WHO-Facts Sheet

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Kuwait Medical Journal 2002, 34 (4): 336-344

1. POLIOMYELITIS

Poliomyelitis and its symptoms: Poliomyelitis (polio) is a highly infectious disease caused by a virus. It invades the nervous system, and can cause total paralysis in a matter of hours. The virus enters the body through the mouth and multiplies in the intestines. Initial symptoms are fever, fatigue, headache, vomiting, stiffness in the neck and pain in the limbs. One in 200 infections leads to irreversible paralysis (usually in the legs). Amongst those paralyzed, 5%-10% die when their breathing muscles become immobilized.

Persons at risk of polio: Polio mainly affects children under five years of age.

Prevention of polio: There is no cure for polio; it can only be prevented. Polio vaccine, given multiple times, can protect a child for life.

Polio caseload: Polio cases have decreased by 99.8% since 1988, from an estimated 350,000 cases to 483 in 2001. The reduction is the result of the global effort to eradicate the disease.

The Global Polio Eradication Initiative

Launch: In 1988, the forty-first World Health Assembly, consisting then of delegates from 166 Member States, launched a global initiative to eradicate polio by the end of the year 2000. This followed the certification of the eradication of smallpox in 1980, the progress during the 1980s towards elimination of the poliovirus in the Americas, and the Rotary International's commitment to raise funds to protect all children from the disease.

Progress: Overall, in the 14 years since the Global Polio Eradication Initiative was launched, the number of cases has fallen by 99.8%, from an estimated 350,000 cases in 1988 to 483 in 2001. In the same time period, the number of polio-infected countries was reduced from 125 to 10.

In 1994, the World Health Organization (WHO) Region of the Americas (36 countries) was certified polio-free, followed by the WHO Western Pacific Region (37 countries and areas including China) in 2000 and the WHO European Region (51 countries) in June 2002. Widely endemic on five continents in 1988, polio is now found only in parts of Africa and South Asia.

Progress from 2000 to 2001 includes a reduction in polio-endemic countries from 20 to 10, and a more than 80% drop in new cases from 2979 to 483. Two traditional poliovirus reservoirs, Bangladesh and the Democratic Republic of the Congo found no wild poliovirus in 2001 despite very good surveillance, demonstrating again the efficacy of the polio eradication strategies even in highly populated or conflict-affected countries.

Objectives:

- To interrupt transmission of the wild poliovirus as soon as possible and certify all WHO regions polio-free by the end of 2005;
- To implement the polio endgame program of work, including containment of wild poliovirus, global polio-free certification, and the development of a post-eradication immunization policy;
- To contribute to health systems development by strengthening routine immunization and surveillance for communicable diseases.

Strategies:

There are four core strategies to stop transmission of the wild poliovirus and certify all WHO regions polio-free by the end of 2005:

- high infant immunization coverage with four doses of oral polio vaccine in the first year of life;
- supplementary doses of oral polio vaccine to all children under five years of age during national immunization days (NIDs);
- surveillance for wild poliovirus through reporting and laboratory testing of all cases of acute flaccid paralysis (AFP) among children under fifteen years of age;

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- targeted "mop-up" campaigns once wild poliovirus transmission is limited to a specific focal area.

Before a WHO region can be certified polio-free, three conditions must be satisfied: (a) at least three years of zero polio cases due to wild poliovirus; (b) excellent certification standard surveillance; (c) each country must illustrate the capacity to detect, report and respond to "imported" polio cases. Laboratory stocks must be contained and safe management of the wild virus in Inactivated Polio Vaccine (IPV) manufacturing sites must be assured before the world can be certified polio-free.

The Global Polio Eradication Technical Consultative Group (TCG) is overseeing a program of research and consensus building, which will lead to the development of post-eradication polio immunization policy options. The World Health Assembly will consider these options as early as 2005.

Coalition: The Global Polio Eradication Initiative is spearheaded by WHO, Rotary International, the US Centers for Disease Control and Prevention (CDC) and the United Nations Children's Fund (UNICEF).

The polio eradication coalition includes: the governments of countries affected by poliomyelitis; private foundations (e.g. United Nations Foundation, Bill & Melinda Gates Foundation); development banks (e.g. World Bank); donor governments (e.g. Australia, Austria, Belgium, Canada, Denmark, Finland, Germany, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, United Kingdom and United States of America); the European Commission; humanitarian and non-governmental organizations (e.g. the International Red Cross and Red Crescent societies); and corporate partners (e.g. Aventis Pasteur, De Beers and Wyeth). Volunteers in developing countries also play a key role: 10 million participated in mass immunization campaigns in 2001 alone.

