2.2. The state of the world's health

2.2.1. Malaria, Tuberculosis, AIDS

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Malaria

"One can nevertheless be confident that malaria is well on its way towards oblivion. Already as a malariologist, I feel premonitory twinges of lonesomeness, and in my own organisation I am now a sort of 'last survivor'"[1].

Given the situation with malaria today, the premonition expressed by the author of the quote above could hardly have been further off the mark. Far from being eradicated – despite the provocative appeal launched by the Gates Foundation[2] – and often elusive for a control programme, malaria remains one of the main causes of death in the world today. Estimates show that the population at risk of malaria is expanding all the time and predict that, by 2010, it will be over three billion people: almost half the total world population. Sub-Saraharan Africa, with 60% of all symptomatic cases and where 80% of all deaths from malaria occur, is particularly hard hit and estimates say that this leads to a loss of approximately 1.3%[3] in potential economic growth. Reducing the morbidity and mortality of malaria is just one of the Millennium Development Goals, however, if it is to be met, there must be a massive injection of funds, because an estimated 4 billion US dollars per year, for the next 10 years, will be required, half of which must go to Africa[4].

In recent years malaria has, once again, become a focus of attention, thanks to support from the *Roll Back Malaria Partnership* and the Global Fund, which has attracted generous funding, contributed by foundations, international agencies and philanthropic organisations, available for research. This has resulted in marked progress in the fight against the disease, both in diagnostic procedures and more generally improvements in treatment: for example, using the combination of antimalaria drugs based on artemisinin, that is recommended by the World Health Organisation (WHO), in a growing number of countries to replace the former, inefficacious and obsolete therapies, based on chloroquine or sulfadoxine-pyrimethamine[5]; using the promising new rapid diagnostic tests which are fast and simple to use, even for less professionally qualified personnel[6]; developing a safe vaccine, efficacious and with good immunogenicity, which is now in the final stages of testing[7,8,9]; and lastly, developing transgenic mosquitoes as part and parcel of the overall strategy of vector control. Furthermore, so as to reduce the time between infection and treatment (less complications, lower mortality) and to reach the targets set at the Abuja Conference in 2000 (at least 60% of children to receive effective treatment within 24 hours from the onset of fever), various countries have tried, and successfully promulgated, a system of treatment administered by community distributors.

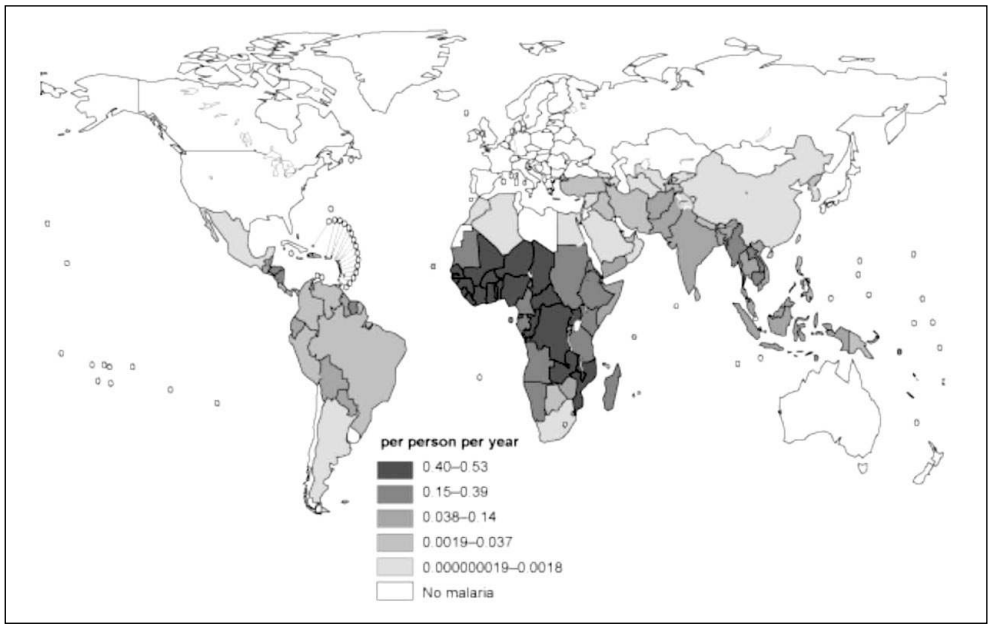

Figure 1. Estimate of new cases of malaria in the World, 2005.
Source: WHO.

