Ex. V
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Return to Dr.
G. M. Jeffery

EPIDEMIOLOGICAL DATA FOR MALARIA CONTROL ACTIVITIES

Medical Division
Malaria Control in War Areas
U. S. Public Health Service
Atlanta, Georgia
July, 1945

Epidemiological Data For Malaria Control Activities

Malaria in the United States of America is a disease of apparent decreasing importance. Graph A illustrates this point. It shows that for all States which report deaths and cases of malaria, there has been a steady downward trend during the last 24 years, despite two cyclic increases one in the late 20's and the other in the early 30's. Table I shows a decrease in the country-wide mortality rate from 5.8 per 100,000 population in 1920 to 0.5 per 100,000 population in 1943. Table II likewise shows a decrease in the country-wide morbidity rate from 336.5 per 100,000 population in 1920 to 40.7 per 100,000 population in 1943. Thus 1943 became the year of lowest rates in the history of malaria in this country.

Although malaria appears to be of decreasing importance as a public health problem in this country there are two reasons why malaria control operations must still be carried on: 1) Malaria is traditionally an endemic disease in the Southeastern States which as a unit show mortality and morbidity rates of 2 to 3 times the rates for the country; and 2) The cyclic character exhibited by the epidemic curve of malaria suggests that in spite of the consistent downward trend of the last ten years the time may yet come when the disease will sharply increase in another cycle. Carriers returning from abroad after service with the armed forces may provide the impetus which will give rise to another upswing in the epidemic curve. For these reasons considerable emphasis is being given by the Office of Malaria Control in War Areas toward maintaining efforts directed at decreasing the hazard from malaria in the endemic areas of the Southeast.

In considering choice of areas for control operations it has been the policy of MCWA to concentrate on the most important counties as determined by death rates. It is generally considered that reporting of deaths due to malaria is more reliable than the reporting of cases, although glaring examples of the respective faults of either are not difficult to demonstrate.

Using mortality rates as the criterion, Map I illustrates the endemic malaria regions of the Southeast. The most important malarious areas, that is, the counties with the highest death rates, are to be found in 13 States. These are: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee and Texas.

Graph B illustrates that the mortality and morbidity reported from these 13 States has declined during the past 24 years in a manner

similar to that of the country as a whole and also has shown comparable cyclic variations. Table III shows that the mortality rate in the 13 States dropped from 13.6 per 100,000 population in 1920 to 1.4 per 100,000 population in 1943. Table IV shows that the morbidity rate in the 13 States dropped from 982.7 per 100,000 population in 1920 to 128.8 per 100,000 population in 1943.

Residual spraying of houses with DDT during the fiscal year 1945 was carried on in 113 counties in these 13 States plus 3 demonstration projects in two additional states. The present 113 counties do not provide adequate coverage in relation to the total number of malarious counties, but represent the maximum coverage with present allocations of DDT. Next season the number of counties should be increased.

Table V shows the distribution of 1321 counties in 13 States according to the average annual malaria mortality rates* for the period 1938-1942 inclusive. It is noted that 188 counties recorded a rate of 10 or more per 100,000 population; that 649 counties showed a rate of 0.1-9; and 484 counties reported no deaths. This table viewed in connection with Map I would suggest that counties with death rates of 10 or more per 100,000 population represent in general the cores of the endemic foci of the Southeast. They would therefore appear to be the areas around which major control activities should be directed.

Table VI shows the relative concentration of the malaria problem, as represented by mortality data for this period among the counties with rates of 10 or more per 100,000 population. It is noted that in 7 of the 13 States more than 50% of the deaths were reported from these counties. In the remaining 6 States there is less focalized concentration of deaths.

Table VII shows the number of rural homes in the 188 counties reporting malaria mortality rates of 10 or more per 100,000 population during the period 1938-1942. These figures were taken from the Bureau of the Census tabulation of housing in 1940 and represent all rural homes, including those in towns of less than 2500 population.

The second portion of Table VII shows in column (3) the number of counties that reported malaria deaths with rates of less than 10 per 100,000. To obtain the number of cases estimated to occur in these counties (and hence the additional number of houses needed to spray) the average number of deaths reported annually is multiplied by the arbitrary figure 400. This figure is selected as a reasonable estimate of the number of cases per death. The results of this calculation are listed in column (4).

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* These rates are tentative and are based on State Health Department and Bureau of the Census reports of deaths.

Column (5) is an addition of columns (2) and (4) and represents the proposed number of homes for residual spray to be allocated to each State under an "ideal program".

Column (6) shows the percentage that each State's total is to the total for all 13 States.

Table VIII shows the "goodness of fit" of allocations actually made for the fiscal year 1945 as related to allocations which would have been made under the system to be followed hereafter.

It is immediately apparent that certain states have been allocated projects far in excess of the relative importance of their malaria problem as measured in terms of malaria mortality. In approving projects for the fiscal year 1946, and thereafter, every effort will be made to readjust allocations to states towards equalization of the program in terms of the percentages listed in Table VII, Column 6.

