct

and strategically important." In the same issue of *Science* (2004;303:954-5), Charal Trinvuthipong, Director General of the Department of Disease Control in Thailand's Ministry of Public Health which is co-sponsoring the trial, pointed out that the critics' argument was flawed and that "there is no such thing as wasting time or money in researching an AIDS vaccine."

In September 2003, the first of 16 000 young, heterosexual volunteers began receiving the vaccine which comprises Aventis-Pasteur's live canarypox virus vector ALVAC combined with VaxGen's genetically engineered HIV surface protein gp120. The Aventis-Pasteur vaccine is designed to stimulate cellular immunity by promoting the growth of cytotoxic T cells. VaxGen's gp120 vaccine aims to induce antibodies against HIV. According to the critics, phase I and II clinical trials revealed that the ALVAC vector alone was poorly immunogenic, and trials in the US and Thailand indicated that the gp120 component was "completely incapable of preventing or ameliorating HIV-1 infection." The "prime-boost" combination vaccine was designed to strengthen cellular and humoral immunity to prevent and or control HIV-1 more than either vaccine does alone.

The critics argue that "there are no persuasive data" to support this idea. "I don't think there's anyone who thinks this will be protective," said Beatrice Hahn of the University of Alabama in the US, a co-author of the critique in *Science*. For a phase III trial to be justifiable, there should be a "reasonable prospect" that the vaccine will benefit the study population but this prospect is lacking, argue the authors.

The article accuses the National Institutes of Health (NIH), the agency of the US Department of Health and Human Services backing the trial, of not consulting closely enough with independent experts. The authors fear that the study's failure could erode public and political confidence in HIV/AIDS vaccines and deplete the reservoir of willing participants in future HIV/AIDS vaccine trials. "Our opinion is that the overall approval process lacked input from independent immunologists and virologists who could have judged whether the trial was scientifically meritorious," they said.

However, McNeil and colleagues from the National Institute of Allergy

and Infectious Diseases (NIAID) — the research component of NIH, and the Walter Reed Army Institute of Research in Washington which has also been involved in the project, point out that the combination vaccine was reviewed and endorsed by 11 international governmental and academic scientific, ethical and regulatory review bodies in Thailand and the US and by WHO and the Joint UN Programme on HIV/AIDS (UNAIDS). They also argue that the "prime-boost" combination did seem to increase immune responses in small phase I and phase II studies and since there is no suitable animal model, the only way to test the method further is a large human trial.

Trinvuthipong argues that the basis of the criticism is flawed "in that it uses data from efficacy trials of a single vaccine concept to predict the results of a prime-boost combination vaccine study. Only by conducting the trial will we be able to determine if the combination of two candidate vaccines will induce both cellular and humoral immunity and protect against HIV infection."

Trinvuthipong also said that even if the trial is not successful, it will still give rise to important benefits. "Regardless of the efficacy of the results, Thailand is benefiting from conducting this trial in several areas," he said, pointing out the importance of the experience for scientists, health workers, Thailand's laboratory infrastructure and specimen archiving systems. "Another important benefit," he added, "is the intensified HIV/AIDS awareness campaign around the trial, which directly benefits the local communities in Chon Buri and Rayong."

Modifications to the trial's design are currently under way. "We certainly are looking at ways to improve the design," said Anthony Fauci, Director of NIAID. "And we are going to be doing further immunological monitoring, so that we can get a better handle early on if [the vaccine] isn't giving at least the immunological effect that we're looking for," he added. Additional scientific rationale for the trial will be published soon.

Dr Saladin Osmanov, from the WHO-UNAIDS Vaccine Initiative said that "no one can guarantee that this trial will result in an efficacious vaccine, but what we can guarantee is that if we do not conduct clinical trials, we will never have an AIDS vaccine." ■

Bruce Agnew, *Bethesda, USA*

## Ailing French health care system to go under the knife

The French public health system — once praised by WHO as the best in the world — is overburdened, wasteful and in urgent need of an overhaul, says a government-commissioned report released in January. The diagnosis lays the groundwork for the second of two “modernization” packages — this one targeting the social security system that reimburses medical expenses, the other aimed at the public hospitals themselves — long planned by French Health Minister, Jean-François Mattei.

Written by the High Council for the Future of Health Insurance, a 53-member panel set up last October that included politicians, medical professionals and health insurers, the report highlighted several problems. In particular, a projected €10.9 billion (US\$ 13.7 billion) shortfall in the public health insurance budget in 2004, which could balloon to nearly €66 billion (US\$ 82.9 billion) by 2020.

