

# Leprosy from the Global Public Health Point of View

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The Successes, Challenges, and Opportunities

Leprosy can be looked at from the points of view - Social, Medical, or Public Health.



- Social – For a very long time the social dimension had played a predominant role in the disease.
- Medical - the medical dimension became important once there was a better understanding of the disease and its causation.
- Public Health – this is the point of view we want focus on now.



- The recognition of leprosy as a public health problem is relatively recent.
- From the public health and epidemiological points of view leprosy has several interesting features.
- It is a very unevenly distributed disease, among and within countries.
- The disease is only feebly infectious.
- Only a small proportion of new cases are bacteriologically positive as recognized from the skin smears.



- Even under the worst of circumstances leprosy hardly affects more than 3% of the population in high endemic countries.
- The attack rate even for high risk groups such as household contacts is only about 1 to 2 % per year. However the life time risk for contacts is considerable as untreated cases remain infectious for several years due to the chronicity of the disease.



- Again a very high proportion of as much 90 to 95% of leprosy that occurs in the community is mild and self-healing. It is the remaining proportion that ends in progressive disease contributing to the reservoir of infection and also to deformities.



- The major problem in leprosy is deformities caused by nerve damage. However deformities take a very long time to develop offering good opportunities to intervene and prevent problems. Deformities not only cause physical problems but also enormous social problems



- With a limited understanding of the disease leprosy could not be addressed as a public health problem for a long time. The best that was possible was isolation of patients in institutions. It was practiced more as a social measure in order to keep the leprosy patients out of sight. However institutions did offer a degree of care for the patients.



- The public health approach took a major turn with the advent of effective treatment for the disease and the possibility of reducing the infectious burden in the community and consequently its transmission.



Dapsone, the first chemotherapeutic drug against leprosy offered a breakthrough. Domiciliary treatment with Dapsone was widely practiced starting from 1950's and this offered much hope. The hopes however were belied over a period of time due to:

- Non compliance of patients to treatment due to the slow clinical response and the need for prolonged treatment
- Emergence of resistance of *M. Leprae* to Dapsone.



- Other approaches to prevent leprosy have been considered from time to time.
- The possibility of developing an anti-leprosy vaccine has been discussed for a long time and considerable research in this regard had been carried out particularly under TDR. However none of the experimental vaccines was capable of providing any significant protection against the disease. BCG itself provides limited protection even if this protection varies widely with different geographic situations.



- Identification of high risk groups and intervention through chemoprophylaxis has been considered for long. Single dose Rifampicin itself has been found to be quite effective in preventing leprosy.
- The household contacts of patients are an easily identifiable high risk group. They have an increased risk of leprosy which is 2 to 5 times that of the general population. However with a low frequency disease like leprosy household contacts contribute only to a very small proportion of the total population.



- Even with a five fold increased risk, because of their very limited population size contacts contribute to only a minority of new cases in the community the rest of the cases coming from the low risk general population. Thus even if chemoprophylaxis is highly effective it has serious limitations as a public health measure.



- Thus from the public health point of view intervention through effective chemotherapy of patients remains the only viable option. Research breakthroughs in the 1960's and 1970's opened great opportunities to have a highly effective bactericidal chemotherapy with a potential not only to cure leprosy but also to greatly reduce the reservoir of infection in the community.



- Such an effective curative chemotherapy became possible with the advent of Multi Drug Therapy (MDT) in the 1980's which is capable of making the patient non-infectious in a very short period of time and also capable of effectively addressing the problem of drug resistance.



- With MDT there was a great opportunity to bring about a steep reduction in the disease burden, and this was envisaged through (a) the recognition that a large majority of leprosy burden in the 1980's was the result of untreated backlog of prevalent cases in the community that could be treated through vigorous field treatment programmes, and (b) the expectation that subsequent to dealing with the backlog the remaining prevalence will consist of largely of the incident cases and timely detection and treatment of such cases would lead to further progressive reduction in the disease burden.