These volunteers receive special training in distributing drugs and their work is regularly supervised[10]. Other measures, recommended by the *Roll Back Malaria* programme, are already being adopted and there is widespread scientific evidence of their efficacy. Firstly, insecticide-treated mosquito nets work well, especially if long-acting (lasting 3 to 5 years); they are most accessible and useful when they are distributed free, through a mass campaign and linked to public health interventions[11] such as, vaccinations, Vitamin A supplementation or periodic treatment of the population for tropical diseases. Secondly, intermittent preventive treatment for pregnant women and – if it proves useful – for children under twelve years of age[12]. Lastly, epidemiological surveillance, which is indispensible for recognising and moving fast to control epidemics especially in more unstable transmission regions where the population has not yet acquired immunity and where increases in temperature and rainfall have resulted in a proliferation of the vector[13]. It should be added that indoor residual spraying in houses, schools, hospitals and other institutions with long-acting insecticides including DDT, is also effective. For a long time DDT was unjustly "criminalised" but has recently been re-instated, even in the authoritative opinion of the WHO[14], and it is now being used again. However, because it was ostracised for so long it is still being used only sporadically, and not systematically.

Despite this encouraging picture, some crucial issues remain. Too few people are being reached, even by a remedy as simple as a mosquito net, for it to have a real inhibitory effect on the transmission of malaria among the general population. The costs of providing the artemisinin-based combination are still high, especially for

Health Services who have less than 12 dollars per capita per year to spend; furthermore, supplies of the plant the drug is made from are limited and it is not yet being produced in sufficient quantities to satisfy the rocketing demand. Also, artemisinin is as likely as any other drug to develop the problem of drug resistance, especially if it is not used properly: and if it should affect its treatment category we would be faced with the same disaster[15] as has hit former anti-malarial drugs. Lastly, the geographical distribution of malaria is likely to be strongly affected by the current climate changes which will facilitate transmission and/or spread the disease even wider, with devastating results[16].

Tuberculosis

"I was in jail when they took a specimen of my sputum and sent it to hospital. I was diagnosed with TB"[17].

The direct testimony and support of a famous and widely respected person such as Nelson Mandela has certainly contributed to the renewed commitment to combat tuberculosis (TB) throughout the world. The global TB epidemic is showing no signs of abating and it co-exists in close synergy with HIV: estimates suggest that in 2006, there were 9.2 million new cases of TB in the world and more than one and a half million deaths from the disease (as well as another 200,000 deaths from TB associated with HIV)[18]. The majority of these cases, and deaths, were in Asia and Sub-Saharan Africa.

In May 1991, in the hope of reversing the rising trend in the incidence of TB and preventing it spreading further, the WHO proposed that all countries should commit themselves to meeting the following objectives by the year 2000: diagnosis of at least 70% of all new cases of positive TB sputum; and treatment of at least 85% of all these new cases of positive TB sputum[19]. The deadline for meeting these objectives was put back to 2005 and by this date the WHO objectives had very nearly been met: world data show that, in 2005, the case detection rate stood at 64% and the treatment success rate at 84%.

However, Sub-Saharan Africa and Eastern Europe still have a long way to go before they will be able to meet the objectives set by the *Stop-TB Partnership* (a network with over 500 members drawn from governments, International agencies and NGOs). The Partnership aims to halve both prevalence and mortality rates for TB by 50% before 2015: the former, because of it is association with HIV and the latter because of the ever present threat of drug resistance.

To do this they recommend a strategy based on short treatment regimes, the so called *Direct Observed Treatment Short-course* (DOTS) strategy, of directly supervised intake of drugs each day. Supervision ensures both drugs are taken correctly, and, consequently, that there will be a higher recovery rate, especially in patients with open pulmonary tuberculosis, i.e., those who are potentially contagious.

Even though the DOTS strategy is officially being used in 187 countries, it is not easy to assess exactly how many patients are really being cared for in strict accordance with DOTS methods.

