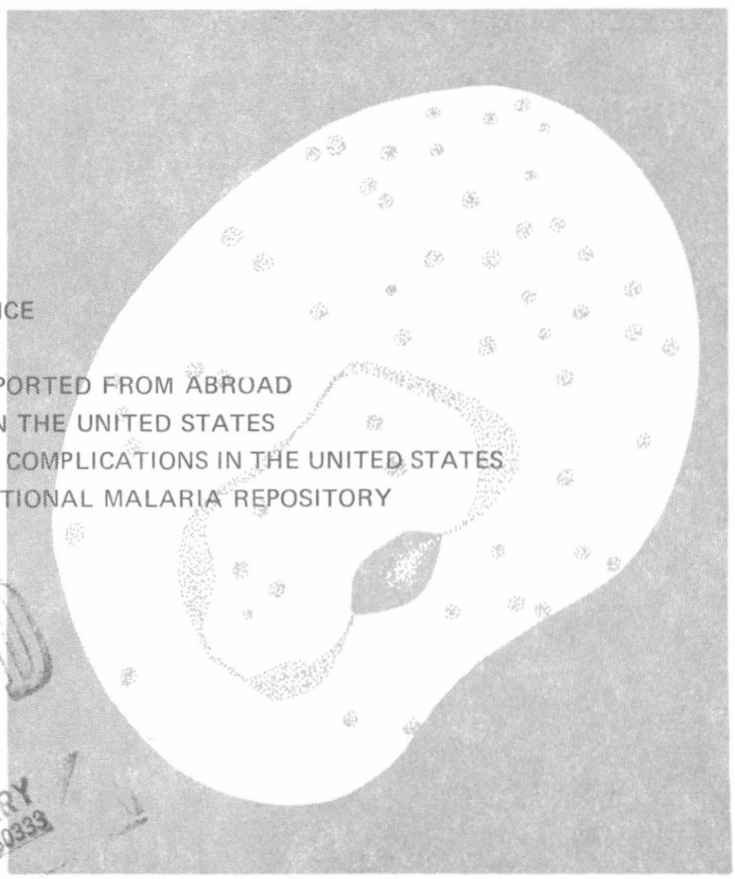
CENTER FOR DISEASE CONTROL

ANNUAL SUMMARY 1975
Issued September 1976

MALARIA

SURVEILLANCE



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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL
ATLANTA, GEORGIA 30333

PREFACE

This report summarizes information received from State Health Departments, Medical Departments of the Armed Forces, and other pertinent sources. It is intended primarily for the use of those with responsibility for disease control activities. Anyone desiring to quote this report should contact the original investigator for confirmation and interpretation.

Contributions to the Surveillance Report are most welcome. Please address them to:

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I. SUMMARY

In 1975, 447 cases of malaria were reported in the United States. This represents a 38.4% increase compared with the 323 cases reported for a similar period in 1974, and was primarily related to a substantial increase in the number of malaria cases in civilians. Only 17 reported cases (4% of all cases reported in the United States) were in military personnel in 1975, the smallest number since 1959. As in previous years, imported Plasmodium vivax infections were more common than P. falciparum (61.3% versus 24.4%).

In 2 instances, infection was acquired in the United States: in 1 case infection was induced by transfusion and in 1 the disease was transmitted congenitally. Two deaths attributed to malaria were reported in 1975, compared with 6 in 1974. Both deaths occurred in civilians; 1 patient was infected with P. falciparum acquired in Cambodia, and the other had acquired P. malariae malaria by blood transfusion. The P. falciparum malaria death-to-case ratio of 0.9% was lower than that in 1974 (6.4%), but did not differ significantly from the 10-year (1965-1974) ratio of 1.6%.

II. TERMINOLOGY

The terminology used in this report is derived from the recommendations of the World Health Organization, (1, 2). The definitions of the following terms are included for reference purposes.

1. Autochthonous

   a. Indigenous - malaria acquired by mosquito transmission in an area where malaria is a regular occurrence.

   b. Introduced - malaria acquired by mosquito transmission from an imported case in an area where malaria is not a regular occurrence.

2. Imported

   Malaria acquired outside of a specific area (the United States and Puerto Rico in this report).

3. Induced

   Malaria acquired through artificial means, i.e., blood transfusion, common syringes, or malariotherapy.

4. Relapsing

   Renewal of clinical activity occurring after an interval from the primary attack greater than that due merely to periodicity.

5. Cryptic

   An isolated case of malaria not associated with secondary cases as determined through appropriate epidemiologic investigation.

HEW Publication No. (CDC) 76-8243

III. GENERAL SURVEILLANCE

Between January 1, 1975, and June 1, 1976, 447 cases* of malaria with onset of illness in 1975 in the United States and Puerto Rico were reported to the Parasitic Diseases and Veterinary Public Health Division, Center for Disease Control; this represents a 38.4% increase over a similar period in 1974 when 323 cases were reported. As in 1974, the increase in reported cases was due principally to increased malaria in civilians. Civilian cases increased from 302 in 1974 to 430 in 1975 and comprised 96% of all cases diagnosed in this country (Table 1), compared with 93% in 1974. Cases of malaria among military personnel continued to decline, a trend first seen in 1971. The number of military cases fell from 21 in 1974 to 17 in 1975 and comprised only 4% of all cases diagnosed in this country, compared with 7% in 1974 (Figure 1). Additionally, in 1975, 2 persons experienced relapses of P. vivax malaria. One relapse occurred in a man 14 months after his initial illness in 1974; the relapse in the other followed the patient's first attack, which occurred in 1975, by 3 months.

Table 1
Military and Civilian Malaria Cases,
United States, 1959-1975*

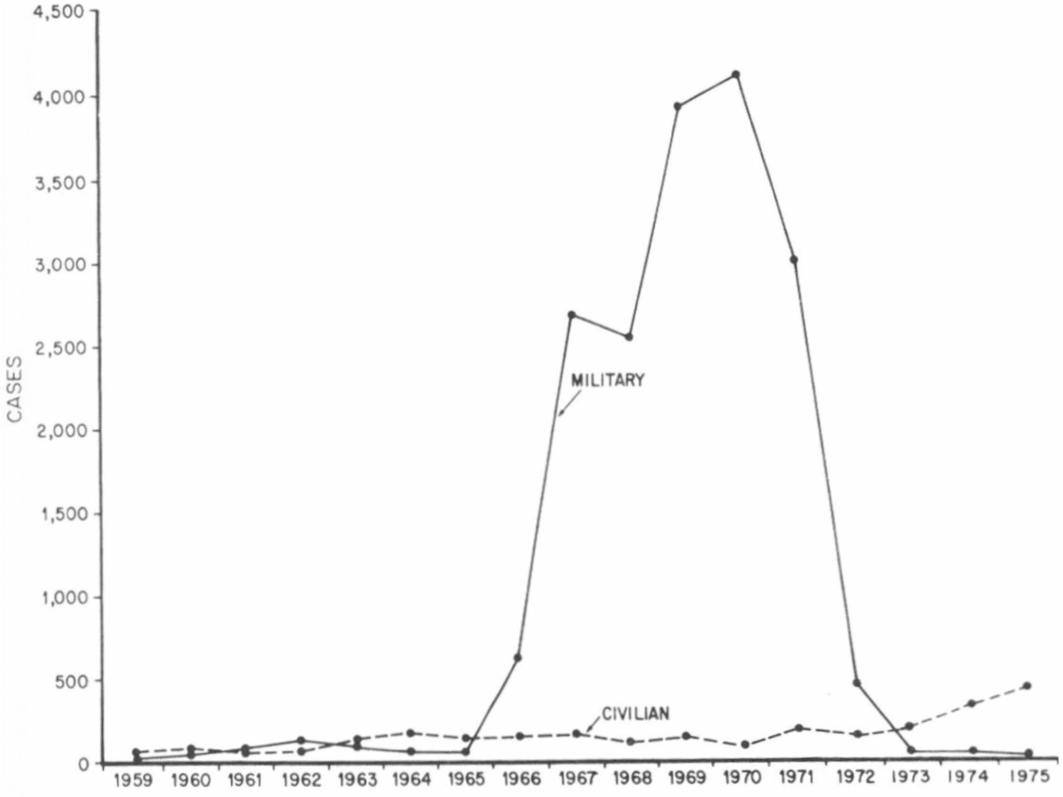
Year	Military	Civilian	Total
1959	12	38	50
1960	21	41	62
1961	45	37	83
1962	75	40	115
1963	58	90	148
1964	52	119	171
1965	51	105	156
1966**	621	143	764
1967**	2,699	158	2,857
1968**	2,567	130	2,697
1969**	3,914	145	4,059
1970**	4,096	151	4,247
1971**	2,975	205	3,180
1972**	454	160	614
1973**	41	175	216
1974**	21	302	323
1975	17	430	447

*Onset of illness in the United States and Puerto Rico
**Figures for these years have been updated to include cases reported after the publication of previous annual summaries

*A "case" is defined as an individual's first attack of malaria in the United States, regardless of whether or not he had experienced previous attacks of malaria while outside the country. A subsequent attack in the same individual caused by a different Plasmodium species is counted as an additional case. Repeat attacks in this country caused by the same species are considered relapses, not additional cases. All cases included in this report were diagnosed as malaria on the basis of a positive peripheral blood smear examined in the local or state laboratory. Doubtful cases were referred to the National Malaria Repository, CDC.