For the remainder of the calendar year 1945 sufficient DDT is available to spray approximately 385,000 homes. However, because of operational cut-backs, some states will be unable to complete the total sprayings allotted them for the remainder of the 1945 malaria season. DDT thus accrued may be transferred to other states where operational facilities permit the spraying of additional homes.

For the calendar year 1946 DDT will be available to spray 550,000 homes. This will permit a considerable expansion of activities for the 1946 malaria season in all 13 states except Kentucky and Missouri. Allocations to the latter two states cannot be increased until equalized with other states. Table IX, column 5 shows the increase allowable in each state.

In summary, the following policies will be adopted in regard to approval of projects for fiscal year 1946 in order to attain the objectives outlined in the preceding paragraphs:

1. For the remainder of the 1945 malaria season each state will have a ceiling of houses to be sprayed in regular projects. The ceiling for each state is listed in Table IX column 3 with the exception of certain emergency flood control projects already approved. Provision also exists for moderately increasing the 1945 malaria season ceiling in some of those states where operational schedules permit the spraying of additional homes in the latter part of the season. Such increase may approach, but not exceed, the 1946 malaria season ceiling (Table IX, column 4.)

2. For the 1946 season allocations of DDT will be available to spray 550,000 homes and a small additional reserve will be held for

special emergency allocation by the Atlanta office. During this period each state may expect project approvals not to exceed the ceilings listed in Table IX column 4. However, because Kentucky and Missouri have already had projects approved in fiscal year 1945 in excess of the proposed ceilings, the ceilings for these states will be set at the same figures as for 1945 (Kentucky, 13,875 and Missouri 26,862). This excess will be met from the reserve mentioned above.

3. Project proposals currently being submitted for the fiscal year 1946 will be approved up to the ceilings listed in Table IX Column 3. Supplementary proposals may be submitted for operations beginning January 1, 1946 and approval of them may be expected up to the ceilings listed in Table IX column 4. If possible the latter ceilings will be increased at a later date.

4. According to information available to the Medical Division of MCWA the 188 counties listed with average annual mortality rates of 10 or more per 100,000 population represent the most important foci of endemic malaria. Work in all or parts of rural areas of these counties - up to the ceilings mentioned - will be approved by this Division. It is recognized, however, that mortality data on a county-wide basis do not necessarily focalize the malaria problem sufficiently accurately for practical operational purposes. Projects submitted for operations in counties not included in this list will be approved on the basis of additional epidemiological justification submitted by the States with the project proposal. Such written justification will hereafter be required for all projects outside of these 188 counties.

In this connection it should be pointed out that when work was initiated in the spring of 1945, some projects were approved initially on a county-wide basis in spite of the fact that the malaria hazard varied widely in different portions of the county. Frequently such approvals therefore incorporated local areas and houses where the malaria mosquito hazard was absent or negligible. With continued operation of the program, it is suggested that entomological reconnaissance be established as an integral part of project operations. This should result in refinement in selection of intra-county areas where protection is indicated. Such procedure has been followed in several states. Others are urged to re-assess accordingly.

5. The Medical Division MCWA would like to encourage premise residual spraying, where practicable, of homes from which blood film verified cases or carriers of malaria have been reported. Spraying of such premises is pre-approved within the limits of the ceilings mentioned.

