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World Malaria Situation 1988
Overview

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Indigenous malaria continues to occur in some 100 countries or areas *(Map 1)*. Excluding the WHO African Region where reporting is fragmentary and irregular, the trends in individual countries of the different regions vary, but an upward trend in the number of malaria cases reported in the Americas and some Asian countries is clearly visible. Some 83% of the total number of cases reported annually to WHO (excluding the African Region) are concentrated in Afghanistan, Brazil, China, India, Mexico, Philippines, Sri Lanka, Thailand, Viet Nam. Within these countries malaria shows a marked focalization.

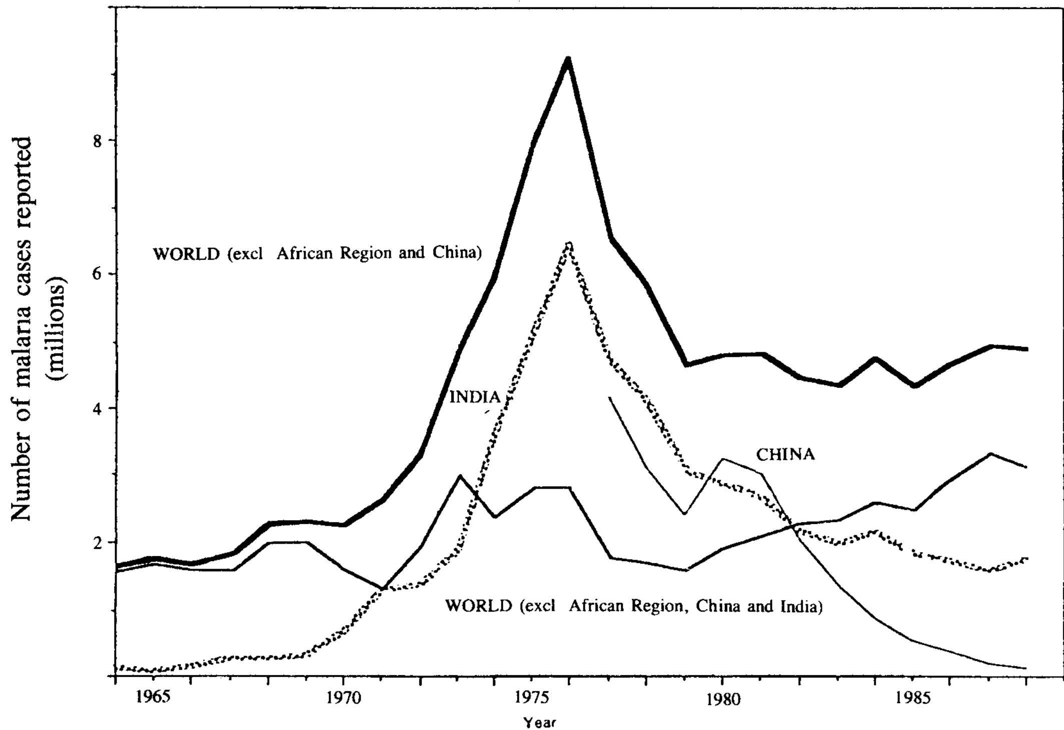
Of a total world population of about 5,011 million people (1988), 2988 million (59%) live in areas free of malaria (it never existed, disappeared or was eliminated by antimalaria campaigns and the malaria-free situation has been maintained). A population of 1599 million people (32%) live in areas where endemic malaria was considerably reduced or even eliminated but transmission was reinstated and the situation is unstable or deteriorating. These latter areas include zones with the most severe malaria problems which developed following major ecological or social changes. They comprise only about 1% of the world population. Areas where endemic malaria remains basically unchanged and no national antimalaria programme was ever implemented, are inhabited by 474 million people (9%), mainly in tropical Africa.

The global incidence of malaria is estimated to be in the order of 110 million clinical cases annually with some 270 million people being infected.

Table 1 shows the number of malaria cases reported by WHO Regions. The total does not include the WHO African Region due to the insufficiency and irregularity of reporting. *Fig. 1* shows the number of cases reported in the world from 1964 to 1988.

WHO receives very limited and irregular reports on malaria deaths, mostly from non-endemic areas. Antimalaria services in endemic countries have concentrated on measuring infection and have not paid sufficient attention to the reporting of malaria mortality. In Africa, there is apparently great variability and there are indications that, at least in some areas, general infant and malaria-specific mortality may be declining.