Countries At Risk of Polio

As long as a single child remains infected with poliovirus, children in all countries are at risk of contracting the disease. The poliovirus can easily be imported into a polio-free country and can spread rapidly amongst non-immunized populations. At the beginning of 2002, 10 countries were known to have ongoing poliovirus transmission.

These ten polio-endemic countries are divided into two categories: areas with high-intensity and areas with low-intensity transmission.

Areas with high-intensity transmission: Together, these countries accounted for more than 85% of the new polio caseload in 2001. They are characterized by having areas with large populations and low routine immunization coverage, sub-optimal sanitation and relatively wide geographical distribution of the wild poliovirus. These countries are: India, Pakistan, Afghanistan, Nigeria and Niger.

Areas with low-intensity transmission: Together, these areas accounted for less than 15% of the new polio caseload in 2001. They generally have lower-density populations and focal areas of wild poliovirus transmission. These countries are: Somalia, Sudan, Ethiopia, Angola and Egypt.

Priorities for Polio Eradication

In order to stop transmission of the wild poliovirus and optimize the benefits of polio eradication, there are three global priorities:

Closing the funding gap: The total external financial support needed to the end of 2005 – the target date for certification – is US$ 1 billion. Of that, US$ 725 million have been pledged or are projected, leaving a US$ 275 million funding gap. Necessary financial resources must be secured to purchase oral polio vaccine (OPV), to plan and implement national immunization days and mop-up campaigns, and to cover surveillance and laboratory costs. Should wild poliovirus transmission continue into 2003 in all remaining endemic areas, the total program costs could increase by as much as US$ 150 million.

Maintaining access and political commitment: To eradicate polio, all children under five years of age, in every corner of the world, must be reached and vaccinated. This includes children in densely populated urban areas, those in remote regions and children who may be difficult to access because of conflict. Efforts to establish cease-fires and "Days of Tranquility" must continue to be expanded, drawing upon the strengths of UN agencies, the International Red Cross and Red Crescent societies, and other new and existing partners. In polio-endemic countries, personal monitoring of progress towards eradication by the head of state is the key to improving the quality of activities. In polio-free countries, political commitment is needed to sustain certification-standard surveillance, achieve laboratory containment of poliovirus and support eradication activities in the remaining polio-endemic countries.

Implementing the "polio endgame" strategies: laboratory containment, certification of polio eradication and development of post-certification polio immunization policy: Before the world can be certified polio-free, all wild polioviruses in laboratories must be adequately contained. This is a process, which has begun with the identification of wild poliovirus materials in laboratories and will culminate when all remaining laboratory stocks are handled under appropriate bio-safety conditions in the post-eradication era. Global polio-free

certification requires the maintenance of certification-standard AFP surveillance for at least three years following the last polio case in any WHO region, and assurance that wild virus in (IPV) manufacturing sites will be safely managed. The Global TCG for Poliomyelitis Eradication is overseeing the program of work on the development of polio immunization policy in the post-eradication era. Ultimately the World Health Assembly will determine this policy.

Impact of The Global Polio Eradication Initiative

From the launch of the global initiative in 1988 to the eradication target date of 2005, 5 million people - mainly in the developing world - who would otherwise have been paralyzed, will be walking because they have been immunized against polio. By preventing a debilitating disease, the Global Polio Eradication Initiative is helping reduce poverty, and is giving children and their families a greater chance of leading healthy and productive lives. By establishing the capacity to access children everywhere, almost two billion children worldwide have been immunized during national immunization days (NIDs), demonstrating that well-planned health interventions can reach even the most remote, conflict-affected or poorest areas. In 2001 alone, 575 million children were reached as part of these efforts in 94 countries. Planning for NIDs provides key demographic data – "finding" children in remote villages and households for the first time, and putting them on the map for future health services.

In most countries the Polio Eradication Initiative has expanded the capacity to tackle other diseases by building effective disease reporting and surveillance systems, training epidemiologists and establishing a global laboratory network. Bolstering the cold chain, and the transport and communications systems for immunization has strengthened routine immunization services. At the end of 2001, 90% of polio-funded staff was already involved in planning and implementing routine immunization and surveillance services.