- The first years of experience after the introduction of MDT in leprosy control programmes demonstrated that the expectations were well justified. MDT was found to be a robust treatment, and well accepted. It was clear that with further intensification a lot more progress could be made.
- Thus came the concept of elimination of leprosy as public health problem, a public health strategy with great potential to garner support from all the concerned.



- The concept of leprosy elimination was taken forward and WHO took a very bold step in 1991 in getting the World Health Assembly to adopt a resolution committing the organization and its member countries to a goal of elimination of leprosy as public health problem by the year 2000, defining elimination as attaining a level of prevalence below 1 case per 10,000 population. The deadline and the prevalence cut off point were arbitrary to some extent but provided a great opportunity to bring about a major impact. This was a truly historic step in the annals of leprosy and WHO.

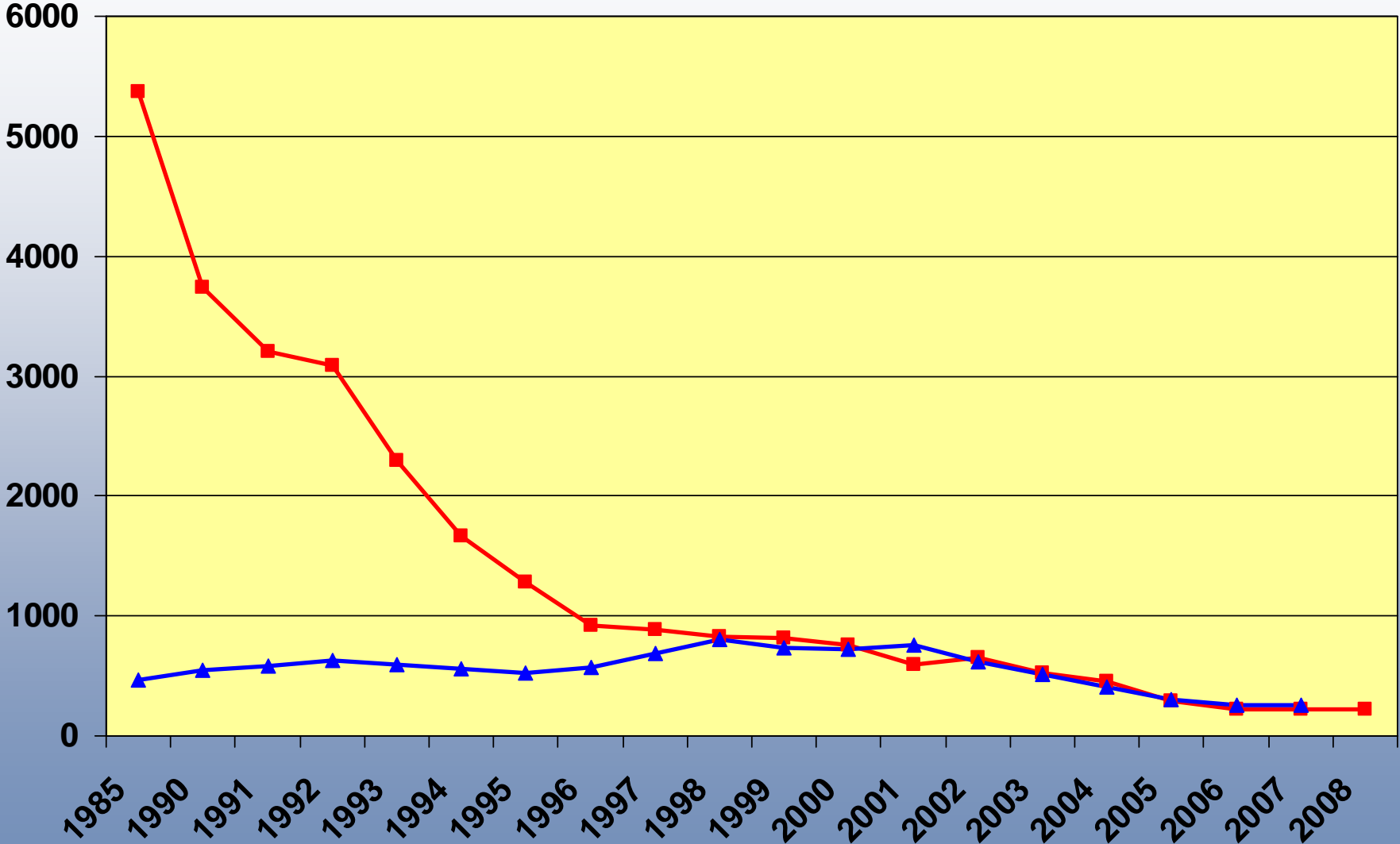
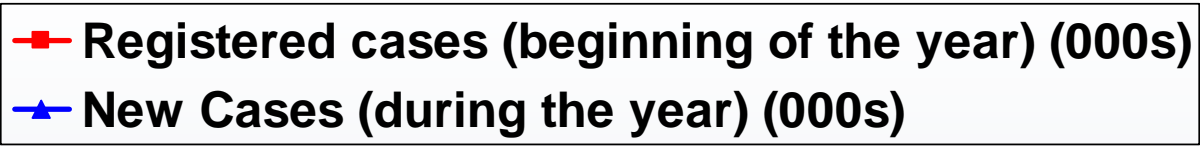