Fig. 1
Number of malaria cases reported, 1964-1988



One of the important problems, the resistance of *Plasmodium falciparum* to drugs, has been spreading further and there are only a few countries from which it has not been reported. However, this phenomenon has mostly a focal distribution especially in West Africa. Therefore, chloroquine can still be an effective drug as it gives a clinical cure in large areas of the world. The present distribution of areas where chloroquine-resistant *P. falciparum* has been reported is shown in *Map 2*.

Table 1. **Number of malaria cases reported, by WHO Region (in thousands), 1981-1988[a]**

WHO Region	1981	1982	1983	1984	1985	1986	1987	1988[c]
Africa[b,c] ...	6,754	6,042	2,726	4,420	3,373	3,046	3,309	3,285
Americas	638	718	831	931	911	951	1,019	1,100
South-East Asia	3,566	2,964	2,731	3,004	2,521	2,689	2,823	2,645
Europe	60	66	71	60	32	45	27	8
Eastern Mediterranean orientale	207	308	305	335	391	610	564	602
Western Pacific	3,464	2,487	1,839	1,361	1,066	786	758	704
Total (excluding Africa) ..	**7,935**	**6,543**	**5,777**	**5,691**	**4,921**	**5,081**	**5,191**	**5,059**

[a] The information provided does not cover the total population at risk in some instances
[b] Mainly clinically diagnosed cases
[c] Incomplete figures.

Africa

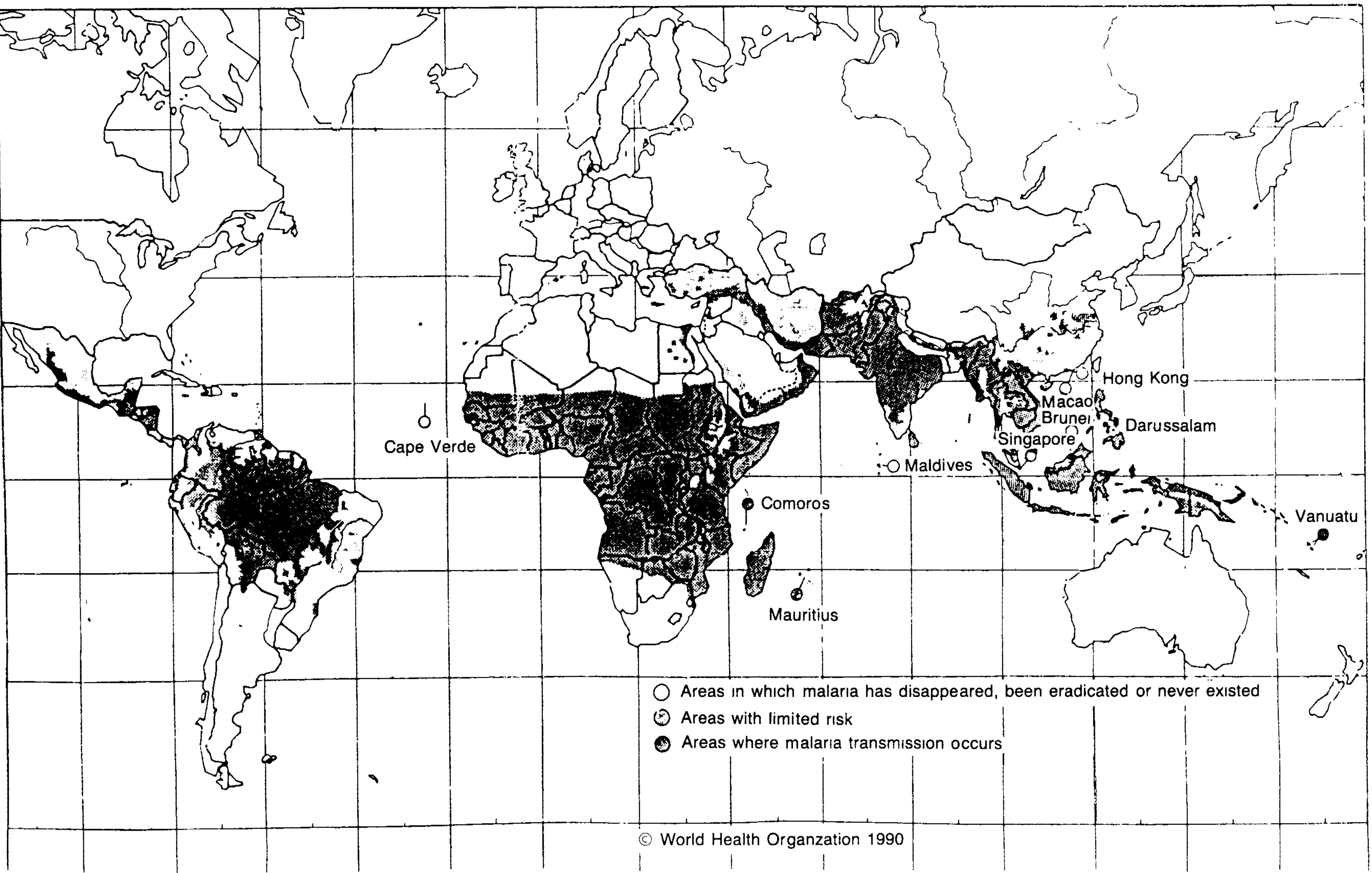
In Africa north of the Sahara, the total number of cases reported decreased from 1,467 in 1987 to 1061 in 1988. The Libyan Arab Jamahiriya and Tunisia are considered free from malaria transmission, with only imported cases being reported. In Egypt, 225 cases were detected (33 in 1987), 218 of them being falciparum infections originating from Sinnuris District in El Faiyûm Governorate. In Algeria, imported malaria cases rose from 57 in 1987 to 164 in 1988, but indigenous malaria remained rare (7 vivax cases). In Morocco, the number of cases detected in 1988 was 550 (1,287 in 1987); 435 were of local origin — all *P. vivax* — (Fez Province 117, Khouribga 104, Meknes 79, Chefchaouen 32, Taounate 26, Larache 17, Tanger 15). Ten other provinces reported 8 or fewer local cases.