In 2001 alone, over 60 countries gave vitamin A during polio national immunization days, preventing over 250 000 childhood deaths. A recent study suggests that in total, 1 million childhood deaths have been prevented since 1998 through the provision of vitamin Aduring NIDs. On average, one in every 250 people in a country have been involved in polio immunization campaigns. Tens of millions of volunteers have been trained to deliver OPV and vitamin A, fostering a culture of disease prevention.

Through the synchronization of NIDs, many countries have established a new mechanism for coordinating major cross-border health initiatives aimed at reaching all people – a model for regional and international cooperation for health.

Future Benefits of Polio Eradication

Once polio is eradicated, the world can celebrate not only the eradication of a disease but the delivery of a global public good – something from which every person, regardless of race, sex, ethnicity, economic status or religious belief, can benefit for all time, no matter where they live. The savings of polio eradication are potentially as high as US$ 1.5 billion per year – funds that could be used to address other public health priorities.

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2. CARDIOVASCULAR DEATH AND DISABILITY CAN BE REDUCED BY MORE THAN 50 PERCENT

Particularly in developing world, more people are at risk than previously thought, and conditions could be controlled quickly with medical and social interventions. More than 50 percent of deaths and disability from heart disease and strokes, which together kill more than 12 million people worldwide each year, can be cut by a combination of simple, cost effective national efforts and individual actions to reduce major risk factors such as high blood pressure, high cholesterol, obesity and smoking, the World Health Organization (WHO) says. Most of the benefits from these combined interventions can be achieved within five years of their implementation, since the progression of cardiovascular (CV) disease is relatively easily interrupted. If no action is taken to improve cardiovascular health and current trends continue, WHO estimates that 25 percent more healthy life years will be lost to cardiovascular disease globally by 2020. The brunt of this increase will be borne by developing countries.

These findings come from the first-ever global analysis of disease burden due to major CV risks: high blood pressure, high cholesterol, tobacco, obesity, physical inactivity and low consumption of fruits and vegetables. They are contained in the upcoming World Health Report 2002: reducing risks, promoting healthy life, to be released at the end of this month.

One major finding of the report is that blood pressure alone causes about 50 percent of CV disease worldwide. Cholesterol causes about one-third. Inactive lifestyles, tobacco use and low fruit and vegetable intake account for 20 percent each. (These percentages add up to more than 100

percent because some risks overlap. One individual could be at risk from cholesterol alone, while another could be at risk from cholesterol and blood pressure together).

It was estimated that about nine million deaths and more than 75 million lost healthy life years annually were due to unfavorable levels of blood pressure or cholesterol. Overall, approximately 75 percent of CV disease can be attributed to the established risks assessed in the report, far higher than the one-third to one-half commonly thought. The burden is about equally shared among men and women.

In total, 10-30 percent of adults in almost all countries suffer from high blood pressure, but a further 50-60 percent would be in better health if they had lower blood pressure. Even small reductions in blood pressure for this "silent majority" would reduce their heart attack and stroke risk. A very similar pattern occurs for cholesterol. "The global disease burden due to blood pressure is twice as much as previously thought," says Gro Harlem Brundtland, M.D., Director-General of WHO. "This reflects recent findings on how strongly blood pressure is linked to disease in many diverse populations around the globe, and the realization that most people have sub-optimal levels."

The most immediate improvements in cardiovascular health can be achieved with a combination of drugs; statins for cholesterol lowering and low-doses of common blood pressure lowering drugs and aspirin given daily, to people at elevated risk of heart attack and stroke. This highly effective combination therapy could be much more widely used in the industrialized world, and is increasingly affordable in the developing world. "This drug combination could cut death and disability rates from CV disease by more than 50 percent among people at risk of cardiovascular disease," says Christopher Murray, MD, Ph.D., Executive Director of the Cluster on Evidence and Information Policy at WHO. "More people at elevated risk for CV disease should start taking the combination now, before they have heart attacks or strokes."

This drug combination would cost less than US$ 14 to treat each person annually. Although this is a very low cost, it might not be affordable to poor countries facing the traditional burdens posed by communicable diseases and the growing burden of non-communicable and chronic diseases. New resources would need to be found if the opportunities presented by this combination are to be fully realized. The recent WHO Commission on Macroeconomics and Health highlighted the need for major new injections of resources from high-income countries.