Figure 1

MILITARY AND CIVILIAN CASES OF MALARIA, UNITED STATES, 1959-1975



In 2 of the 430 civilian cases and in none of the military cases, patients acquired their infections in the United States. In 1 case P. malariae was induced by blood transfusion; in the other P. vivax infection resulted from congenital transmission.

The ratios of cases caused by the various Plasmodium species generally showed little change between 1974 and 1975. In 1975, however, P. vivax accounted for 61.3% of infections (Table 2), an increase of 10.5% from 1974. The increase in the overall proportion reflected a statistically significant increase in reported cases from Vietnam and Cambodia (9 in 1974 to 65 in 1975, $p < 0.001$), 63% of which were due to P. vivax.

Table 2
Malaria Cases by Plasmodium Species,
United States, 1975

Species	Total	Percent
P. vivax	274	61.3
P. falciparum	109	24.4
P. malariae	21	4.7
P. ovale	10	2.2
Mixed Infections	4	0.9
Undetermined	29	6.5
Total	447	100.0

The countries in which the 447 patients contracted malaria in 1975 are shown in Table 3. Areas of acquisition were identifiable for all but 1 (0.2%) of the cases reported in 1975. Asia accounted for 41.6% of cases, Africa for 30.2%, Central America and the Caribbean for 15.7%, North America for 7.8%, Oceania for 2.5%, South America for 1.8%, and Europe for 0.2%. Exposure in Africa occurred in nearly the same number of cases in 1975 as in 1974 (135 versus 136); however, because of the large increase in overall cases, Africa accounted for a significantly lower percentage of cases this year (30.2%) than last (42.1%) ($p < 0.001$). More malaria cases were reported from Asia in 1975 (186 or 41.6% of cases) than in 1974 (113 or 35.0% of cases) reflecting an increased number of cases from India (80 in 1975 from 50 in 1974, $p < 0.05$) and from Vietnam or Cambodia (65 in 1975 from 9 in 1974 $p < 0.001$). Of the cases reported in 1975 from Vietnam or Cambodia, only 3 (4.6%) occurred in U.S. military personnel, and the same number in U.S. civilians. The remaining 59 cases were in foreign nationals, most of whom were transported into this country as refugees following political changes in both countries. Central America and the Caribbean accounted for a greater percentage of cases in 1975 (15.7%) than in 1974 (9.3%) ($p < 0.02$) with increased numbers of cases from El Salvador, Nicaragua, and Haiti. Essentially the same percentage of exposures occurred in North America, Oceania, and South America in 1975 as in 1974.

As in 1974, the largest number of cases from any single country were reported from India (80) comprising 17% of all reported cases in 1975. Other countries where exposure occurred in a large number of imported cases were Nigeria (35), Mexico (33), Pakistan (23), El Salvador (24), and Nicaragua (20).

A history of previous malaria while abroad was obtained in 142 of the 447 imported cases (31.8%). Patients with P. falciparum (22.9%) malaria appeared less likely to give a history of having had malaria previously than patients with either P. vivax (33.2%) or P. malariae (47.6%) infection.

For the United States the geographic distribution of the 1975 malaria cases is shown by the state in which the patient first developed clinical symptoms of the disease (Figure 2). Large increases over 1974 totals occurred in Pennsylvania (from 12 to 43) and California (from 92 to 145) primarily because of the Vietnamese and Cambodian refugee camps in these states.

In 1975, as in 1974, the seasonal distribution of malaria cases showed a distinct pattern; a definite peak in cases (excluding cases with unknown date of onset) was apparent in the summer months (Figure 3). During the Vietnam conflict, this seasonality had been obscured by the year-round return of military personnel. This year the influx of Southeast Asian refugees in the springtime coupled with a general increase in travel by Americans during the summer months probably accounted for the pattern.

As in previous years, for cases in which the exact date of arrival and the date of onset were available, clinical malaria developed within 30 days of arrival in the United States in 64.6% of persons with P. falciparum infection and in 31.8% of those with P. vivax infection (Table 4). Within 6 months after returning to this country, 97% of patients with P. falciparum malaria and 76.9% of those with P. vivax malaria developed clinical symptoms. Only 14 patients (5.9%) with P. vivax malaria became ill more than 1 year after the last possible exposure to malaria abroad. The longest interval documented between entry into the United States and onset of clinical illness in 1975 was 4 years for 1 patient each with P. vivax and P. malariae malaria and 11 months for a patient with P. falciparum malaria.

Of the 447 cases reported in 1975, 12.8% of patients were initially treated in military hospitals, 0.2% in Veterans Administration hospitals, and 64.2% in civilian hospitals (Table 5). The Armed Forces and Veterans Administration have made complete malaria reporting a major responsibility of their hospital staff. Reporting by civilian physicians, however, is largely a matter of individual initiative, even though malaria is a reportable disease in every state. Thus, the above percentages probably underestimate the extent to which civilian physicians encounter patients with malaria.

Table 3
Malaria Cases by Distribution of Plasmodium Species and Area of Acquisition, United States, 1975*

	vivax	falciparum	malariae	ovale	Mixed	Unknown	Total
AFRICA	41	66	8	10	1	9	135
Africa**	8	4	0	0	0	1	13
East Africa**	4	0	1	1	0	0	6
North Africa**	0	1	0	0	0	0	1
West and Central Africa**	5	7	1	2	0	0	15
Algeria	1	1	0	0	0	0	2
Angola	0	1	0	0	0	0	1
Cameroon	0	3	0	0	0	2	5
Central Africa Republic	1	0	0	0	0	0	1
Congo (Braz.)	0	0	1	0	0	0	1
Ethiopia	3	0	1	0	0	0	4
Ghana	2	8	0	1	0	1	12
Ivory Coast	0	1	0	0	0	0	1
Comoro Islands	0	1	0	0	0	0	1
Kenya	2	3	0	1	0	1	7
Zaire	1	4	0	0	0	0	5
Liberia	2	4	0	3	0	0	9
Morocco	0	1	0	0	0	0	1
Niger	2	1	0	0	0	1	4
Nigeria	6	22	3	2	0	2	35
Malawi	0	1	0	0	0	0	1
Zambia	1	1	0	0	0	0	2
Sierra Leone	1	0	0	0	0	0	1
Sudan	0	0	1	0	0	0	1
Tanzania	1	2	0	0	0	0	3
Uganda	1	0	0	0	1	0	2
Upper Volta	0	0	0	0	0	1	1
ASIA	139	25	10	0	2	10	186
Asia**	1	0	0	0	0	0	1
Asia, SE**	4	1	0	0	0	0	5
Cambodia	21	6	2	0	2	1	32
India	66	3	4	0	0	7	80
Indonesia	1	0	0	0	0	0	1
Laos	1	0	0	0	0	0	1
Malaysia	1	0	0	0	0	0	1
Pakistan	21	0	2	0	0	0	23
Philippines	2	0	1	0	0	1	4
Saudi Arabia	0	1	0	0	0	0	1
Sri Lanka	0	1	0	0	0	0	1
Thailand	1	1	0	0	0	1	3
Vietnam	20	12	1	0	0	0	33
CENTRAL AMERICA AND CARIBBEAN	47	16	2	0	1	4	70
Central America**	7	3	1	0	0	0	11
Caribbean**	0	0	0	0	0	1	1
Cuba	0	1	0	0	0	0	1
El Salvador	21	2	0	0	0	1	24
Haiti	2	8	0	0	0	0	10
Honduras	1	0	0	0	1	0	2
Nicaragua	15	2	1	0	0	2	20
Panama	1	0	0	0	0	0	1
NORTH AMERICA	32	0	1	0	0	2	35
Mexico	31	0	0	0	0	2	33
United States	1	0	1	0	0	0	2
OCEANIA	9	1	0	0	0	1	11
Oceania**	2	0	0	0	0	1	3
New Guinea	7	1	0	0	0	0	8
SOUTH AMERICA	4	1	0	0	0	3	8
South America**	0	0	0	0	0	1	1
Brazil	0	1	0	0	0	0	1
Colombia	1	0	0	0	0	0	1
Peru	1	0	0	0	0	0	1
Venzuela	2	0	0	0	0	2	4
EUROPE**	1	0	0	0	0	0	1
UNKNOWN	1	0	0	0	0	0	1
TOTAL	274	109	21	10	4	29	447