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U. S. Public Health Service
Atlanta, Georgia
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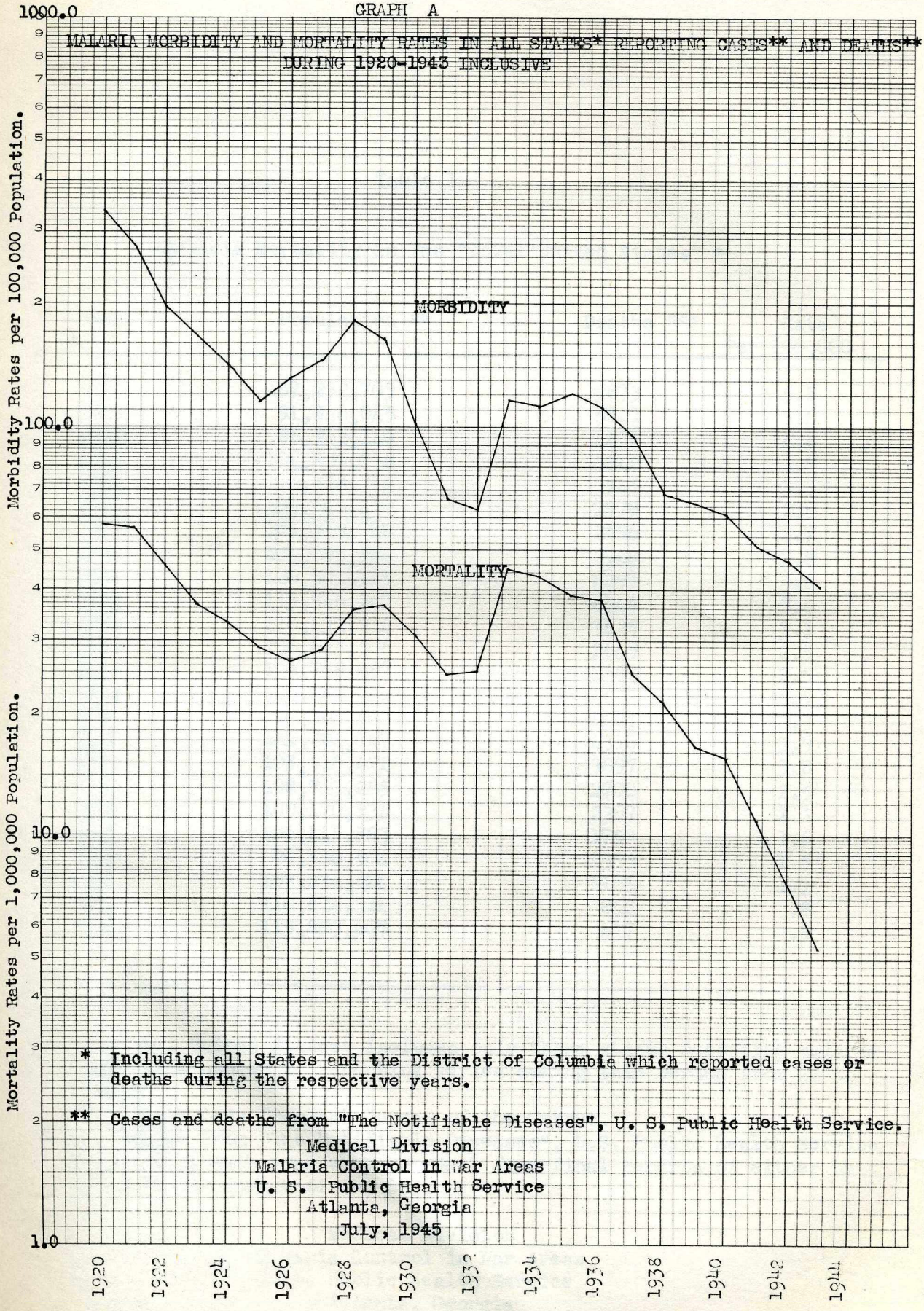
GRAPH A

MALARIA MORBIDITY AND MORTALITY RATES IN ALL STATES* REPORTING CASES** AND DEATHS** DURING 1920-1943 INCLUSIVE



* Including all States and the District of Columbia which reported cases or deaths during the respective years.

** Cases and deaths from "The Notifiable Diseases", U. S. Public Health Service.

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Table I

Malaria Mortality in The "Total United States" *

Year	Population **	Deaths ***	Rate Per 100,000
1920	67,232,703	3873	5.8
1921	91,346,045	5121	5.6
1922	96,262,140	4402	4.6
1923	104,803,038	3848	3.7
1924	101,328,774	3345	3.3
1925	103,340,137	2978	2.9
1926	101,319,008	2696	2.7
1927	104,695,564	2968	2.8
1928	120,501,115	4291	3.6
1929	113,546,267	4146	3.6
1930	110,431,214	3428	3.1
1931	106,625,506	2649	2.5
1932	106,768,887	2688	2.5
1933	100,084,751	4471	4.5
1934	102,306,559	4401	4.3
1935	111,284,067	4310	3.9
1936	103,515,422	3897	3.8
1937	108,713,285	2700	2.5
1938	109,470,134	2307	2.1
1939	106,445,883	1750	1.6
1940	90,550,504	1393	1.5
1941	107,131,604	1165	1.1
1942	110,614,314	842	.8
1943	115,883,607	617	.5

* "Total United States" includes only those states reporting malaria deaths. The number so reporting varied during this period from 27 to 37 states.

** Populations from the Bureau of the Census.

*** Deaths from "The Notifiable Diseases", U.S. Public Health Service. Total deaths each year vary somewhat from final reports of either th· ·tates or the Bureau of the Census.

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Table II

Malaria Morbidity in the "Total United States" *

Year	Population**	Cases***	Rate Per 100,000
1920	54,730,668	184,163	336.5
1921	68,559,162	189,630	276.6
1922	80,572,395	157,221	195.1
1923	83,106,140	139,090	167.4
1924	78,914,693	111,632	141.5
1925	86,514,161	100,416	116.1
1926	88,355,474	115,999	131.3
1927	96,573,880	140,651	145.6
1928	92,225,175	166,521	180.6
1929	101,104,997	164,030	162.2
1930	96,147,749	98,481	102.4
1931	105,465,741	70,353	66.7
1932	109,505,964	68,613	62.7
1933	107,049,125	125,549	117.3
1934	115,970,296	133,222	114.9
1935	114,563,500	137,502	120.0
1936	119,490,310	132,928	111.2
1937	114,256,059	107,583	94.2
1938	123,461,594	84,206	68.2
1939	126,755,375	82,655	65.2
1940	127,841,038	78,130	61.1
1941	129,736,070	67,053	51.7
1942	127,871,598	60,071	47.0
1943	133,966,319	54,555	40.7

* "Total United States" includes only those states reporting malaria cases. The number so reporting varied during this period from 25 to 49 states.