The World Health Report 2002 also urges countries to adopt policies and programs to promote population-wide interventions like reducing salt in processed foods, cutting dietary fat, encouraging exercise and higher consumption of fruits and vegetables, and lowering smoking. The fact that the vast majority of adults world-wide have blood pressure and cholesterol that are not optimal for health has clear implications for governments, which have the capacity to address the root causes with population-wide measures. Such efforts will also require increased access to cost-effective medications for those at elevated risk.

"Prevention is the key to lowering the global disease burden of heart attacks and strokes," says Dr Brundtland. "The ideal strategy for many countries would be to devote many more resources to introduce broad measures that can benefit the whole population and at the same time target those at elevated risk with the combination of pills." "Our new research finds that many established approaches to cutting CV disease risk factors are very inexpensive, so that even countries with limited health budgets can implement them and cut their CV disease rate by 50 percent," says Derek Yach, M.D., Executive Director of the Cluster on Non-communicable Diseases and Mental Health. "In addition, established drug treatments are increasingly affordable in middle and low-income countries, as effective drugs come off patent."

WHO has developed a first-ever system of identifying and reporting cost-effective health interventions consistently across settings that it calls CHOICE (Choosing Interventions that are Cost-Effective). Various CHOICE options are contained in a new statistical database that is also a part of the World Health Report 2002. These interventions can be implemented on an à la carte basis, depending on each country's individual circumstances.

CV Disease: No Longer a "Western" Problem. The Report shows for the first time that most of the global burden due to CV risks occurs in the developing world. This is a result of already high and increasing risk factor levels (e.g. high cholesterol) and large and ageing populations. Tobacco, blood pressure and cholesterol are leading risks in industrialized countries, together accounting for more than a quarter of lost healthy life years. But they also feature prominently in the top risks in middle-income countries and are beginning to appear in the leading risks of poorer developing countries.

"We are seeing that conditions like high blood pressure and high cholesterol are much more prominent in developing countries than previously

thought and they contribute significantly to their overall disease burden," says Anthony Rodgers, M.D., Ph.D., of the University of Auckland, New Zealand, who is a WHO consultant and one of the report's main writers.

"The world once thought of CV disease as a Western problem, but clearly this is not the case. We can no longer frame diseases in terms of where they occur, but rather with what frequency they occur in any given population." "The need to control CV disease is especially important in poor countries because it places a double burden on their national health systems. They must simultaneously deal with infectious diseases found primarily in these countries as well as newer cardiovascular conditions," says Dr Brundtland.

"In the new mega-cities of the developing world, we see illnesses due to under-nutrition side by side with poor cardiovascular health." The trend toward increased CV disease in developing countries may be particularly dangerous in the lower end of the socio-economic spectrum. In industrialized countries CV disease once afflicted wealthier people in disproportionate numbers. However, as knowledge of cardiovascular health increased, the wealthy were able to reduce the frequency of their affliction, while the incidence of CV disease increased among the poor and minorities. If this trend repeats in the developing countries, the very poorest of the world's poor will be the ones most at risk.

Population-wide interventions should be given priority, as they are very effective; the combination of pills alone should not be considered the exclusive or even the primary means of reducing cardiovascular risks. Population-wide interventions are the most cost-effective methods of reducing risk among an entire population. They should be the first to be considered in all settings.

"In many countries, too much focus is being placed on one-to-one interventions among people at medium risk for CV disease," Dr Murray says. "A much better use of resources would be to focus on those at elevated risk and to use other resources to introduce population-wide efforts to reduce risk factors through multiple economic and educational policies and programs."

The WHO report also questions the accepted common threshold labels such as "hypertension." The report outlines the increasingly clear evidence that health risks are not restricted to those above these thresholds. Rather, the vast majority of people would benefit from lower levels, as the risks are continuous. In fact, cholesterol and blood pressure measurements that are considered "average" are actually too high for good health.

"CV disease risk often falls along a standard bell curve, with the vast majority of the population at some elevated risk of CV disease and only a few with very high or very low risk," says Dr Rodgers. "The most inexpensive means of reducing CV disease in a given country is to move the entire population to a lower risk zone through public education and government-led interventions. This is particularly true in poor countries that may have more difficulty affording modern medical treatments in spite of their decreasing costs."