In Africa south of the Sahara, 2-7 million cases per year are reported, but taking into account the number of infections expected according to the degree of endemicity one can estimate that about 90 million clinical malaria cases may occur every year, and that prevalence of infection may be in the order of 250 million parasite carriers. Endemicity varies greatly from place to place. It reaches the highest levels in the world, with very large areas classified as holoendemic (forest or savannah, altitude up to 1,000m, rainfall over 2,000 mm/year). In areas of lower endemicity marked seasonality and quasi-cyclic occurrence of heavy rains lead occasionally to epidemics or serious exacerbations of endemicity.

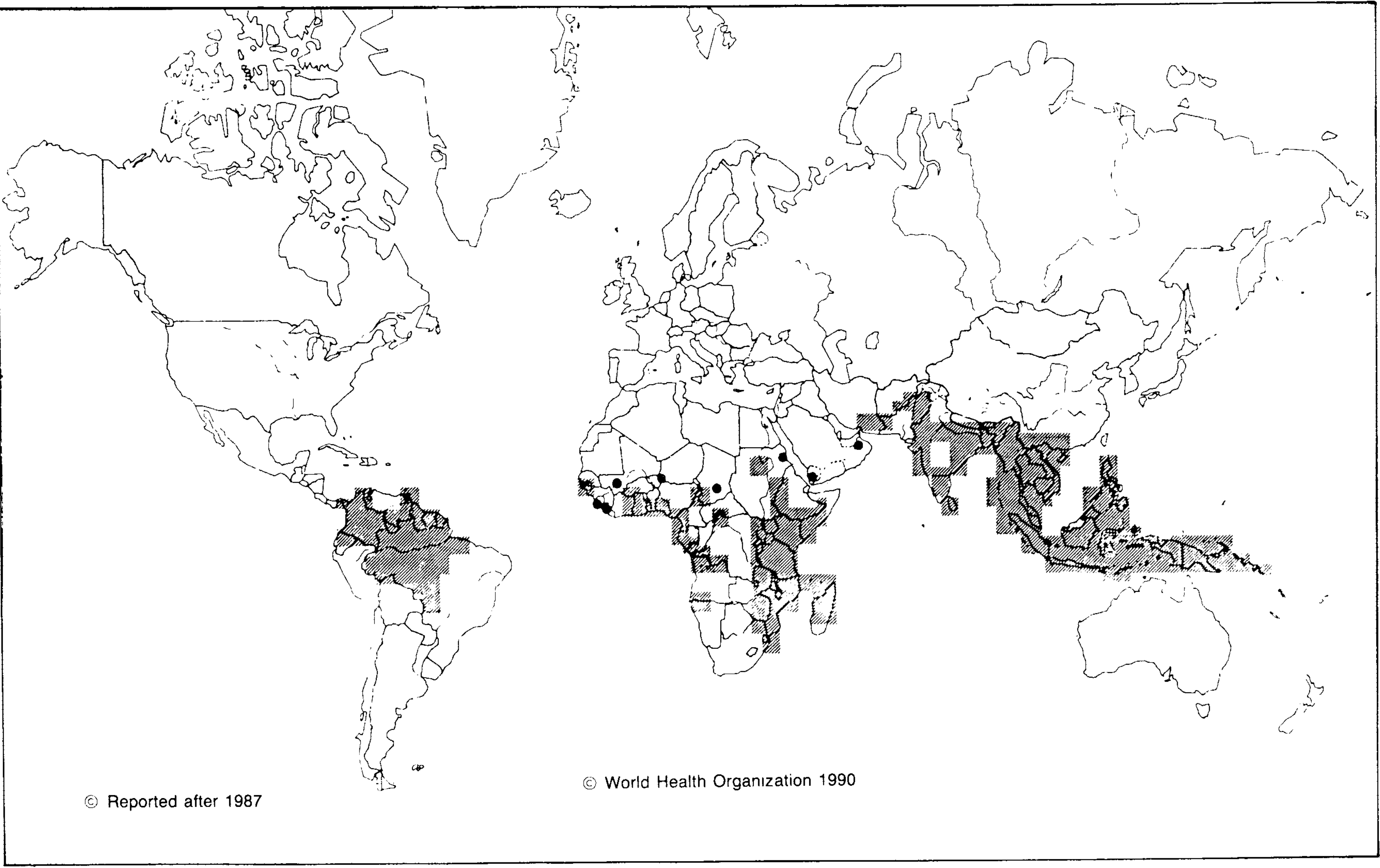
One of the major constraints is the lack or shortage of trained personnel for the organization of programmes.