*Onset of illness in the United States and Puerto Rico
**Country not specified

Fig. 2 GEOGRAPHIC DISTRIBUTION OF MALARIA CASES WITH ONSET IN UNITED STATES, 1975

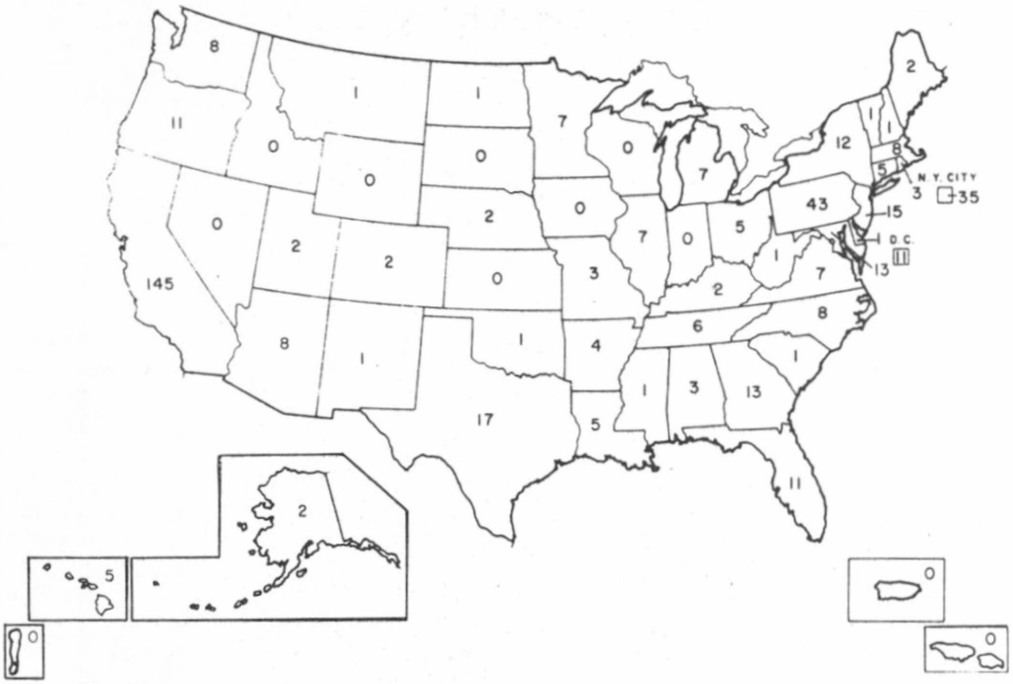


Fig. 3 MALARIA CASES BY MONTH OF ONSET, UNITED STATES, 1975

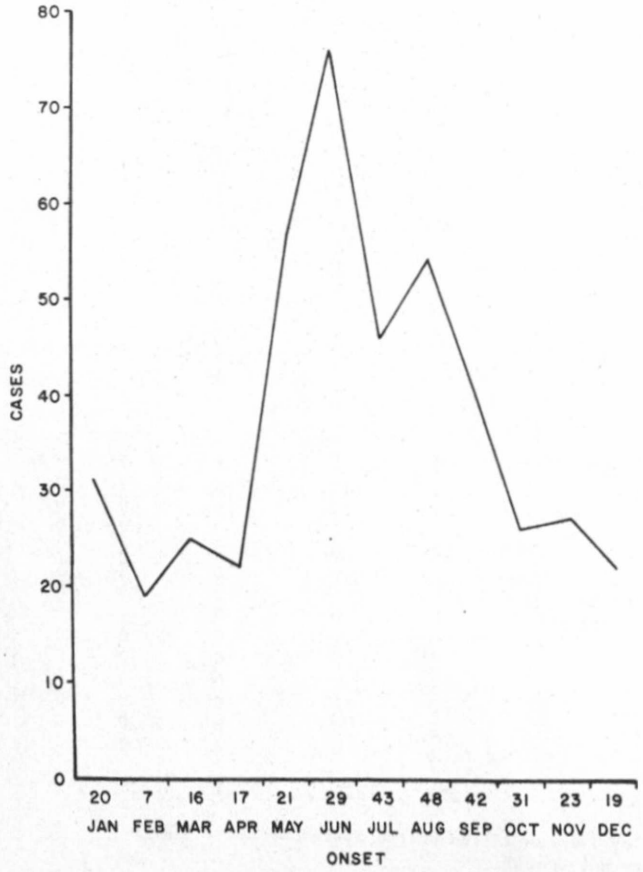


Table 4
Malaria Cases by Interval Between Date of Entry Into the United States and Onset of Illness, and by Plasmodium Species, United States, 1975*

Interval (in months)	Plasmodium species								All Cases	
	Vivax	(%)	Falciparum	(%)	Malariae	(%)	Ovale	(%)		
< 1	76	(31.7)	64	(64.7)	7	(36.8)	2	(20.0)	149	(40.6)
1-2	53	(22.2)	29	(29.3)	4	(21.1)	0	(0.0)	86	(23.4)
3-5	55	(23.0)	3	(3.0)	2	(10.5)	3	(30.0)	63	(17.2)
6-11	41	(17.2)	3	(3.0)	3	(15.8)	4	(40.0)	51	(13.9)
≥ 12	14	(5.9)	0	(0.0)	3	(15.8)	1	(10.0)	18	(4.9)
Total	239	(100.0)	99	(100.0)	19	(100.0)	10	(100.0)	367	(100.0)

*Cases acquired in the United States (2), cases with species undetermined (29) or mixed (4), and cases with exact entry date or onset of illness date unknown (45) are not included.

Table 5
Malaria Cases by Type of Initial Hospital Admission, United States, 1975

Type of Hospital	Number of Patients	Percent
Military	57	12.8
Veterans Administration	1	0.2
Civilian	287	64.2
Public Health Service	10	2.2
Other	19	4.3
Not Hospitalized	73	16.3
Total	447	100.0

Thorough and comprehensive evaluation of all cases of malaria reported in the United States constitutes the most effective approach to preventing reestablishment of malaria transmission subsequent to importation.

All cases of malaria, whether first attacks or relapses, regardless of where they were acquired, should be promptly reported to the appropriate health department. Clinical and epidemiologic information on each case should be provided on the Malaria Case Surveillance Report Form 4.80 (CDC) (Rev. 10-74). Additional copies of this form are available on request. Every effort should be made to obtain pretreatment thick and thin blood films for each case. These films may be submitted with the Surveillance Form.

IV. MILITARY MALARIA

In 1975, 17 cases of malaria among military personnel were reported, continuing the downward trend which began with the end of the American military involvement in Vietnam (Table 6). This is the fewest cases reported since 1959. Two of the cases occurred in returnees from Vietnam (2 and 4 years after arriving in the United States, respectively). Rare delayed primary attacks or relapses among military personnel who have returned from Vietnam can be expected in the future.

Table 6
Malaria Cases in Military Personnel,
by Branch of Service, United States, 1975

Branch of Service	Number of Cases	Percent of Cases
Army	4	23.5
Navy	2	11.8
Air Force	3	17.6
Marine	1	5.9
Unknown	7	41.2
Total	17	100.0

V. CIVILIAN MALARIA IMPORTED FROM ABROAD

In contrast to the continuing decrease in military cases of malaria, the number of imported civilian cases increased in 1975. The age and sex distribution of the 430 civilian cases which occurred in the United States is presented in Table 7; as in previous years, a predominance was observed in males in the 20 to 29-year age group. United States citizens accounted for 45.8% of the imported civilian cases for which nationality was available (Table 8). When purpose of travel in malarious areas was considered, tourists comprised the largest group among U.S. citizens. Among foreign visitors and immigrants, college students or teachers and persons with unknown occupations (represented mostly by refugees from Southeast Asia) were most commonly represented.

Table 7
Civilian Malaria Cases, by Age and Sex
United States, 1975

Age Group	Male	Female	Unknown	Total	Percent
0-09	24	24	2	50	11.6
10-19	35	19	1	55	12.8
20-29	114	59	4	177	41.2
30-39	46	24	0	70	16.3
40-49	27	5	0	32	7.4
50-59	21	3	0	24	5.6
60-69	5	4	0	9	2.1
70	1	2	0	3	0.7
Unknown	7	1	2	10	2.3
Total	280	141	9	430	100.0

Table 8
Imported* Civilian Malaria Cases, by Occupation While in Malarious Area and Nationality, United States, 1975

Occupation	U.S. Citizen	Foreign Visitor	Total	Percent
Tourist	54	10	64	15.0
Businessman	19	12	31	7.2
Government Representative	1	15	16	3.7
Missionary	10	0	10	2.3
Peace Corps	10	0	10	2.3
Seaman	5	8	13	3.0
College Student or Teacher	35	59	94	22.0
Other	24	48	72	16.8
Unknown	38	80	118	27.7
Total	196	232	428	100.0

*Introduced, Induced and Congenital Cases not included

VI. MALARIA ACQUIRED IN THE UNITED STATES

In 1975, 1 case of congenitally-acquired and 1 case of transfusion-induced malaria were reported in the United States. No cases of introduced malaria were reported.

A. Congenital Malaria

Case 1. On May 18, 1975, a 1-month-old male infant of Mexican descent was admitted to the Los Angeles County-University of Southern California Medical Center with jaundice, fever, and splenomegaly. He had been delivered in Los Angeles without complications at term by the vaginal route and had weighed 7 lb 11 oz at birth. He had been seen twice previously at a local health center on May 9 and 16 with the same signs.

A blood smear obtained from the infant on admission showed *Plasmodium vivax*. He was treated with chloroquine phosphate 5 mg/kg/day for 5 days, and a repeat blood smear obtained 4 days after admission revealed no *Plasmodium* organisms. Malaria indirect immunoflourescence (IFA) tests performed at CDC showed a titer of 1:256 to *P. vivax* and 1:64 to *P. falciparum* antigens.

The infants's mother, who had lived in Mexico throughout her pregnancy, had traveled to malarious areas in Mexico in both June and December 1974. She had been ill both times with fever and chills and had been treated with penicillin. *P. vivax* were not seen in her blood smear, but she did have a titer of 1:1024 to *P. vivax* by the IFA test. The mother and child have returned to Mexico, and no follow-up data are available.