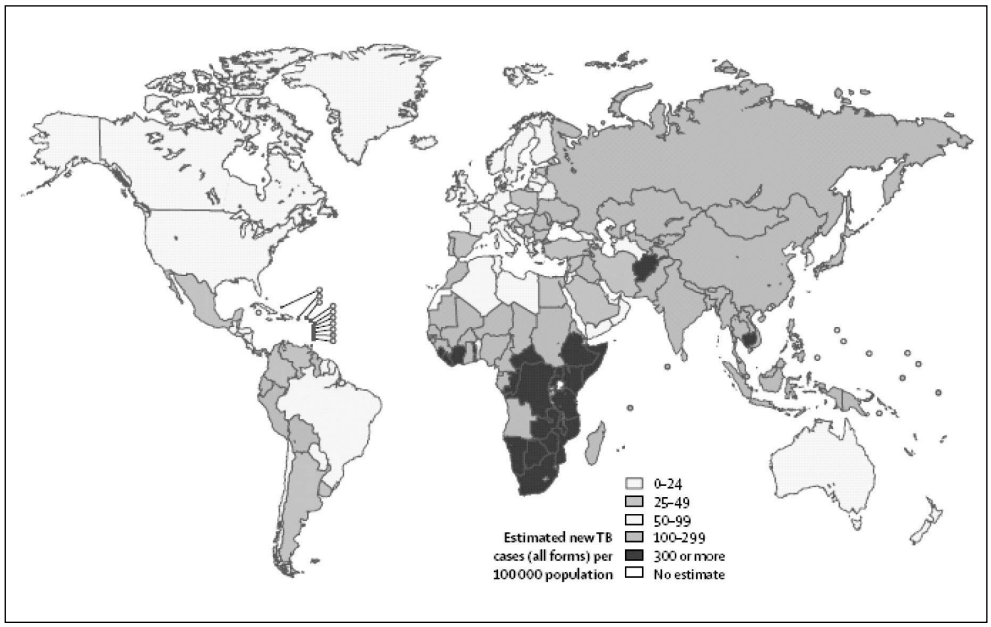

Figure 2. Estimated new TB cases (all forms) 2005.
Source: WHO.

HIV infection strongly influences the clinical aspects of TB[20]: cases tend to be less typical, with many extra-pulmonary forms and, also, with less clear pulmonary forms. Furthermore, the disease progresses more rapidly, even in adults and patients may suffer a relapse when latent nodules suddenly become active again even after they have, seemingly, recovered[21]. This poses various problems for accurate diagnosis. Diagnosis is based on simple laboratory tests that are high specificity, but limited sensitivity for accurate diagnosis. Furthermore, lack of suitable equipment and of the human skills to operate them, along with the way in which smear samples are sometimes collected and a low bacterial load further reduce the rate at which new cases will be notified. Fluorescent microscopy, immunological tests and DNA recognition using the PCR (Polymerase Chain Reaction) method are all better alternatives but are not widely adopted, largely because of their prohibitive costs and of the advanced technical skills they require when used[22]. Indeed, pretreatment of the sputum sample, either by centrifugation or with sodium hypochlorite, offer more practical solutions to the problem of accurate diagnosis[23,24].

The main preventive measures adopted in the struggle against TB are: vaccination, even though there have been serious doubts about the real efficacy of the current vaccine and a new vaccine is currently being developed[25]; early identification of cases; prophylactic administration of isoniazid to cases with latent TB, especially to HIV positive patients[26] who may also benefit from anti-retroviral treatment. The skin test with tuberculin has lost any meaning now that there is a universal vaccination with BCG and other mycobacterioses[27]. Indeed, current treatment regimes are

often out-of-date, complex to run and full of adverse effects. However, there are real hopes of introducing new drugs, such as the fluoroquinolones, within a few years[28]. In the meantime, Multi Drug Resistant (MDR) strains, resistant to the two main drugs – isoniazid and rifampicin – are developing as are Extensively Drug Resistant (XDR) strains, which are resistant even to second-line drugs. According to a recent survey, overall, the percentage of XDR found among the MDR rose from 5% in 2000 to 7% in 2004[29]. This poses real problems at a global level and threatens to destabilise the, already fragile, TB control systems in those same countries that will be the most vulnerable to XDR and are the least equipped to deal with it[30].