The WHO Regional Committee for Africa adopted the policy to encourage the development of malaria control within the framework of primary health care at district level. The aim is to prevent and reduce malaria mortality by providing prompt diagnosis or recognition and adequate treatment of malaria cases through the basic health services and primary health care. This implies the creation of efficient referral systems for the management of severe and complicated cases as well as for treatment failures.

Map 1. Epidemiological assessment of the status of malaria, 1988



Map 2. Areas where chloroquine-resistant *Plasmodium falciparum* has been reported



The Americas

Since 1974, when only 269,000 malaria cases were recorded, the number of cases detected every year has been rising continually with 1,100,000 cases reported in 1988 compared with 1,019,000 in 1987, 951,000 in 1986 and 911,000 in 1985. More than half of the cases were registered in Brazil (51%); 21% originated from the Andean countries; 12% were from Central America and 11% from Mexico.

Vivax malaria continued to predominate in the Americas (64% of all infections). Its relative prevalence is 99.9% in Mexico and 95.7% in Central America. In Brazil, the Dominican Republic, French Guiana, Guyana, Haiti, and Suriname *P. falciparum* predominates; 73% of all falciparum infections detected in the Americas occurred in Brazil.

North America (including Mexico). Malaria is endemic only in Mexico, where cases increased from 18,000 in 1976 to 116,000 in 1988; 150 were falciparum infections, principally from Oaxaca State.

Caribbean. The malaria problem is limited to the Dominican Republic, where cases decreased from 1,400 in 1986 to 1,100 in 1988, and to Haiti where the number of cases recorded decreased from 17,000 in 1985 to 12,000 in 1987 and 1988.

Central America. Overall, the number of cases declined from 189,000 cases in 1984 to 112,000 in 1987, increasing again in 1988 with 129,000 cases reported. Incidence rose by 94% in Nicaragua and by 47% in Honduras. The situation continued to improve in El Salvador with a reduction from 96,000 cases in 1980 to 9,100 in 1988 (falciparum infections from 16,000 to 230).

South America (Andean subregion). This region (Bolivia, Colombia, Ecuador, Peru, Venezuela) reported 235,000 malaria cases in 1988, nearly half of the cases occurring in Colombia (101,000). An important rise in the incidence was recorded in Venezuela.

Falciparum cases were not recorded in Peru; their relative frequency was 33% in Colombia, 31% in Venezuela, 25% in Ecuador, and 7% in Bolivia.