- The prerequisites for attaining the goal included the need for strong WHO leadership, genuine national commitments, availability of MDT drugs free of cost, adequate NGO and donor support, and sufficient awareness creation of the community. The prerequisites were met to a large extent resulting in unprecedented progress towards the goal.

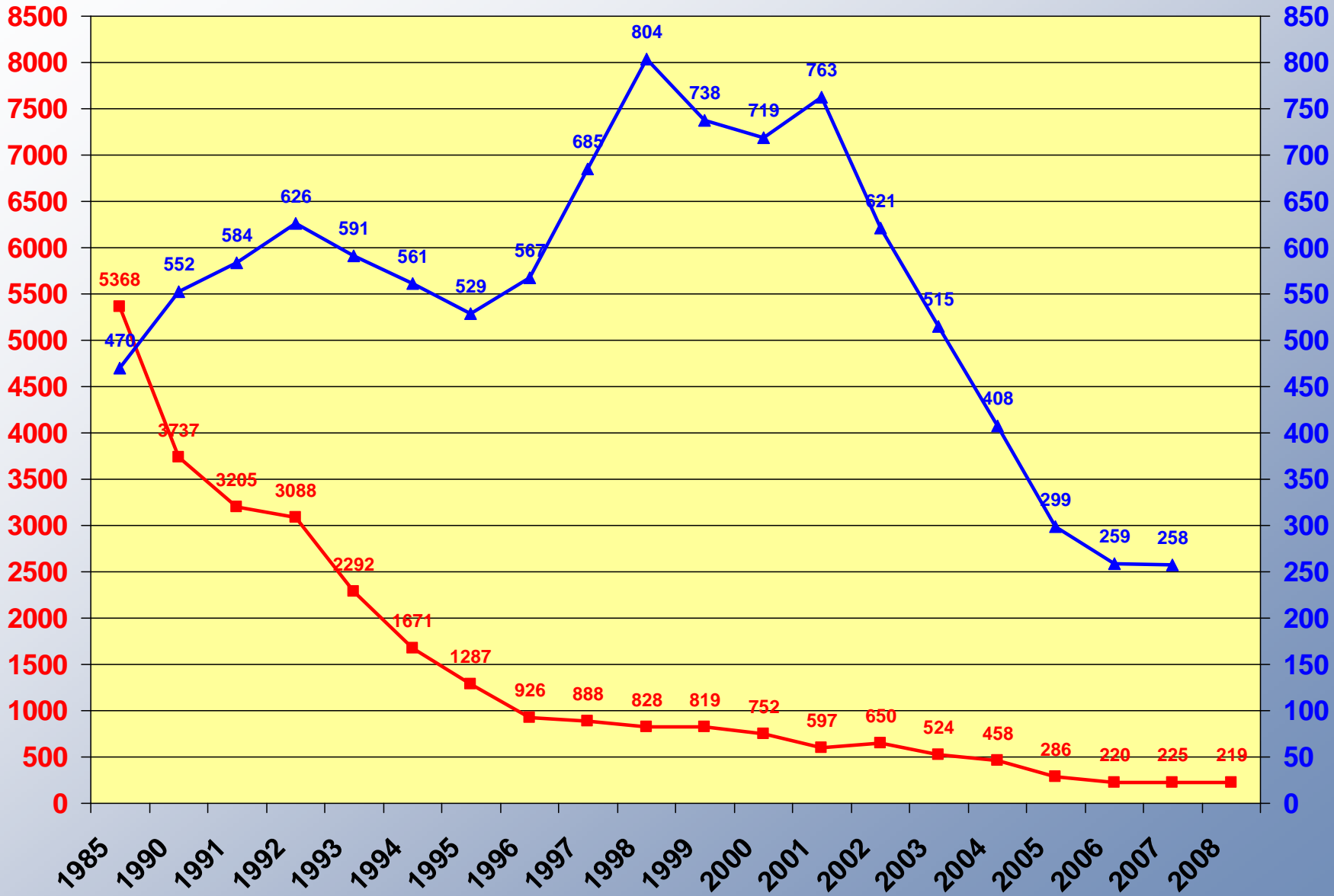
In simple terms this is the progress made so far since the adoption of WHA resolution