AIDS

*"*It is worth noting that the industrial world is spending $600 billion a year on defence, and $350 billion on agricultural subsidies*,* while Africa had slightly less than a billion dollars to spend on AIDS. My use of the phrase "grotesque obscenity" at the conference opening may sound strong, but it wilts in the face of those numbers*"*[31].

Investment in research and control of the HIV pandemic still does not seem to be enough, given the severity, and the continuing spread, of the disease, even though, at least over the past decade, there has been an exponential increase in funding, especially in low and middle income countries[32].

In 2007, the number of people with HIV+ in the world was estimated to be around 33 million[33]. However, this figure, while somewhat lower than that for the preceding year, does not represent a real drop in HIV+ incidence. Indeed, the

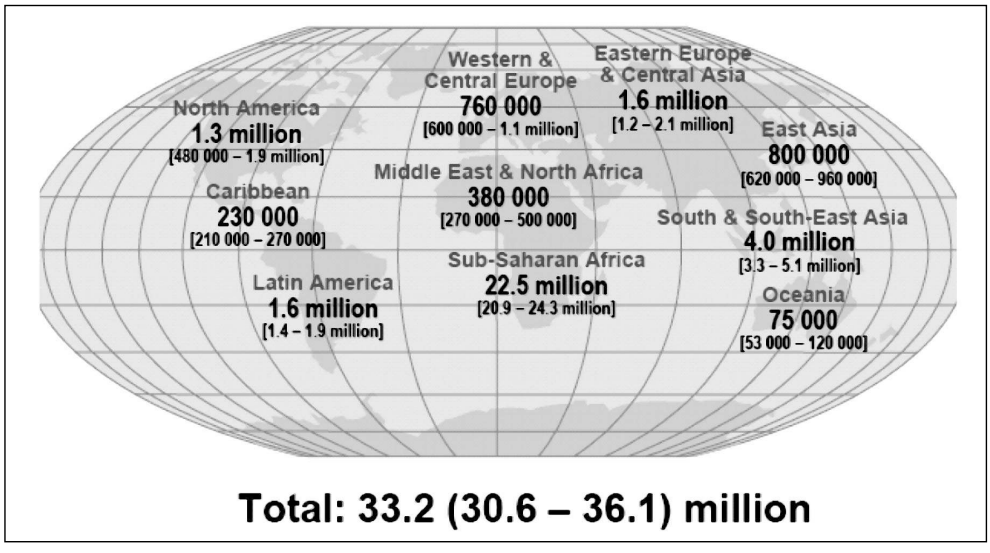

Figure 3. Global estimate of the number of HIV-positive persons in 2007.
Source: UNAIDS

main reason for the drop is linked to a revision of data on India and – more generally – to improved methods being used for making estimates, better data from the various sentinel sites and the technically improved epidemiological studies which also provide data for these estimates. This revision of data has raised a lot of protests and served to encourage the suspicion that numbers could be being inflated in order to justify asking for more funding[34]. But if one studies the overall trend for HIV there have been some heartening – even though geographically limited – successes, such as in Kenya, Cameroon, Cambodia and Thailand. On the other hand, there have also been very disconcerting results, such as in Uganda, where the rate of HIV+ infection has risen, or in Zimbabwe, where the serious economic crisis has had serious consequences for health programmes designed to intervene in and control the HIV epidemic.