Beyond finances, the Council also pointed out troubling medical aspects of a system lacking oversight and accountability. For example, the report noted that “nothing justifies” the consumption of two to four times more analgesics, antidepressants, and tranquillisers in France compared to its neighbours. The associated costs and dangers are “considerable,” amounting to over €16 billion (US\$ 20 billion) per year and 350 hospitalizations a day due to toxic interactions between prescription drugs. Remedying the situation, the Council wrote, “requires extremely decided actions” and “active participation from all the players in the ‘medicine chain’: the State, laboratories, drug makers, physicians, pharmacists, public and private health insurers and the patients themselves.”

The report also discusses “grave inadequacies” in the way the health insurance system is currently managed. Compartmentalization, “confusion about who is in charge of what,” and a “sometimes ridiculous accumulation of administration” were cited as major obstacles to efficiency.

Only three years ago, France’s public health system was hailed the best in the world by WHO. It provides universal coverage while allowing relatively unhindered access to both public and

private doctors, services and institutions, generally without long waiting lists. Reimbursement of obligatory medical services averages 76%, but for the sickest patients, costs are 100% paid for up front.

The High Council report warned that the current system of refunding medical expenditures “probably promotes some of the problems.” As a result, the French are bracing themselves for changes that will likely curb their liberal access to medical specialists, treatments and drugs. They will probably have to pay more, too.

Days after the report was delivered, Mattei called for bilateral discussions and set up working groups to detail possible remedies for the ailing health insurance system. The discussions, which are to conclude in early April, will focus on eight topics ranging from the good use of medicines to sharing medical records. The ministry is scheduled to outline the reforms by July.

Meanwhile, after months of negotiations, several unions of medical professionals have agreed to participate in writing the decrees that will govern the implementation of another set of reforms called “Hospital 2007.” These aim to revitalize French public hospitals as well as make them more cost-efficient.

“The last sweeping reform of French public hospitals was in 1958,” says gynaecologist–obstetrician, André Nazac, president of a union representing various medical professionals including assistant clinical directors and young doctors, which has signed its support to Hospital 2007. “Staying in the situation we have now would be more serious than what might happen [with Hospital 2007]. So, we prefer to participate in shaping the law rather than wait until it is written and say we don’t agree.”

“Hospital 2007,” which will be phased in over 3 years starting in June has triggered work stoppages and protests among some medical professionals, since Mattei, a doctor himself, first outlined its goals in 2002. It proposes to tear down compartmentalization within hospitals by creating multidisciplinary “poles” or service units. It also calls for each public hospital to set up an executive committee made up of administrative and medical personnel to direct treatment, teaching and research priorities. Funding will be restructured to give the most active departments and services a larger share of the budget. Other changes will range

from updating purchasing and pricing procedures to reducing the wait in emergency rooms. A system of evaluation and promotion based on competency may also be inaugurated.

Problems with the French public health care system became increasingly apparent in recent months. When Europe sweltered under a heat wave last August, for example, more than 15 000 people died in France, dwarfing the number of deaths in neighbouring countries. In December, a nationwide flu and bronchitis epidemic led to a shortage of hospital beds. ■

Charlene Crabb, *Paris*

## Top broadcasters join forces with UN on HIV/AIDS prevention

Twenty of the world’s most powerful broadcasters and media conglomerates joined forces with humanitarian agencies to fight HIV/AIDS in a new initiative which UN Secretary-General, Kofi Annan, said had the potential to save “as many, if not more, lives than physicians.”

“In the world of AIDS, silence is death,” Annan told broadcasters at a meeting in New York on 15 January to launch the Global Media AIDS Initiative.

The initiative — the first of its kind to be launched by the UN — is financed by the Bill and Melinda Gates Foundation and run jointly with the Kaiser Family Foundation, a US non-profit group that has been working with health agencies and media groups addressing the HIV/AIDS epidemic for more than a decade. The project aims to find ways in which the media can use their resources to raise awareness about HIV/AIDS and to help gather broader support in the fight against it.

Participants included leading global networks like Viacom of the US and the British Broadcasting Corporation, as well as domestic broadcasters in China, India, Nigeria and South Africa.

“AIDS is an epidemic of the information age,” said UNAIDS Executive Director, Dr Peter Piot, adding that information was one of the “strongest weapons against the AIDS epidemic “to fight denial, inaction, ignorance, discrimination — the key forces that allow this epidemic to spread.”

Annan appealed to broadcasters to make the fight against AIDS a corporate priority. His proposals included devoting programming, news, editorial

and advertising space to the issue, supporting efforts to train reporters and the development and broadcasting of AIDS-related shows and films. Many broadcasters reported that they had already stepped up their AIDS coverage in recent years.