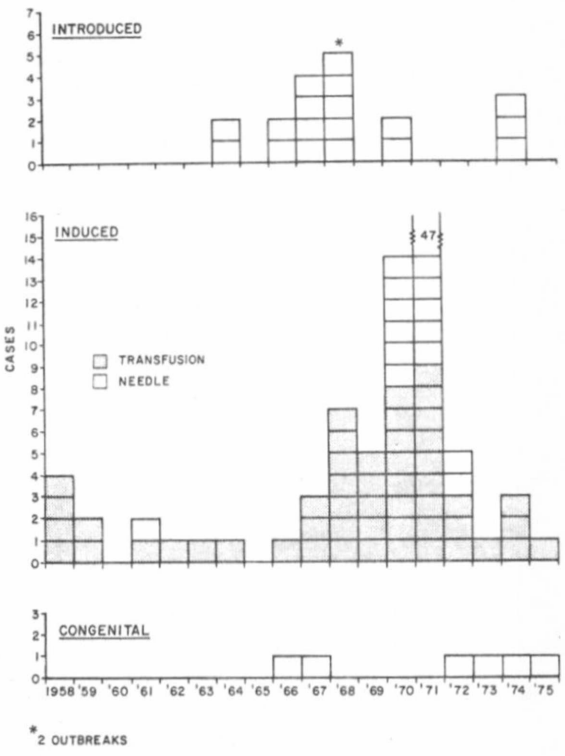
(Reported by Larry Baroff, M.D., Infectious Disease Fellow, LAC-USC Medical Center; Martin D. Finn, M.D., Acting Deputy Director; Betsy B. MacCracken, M.D., Director of Epidemiology; and Robert A. Gunn, M.D., Deputy Chief, Acute Communicable Disease Control, Community Health Services, Los Angeles County; the Parasitic Diseases Branch, Bureau of Epidemiology, CDC; and an EIS Officer.)

B. Transfusion-Induced Malaria (Figure 4)

Case 1 - On June 17, 1975, an 83-year-old woman was admitted to a Stanislaus County, California, hospital for evaluation of anemia. A well differentiated adenocarcinoma of the transverse colon was found and resected. There was no evidence of metastasis. Postoperatively she did relatively well and was discharged on July 5. On follow-up visit 1 month after surgery she felt well.

On August 18 she was readmitted to a hospital because of fever, chills, malaise, and diarrhea which had begun about 1 week earlier. She appeared somewhat lethargic. Her vital signs were: BP 150/90, P 80, and T 101.7 F (oral). Physical examination was unremarkable except for some abdominal tenderness. Plasmodium malariae was seen on a peripheral blood smear, and a standard course of 1.5 gm (base) chloroquine by mouth was started on August 19. Her course continued to deteriorate with onset of cerebral confusion and continued fever, nausea, vomiting, and diarrhea. Stool examinations for ova and parasites and enteric pathogens were negative. She died on August 12, 12 hours after her final dose of chloroquine. Autopsy showed the spleen to be twice normal size and congested with malarial pigment in macrophages. Hypostatic bronchopneumonia and pseudomembranous colitis were also present.

Fig. 4 MALARIA ACQUIRED IN THE UNITED STATES, 1958 – 1975



Investigation revealed that the patient had received 1 unit of whole blood (Donor A) on June 18 and 1 unit of packed RBC's (Donor B) on June 19 in preparation for surgery. She had no other possible malaria exposures. Neither of the volunteer donors gave a history of malaria or recent travel to a malaria endemic area. Peripheral thick and thin blood smears on both were negative for malaria parasites. Serologic examination by indirect immunoflourescent antibody (IIF) test showed no malaria antibodies in Donor A, however Donor B's serum gave a high titer (1:4096) against P. malariae.

Donor B, a 33-year-old man born in Imperial County, California, alternated his home between there and Zacatecas, Mexico, until 1948 when he returned to California permanently. Since then he has lived in Imperial County, Alameda County, and since 1955 in Stanislaus County. He never returned to Mexico nor has he traveled overseas. He has no past history of malaria and has never previously served as a blood donor nor received blood transfusions or antimalarial drugs. He denied illicit drug use. Following this investigation he received a curative course of chloroquine for his subclinical P. malariae infection.

(Reported by W. R. Metge, M.D., R. W. Purvis, M.D., Modesto; R. L. Dubois, Delta Blood Bank, Modesto; F. B. Waldorf, M.D., Turlock; R. W. Watson, M.D., J. Shaw, P.H.N., Stanislaus County Health Department; R. R. Roberto, M.D., California State Department of Health; Parasitology Division, Bureau of Laboratories, Field Services Divison, Parasitic Diseases Branch, Parasitic Diseases and Veterinary Public Health Division, Bureau of Epidemiology, CDC.)

VII. MALARIA DEATHS AND COMPLICATIONS IN THE UNITED STATES

A. Malaria Deaths

Two malaria deaths were reported in the United States in 1975. One was due to Plasmodium falciparum, and the other was caused by transfusion induced P. malariae.

Case 1 - See transfusion-induced malaria case 1, page 10.

Case 2 - An 8-year-old Cambodian child at the Fort Chaffee Refugee Center, Arkansas, was admitted to the infirmary on November 6, 1975, with nausea, vomiting, lethargy, and malaise. On admission peripheral blood smear showed Plasmodium falciparum. The patient was treated with chloroquine, but 36 hours after admission suddenly aspirated and died despite attempts at resuscitation. Postmortem examination revealed numerous parasitized erythrocytes within capillaries of the brain, heart, and other viscera.

The child had no past history of malaria although 3 months before her death she had had a febrile illness while staying in a refugee camp in Thailand. Her symptoms resolved after an injection of an unknown medication. She arrived in the United States on October 19, 1975, and was well until shortly before her hospitalization.

(Reported by F. Bussey, M.D., W. Faggett, M.D., R. Hodder, M.D., U.S. Army, Fort Chaffee; L. Davenport, M.D., Fort Smith; A. G. Dean, M.D., Acting State Epidemiologist, Arkansas State Board of Health; Field Services Division, Parasitic Diseases Branch, Parasitic Diseases and Veterinary Public Health Division, Bureau of Epidemiology, CDC.)

B. Malaria Complications

Fifty-nine complications of malaria, aside from death, were reported in 1975 (Table 9).

Table 9
Malaria Complications by Species, United States, 1975

	Vivax	Falciparum	Malariae	Ovale	Mixed	Undetermined	Total
Hemolysis	21	16	4	1	0	1	43
Cerebral	3	3	2	0	0	1	9
Renal	2	4	1	0	0	0	7
Total	26	23	7	1	0	2	59
Total Number of Cases Diagnosed	274	109	21	10	4	29	447

VIII. REPORT FROM THE NATIONAL MALARIA REPOSITORY - 1975

In 1975 the presence of Plasmodium species or agreement that there were no parasites present was confirmed in blood films from 209 cases submitted to the National Malaria Repository. There were 2 instances where blood films submitted as containing malaria organisms were found not to have organisms present. No specimens were submitted as negative and later found to be positive at CDC. In 10 instances, the species diagnosis of the National Malaria Repository differed from that of the institution submitting the slide. The origin and species diagnosis of malaria smears examined by the repository are shown in Tables 10 and 11. Totals for the calendar year 1973 and 1974 are included for comparison.

Table 10
Institutions Submitting Positive Slides for Malaria to the National Malaria Repository*, 1973-1975

	ORIGIN							
	Army	Navy	VA Hosp	Air Force	Health Dept. (State, County, City)	PHS Hosp	Other Hospitals Clinics, Physicians, etc.	Cumulative
Cumulative total positive 1975	2	30	0	1	25	2	65	125
Cumulative total positive 1974	4	28	2	3	36	10	23	106
Cumulative total positive 1973	6	0	3	4	31	2	63	109

*CDC

Table 11
Species of Malaria Identified by National Malaria Repository*, 1973-1975

Species	Cumulative Total 1975	Cumulative Total 1974	Cumulative Total 1973
P. vivax	57	46	46
P. falciparum	48	46	41
P. malariae	3	4	1
P. ovale	13	8	20
Plasmodium sp.	4	2	3
Negative	96	84	81
Total examined	221	190	192
Cumulative positive	125	106	111**

*CDC
**Mixed infections included

ACKNOWLEDGMENT

The Malaria Surveillance Report, prepared annually at the Center for Disease Control, is based on information provided in individual case reports. The excellent support given to malaria surveillance by state and local health departments and personnel of the preventive medicine services of the U.S. Army, Navy, and Air Force is greatly appreciated.

REFERENCES

1. World Health Organization: Terminology of malaria and of malaria eradication, 1963, p 32
2. World Health Organization: Expert committee on malaria, 10th report, Tech Rep Ser no. 272, p 34

IX. ADDENDUM I

The Prevention of Malaria

The purpose of this addendum is to provide international travelers with current information about the risk of acquiring malaria in areas of the world that they intend to visit. This information is taken from the World Health Organization's Weekly Epidemiological Record 48, 25-45, January 19, 1973, and updated through December, 1975.

The information in the table is presented in 6 columns. Note that for North America, Europe, and Oceania, if a country does not appear in Column 1 it can be assumed it has no malaria risk. In other regions the absence of malaria is noted by 0 in Column 2. If a country is malarious but there are areas of no risk within it this is noted by X in Column 3. These areas are listed by country at the end of the table. High altitude areas, urban areas, and seasons without malaria risk are shown in Columns 4, 5, and 6. A + in Column 5 indicates malaria exists at all altitudes. A dash indicates that the information is not available.