Modern-day conditions frequently mean that individuals, particularly the poor in the cities of the developing countries, often have little control over the major risk factors. For example, urban poor often can only buy high-fat and high-salt processed foods. Many processed foods - breads, soups, meats, etc. -- have salt concentrations approaching or even exceeding that found in seawater. For example, when their sodium content is compared to that of seawater, which has 1g of sodium per 100g:

- Bread and crackers are about 50 percent as salty
- Cornflakes are about 100 percent as salty
- Soups are up to 300 percent as salty
- Sausages are 50-150 percent as salty

As a result, salt intakes are usually very high and, in industrialized countries, more than 75 percent is usually from processed foods.

Targeted Medical Interventions: Inexpensive, yet powerful.

An "absolute risk approach" to managing blood pressure and cholesterol is also very cost-effective in all regions and has the potential of leading to dramatic reductions in ischaemic heart disease and stroke. This involves people at elevated risk of cardiovascular disease being provided with "low dose combination treatment" -- a combination of multiple drugs including blood pressure lowering pills, statins and aspirin. This reflects recent evidence that such therapy benefits all groups at elevated risk, even those with average or below average blood pressure or cholesterol.

Side effects from these drugs exist, but they are less than generally perceived, and can be minimized with low-dose combinations. The benefits will considerably outweigh any harm in those at elevated risk of vascular disease.

This report will likely challenge current priorities for health systems in many countries:

- Few governments have yet to develop successful collaboration with the food industry to reduce salt and high fat in processed food.
- The report calls for new strategies and new thinking. It is increasingly clear that people at elevated risk benefit from combined, multi-modal treatment, largely irrespective of what

initially caused their risk to be high, and what their current risk factor levels are. This is a paradigm shift for many doctors.
- WHO also suggests that the large resources now devoted to detecting, treating and monitoring people at comparatively low risk of heart disease or stroke be reduced, while greater resources be given to those with multiple risk factors who are at the highest risk, who are now often under-treated.

CHOICE: Finding the Most Cost-Effective Method

The WHO CHOICE project reports that several established approaches to CV disease risk factor management easily meet international standards for cost-effectiveness, even in the poorest countries of the world.

"Take tobacco taxes, for example," says Dr Murray. "Countries that raise their tobacco taxes dramatically witness an almost immediate reduction in tobacco use and have corresponding improvement in cardiovascular health quickly. A seven-dollar pack of cigarettes will go a long way toward persuading smokers to quit and non-smokers not to start."

Governments, industries and civil societies can work together to enable the behavioral changes necessary to reduce risk among entire populations. The best approaches will be different from country to country, and many lessons can be learned from past experiences. Some of the successes include:
- In the United Kingdom, a government-promoted program in consort with the food and drink manufacturing industry successfully reduced salt content in almost a quarter of manufactured foods. This occurred gradually over several years and examples included an agreement among members of the Bakers Federation and reductions within products produced by several major supermarket chains.
- In Mauritius, cholesterol reduction was achieved largely by a government-led effort switching the main source of cooking oil from palm to soya bean oil.
- Korea has worked to retain elements of the traditional diet.

Civil society and government initiatives led mass media campaigns, such as television programs, to promote local foods, traditional cooking methods and the need to support local farmers.
- In Japan, government-led health education campaigns and increased blood pressure treatment have reduced blood pressure population-wide, and stroke rates have fallen by more than 70 percent.
- In Finland, community based interventions, including health education and nutrition labeling, led to population-wide reductions in cholesterol and many other risks, closely followed by a precipitous decline in heart disease.
- In the USA, a decrease in saturated fat intake in the late 1960s began the large decline in coronary heart disease (CHD) deaths seen in the last few decades there.
- In New Zealand, introduction of a recognizable food labeling logos for healthier foods led many companies to reformulate their products.

The benefits included large decreases in the salt content of processed foods. "If we consider the dramatic improvement in cardiovascular health that, for example, the Japanese and the Finns have experienced in the last few decades, we can see that entire populations have been able to significantly improve their situations without any change in their gene pool," says Dr Murray. "Clearly diet, exercise and a reduction in tobacco and alcohol intake are the most important factors to consider."

The World Health Report 2002 is focusing on risks to health. It will rank the top global risk factors and outline cost effective measures for reducing risks, showing in detail the reductions in death and disability that can result from a risk-focused approach to health issues. The report will be launched on 30 October.