Award-winning TV dramas like MTV's "Staying Alive" and "Angels in America", a two-part television series based on a Broadway drama about AIDS in New York in the 1980s, have played a vital role in giving the disease a human face, participants said.

In India where some HIV/AIDS patients are stigmatized, Detective Vijay, the main character in a popular crime series, is an HIV-positive private investigator.

South Africa's version of the US children's show, "Sesame Street" — "Takali Sesame" — recently introduced an HIV-positive Muppet called Kami to encourage children to play with school friends who have HIV.

Peter Matlare, Chief Executive of the South African Broadcasting Company, said his network had set up an AIDS helpline called "Love Life" and that 250 000 young South Africans call in every month.

Many broadcasters said respected and popular personalities from sport, entertainment and politics were a powerful tool for communicating the dangers of unsafe sex.

"Who would think we would have Nelson Mandela speaking to our audience on ... condom usage?" MTV chief, Bill Roedy, said.

The president of China Central Television, Zhao Huayong, said a news report showing a Chinese minister shaking hands with an AIDS patient had been groundbreaking in raising awareness about the epidemic in China where few programmes had broached the subject in the past.

Mark Byford, Executive Director General of the BBC, said he had stepped up AIDS coverage on BBC World radio and television massively last year because AIDS was "a global story."

"It's not just about southern Africa. It's Russia, it's the Caribbean, it's China, it's Europe, it's everywhere," Byford said.

In response to Annan's appeal to make HIV/AIDS related material accessible to other media outlets, participants agreed to share footage and information rights-free possibly in the form of a

database. All 20 media networks signed a statement of support and their efforts will be reviewed at an international AIDS conference in Bangkok in July. ■

Fiona Fleck, *Geneva*

## In brief

### *In brief*

This month sees the introduction of an additional *News* section. The objective of *In brief* is to provide readers with short summaries of developments, events or debates in the field of public health that do not merit in-depth reporting but are nevertheless important. We hope that this will help make the *News* a more comprehensive service for *Bulletin* readers.

## European centre for disease control

European Union governments are soon to give their formal approval for a European centre for disease prevention and control. The initiative was given the go-ahead by the European parliament on 10 February.

The centre, which aims to be operating by early 2005, will be based in Sweden and will comprise a core staff of some 30 to 40 officials. It will be managed by representatives from national governments and European Union institutions with an initial three-year budget of US\$ 61 million.

The centre will become responsible for the management of the European communicable disease network and will be closely involved in the work of the EU health security task force which plans against bio-terrorist attacks.

One of its immediate tasks will be to establish a clear working relationship with WHO. The case for a European centre for disease control was argued by Michel Tibayrenc in the *Bulletin* (2001;79:1094). ■

## Yellow fever emergency in Liberia

Three people with confirmed cases and two with suspected cases of yellow fever have died in Liberia prompting the launch of an emergency mass vaccination campaign.

WHO and UNICEF will launch the campaign together with Liberia's Ministry of Health and Social Welfare.

"Conditions are ripe here for an epidemic," said Dr Luzito Simao, of the WHO office in Liberia. "The last 14 years of civil war have literally destroyed Liberia's health infrastructure and yellow fever is an extremely deadly disease. Even among hospitalized patients, the mortality rate may reach up to 50%," he said, explaining that WHO considers just one laboratory confirmed case to be an outbreak.

UNICEF warned that 522 000 people were in need of urgent vaccination but there were only 80 000 vaccination doses available. Both agencies are appealing for US\$ 1.3 million to prevent the outbreak from spreading into the population at large.

With the onset of the rainy season, environmental conditions are set to become even more favourable for the disease. ■

## Humanitarian crisis in Sudan

The recent escalation of violence in Darfur, western Sudan, has led to a humanitarian crisis with thousands of people fleeing into the desert. Three million people remain beyond the reach of aid. Lack of access to food, water and medical facilities is threatening the survival of many, report Médecins Sans Frontières and the UN World Food Programme.

The crisis follows the breakdown of peace talks in mid-December. The ensuing deterioration of security and collapse of law have prevented agencies from operating in the province — one of the most inhospitable regions in the world. According to the UN Office for the Coordination of Humanitarian Affairs, access to most areas outside the region's three state capitals — Nyala, El Geneina and El Fasher — is impaired by daily incidents of militarized violence on major roads and routes. The prevalence of landmines is also complicating efforts to deliver aid.

UN Emergency Relief Coordinator, Jan Egeland, praised the delivery of aid to the region but warned that aid workers "are still not reaching the majority of those in need."