TABLE - INFORMATION ON MALARIA RISK BY COUNTRY

			For Countries Where Malaria Risk Exists		
			For All Areas Not Shown in Col. 3		
Country	Malaria Risk	Areas Without Risk	Months with Risk	Altitude below which risk exists (meters)	Risk in Urban Areas
Col. 1	2	3	4	5	6
AFRICA					
Algeria	X	X	6-10[1]	1,500	0
Angola incl. Cabinda	X	-	-	-	-
Botswana	X	X	10-3	+	X[2]
Brit. Indian Ocean Terr.[3]	X	-	-	-	-
Burundi	X	-	-	-	-
Cameroon	X	0	1-12	+	X
Cape Verde Is.	X	-	-	-	-
Central Africa Rep.	X	0	1-12	+	X
Chad	X	-	-	-	-
Comoro Is.	X	0	1-12	+	X
Congo, People's Rep. of[4]	X	0	1-12	+	X
Dahomey	X	0	1-12	+	X
Egypt	X	-	-	-	-
Equatorial Guinea[5]	X	-	-	-	-
Ethiopia	X	-	-	-	-

1 Oasis, Saoura, Wilaya (= Dep.):2-8
2 Kasane, Maun, towns
3 Comprising Chagos Arch. (formerly dependency of Mauritius) and the islands of Aldabra, Farquhar, and Des Roches (formerly dependency of Seychelles)
4 Brazzaville
5 Fernando Poo (incl. Annobon), Rio Muni (incl. Corisco, Elobeys).

Dep. - Department
D. - District
S. - State

(Table continued next page)

TABLE (continued)

Country	For Countries Where Malaria Risk Exists: Malaria Risk	Areas Without Risk	For All Areas Not Shown in Col. 3: Months with Risk	Altitude below which risk exists (meters)	Risk in Urban Areas
Col. 1	2	3	4	5	6
French Southern & Antarctic Terr.[1]	0				
French Terr. of the Afars and the Issas	0				
Gabon	X	0	1-12	1,000	X
Gambia	X	0	1-12	+	X
Ghana	X	0	1-12	+	X
Guinea	X	-	-	-	-
Ivory Coast	X	0	1-12	+	X
Kenya	X	0	4-6 & 11-12[2]	2,000[3]	X[4]
Lesotho	0				
Liberia	X	0	1-12	+	X
Libyan Arab Rep.	X	X	-	-	-
Madagascar	X	X	9-3	1,100	X[5]
Malawi	X	0	1-12	1,700	X
Mali	X	0	1-12[6]	+	X
Mauritania	X	-	-	-	-
Mauritius[7]	0				
Morocco	X	-	-	-	-
Mozambique	X	-	-	-	-
Namibia[8]	X	-	-	-	-
Niger	X	0	7-11[9]	+	X
Nigeria	X	0	1-12	+	X
Portuguese Guinea	X	-	-	-	-
Reunion	0				
Rwanda	X	-	-	-	-
St. Helena[10]	0				
Sao Tome & Principe	X	-	-	-	-
Senegal	X	0	1-12[11]	+	X[12]

[1] Comprising the islands of St. Paul and Amsterdam, the Kerguelen and Crozet Arch. and Adelie Coast
[2] North Eastern, Nyanza, Western, Coast, Prov.: 1-12
[3] Rift Valley Prov: 2,500; North Eastern Prov.: 1,500
[4] Risk very low: Nairobi Area, Central Prov., Rift Valley Prov. Low-risk - Eastern, Nyanza, Western, Coast, Prov. Moderate risk - North Eastern Prov.
[5] Excl. Ambositra, Antsirabe, Tananarive
[6] Less risk - 4-6
[7] Incl. Rodrigues, Agalega, St. Brandon Is.
[8] Incl. Walvis Bay, which is an integral part of South Africa but administered as if it were part of Namibia
[9] Agades Dep.: 8-10
[10] Incl. Ascension, Tristan da Cunha
[11] Cap-Vert: less risk during 1-6
[12] Dakar, town - no risk during 1-6

(Table continued next page)

TABLE (continued)

Country	Malaria Risk	For Countries Where Malaria Risk Exists: Areas Without Risk	For All Areas Not Shown in Col. 3: Months with Risk	Altitude below which risk exists (meters)	Risk in Urban Areas
Col. 1	2	3	4	5	6
Seychelles	0				
Sierra Leone	X	0	1-12	+	X
Somalia	X	0	1-12	+	X[1]
South Africa[2]	X	X	1-12[3]	1,200	0[4]
Southern Rhodesia	X	-	-	-	-
South West Africa[5]					
Spanish North Africa[6]					
Spanish Sahara[7]	0				
Sudan	X	X	-	-	-
Swaziland	X	X	-	-	-
Togo	X	0	1-12	+[8]	X
Tunisia	X	X	5-11[9]	+	0[10]
Uganda	X	X	1-12	1,800	X[11]
United Arab Rep.[12]					
United Rep. of Tanzania					
Tanganyika	X	0	1-12	+	X
Zanzibar	X	-	-	-	-
Upper Volta	X	0	1-12[13]	+	X
Zaire	X	0	1-12	+	X
Zambia	X	0	11-5	+	X
AMERICA, NORTH -					
Malaria Risk Only in Countries Noted Below					
Belize	X	0	1-12	500	X
Costa Rica	X	X	-	500	0
Dominican Rep.	X	X	1-12	500	0
El Salvador	X	0	1-12	800	0[14]
Guatemala	X	X	6-11[15]	1,000	0
Haiti	X	X	7-3	500	0

1 Mogadishu: very low risk
2 Walvis Bay, See Note 8 on previous page
3 Cape Province - areas adjacent Molopo and lower Orange Rivers: 2-5
4 Transvaal east north and western low altitude areas: X
5 Namibia
6 See Spain
7 Comprising the Northern Region (former Seguia el Hamra) and the Southern Region (former Rio de Oro)
8 Above 600 m. marked reduction of risk
9 Sfax Governorate
10 Gabes Governorate
11 Entebbe, Fort Portal, Jinja, Kampala, Mbale: 0
12 Egypt
13 Djibo, Oudalan, cercles: 6-12
14 Acajutla, la Libertad, la Union, Usulatan, Dep.: X
15 Alta Verapaz, Izabal, Dep.: 1-12

(Table continued on next page)

TABLE (continued)

Country	For Countries Where Malaria Risk Exists: Malaria Risk	Areas Without Risk	For All Areas Not Shown in Col. 3: Months with Risk	Altitude below which risk exists (meters)	Risk in Urban Areas
Col. 1	2	3	4	5	6
Honduras	X	X	1-12[1]	1,000	0
Mexico	X	X	1-12[2]	1,500	0
Nicaragua	X	0	1-12	1,000	0
Panama[3]	X	X	1-12	1,000[4]	0[5]
Canal Zone -	0				
AMERICA, SOUTH					
Argentina	X	X	9-5	2,000	0
Bolivia	X	X	1-12	2,000	0
Brazil	X	X	1-12	900	0[6]
Brit. Antarctic Terr.[7]	0				
Chile	0				
Colombia	X	X	-	1,500[8]	0
Ecuador	X	X	1-12[9]	1,500[10]	0[11]
Falkland Is. (Malvinas)	0				
French Guiana	X	X	1-3[12]	-	X
Guyana	X	X	1-12	+	0
Paraguay	X	X	9-5[13]	+	X
Peru	X	X	1-12[14]	1,500	0
Surinam	X	X	1-12	+	X[15]

1 Copan, Intibuca, la Paz, Lempira, Olancho, Dep.: 5-12
2 Higher risk during 6-11 in -: Campeche, Chiapas, Colima, Guerrero, Jalisco, Michoacan, Morelos, Nayarit, Oaxaca, Puebla, Quintana Roo, Sinaloa, Sonora, Tabasco, Veracruz, Yucatan
3 Excl. Canal Zone, shown separately hereunder
4 Colon, Darien, Panama. Prov.: +
5 Occasionally possible
6 Amazonas, Maranhao, Para, S. - ; Terr. Federales: X
7 Comprising the South Orkney Is., South Shetland Is. and Graham Land (former dependencies of Falkland Is. (Malvinas) south of 60° latitude) and the sector of Antarctic Continent between longitudes 20° W and 80° W
8 Boyaca, Norte de Santander, Santander, Dep.; Caqueta, Meta, Intendencias; Putumayo, Comisaria: 1,000 m
9 Canar, Loja, Prov.: 12-7
10 Concerning Pichincha Prov. only
11 Concerning only the urban centres of - : Guayaquil (Guayas Prov.); Manta, Portoviejao (manabi Prov.); Macas (Morona Prov.)
12 Main season with risk
13 Amambay, Cordillera, Itapua, Dep.: risk very low, and in small parts only
14 Piura Dep.: 12-7
15 Albina, Moengo (Marowijne D.), Nickerie, Wageningen (Nickerie D.): 0

(Table continued next page)

TABLE (continued)

Country	For Countries Where Malaria Risk Exists: Malaria Risk	Areas Without Risk	For All Areas Not Shown in Col. 3: Months with Risk	Altitude below which risk exists (meters)	Risk in Urban Areas
Col. 1	2	3	4	5	6
Uruguay	0				
Venezuela	X	X	1-12	600	0[1]
ASIA					
Afghanistan	X	-	-	-	-
Bahrain	X	-	-	-	-
Bangladesh	X	-	-	-	-
Bhutan	X	-	-	-	-
Brunei	0				
Burma	X	X	4-11	900	0[2]
Ceylon[3]					
China	-	-	-	-	-
Cyprus	0				
Hong Kong[4]	X	X	-	-	-
India[5]	X	X	3-10	1,600	X
Indonesia[6]	X	X	1-12	1,200	X[7]
West Irian[8]	X	0	1-12	1,200	X
Iran	X	X	1-12	1,500	0[10]
Iraq	X	-	-	-	-
Israel	0				
Japan[11]	0				
Jordon	X	X	-	-	0
Khmer Rep.	X	X	1-12[12]	+	X[13]
Korea - Dem. People's Rep. of Korea	X	-	-	-	-
Rep. of Korea	X	X	5-10	+	0
Kuwait	0				
Laos	X	X	-	-	-
Lebanon	0				