South America (French Guiana, Guyana, Suriname). During recent years, migration and border traffic have reestablished or exacerbated malaria transmission in the coastal plains previously freed from malaria. The number of malaria cases multiplied from year to year between 1983 (5,100 cases) and 1988 (41,000 cases). Guyana is the most affected country, with 36,000 cases and an annual incidence of 47 per 1,000 (Suriname, 9 per 1,000; French Guiana, 37 per 1,000).

South America (Brazil). About 45% of the 142 million inhabtants live in originally malarious areas; 43 million (67%) of these live in areas where transmission has been interrupted. In 1988, Brazil reported 560,000 cases (509,000 in 1987), or 51% of all cases in the Americas, although its population at risk represents just 23% of the population of this continent living in malarious areas; 51% of the malaria cases are falciparum infections, 545,000 cases (97% of all cases) were recorded in the Amazonian region. Within this region Pará, Rondônia and Maranhao, reported 80% of all cases recorded in Brazil.

South America (southern cone). In this subregion (Argentina, Chile, Paraguay and Uruguay) malaria is endemic only in Paraguay and in a small area in northern Argentina. In both countries, the malaria situation improved in 1988.

Asia

Asia west of India. No indigenous malaria was detected in Bahrain, Cyprus, Israel, Jordan, Kuwait, Lebanon and Qatar; no active foci were found in the United Arab Emirates.

In the Syrian Arab Republic, indigenous malaria (vivax only) was limited during 1987 to 3 main foci: Aleppo-Hassan Kabir (86 cases), Lattakia (27), Malkiya (north-east border) on the Dejla River (20). In Saudi Arabia, the malaria situation improved considerably and the most affected areas (Tihama Region) recorded a reduction from 11,000 cases in 1987 to 4,000 cases in 1988.

In Pakistan, the number of cases continued to decrease from 90,000 in 1986 and 64,000 in 1987 to 50,000 in 1988.

The relative prevalence of falciparum infections was about 80% in Balcuchistan, 50% in Sind, 26% in Punjab and 21% in North West Frontier Provinces. In Oman, surveys carried out in protected areas showed malaria prevalence rates of 1.1% in the coastal areas, 1.4% in the foothills, and 0.7% in the oases.

In Iraq, the number of cases recorded increased from 3,700 in 1987 to 6,800 in 1988 — all vivax cases except for 108 imported falciparum infections. Nearly all the cases occurred in a few new important foci in previously malaria-free areas of Erbil and Tamin Provinces (Northern Region). Only some 200 were detected in the central and southern region, most of them imported.

In the Islamic Republic of Iran, the number of cases increased in the south-eastern parts of the country.

In Afghanistan, some 40% of the blood specimens were found positive between 1985 and 1987. High morbidity rates were recorded in Laghman, Kunar, Jalalabad, Ghaziabad, Kunduz, Imamsahib, Taloquan and Faizabad units.

In Yemen, antimalaria activities carried out as part of the primary health care system do not yet cover the whole country.

Middle South Asia

The overall situation remained relatively static in spite of a further decrease in the number of cases reported.

In Bangladesh, about 33,000 cases were recorded in 1988 (36,000 in 1987 and 41,000 in 1986), some 64% of which were falciparum infections (49% in 1985). The majority of cases were reported from the districts of Cox's Bazar, Bandarban, Rangamati and Khagrachari. Out of a total of 20,600 falciparum cases, 20,400 occurred in Chittagong Division alone.

In Bhutan, malaria incidence, although decreasing, is still very high.

In India, the number of confirmed cases, increased by 7%, with 1.78 million cases recorded in 1988. About 46% of the states reported a decrease of malaria; others such as Andhra Pradesh, Goa, Gujarat, Karnataka, Maharashtra and Rajasthan, recorded a rise. Falciparum cases in 1988 (34%) were slightly less than in 1987 (37%). The *P. falciparum* containment programme continued in northeast India, large parts of Orissa and parts of Andhra Pradesh, parts of Bihar and West Bengal, parts of Madhya Pradesh and Maharashtra, and in a few districts of Rajasthan, Gujarat, Tamil Nadu, Karnataka as well as the Andaman and Nicobar Islands.

In Maldives, no indigenous malaria cases have been detected since 1984. Serological investigations have indicated that malaria is disappearing.

In Nepal, the situation continued to improve with 24,000 cases reported (42,000 in 1985). Outbreaks occurred in Dhanusha, Sindhuli and to a lesser extent in Dadeldhura District. The latter outbreak was due to *P. falciparum.*

In Sri Lanka, malaria incidence rose sharply from only 38,500 malaria cases in 1982 (37,000 *P. vivax,* 1,500 *P. falciparum)* to 676,000 (493,000 *P. vivax,* 183,000 *P. falciparum)* in 1987.