** Populations from the Bureau of the Census.

*** Cases from "The Notifiable Diseases", U.S.Public Health Service

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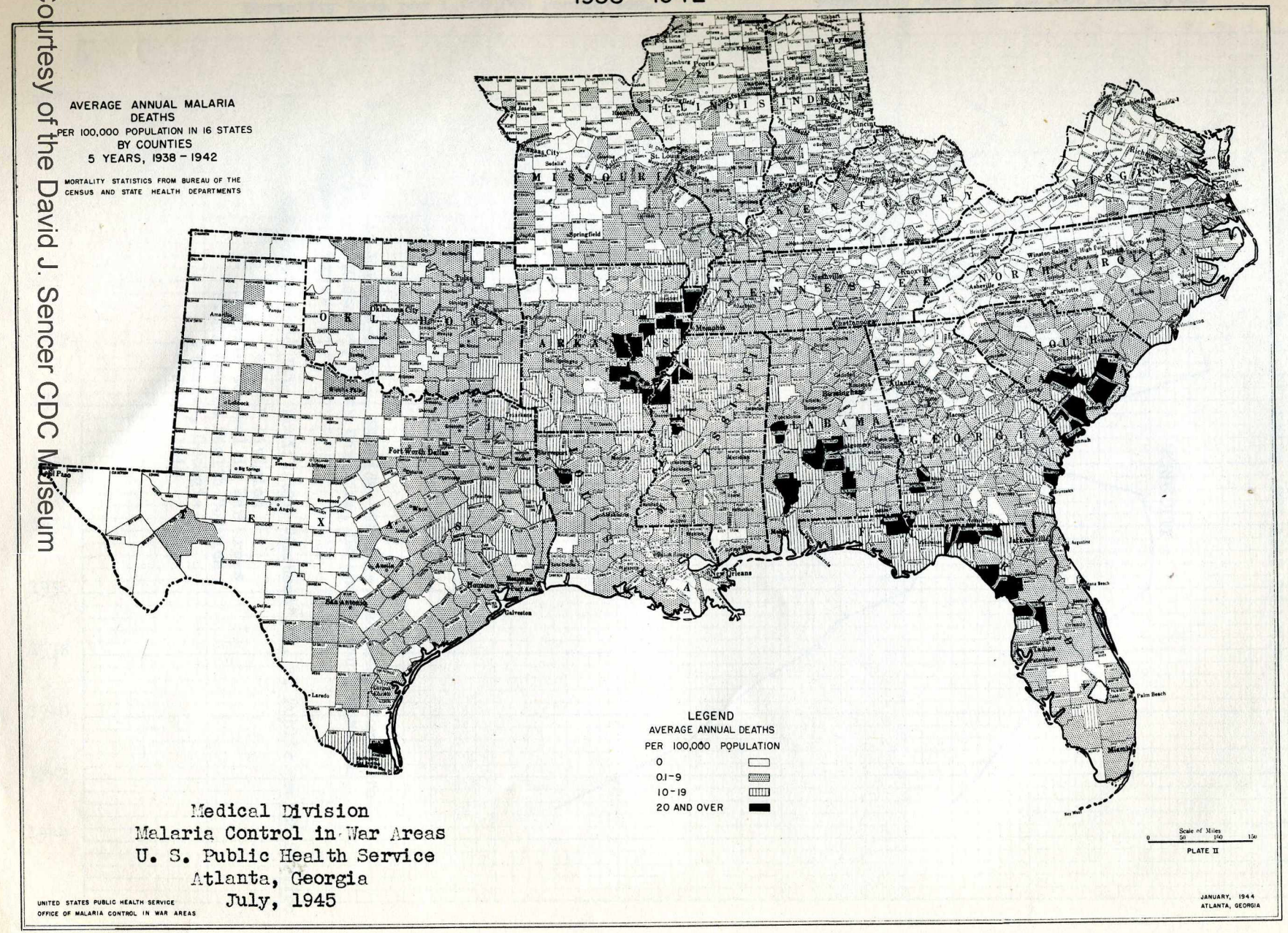
MALARIA DEATHS PER 100,000 POPULATION
1938 – 1942