1 Practically no risk
2 Generally no risk in most urban areas
3 Sri Lanka
4 Hong Kong I., Kowloon and the New (leased) Territories
5 Incl. Andaman, Nicobar, Laccadive, Minicoy and Aminidivi Is.; excl. Sikkim shown separately; also incl. Jammu and Kashmir, the final status of which has not yet been determined
6 Excl. West Irian, shown separately hereunder
7 Outskirts only
8 Western part of island of New Guinea
9 Baluchestan, Fars (excl. Abadeh, Shiraz): 1-2; Kerman (excl. Kerman, Sharestan), Kermanshah, Lorestan: 12-3
10 Baluchestan, Khuzestan (excl. Abadan, Ahwaz), Lorestan, Oman and Fars Coastal Oman: X
11 Comprising Hokkaido, Honshu, Kyushu, Shikoku, the Amami Isl., and The Tokara Arch.
12 Kg. Som, Kep-Bokor, Municipality: 11-5
13 Kirivong Town (Takeo Prov.): 0

(Table continued next page)

TABLE (continued)

Country	For Countries Where Malaria Risk Exists: Malaria Risk	Areas Without Risk	For All Areas Not Shown in Col. 3: Months with Risk	Altitude below which Risk exists (meters)	Risk in Urban Areas
Col. 1	2	3	4	5	6
Macao[1]	0				
Malaysia					
East Malaysia					
Sabah	X	X	1-12	1,700	0
Sarawak	X	0	1-12	+	0
West Malaysia	X	X	1-12	1,700	0[2]
Maldives	X	X	1-12	+	0[3]
Mongolia	0				
Muscat and Oman[4]					
Nepal	X	X	6-11[5] 1-12[6]	1,200	X
Oman[7]	X	-	-	-	-
Pakistan[8]	X	0	3-10[9]	2,000	X
Palestine[10]					
Gaza Strip[11]	X	-	-	-	-
Philippines	X	X	1-12	600	0[12]
Portuguese Timor	X	0	1-12	+	X
Qatar	X	-	-	-	-
Ryukyu Is.[13]	0				
Saudi Arabia	X	X	1-12	-	X[14]
Sikkim	X	-	-	-	-
Singapore	X	X	1-12	+	0
Sri Lanka[15]	X	X	1-12	800	X
Syrian Arab Rep.	X	X	5-10	600	0

1 Comprising Macao City and islands of Taipa and Coloane
2 Small towns near foothills: X
3 There are no urban agglomerations in the malarious areas except the capital city.
4 Oman
5 In cultivated areas (below 250 m.) and hill valleys (750-1,200 m.): 6-11
6 250-750 m.
7 Formerly Muscat and Oman
8 Excl. Jammu and Kashmir, the final status of which has not yet been determined
9 North-West-Frontier Prov., hilly areas of Baluchistan and Punjab Prov. - North-West-Frontier Prov.,: 6-9
10 Former mandated territory administered by the United Kingdom until Armistice of 1949
11 Comprising that part of Palestine under Egyptian administration from the Armistice of 1949 until June 1967, when it was occupied by Israeli military forces
12 Practically no risk
13 Comprising those islands of the Ryukyu group south of 28° N, except the Amami Is.
14 Jeddah, Mecca, Medina, Qatif: 0
15 Formerly Ceylon

(Table continued next page)

TABLE (continued)

Country	For Countries Where Malaria Risk Exists: Malaria Risk	Areas Without Risk	For All Areas Not Shown in Col. 3: Months with Risk	Altitude below which Risk exists (meters)	Risk in Urban Areas
Col. 1	2	3	4	5	6
Thailand	X	X	1-12	+	0[1]
Trucial Oman[2]					
Turkey	X	X	7-10[3]	1,000	0
United Arab Emirates[4]	X	-	-	-	-
Vietnam					
Dem. Rep. of Vietnam	X	-	-	-	-
Rep. of Vietnam	X	X	5-12[5]	-	0[6]
Yemen	X	X	9-2	1,400	X
Yemen, Democratic	X	-	-	-	-
EUROPE					
Risk Only in Countries Noted Below					
Greece	X	X	6-11	+	0
OCEANIA					
Risk Only in Countries Noted Below					
British Solomon Is.[7]	X	0	1-12	400	X
New Guinea[8]					
New Hebrides	X	0	1-12	+	X[9]
Papua New Guinea[10]	X	0	1-12	-	X
UNION OF SOVIET SOCIALIST REPUBLICS					
Union of Soviet Socialist Rep.	X	-	-	-	-
Byelorussian Soviet Socialist Rep.	0				
Ukrainian Soviet Socialist Rep.	0				

1 In Bangkok and in most urban areas
2 United Arab Emirates
3 Siirt, Prov.: 7-9; Hakkari Prov.: 8-10
4 Comprising 6 sheikhdoms of Abu Dhabi, Dubai, Sharjah, Ajman, Umal Qaiwayn and Fujairah
5 Binh-Long, Darlac, Kon-Tum, Lam-Dong, Phu-Bon, Phuoc-Long, Pleiku, Quang-Duc, Tuyen-Duc: 1-12
6 Practically no risk
7 Comprising the Solomon Is. group (except Bougainville and Buka which are included with New Guinea below), Ontong Java, Rennell and Santa Cruz Is.
8 Papua New Guinea
9 Southern Division: 0
10 New name for the Territory of Papua under Australian administration and for New Guinea, UN Trust Territory administered by Australia, adopted by UN General Assembly Resolution A/Res/286 (XXVI) on 20 December 1971

Areas of Countries Free of Malaria

Algeria - Oran Wilaya (= Dep.), Saida Wilaya; Frenda Daira (= Arrond.), Aflou Daira, (Tairet Wilaya); Ain Oussera Daira, Bou-Saada Daira, Djelfa Daira, (Titteri Wilaya); Mascara Daira, Mostaganem Daira, Tighennif Daira, (Mostaganem Wilaya).

Argentina - Most of the Country, malaria risk exists only in - Oran, San Martin Dep. (Salta Prov.); Ledesma, San Pedro, Santa Barbara, Dep. (Jujuy Prov.).

Bolivia - la Paz, Cochabamba, Santa Crux, Oruro, Potosi, Sucre, Tarija, Trinidad, Dep.

Botswana - Ghanzi, Kgalagadi, Kweneng, Ngamiland,[1] Ngwaketse, Ngwato,[2] Tuli Block,[2] D.

Brazil - Alagoas, Distrito Federal, Guanabara, Paraiba, Pernambuco, Rio Grand do Norte, Rio Grande do Sul, Rio de Janeiro, Sergipe, States - Partially - Bahia, Ceara, Espirito Santo, Minas Gerais, Parana, Santa Catarina, Sao Paulo, States

Burma - Rangoon Division

Colombia - Bogota, Cundinamarca, Huila, Tolima, Dep., San Andres Is.

Costa Rica - Ciudad San Jose (San Jose Prov.); Penas Blancas, Pasoc Canoas (Carretera Interamericana)

Dominican Rep. - Most of the country, malaria risk exists only in - : Dajabon, Oma de Cabrera, Municipios (Dajabon Prov.);Pepillo Salcedo Mun. (Monte Cristi Prov.); Pedernales Mun. (Pedernales Prov.); Elias Pina, Hondo Valle, Banica, Pedro Santana, Mun. (Estrelleta Prov.)

Ecuador - Azuay, Bolivar, Carchi, Chimborazo, Cotopaxi, Imbabura, Tungurahua, Arch. de Colon (Galapagos Is.), Zamora-Chinchipe, Prov.

French Guiana - Cayenne City

Greece - Practically the whole country; extremely limited risk exists only in - : Alexandria (Hematheia - Imathia, Dep.); Propouliou (Lesbos Dep.)

Guatemala - Chimaltenango, el Progreso, Guatemala, Jalapa, Sacatepequez, Solola, Totonicapan, Dep.

Guyana - East Berbice, West Berbice, East Demerara, West Demerara, Essequebo Is., Essequebo, Circles

Haiti - Sud-Ouest Dep.; part of - : Artibonite, Centre, Nord, Sud, Dep.

Honduras - Ocotopeque Dep.

Hong Kong - Hong Kong I, Kowloon, New Kowloon

India - Andhra Pradesh S.: Anantapur, Chittoor, Cuddappah, E. Godavari, W. Godavari, Hyderabad, Karimganj, Khammam, Krishna, Kurnool, Mahbubnaga, Medak, Nalgonda, Nellore, Nizamabad, Warangal, D.

Bilhar S.: Bhagalpur, Champaran, Darbhanga, Gaya, Monghyr, Muzaffarpur, Palamau, Patna, Purnea, Saharsa, Santal Parganas, Saran, Shahdol, D.

Chandigarh Union Terr.: Chandigarh D.

Coalfields: Dhanbad D.