	<u>1992</u>	<u>2008</u>	<u>Percent Reduction</u>
Number of Registered of cases	2,981,000	219,000	92.7%
Prevalence per 10,000 population	5.44	0.33	93.9%
Number of New cases	657,000	258,000	60.7%
New Cases detection per 10,000 population	1.20	0.38	68.3%



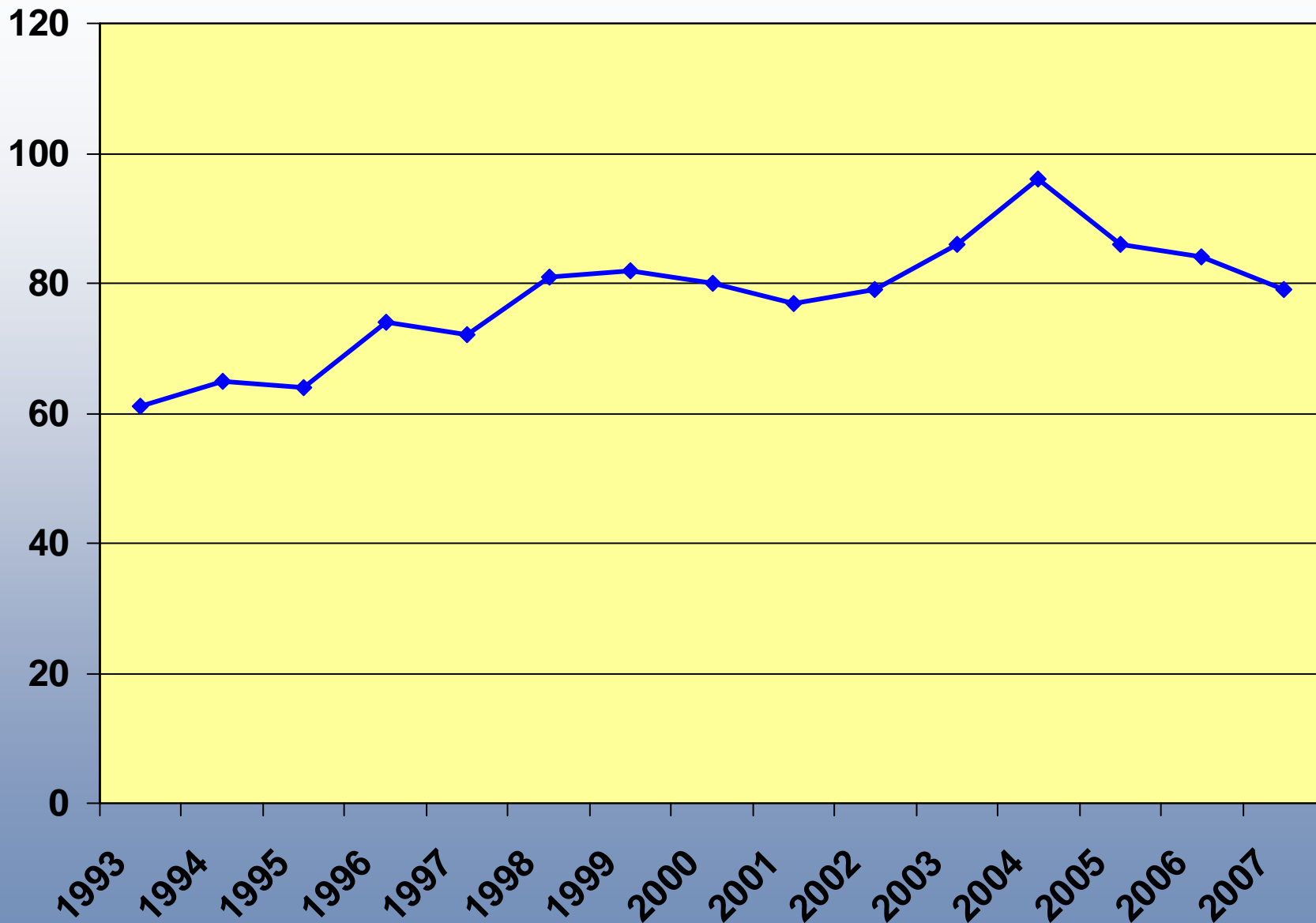
■ Registered cases (beginning of the year) (000s)  
▲ New Cases (during the year) (000s)