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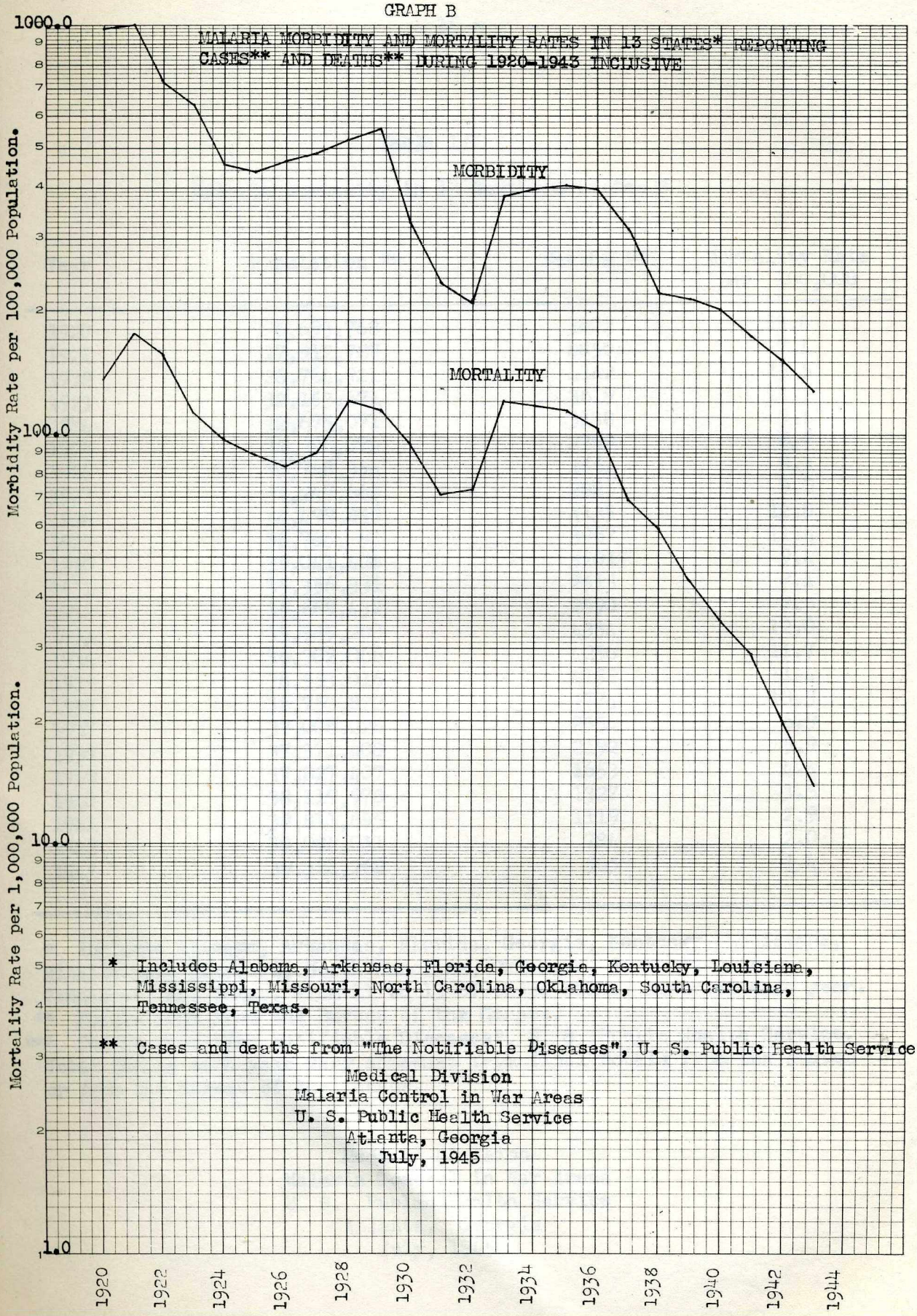
UNITED STATES PUBLIC HEALTH SERVICE
OFFICE OF MALARIA CONTROL IN WAR AREAS

GRAPH B



* Includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas.

** Cases and deaths from "The Notifiable Diseases", U. S. Public Health Service

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Table III

Malaria Mortality in 13 Southern States *

Year	Population **	Deaths ***	Mortality Rate per 100,000
1920	26,693,768	3622	13.6
1921	27,912,787	4850	17.4
1922	26,764,921	4142	15.5
1923	32,153,671	3619	11.2
1924	32,675,071	3138	9.6
1925	31,396,072	2789	8.9
1926	30,748,344	2551	8.3
1927	31,247,665	2825	9.0
1928	34,499,839	4135	12.0
1929	34,765,293	3967	11.4
1930	35,041,406	3281	9.4
1931	35,356,331	2515	7.1
1932	35,669,432	2590	7.3
1933	35,985,280	4334	12.0
1934	36,302,066	4256	11.7
1935	36,553,016	4155	11.4
1936	36,753,872	3774	10.3
1937	37,008,228	2554	6.9
1938	37,371,408	2192	5.9
1939	37,827,407	1653	4.4
1940	38,119,978	1327	3.5
1941	38,811,695	1119	2.9
1942	39,084,011	784	2.0
1943	39,321,268	565	1.4

* Includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, and Texas. From 11 to 13 of these states reported each year.

** Populations from the Bureau of the Census.

*** Deaths from "The Notifiable Diseases", U. S. Public Health Service. Total deaths each year vary somewhat from final totals from the states or from the Bureau of the Census.