Delhi, Terr.: Part of - : Delhi, Terr.

Goa Daman & Div., Terr.: Panaji D.

Haryana S.: Ambala, Jind, Karnal, D. Part of - : Gurgaon, Hissar, Rohtak, D.

Himachal Pradesh S.: Part of - : Dharamshala, Simla, D.

Jammu & Kashmir S.: Part of - : Doda, Jammu, Kathua, Punch, Udhampur, D.

Kerala S.: Alleppey, Cannanore, Ernakulam, Kottayam, Kozhikode, Palghat, Quilon, Trichur, Trivandrum, D.

Maharashtra S.: Akola, Amravati, Kilhapur, Ratnagiri, Wardha, D.
Part of - : Ahmednagar, Aurangabad, Bhandara, Bhir, Buldhana, Nagpur, Nasik, Osmanabad, Parbhani, Poona, Sangli, Satara, Sholapur, Yeotmal, D.

Mysore S.: Bangalore, Chikmagalur, Chitradurga, Coorg, Hassan, N. Kanara, S. Kanara, Kolar, Mandya, Tumkur, D.
Part of - : Belgaum, Bellary, Bijapur, Dharwar, Gulbarga, Mysore, Shimoga, D.

[1] West of 22° E and south of 19° S
[2] South of 23° S

Areas of Countries Free of Malaria

India - (cont.) Orissa S.: Part of - : Balasore, Cuttack, Puri, D.
Punjab S.: Amritsar, Bhatinda, Gurdaspur, Hoshiarpur, Jullundur, Kapurthala, Ludhiana, Patiala, D.
Part of - : Ferozepur, Ropar, Sangrur, D.
Rajasthan S.: Jhundjhunu, Sikar D.
Part of - : Churu, Jaipur, Nagaur, Sawai Madhopur, D.
Tamil Nadu: N. Arcot, Chingleput, Coimbatore, Kanyakumari, Nilgiris, Thanjavur, Tiruchirapalli, Tirunelveli, D.
Part of - : South Arcot, Dharmapuri, Madras Corp., Madurai, Ramanathapuram, Salem D.
Uttar Pradesh S.: Agra, Aligarh, Azamgarh, Ballia, Bara-Banki, Budaun, Bulandshahr, Chamoli, Deoria, Etah, Etawah, Faizabad, Farrukhabad, Fatehpur, Ghazipur, Hardoi, Jalaun, Jaunpur, Kanpur, Lucknow, Mainpuri, Mathura, Pratapgarh, Rae Bareli, Sitapur, Sultanpur, Unnao, Varanasi, D. Part of : Allahabad, Almora, Bahraich, Bareilly, Basti, Bijnor, Gonda, Gorakhpur, Meerut, Moradabad, Muzaffarnagar, Pauri, Rampur, Saharanpur, Shahjahanpur, D.

Indonesia - Djakarta-Raya, Surabaja, Regencies

Iran - Ostans (=Regions): Azarbaijan (East-oriental), Azarbaijan (West-occidental), Gilan, Hamadan, Istahan, Khorasan, Mazanderan; Sharestons (=Prov.): Abadan, Abadeh, Ahwaz, Kerman, Semnan, Shiraz, Yazd, Zanjan

Jordon - Whole country, with exception of Jordon Valley and Karak Lowlands where there is some risk, but normally not visited by tourists

Khmer Rep. - Kandal, Preyveng, Svay-Rieng, Takeo (excl. Kirivong D.), Prov.: Phnom-Penh Municip.

Laos - Vientiane

Libyan Arab Rep. - Whole country, except 2 small foci in the southwest of the country

Madagascar - Andramasina, Antanifotsy, Arivonimamo, Imeririna-Fovoany, Manjakandriana, Pref.: Nossi-Be, Is.

Maldives - Male I. (Cap.), Male Atoll (Kaaf)

Mexico - Aguascalientes, Baja California Norte, Baja California Sur, Chihuahua, Coahuila, Distrito Federal, Durango, Guanajuato, Hidalgo, Mexico, Nuevo Leon, Queretaro, San Luis Potosi, Tamaulipas, Tlaxcala, Zacatecas, States

Nepal - Dhaulagiri Anchal (=Prov.), Karnali Anchal

Panama - Ciudad Panama, Ciudad Colon

Paraguay - Boqueron, Central, Concepcion, Misiones, Neembucu, Olimpo, Paraguari, Presidente Hayes, Dep.

Peru - Amazonas (excl. Bagua Prov.), Ancash, Apurimac, Arequipa, Ayacucho, Cajamarca (excl. Cutervo, Jaen, S. Ignacio, Prov.), Callao, Cuzco Huancavelica, Huanuco, Ica, Junin (excl. Satipo Prov.), la Libertad, Lambayeque, Lima, Madre de Dios, Moquegua, Pasco, Piura (excl. Ayabaca, Huancabamba, Morropon, Prov.), Puno, Tacna, Tumbes, Dep.

Philippines - Greater Manila, Baguio City, Davao City, Zamboanga City; Bohol, Catanduanes, Cebu, Leyte, Masbate Negros (northern part), Panay Is. Albay, Sorsogon, Prov.: plain areas of - :Bulacan, Nueva Ecija, Pampanga, Pangasinan, Tarlac, Prov.; Luzon (west coast of northern part)

Rep. of Korea - Cheju-Do, Cholla-Namdo, Cholla-Pukto, Chungchong-Namdo, Chungchong-Pukto, Kangwon-Do, Kyongsang-Namdo, Prov.; Seoul Special City

Rep. of Vietnam - An-Giang, An-Xuyen, Ba-Xuyen, Chuong-Thien, Kien-Giang, Kien-Phong, Kien-Tuong, Phong-Dinh, Vinh-Long, Sa-Dec, Vinh-Long, Vung-Tau, Prov.