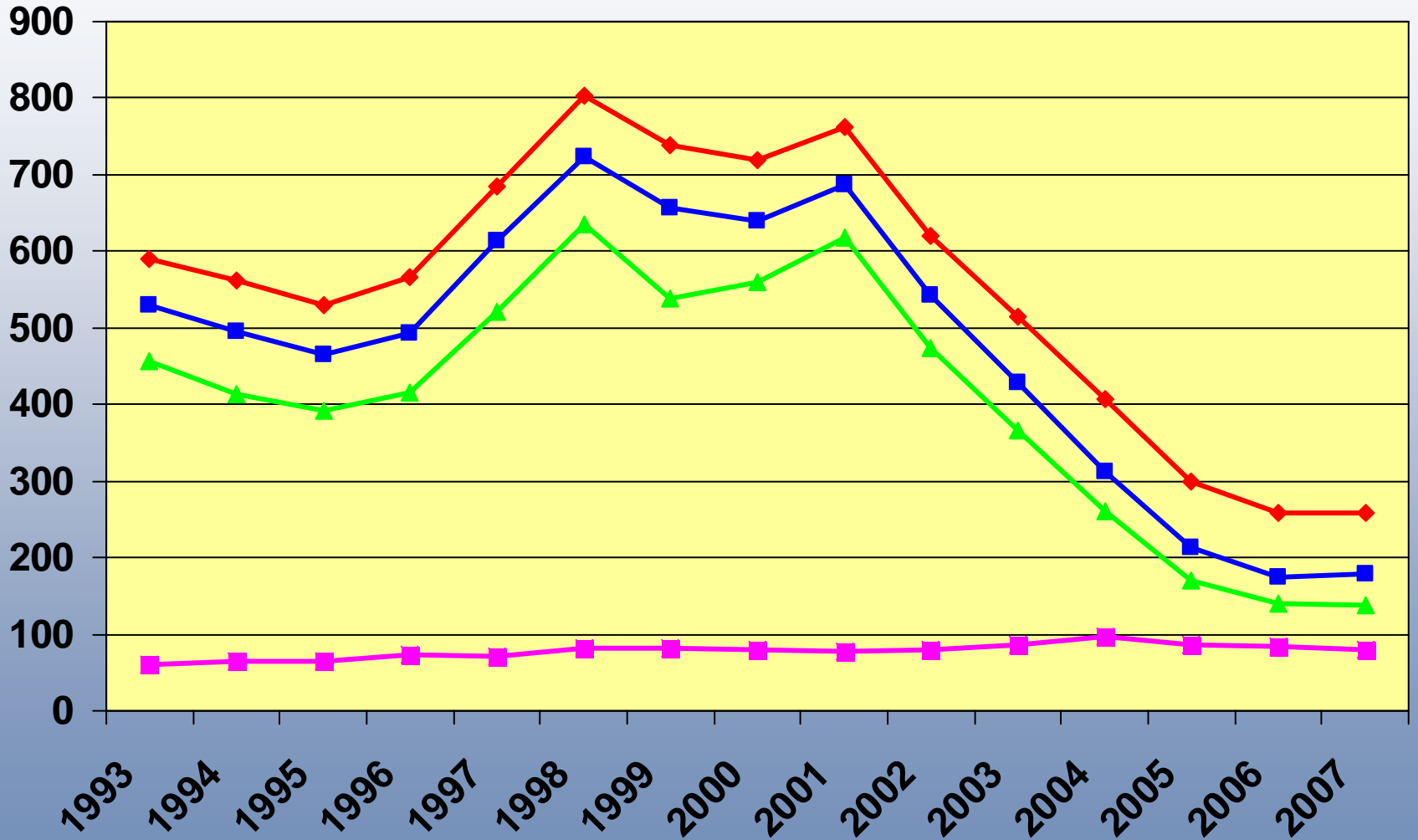


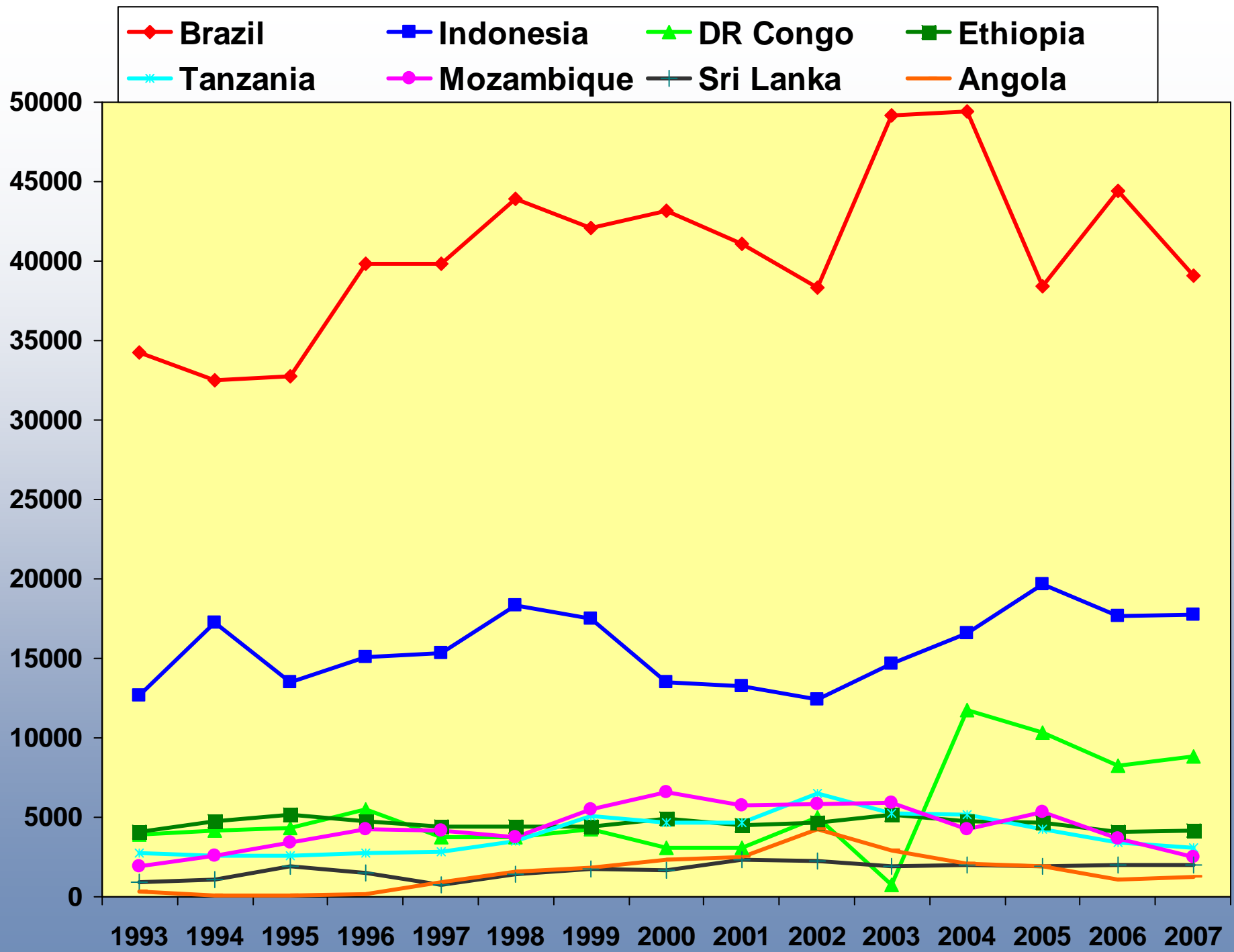
- In spite of the excellent overall progress there are countries which show considerable slowing down or stagnation in terms of new cases detection. These difficult countries numbering eight are: Brazil, Indonesia, Ethiopia, DR Congo, Tanzania, Mozambique, Angola, and Sri Lanka. These countries together which used to contribute to less than one tenth of the leprosy burden in the 1990's currently contribute to about a third of the leprosy burden. Even among the eight two important countries are Brazil and Indonesia.