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Table IV

Malaria Morbidity in 13 Southern States *

Year	Population **	Cases ***	Morbidity Rate per 100,000
1920	18,026,038	177,150	982.7
1921	18,348,952	183,551	1000.3
1922	21,018,618	151,823	722.3
1923	20,994,389	134,546	640.9
1924	23,805,562	108,641	456.4
1925	22,454,810	98,043	436.6
1926	24,557,177	113,793	463.4
1927	28,559,922	138,346	484.4
1928	31,417,459	164,494	523.6
1929	29,026,301	162,148	558.6
1930	29,252,183	96,520	330.0
1931	29,516,647	68,815	233.1
1932	32,404,516	67,793	209.2
1933	32,666,903	124,471	381.0
1934	32,942,790	131,648	399.6
1935	33,172,789	134,968	406.9
1936	33,353,347	132,376	396.9
1937	33,576,129	106,470	317.1
1938	37,371,408	82,919	221.9
1939	37,827,407	81,258	214.8
1940	38,119,978	77,027	202.1
1941	38,811,695	67,302	173.4
1942	39,084,011	59,421	152.0
1943	39,321,268	50,640	128.8

* Includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, and Texas. From 8 to 13 states reported each year.

** Populations from the Bureau of the Census.

*** Cases from "The Notifiable Diseases", U. S. Public Health Service.

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Table V

Distribution of All Counties, by States, According to Average Annual Mortality Rates* per 100,000 Population, 1938-42

State	Number of Counties: Average annual mortality rate per 100,000								Total
	0	0.1-4	5-9	10-14	15-19	20-24	25-29	30&over	Counties
Alabama	6	28	14	11	2	4	-	2	67
Arkansas	6	16	21	13	8	10	-	1	75
Florida	6	22	14	10	7	2	2	4	67
Georgia	46	58	22	22	7	3	-	1	159
Kentucky	82	34	2	1	1	-	-	-	120
Louisiana	5	33	17	5	3	1	-	-	64
Mississippi	3	33	26	12	4	2	1	1	82
Missouri	66	40	4	3	2	-	-	-	115
North Carolina	47	42	7	4	-	-	-	-	100
Oklahoma	32	35	8	1	1	-	-	-	77
South Carolina	5	18	8	4	4	1	2	4	46
Tennessee	40	38	13	2	2	-	-	-	95
Texas	140	71	25	13	4	-	-	1	254
Total Counties	484	468	181	101	45	23	5	14	1321
Cumulative total	1321	837	369	188	87	42	19	14	

* These rates are tentative and are based on State Health Department and Bureau of the Census reports of deaths.

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Table VI

Distribution Of Counties By States According To Deaths and Death Rates Per 100,000 Population
1938-1942

State	Counties Reporting Malaria Deaths	Counties with death rate of 10 or more per 100,000	Per Cent of Counties with rate of 10 or more	Total Deaths	Deaths in Counties with rate of 10 or more	% of Deaths in Counties with rate of 10 or more
Alabama	61	19	31.1	845	478	56.6
Arkansas	69	32	46.4	1088	823	75.6
Florida	61	25	41.0	504	304	60.3
Georgia	113	33	29.2	590	308	52.2
Kentucky	38	2	5.3	106	18	17.0
Louisiana	59	9	15.3	520	160	30.8
Mississippi	79	20	25.3	911	534	58.6
Missouri	49	5	10.2	230	129	56.1
North Carolina	53	4	7.5	254	62	24.4
Oklahoma	45	2	4.4	239	51	21.3
South Carolina	41	15	36.6	732	506	69.1
Tennessee	55	4	7.3	347	73	21.0
Texas	114	18	15.8	851	390	45.8
Total	837	188	22.5	7217	3836	53.2

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Table VII

Number of counties necessary to operate in, and number of homes necessary to spray to (1) give county-wide coverage in counties reporting in 1938 - 1942 an average of 10 or more deaths from malaria per 100,000 population, and (2) to spray estimated homes in which malaria is reported in remaining counties. *

State	Counties with rates of 10 or more per 100,000 pop.		Counties with rates of 0.1 - 9 per 100,000 pop.		Total Homes	% of Total
	No. Counties (1)	No. Homes** (2)	No. Counties (3)	No. Homes* (4)	(5)	(6)
Alabama	19	118833	42	29280	148113	12.06
Arkansas	32	198298	37	21200	219498	17.88
Florida	25	70627	36	16000	86627	7.06
Georgia	33	93732	80	22560	116292	9.47
Kentucky	2	5711	36	7040	12751	1.04
Louisiana	9	48309	50	28800	77109	6.28
Mississippi	20	144308	59	30160	174468	14.21
Missouri	5	37182	44	8080	45262	3.69
N. C.	4	18779	49	15360	34139	2.78
Oklahoma	2	13758	43	15040	28798	2.34
S. C.	15	85810	26	18080	103890	8.46
Tennessee	4	20451	51	21920	42371	3.45
Texas	18	101627	96	36880	138507	11.28
Total	188	957425	649	270400	1227825	100.00

* No. Homes = 400 x average number of deaths reported annually

** From Bureau of Census volume on Housing, 1940. Total includes homes in towns of less than 2500 population

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Table VIII

"Goodness of fit" of allocations for 1945.

Number of home sprayings allocated for 1945 and number which would have been allocated in each state under proposed system.