As regards control programmes, prevention strategies have had to deal with two bitterly controversial questions. On the one hand the difficult alliance within the ABC (Abstinence, Be faithful, Condom) strategy, whose sometimes conflicting ideological positions (especially those aiming at abstinence-only) have merely created confusion and produced disappointing, if not counter-productive results[35]. And the question of male circumcision, notwithstanding the emphasis laid on it, has not really resolved any of feasibility problems that its implementation can bring[36]. Lastly, although HIV testing is now being regarded as an important part of prevention strategies, which should no longer only be client-initiated but should rather become provider-initiated[37], the coverage offered by testing services, including the prevention of mother-to-child transmission, is worryingly low especially in Africa[38]. To a certain extent treatment programmes using anti-retroviral (ARV) drugs seem to have been more successful. At the end of 2007 there were about 3 million people undergoing ARV treatment, this represents about 30% of all those who, it has been estimated, need such treatment (9.7 million)[39]. The most crucial question here is being able to retain people in treatment and whether such treatment is really successful or not: opinions on this seem to diverge mostly as regards the number of people who join such programmes[40,41,42], however it is generally thought that the main reason why people do not come for follow up is because they have died[43]. There are, however, other complex problems, often difficult to resolve, that are frequently met with when setting up functional programmes for the administration of ARV in those countries where there are few resources. Problems, such as the lack of a technical support to monitor drug effectiveness and the possibility of creating resistance by incorrect use, the limited choice of which drugs to use as first and second line regimens, the lack of paediatric formulations and, lastly, the scarcity of human resources to carry out health programmes. This latter is, indeed, the main limiting factor for any capillary expansion of treatment services with ARV and is that which most requires structural changes in health policies. Policy changes such as re-designing the system through which ARV services are supplied, delegating these services to the least qualified personnel (task shifting), or operating from mobile clinics, may resolve the immediate problem of the lack of human resources but risk jeopardising the quality of the services offered[44].

As regards vaccination, enormous efforts have been made to produce a safe and

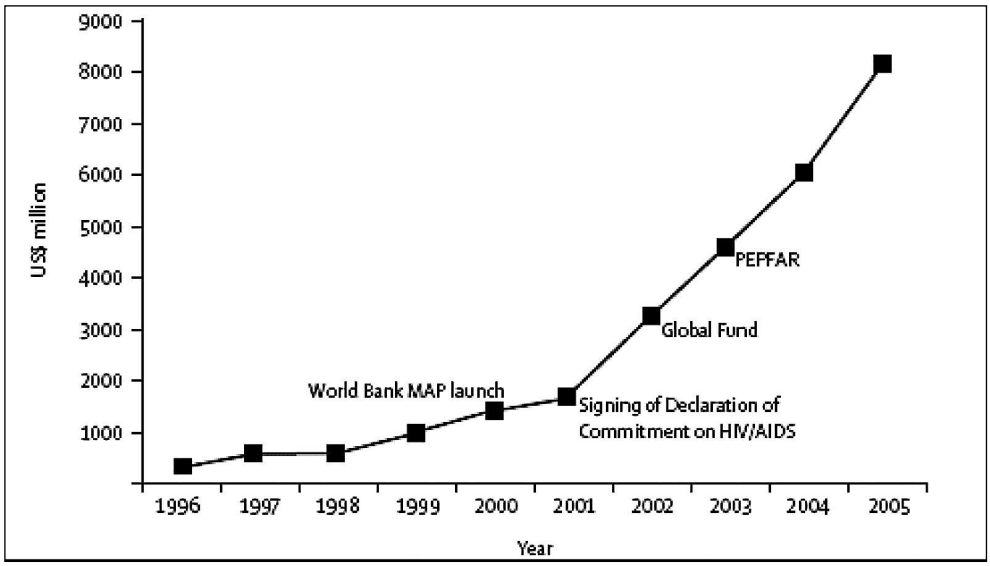

Figure 4. Estimate of the resources available, per year, for the struggle against AIDS 1996-2005.
Source: Bibliog. Ref. n. 32.

efficacious vaccine but, so far, these efforts have met with little or no success: indeed, attenuated vaccine is not suitable for reasons of safety, while inactivated vaccine is not suitable for reasons of inadequate immunogenicity. Although more than 30 vaccines have been proposed as possible candidates, none of them seem to offer much hope of success in the near future. The extreme variability of the HIV virus, together with its complex relationship with the immune system, increases the technical problems of developing a vaccine. It is believed that research must not restrict itself to finding one vaccine that will stimulate cell-mediated immunity, but must also include a response from the neutralising antibodies[45]. Constant, adequate funding so as to encourage research is a prime requisite for success. Currently there are more and more clinical trials being done, especially in African countries which, although it makes it possible to test potential vaccines in environments where there is a high rate of infection, requires serious and strong commitment to respecting the ethical questions that are raised by the experiments themselves.

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