During 1988, the number of cases detected decreased to 380,000, 94,000 of them being falciparum infections. However, the number of blood examinations decreased also, from 1.95 million in 1987 to 1.33 million in 1988.

Eastern Asia and Oceania

Australia, Brunei Darussalam, the Democratic People's Republic of Korea, Hong Kong, Japan, Macao, Mongolia, the Republic of Korea, Singapore, large areas of China and most of Oceania are considered free from malaria.

In Hong Kong, indigenous cases continue to occur sporadically in the border areas or other rural areas. There was 1 such case *(P. vivax)* in 1988.

In Singapore, 4 introduced cases were reported in 1988; the foci were promptly eliminated by appropriate remedial measures.

In China, malaria incidence continued to decrease with 134,000 cases reported in 1988. Incidence decreased markedly in most endemic areas. However, in Hainan Province it increased by 21% compared with 1987, and focal outbreaks occurred in some areas of Yunnan, Guangdong, Guangxi, Guizhou Provinces/Au-tonomous Region. In the Provinces of Anhui, Jiangsu, henan and Jiangxi, the major endemic areas of central China, the incidence decreased by 44% to 71% compared with 1987; there were 57,000 cases accounting for 43% of the total cases recorded. The distribution of indigenous falciparum malaria was confined to 5 provinces/autonomous regions. In Hainan and Yunnan, the number of falciparum cases increased, accounting for 37% and 21% of the confirmed cases, respectively. In Guizhou Province and in Guangxi Autonomous Region, the distribution of falciparum malaria in 1988 did not change much. There were only 59 falciparum cases recorded in Anhui Province. Of the total number of cases registered in 1988, 66% were confirmed, among them about 11,600 falciparum infections (13%).

In Indonesia, where the situation had improved in Java and Bali during recent years, incidence increased again in 1988; 32,000 malaria cases were detected although the case-finding activities seem to be deteriorating slowly. The proportion of falciparum cases increased from 42% in 1987 to 46% in 1988. Malaria control activities in the outer islands are limited to areas of socioeconomic importance.

In Malaysia, successful malaria control has been maintained in the peninsula, and in Sarawak. In Sabah, however, 37,000 cases were reported in 1988, compared with 26,000 in 1987.

In Myanmar, the Lao People's Democratic Republic, Papua New Guinea and Vanuatu, the malaria situation has not changed significantly during the past few years.

In Thailand, the number of malaria cases increased from 322,000 cases in 1987 to 344,000 in 1988, and one of the major problems continues to be the increasing frequency of falciparum strains highly resistant to chloroquine and sulfadoxine/pyrimethamine.

In the Philippines, where malaria incidence had risen by nearly 50% from 1986 to 1987, the malaria situation seems to have stabilized; 155,000 cases were reported in 1988 (154,000 in 1987). In 1988, an integrated malaria programme has been established.

In the Solomon Islands, 64,000 malaria cases were detected in 1988 compared with more than 72,000 in 1987. The decrease was noticed particularly in the Central Province. About 60% of falciparum infections are resistant to chloroquine, most of them at RI level; RII and RIII resistant strains are rare.

In Viet Nam, the overall malaria incidence did not vary much, although its distribution changed. Whereas there was a decrease in the number of malaria cases in the midland and coastal plain areas, incidence increased in the mountainous zones, particularly in the central high plateau as well as the provinces neighbouring China, the Lao People's Republic and Cambodia. Among the reaosns for this deterioration are technical and operational problems, lack of personnel, and population movements to new development zones and gold mines.

Europe, including Turkey and the USSR

Endemic malaria *(P. vivax* only) occurs mainly in the south eastern part of Turkey and in a few other foci in that country. Comparing the situation in 1987 and 1988, a decrease in the number of cases has been reported. In the USSR, indigenous malaria exists in some limited foci, mainly in the Azerbaijan and Tadjik Soviet Socialist Republics. Overall, 338 indigenous and introduced vivax malaria cases were recorded in the USSR during 1987. The number of imported malaria cases recorded in Europe continued to grow and it is thought that the actual number is considerably higher than the number of cases reported.

Source:

WHO Weekly Epidemiological Record No. 25-26 1990, Report of Department of Health, ROC, 1990.