The UN World Food Programme (WFP), which began an airlift of 500 metric tonnes of sorghum into the region in mid-February, described the situation for displaced people in the

region as “deplorable.” Many have lost all their possessions and are living in the open without any facilities. Although huge numbers of people are injured, there is no medical care, said WFP staff.

“It is a very, very alarming situation,” said Getachew Diriba, WFP Senior Programme Officer for Sudan, who had recently visited the region with a delegation from the European Union. “No matter how seriously wounded they are, there is hardly anything to alleviate their suffering.”

Médecins Sans Frontières reported that 17 000 people who have recently gathered in the north-west of the province do not have enough access to drinking water, food or medical assistance to ensure their survival. ■

## In focus

### *In focus*

This month sees the introduction of a second new addition to the *News*. Every month, *In focus* will present a feature on a current public health topic. Its objective is to take a closer, more focused look at a particular issue and to place it in context whether this be historical, geographical or theoretical.

## Flagging global sanitation target threatens other Millennium Development Goals

The global target of halving the proportion of people without access to basic sanitation by 2015 is currently out of reach for many countries, said Børge Brende, Chair of the 12th Session of the UN Commission for Sustainable Development (UNCSD), in a special interview with the *Bulletin*. The Commission is to meet in New York on 14–30 April 2004 to review progress on achieving the Millennium Development Goals relating to water, sanitation and human settlements.

“There are major differences in how much progress has been made, both across [the water and sanitation-related] goals and across countries. The least progress has been made on sanitation,” said Brende. “This affects not only other health-related goals but also some non-health-related goals such as poverty reduction and education,” he added.

A report on the status of progress towards the implementation of the targets relating to sanitation will be submitted by UN Secretary-General,

Kofi Annan, to the UNCSD in April and will be the first review of sanitation as a stand-alone topic by an intergovernmental body.

In 2000, 2.4 billion people lacked access to basic sanitation and 1.1 billion people did not have access to safe water supply, according to a report by WHO and UNICEF Joint Monitoring Programme for Water Supply and Sanitation. Whilst progress was made during the 1990s — over one billion people acquired access to improved sanitation and over 900 million people acquired access to improved water supply — population growth has left the gains looking modest when compared with total global coverage.

WHO projections suggest that continuing the rates of progress maintained in the 1990s could lead to the achievement of the Millennium Development Goal for water — to halve the proportion of the population without access to safe drinking-water by 2015.

For the sanitation target, however, the picture is bleaker. Projections indicate that globally the targets will not be achieved and over 2 billion people will still not have access to any type of improved sanitation facility by 2015. In sub-Saharan Africa, for example, if rates of progress from the 1990s are maintained, the number of people without sanitation coverage will almost double by 2015.

“Even if the target is achieved, 1.7 billion people — almost a quarter of

humanity — would be left without access to even a simple improved latrine in 2015,” said Dr James Bartram, Coordinator of the Water, Sanitation and Health programme, who is leading input to the UN Secretary-General’s report to be submitted to the UNCSD in April.

Achieving the sanitation target requires extending coverage to an additional 1.9 billion people between 2000 and 2015, taking into account projected population expansion in urban areas. The regions that pose the biggest challenge are South-Central Asia and East Asia where an additional one billion people require access to basic sanitation over the same period. Sub-Saharan African countries, where roughly one in two people do not have access to improved sanitation, will need to extend coverage between 2000 and 2015 to an additional 355 million people.

For all regions, access to sanitation in rural areas is much worse than in urban areas. In 2000, only 15% of India’s rural population of 730 million had sanitation coverage whilst in the same year 600 million people living in rural China had no access to basic sanitation.

Urban areas, on the other hand, are faced with the challenge of extending sanitation coverage to slum settlements. Currently 930 million people live in slums and this figure is growing at an accelerated rate. UN Habitat recently



A young girl walks to her home in a slum area in New Delhi, India. Nearly 930 million people worldwide now live in slums and this figure is growing at an accelerated rate. Residents of urban slums like this one face particularly serious obstacles to attracting funds for sewerage and water infrastructure. Uncertainties over settlement durability and lack of land tenure security are strong deterrents to investment.

Keystone

reported that 83 per cent of the population in 43 African cities live without connection to a sewerage system.

Insufficient progress in meeting the sanitation target is holding up other health-related Millennium Development Goals including access to clean drinking water. Water supplies are unlikely to remain safe for drinking without attention to sanitation since human excreta remain one of the most serious sources of drinking-water contamination.