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3. DECODING OF MALARIA GENOMES OPENS NEW ERA IN PUBLIC HEALTH

GENEVA - Today's announcement of the decoding of the genomes of the most dangerous malaria parasite, Plasmodium falciparum, and of the most important mosquito which transmits it, Anopheles gambiae, signal a turning point for global public health. Now, the most advanced tools of science are at last being used to control one of biggest killers in the developing world.

"This is an extraordinary moment in the history of science," said Carlos Morel, Director of TDR the Tropical Disease Research program. "At last, the enormous power of modern technology is penetrating the mysteries of an ancient disease, a disease which continues to kill millions."

Malaria infects more than 300 million people every year, killing at least one million of them. About 90% of the deaths are children under five.

And it's getting worse. Public health campaigns against malaria have been stymied over the last decade as both the mosquito and the parasite have evolved mechanisms to escape the limited, affordable technologies available in the developing world.

Drugs targeting the parasite are losing their effectiveness. Today, resistance to choloroquine, which is the cheapest and most widely used antimalarial, is common throughout Africa. The next most effective but more expensive drug, sulfadoxine-pyrimethamine (SP), is also succumbing to resistance in highly endemic areas of eastern and southern Africa.

The mosquito has proven just as wily a foe. Anopheles gambiae is an extremely efficient transmitter of the disease. Public health experts have long called the mosquito the "most important insect in the world." Unlike other mosquitoes, A. gambiae has earned the epithet of "malaria machine" because it has a strong preference for humans and those humans within its range can be bitten literally hundreds of times a day. Elimination strategies, which have been successful in industrialized countries, have stalled in the developing world as cheap insecticides are losing their potency to resistance, and environmental concerns have reduced their availability.

To open new research paths, TDR and its partners, including its co-sponsor the World Health Organization, have pushed for over a decade to bring genetics into the struggle against malaria. Seeds of this "molecular entomology" were first planted in 1991 when scientists called to a TDR and MacArthur Foundation meeting first proposed the then-unorthodox approach of attacking malaria through genetics. In 2001, another TDR meeting, arranged in collaboration with Institut Pasteur, launched the A. gambiae genome initiative. Now that work is done.

The breakthroughs announced this week in Nature and Science open an entirely new field to public health researchers. With this new knowledge, malaria scientists will be able to pry out information long hidden in the genomes that can be used to design new insecticides, new repellants and new drugs.

"We now have the master plans for man, plasmodium and mosquito," says Morel. "This has opened a completely new field of work for everyone. Now, anyone with a computer and access to the internet will be able to look for targets for new drugs and new insecticides."

The genetic codes themselves would be useless if there were not trained researchers poised to exploit the information. Anticipating this day, TDR has for the last two years been training over 100 scientists from Latin America, Africa and Asia in how to search the genomes, identify vulnerabilities, and build new genetically based drugs and insecticides. While exuberant at the announcements, it is obvious from the pace of developments following the decoding of the human genetic code that the fruit of genomics takes a long time to mature. Still, for scientists who have been stymied by the disease for years, the elucidation of the genomes has electrified the field. "There is now information for everyone to work 24 hours a day to find solutions which can save millions of lives," says TDR director Carlos Morel.

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4. LOW INVESTMENT IN IMMUNIZATION AND VACCINES THREATENS GLOBAL HEALTH

The State of the World's Vaccines and Immunization report released lately, warns that if urgent and strategic action is not taken to close the gaps in funding, research and global immunization coverage, the world will see the re-introduction of old diseases and the emergence of new infections. Jointly produced by the World Health Organization (WHO), UNICEF and the World Bank, the report highlights remarkable achievements in immunization over the last decade and outlines the challenges for the future. The report points out that while vaccines have saved billions of lives in the past century and are still the least expensive way of controlling the spread of infectious diseases, they are not reaching the populations that need them most. "Vaccines are among the most cost effective public health interventions," says Carol Bellamy, Executive Director of UNICEF and Chair of Global Alliance for Vaccines and Immunization (GAVI). "Today, no child should die from a vaccine-preventable disease. We need to invest more - and more rationally - in vaccine coverage and research, and ensure access in all corners of the globe".