Sabah - Kota Kinabalu, Sandakan, Towns

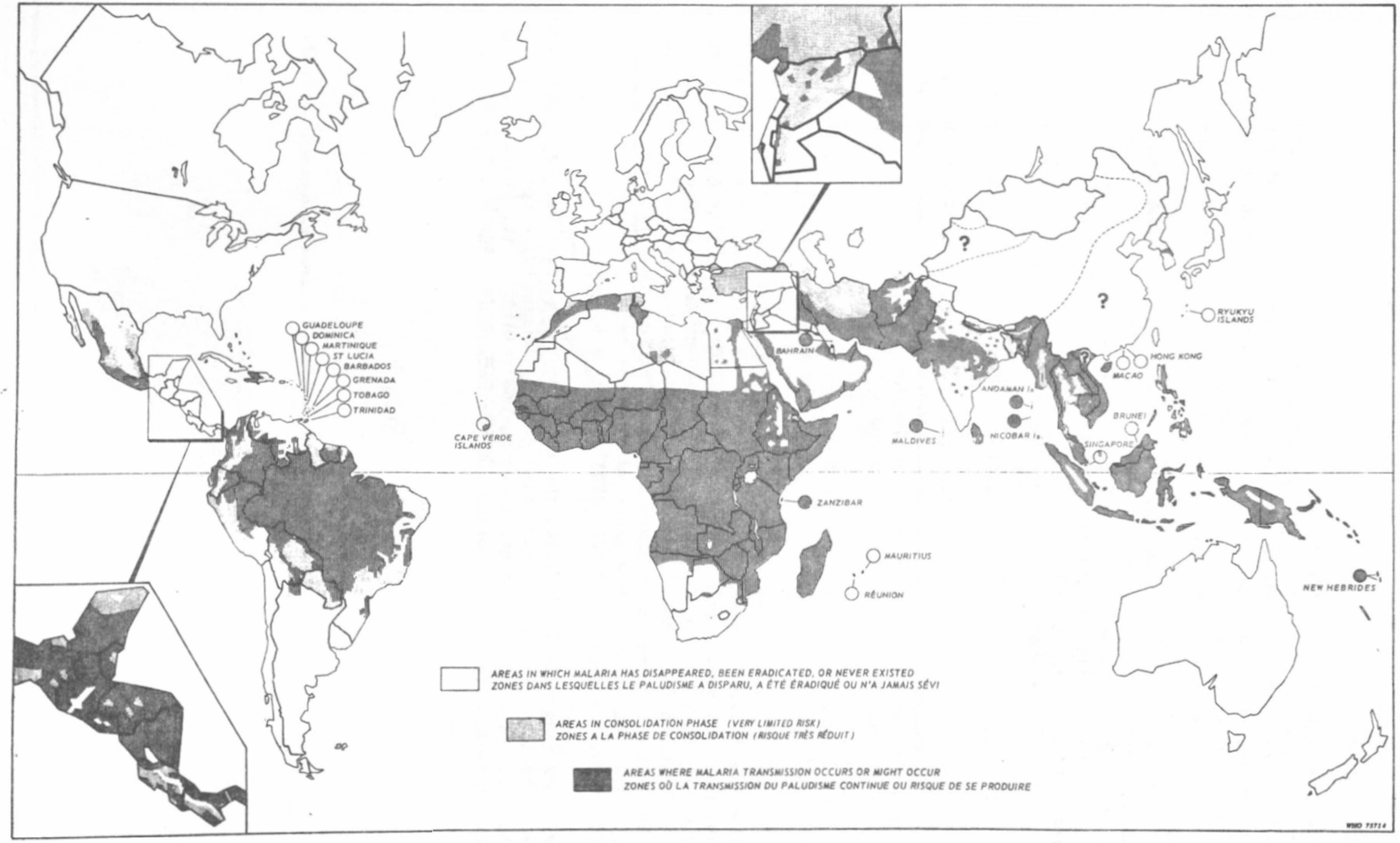
Areas of Countries Free of Malaria

Saudi Arabia - Alhasa, Arar, Jauf, Quraiya (Qurayyat), Riyad, Tabuk, Taif, and rural parts of Jeddah, Mecca, Medina, as well as areas on the pilgrimage road and pilgrimage areas
Singapore - City District (southern part of the island)
South Africa - Cape Prov. except areas adjacent Molopo and lower Orange Rivers; Orange Free State; Transvaal except east north and western low altitude areas; Natal except North Zululand.
Sri Lanka - Galle, Kalutara; partially - : Colombo
Sudan - Northern Prov. (northern part)
Swaziland - Most of the country[3]
Syrian Arab Rep. - Damascua, Deir-ez-Zor, Hama, al Hasakeh, Latakia, Sweida, Tartus, sub. D. (Latakia D.).
Surinam - Commewijne, Coronie, Para, Paramaribo, D.
Thailand - An Thong, Maha Sarakham, Nakhon Pathom, Nonthaburi, Pathum Thani, Phichit, Phra Nakhon, Phra Nakhon Si Ayutthaya, Samut Prakan, Samut Sakhon, Samut Songkhram, Sing Buri, Thon Buri, Prov.
Part of - : Buri Ram, Chachoengsao, Chai Nat, Chiang Mai, Chon Buri, Kalasin, Kanchanaburi, Khon Kaen, Lamphun, Lop Buri, Nakhon Nayok, Nakhon Ratchasima, Nakhon Sawan, Nakhon Si Thammarat, Narathiwat, Nong Khai, Pattani, Phetchaburi, Phitsanulok, Prachin Buri, Ratchaburi, Roi Et, Saraburi, Si Sa Ket, Songkhla, Sukothai, Suphan Buri, Surat Thani, Surin, Udon Thani, Ubon Ratchathani, Uthai Thani, Uttaradit, Prov.
Tunisia - Beja, Bizerte, Jendouba, Kairouan, Kasserine, Le Kef, Nabeul, Sousse, Tunis, Governorates
Turkey - Whole country, excl. plain of Cucurova (partially - Adana, Hatay, Icel, Prov.); Hakkari, Mardin, Siirt, Prov.
Uganda - Kigezi D. (southern part)
Venezuela - Anzoategui, Aragua, Carabobo, Cojedes, Falcon, Guarico, Lara, Miranda Monagas, Nueva Esparta, Portuguesa, Sucre, Trujillo, Yaracuy, States -; Distrito Federal, Territorio Federal Delta-Amacuro
West Malaysia - Kuala Lumpur, Cap.; Georgetown (Penang State); Malacca Municipality
Yemen - Hajja Sada, Prov.

All tourists who travel in a malarious area should use a prophylactic drug no matter how brief their visit. The drug of choice is chloroquine phosphate 500 mg (300 mg. base) once a week beginning 1 week before entering the malarious area and continuing until 6 weeks after departure. The pediatric dose of chloroquine phosphate is 5 mg/kg (base) weekly. Alternatives to chloroquine phosphate, which are given at the same intervals as chloroquine, are hydroxychloroquine sulfate 400 mg (310 mg. base) and amodiaquine hydrochloride 520 mg (400 mg. base). These drugs will suppress a clinical attack of malaria. Primaquine phosphate can be used for terminal chemoprophylaxis but it should not be given routinely. Its use depends on the intensity of exposure to tertian malaria and the patient's predisposition to G-6-P-D deficiency. The dose is 26.3 mg (15 mg base) daily for 14 days after the patient's last exposure. Subsidiary measures to reduce contact with night-biting mosquitoes include the use of insecticides, mosquito nets and screens, and long sleeves and trousers.

3 Excl. some small areas near the border. Most of the notified cases are of non-local origin.

AREAS OF RISK FOR MALARIA TRANSMISSION
December 1975



X. ADDENDUM II

The Microscopic Diagnosis of Malaria

Early diagnosis of malaria requires a high level of clinical suspicion and, in particular, the careful taking of a travel history from every patient with a fever of unknown origin. Once the diagnosis is suspected, a Giemsa-stained smear of peripheral blood should be examined for the presence of parasites. Since the accuracy of diagnosis is dependent on the quality of the blood film, the following guide is offered for the proper preparation of thick and thin blood smears.

1. Manufacturers' "pre-cleaned" slides are not considered clean enough for use in malaria diagnosis. Prior to use, such slides should be washed in mild detergent, rinsed thoroughly in warm running water, then in distilled water, and dipped in ethyl alcohol (90-95%). Slides may then be wiped dry with a lintless cloth or tissue for immediate use or stored in 95% alcohol until needed.
2. The patient's finger should be cleaned with alcohol and wiped dry with a clean cloth or gauze.
3. After puncturing the finger with the blood lancet, allow a large globule of blood to form.
4. Place cleaned surface of slide against drop of blood and with a quick circular motion, make a film the size of a dime in the middle third of 1 end of the slide. Ordinary newsprint should be barely legible through such a wet drop (Figure 6). (Excessive mixing or stirring with a second slide leads to distortion of blood cells and parasites.)
5. The finger should then be wiped dry and a <u>small</u> drop of blood gently squeezed from the puncture and placed at the edge of the middle third of the same slide (Figure 7).
6. Apply a clean "spreader" slide to the edge of the <u>small</u> drop at a 45° angle and allow the blood to extend about two-thirds of the slide width; then keeping even contact, push the spreader forward along the slide. This will produce an even layer of red blood cells with a "feathering" at the lower edge (Figure 8).
7. The blood film should be kept horizontal and protected from dust and insects while the thick film dries (minimum of 6 hrs. at room temperature).*
8. Label the slide in the upper part of the thin film with the date and the name or initials of the patient as illustrated (Figure 8).

* If a rapid diagnosis is desired, the thin and thick films may be made on separate slides. The thin film can be air dried, fixed with methyl alcohol, and stained immediately. If no parasites are found on the thin film, the thick film should be examined subsequently for rare organisms not detected on the thin preparation.

Fig. 6

in all their phases. The importance of the examination of blood films for the presence of malaria parasites will be fully understood

Fig. 7

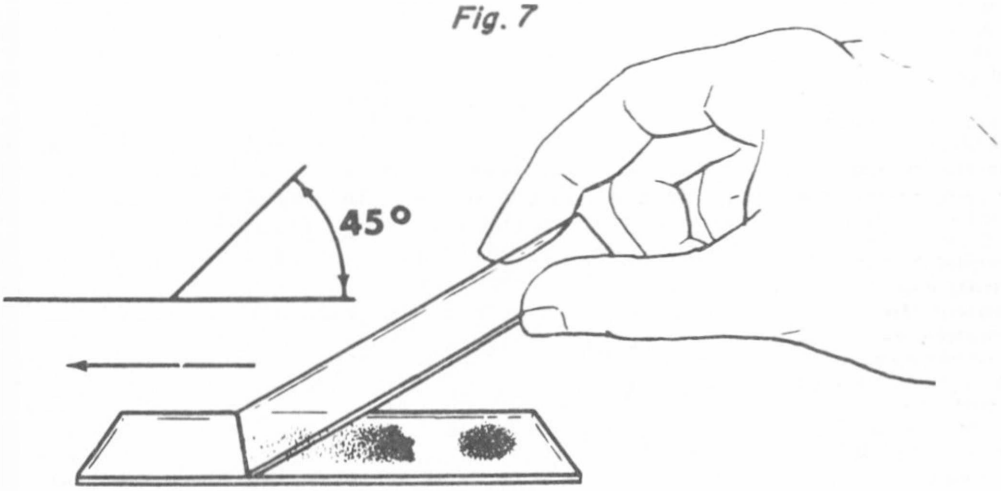
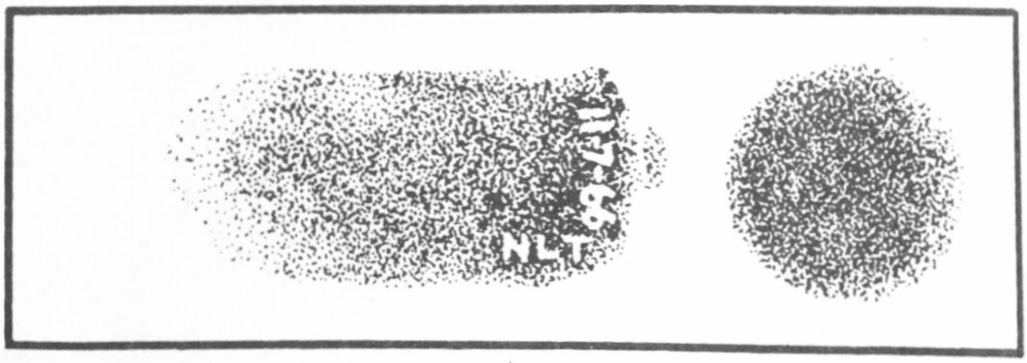


Fig. 8



October 1, 1976

STATE EPIDEMIOLOGISTS

Key to all disease surveillance activities are those in each state who serve the function as State Epidemiologists. Responsible for the collection, interpretation and transmission of data and epidemiologic information from their individual States, the State Epidemiologists perform a most vital role. Their major contributions to the evolution of this report are gratefully acknowledged.

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