According to WHO, at any given time nearly half the people in the developing world are suffering from one or more of the main diseases associated with inadequate provision of water and sanitation such as diarrhoea, ascariis, guinea worm, hook worm, schistosomiasis and trachoma.

This in turn has an impact on the child mortality goal. "Water and sanitation-related diseases remain one of the biggest causes of deaths among children," said Bartram. Diarrhoea alone causes the deaths of 1.8 million people every year, 90% of which occurs in children less than five years old.

Achieving universal primary education, the second Millennium Development Goal, is also likely to be affected by access to sanitation. A joint WHO/UNICEF report showed that the most common single cause of girls dropping out of school in Africa is lack of adequate sanitation.

Debate over the achievability of the sanitation target meant that it was only added to the Millennium Development Goals relatively recently — in 2002 at the World Summit on Sustainable Development in Johannesburg, South Africa. "There was a big discussion over whether to include sanitation because people knew that it would be a hard target to achieve," said Brende.

A major obstacle to expanding access to sanitation has been funding, in particular at the national level. A 2001 review of Poverty Reduction Strategy Papers found that the poorest countries in Africa do not include sanitation in their national budget recommendations. This despite the fact that past experience has shown that poverty cannot be reduced without improving access to sanitation and safe drinking water: the 1990 cholera outbreak in Peru cost the national economy roughly US\$ 1 billion in just 10 weeks — more than three times the total national investment

in water supply and sanitation improvements during the 1980s.

"We cannot combat poverty, the greatest challenge facing the world today, unless action is also taken within the areas of water, sanitation and human settlements," said Brende.

One reason for the reluctance by governments in some developing countries to invest in sanitation may be due to unrealistic expectations of investment from the private sector. "Sanitation is a less attractive investment proposition than other utility services such as electricity and communication since investment payback periods are often 20 years or more — much longer than other utility services such as electricity and communication," said Brende.

Failure to generate demand for sanitation at the community level has been another obstacle. "In most developing countries decisions regarding sanitation are made by individual households," explained Bartram. Previous investments in sanitation have therefore been less effective than they might have been because they failed to generate demand for sanitation services by influencing household-level decision making."

Experiences in Africa, Thailand and India have shown that individual households are willing to invest their own money in low-cost sanitation systems. The Medinipur Intensive Sanitation Project in West Bengal, India, delivered 1.2 million latrines in 10 years, increasing sanitation coverage from almost zero to 80%. Whilst the project — involving a multilateral agency, state and district governments, a nongovernmental organization and voluntary grassroots organizations — funded technical innovation, research and hygiene education, it did not fund the hardware — the householders themselves paid for the construction of on-plot latrines.

Similarly, as part of a World Bank funded programme to expand access to sanitation to 6.7 million slum dwellers in Mumbai, India, each inhabitant paid US\$ 2 towards a fund to maintain 320 new toilet blocks. (For details of this project, see *Bulletin of the World Health Organization* 2002;80:684-5.)

Another problem preventing the expansion of improved sanitation in developing countries is conflict — sanitation systems need social stability to function effectively. The failure to inte-

grate sanitation provision with hygiene education has also reduced the impact of previous sanitation programmes.

"Successful urban sanitation projects have certain key principles in common," David Satterthwaite, from the London-based International Institute for Environment and Development, told the *Bulletin*. "Keep down unit costs to allow limited funding to go further and increase possibilities for cost-recovery; work directly with community organizations, drawing on their priorities — thereby ensuring better and more easily maintained designs — and their members' capacities to contribute to construction and maintenance; and seek partnerships with municipal governments."

Achieving the sanitation target requires a new division of responsibility, said Satterthwaite: "Get the governments to focus on the 'big pipes' — the water, sewer and drainage mains — into which the community-municipal schemes ... can integrate."

Brende believes that both the water and sanitation targets are still achievable but only if action is taken immediately. "If we wait until 2010 to implement changes, we will never reach the targets," he told the *Bulletin*. "We need more comprehensive plans for Integrated Water Resource Management and we must encourage alliances and partnerships among governments, businesses, UN organizations, international financial institutions to drive the implementation process forward."

The UN Millennium Project Task Force on Water and Sanitation, a research team dedicated to identifying means of implementing the water and sanitation targets by 2015, published its interim report in February 2004 (available at [http://www.unmillenniumproject.org/html/interim\\_reports.shtm](http://www.unmillenniumproject.org/html/interim_reports.shtm)).

For more information on the twelfth session of UNCSO, visit: <http://www.un.org/esa/sustdev/csd/csd12/csd12.htm>. ■

Sarah Jane Marshall, *Bulletin*