State	Number homes allocated under arbitrary plan*	Estimated No. Homes actually approved 1945	Excess	Deficit
Alabama	44108	24980		19128
Arkansas	69126	74617	5491	
Florida	27289	31083	3794	
Georgia	36603	23324		13279
Kentucky	4003	13875	9872	
Louisiana	24517	12000		12517
Mississippi	55231	67926	12695	
Missouri	14241	26862	12621	
N. C.	10738	3500		7238
Oklahoma	9083	7100		1983
S. C.	32715	38755	6040	
Tennessee	13356	13096		260
Texas	43877	47769	3892	
Total	384887	384887	54405	54405

* State totals obtained by multiplying 384,887 by percentages listed in column (6) of Table II.

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Table IX

Distribution of 550,000 Houses Among 13 States According to Relative Malaria Problem as Measured by Mortality Statistics.

(1)	(2)	(3)	(4)	(5)
State	% (from Table VII Col. 6)	Ceiling for 1st half Fiscal year 1946	Ceiling for last half fiscal year 1946	Increase
Alabama	12.06	24980	66330	41350
Arkansas	17.88	74617	98340	23723
Florida	7.06	31083	38830	7747
Georgia	9.47	23324	52085	28761
Kentucky	1.04	13875	5720*	None
Louisiana	6.28	12000	34540	22540
Mississippi	14.21	67926	78155	10229
Missouri	3.69	26862	20295**	None
N. C.	2.78	3500	15290	11790
Oklahoma	2.34	7100	12870	5770
S. C.	8.46	38755	46530	7775
Tennessee	3.45	13096	18975	5879
Texas	11.28	47769	62040	14271
	100.00	384887	550000	

* Kentucky will be approved for a ceiling of 13,875 for last half of fiscal year 1946.

** Missouri will be approved for a ceiling of 26,862 for last half of fiscal year 1946.

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TABLE X

COUNTIES IN SOUTHEAST HAVING AN AVERAGE ANNUAL MALARIA DEATH RATE OF 10 OR MORE PER 100,000 POPULATION DURING 5 YEAR PERIOD 1938-42. SHOWING RANK ORDER, EXTENDED MALARIA CONTROL IN 1945 AND RURAL DWELLINGS

Rank Order in State	County	Average Annual Death Rate	Rank Order in S.E. States	Extended Malaria Control YES	Extended Malaria Control NO	Number of Rural Dwellings
			ALABAMA			
1.	Green	35.4	4	X		5099
2.	Lowndes	34.4	5	X		5776
3.	Autauga	22.9	26	X		4660
4.	Dallas	20.6	37	X		8988
5.	Clarke	20.3	41		-	6713
6.	Crenshaw	20.3	42		-	6074
7.	Sumter	16.8	68		-	6918
8.	Bullock	16.2	74		-	4053
9.	Washington	14.8	90		-	3754
10.	Baldwin	13.6	105		-	8901
11.	Montgomery	13.5	109	X		8243
12.	Wilcox	12.9	123		-	6355
13.	Lamar	12.2	141		-	4717
14.	Monroe	12.2	143		-	7001
15.	Perry	12.0	147		-	6389
16.	Elmore	11.0	165		-	7575
17.	Hale	11.0	166		-	6340
18.	Bibb	10.9	167		-	5037
19.	Geneva	10.3	185		-	6240
						118833
20.	(Marengo)	9.5	198	X		
			ARKANSAS			
1.	Lincoln	32.5	9	X		5134
2.	Crittendon	24.0	21	X		11417
3.	Woodruff	23.5	23	X		5424
4.	Jefferson	22.7	27	X		12257
5.	Cross	22.3	29	X		5523
6.	Poinsett	22.3	30	X		7494
7.	Prairie	22.2	31	X		3889
8.	Phillips	21.8	33	X		9099
9.	Lonoke	21.5	34	X		8381
10.	Desha	21.4	35	X		6270
11.	Mississippi	21.4	36	X		17227
12.	Drew	18.2	55	X		4116
13.	Lee	17.9	56	X		5618
14.	Little River	17.6	59	X		4413
15.	Randolph	17.5	61		-	3822
16.	Conway	16.7	69		-	3968
17.	Lafayette	16.6	71		-	4551

TABLE X (Con't)