# New case detection in the 8 difficult countries



# New Case Detection Trends





# Factors that had influenced leprosy prevalence



1. Updating of patient registers
2. Bringing all untreated backlog cases under MDT
3. Employing fixed shortened duration MDT enabling early cure
4. Reduction in transmission of disease
5. Operational factors leading to under/over detection of cases
6. Under/over reporting of figures

# Factors that had influenced Case detection



1. Reduction in transmission of disease
2. Operational factors leading to under/over detection of cases
3. Under/over reporting of figures

# Current Situation



- In summary there are currently around 220,000 registered cases worldwide; less than 25,000 of them are likely to be bacterio-positive. Estimated number of disabled including among old cured patients is a maximum of 500,000. Occurrence of new cases appears to be around 260,000 per year which is expected to diminish progressively as a high proportion of current new cases appear to be due to breakdown of old subclinical infections particularly among older individuals. In terms of leprosy elimination all countries have attained their goal of P.R. of less than one in 10,000 population except for 3 or 4 countries.



- Apart from the numbers the quality of new leprosy cases over the years has greatly changed for the better. Compared to cases diagnosed two decades ago today new leprosy cases have mostly early and minimal disease, have very few deformities at diagnosis and have an extremely low proportion with skin smear positive picture.



- Currently leprosy trends to cling to certain geographic areas and populations. These areas and populations need to be identified and dealt with. There is also a hidden problem of undetected cases among underserved populations.
- As a very low frequency disease leprosy increasingly poses logistic problems in ensuring proper technical support, and drug supply at appropriate levels.
- Fortunately drug resistance is not a problem in leprosy. Relapse rates which can be due to either persisters or drug resistance is still only around 1 per 1000 per year.



- **In conclusion:** From public health point of view and in comparison with other major problems of communicable diseases leprosy may be a relatively small problem in the global context, but it still continues to be an important problem in specific parts of the world. There is therefore a great need to work further towards making leprosy a totally insignificant problem everywhere through focused intensified activities. This is certainly doable as has been demonstrated in several parts of the world.