Currently, nearly three quarters of the world's children are being reached with essential vaccines but wide variations exist between North and South and within regions. Children in the developed nations now have access to additional, newer and more expensive vaccines to protect them against major childhood diseases including hepatitis and Haemophilus influenzae. But in sub-Saharan Africa

only half of the children have access to basic immunization against common diseases such as tuberculosis, measles, tetanus and whooping cough. In poor and isolated areas of developing countries, vaccines reach fewer than one in twenty children. “In wealthy countries we tend to take the absence of certain illnesses for granted,” says Dr Gro Harlem Brundtland, Director-General of WHO. “But in many regions of the world it is more the rule than the exception for children to die of common childhood conditions such as measles, which alone causes about 700,000 deaths a year. We need to act fast and effectively to ensure that children and adults everywhere have access to life-saving vaccines. From a global perspective, this is the only way to avoid major epidemics of new and old diseases.”

The report cites low donor investment as one of the major reasons for the huge gaps in coverage. External aid to developing countries for immunization currently stands at approximately US$ 1.56 billion a year. With an additional investment of US$ 250 million a year, at least 10 million more children would be reached with basic vaccines. A further US$ 100 million a year would cover the cost of newer vaccines including hepatitis B and Haemophilus influenzae type B (Hib) vaccines. It is estimated that every year hepatitis B causes 520,000 deaths a year worldwide, and HiB kills 450,000 children in developing countries. Another factor cited for the low vaccination coverage is the low level of investment in immunization by developing countries. For instance, low-income countries spend as little as US $ 6 per person per year on health, including immunization. In such countries immunization coverage will not scale up without improving the health systems, reinforcing infrastructures, boosting health service delivery and developing managerial skills.

“We know immunization is vital to preventing disease and is also the best way to reach the poor and those most in need,” says James Wolfensohn, President of the World Bank, and a member of the GAVI Board. “Building in financial sustainability from the outset, and bridging the gap between rich and poor countries in terms of access to vaccines, is the key to having well-functioning immunization and health systems. Governments, donors, the private sector, and civil society need a long-term vision and a plan of action. Through such strategic partnerships, it is possible to immunize every child.” The report also states that inequity in access to new vaccines has increased over the past two decades, as most low-income countries cannot afford the cost of new life-saving vaccines such as hepatitis B, HiB, yellow fever and rubella.

The low uptake of vaccines in developing nations in turn has impacted on vaccine research. The lack of a market in these countries does not provide sufficient incentives for companies to invest in developing vaccines for diseases that affect predominantly the poor. This affects vaccine development for diseases as shigella dysentery, dengue, Japanese encephalitis, leishmaniasis, schistosomiasis and cholera.

The market situation in developing countries also affects the types of vaccines that are more suitable to developing country strains of global diseases. For instance, while a vaccine with some efficacy for HIV/AIDS is now seen as possibly achievable within the next ten years, only one clinical trial for this vaccine has been conducted in Africa, the continent that bears 70% of the world's HIV burden. A European, North American or Asian HIV vaccine may not be appropriate for an African population.

The report underscores the urgent need for vaccines against malaria, and a new vaccine for tuberculosis (TB). Today, malaria kills approximately one million people a year, the majority of them African children. It is important to note that the most common and most accessible medicines for malaria are now ineffective as populations develop resistance to them.

Tuberculosis, an ancient scourge once thought to have been brought under control, is today a re-emerging disease, fuelled by the rising tide of co-infection with HIV (especially in Africa) and by increasing resistance to TB medicines. Between 1997 and 2000 there was a 9% increase in the number of TB cases. In 2000, 1.7 million people died from TB. Out of the 8 million new cases of TB each year, only 130,000 occur in industrialized countries. TB needs a more effective vaccine. The current one, BCG, creates an immunity that lasts at best up to adolescence, but not for a lifetime. "While new initiatives to fight killer diseases abound, it is the hard cash that is missing," says Dr Daniel Tarantola, Director of Vaccines and Biologicals at WHO. “The global campaign for access to medicines and vaccines needs to be backed with political and financial commitment if we want it to get beyond words and make a difference to people.”

In conclusion, the report proposes simple solutions and strategies to address the gaps. These include:

- Investing efforts in ensuring a fair return on investment in the research, development and production of vaccines, leading to a strong and healthy global vaccine industry.
- Strengthening manufacturing quality in self-producing developing countries, along with the

improvement of national regulatory controls
- Improving skills and infrastructure in countries to better forecast and plan long-term vaccine needs, optimize the impact of vaccines and reduce wastage.
- Ensuring creative and sustainable financing mechanisms to enhance vaccine security - the uninterrupted sustainable supply of affordable vaccines to developing countries
- Advocating more equitable access to priority vaccines, both new and old, for children and adolescents who need them most.

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