Rank Order in State	County	Average Annual Death Rate	Rank Order in S.E. States	Extended Malaria Control YES	Extended Malaria Control NO	Number of Rural Dwellings
		(Ark. con't)				
18.	St. Francis	16.6	72	X		8062
19.	Bradley	15.5	80		-	3866
20.	Howard	14.4	95		-	3620
21.	Miller	14.4	96		-	5294
22.	Yell	14.3	98		-	5354
23.	Monroe	14.2	99	X		3786
24.	Hempstead	12.8	126		-	6211
25.	Craighead	12.3	138		-	8511
26.	Ouachita	12.2	144		-	5496
27.	Jackson	12.1	145		-	5430
28.	Ashley	11.9	148		-	5757
29.	Sevier	11.8	152		-	3095
30.	Clay	10.6	175		-	7167
31.	Lawrence	10.6	177		-	5623
32.	Calhoun	10.4	183		-	2423
35.	(Arkansas)	9.0	224	X		198298
44.	(Chicot)	7.3	279	X		
		F L O R I D A				
1.	Dixie	57.0	1	X		1965
2.	Levy	31.9	10	X		3569
3.	Jackson	30.8	12	X		7273
4.	Sumter	30.8	13	X		3034
5.	Jefferson	28.3	16	X		3067
6.	Hamilton	26.6	19		-	2594
7.	Madison	24.7	20	X		3541
8.	Citrus	20.5	38	X		1912
9.	Suwanee	17.6	60	X		3522
10.	Taylor	17.3	62	X		2630
11.	Calhoun	17.0	65		-	2092
12.	Franklin	16.7	70		-	1054
13.	Liberty	16.0	76		-	954
14.	Holmes	15.5	81		-	3575
15.	Hendry	15.3	83		-	1864
16.	Wakulla	14.6	93		-	1444
17.	Gilchrist	14.1	100		-	1087
18.	Walton	14.0	102		-	2860
19.	Columbia	11.9	149		-	2973
20.	Gulf	11.5	157		-	2051
21.	Washington	11.4	159		-	3153
22.	Okaloosa	10.9	168		-	3628
23.	Gadsden	10.8	169		-	5146
24.	Leon	10.7	173	X		3877
25.	Hernando	10.6	176		-	1762
						70627

TABLE X (Con't)

Rank Order in State	County	Average Annual Death Rate	Rank Order in S.E. States	Extended Malaria Control YES	Extended Malaria Control NO	Number of Rural Dwellings
			G E O R G I A			
1.	McIntosh	30.2	14		-	1588
2.	Seminole	23.6	22	X		1983
3.	Calhoun	23.0	25	X		2903
4.	Terrell	20.4	39	X		3257
5.	Long	19.6	44		-	1006
6.	Toombs	18.9	51		-	2760
7.	Pulaski	18.3	54		-	1754
8.	Clay	17.0	66		-	1874
9.	Crawford	16.8	67		-	1693
10.	Screven	15.7	79	X		4511
11.	Lee	15.3	85	X		2295
12.	Crisp	14.8	89	X		2394
13.	Wayne	13.7	103		-	2535
14.	Baker	13.6	104	X*		1796
15.	Camden	13.5	107		-	1690
16.	Echols	13.5	108		-	859
17.	Telfair	13.2	114		-	3692
18.	Washington	13.2	115		-	5232
19.	Laurens	13.1	117		-	6171
20.	Turner	12.9	122		-	2864
21.	Early	12.8	125		-	3762
22.	Bryan	12.7	129		-	1494
23.	Webster	12.7	131		-	1095
24.	Wilcox	12.5	134		-	3087
25.	Ben Hill	12.4	135		-	1635
26.	Houston	12.4	137		-	2974
27.	Decatur	11.7	153		-	3864
28.	Johnston	10.8	170		-	3127
29.	Tift	10.8	171		-	3289
30.	Burke	10.6	174	X		6428
31.	Dodge	10.5	181		-	4161
32.	Treutlen	10.5	182		-	1750
33.	Macon	10.3	187		-	4209
						93732
35.	(Dooly)	9.5	198	X		
36.	(Worth)	9.4	204	X		
40.	(Sumter)	8.2	249	X		
72.	(Jenkins)	3.4	477	X		
			K E N T U C K Y			
1.	Hickman	15.3	84	X		2551
2.	Fulton	14.3	97	X		3160
						5711
5.	(Graves)	4.4	407	X		
9.	(McCracken)	3.7	455	X		
18.	(Ballard)	2.1	590	X**		
-	(Carlisle)	0.0	-	X**		

* Research project. Houses not counted in state 1945 total.

** Contingent approval. Emergency flood control project. Houses not counted in state 1945 total.

TABLE X (Con't)

Rank Order in State	County	Average Annual Death Rate	Rank Order in S.E. States	Extended Malaria Control YES	Extended Malaria Control NO	Number of Rural Dwellings
			LOUISIANA			
1.	Red River	22.7	28	X		4201
2.	Morehouse	18.9	50	X		5636
3.	Bossier	15.7	78	X		6873
4.	Natchitoches	15.1	86	X		8533
5.	Madison	13.0	120	X		3351
6.	West Carroll	11.4	160		-	4751
7.	Tensas	11.3	161		-	4974
8.	Jackson	11.2	162		-	3751
9.	Webster	10.1	188		-	6239
						48309
11.	(Caddo)	9.5	198	X		
17.	(Concordia)	8.2	256	X*		
30.	(Catahoula)	4.1	423	X*		
			MISSISSIPPI			
1.	Quitman	33.8	6	X		7325
2.	Humphreys	26.7	18	X		6030
3.	Bolivar	21.9	32	X		18069
4.	Coahoma	20.3	40	X		10399
5.	Sharkey	19.4	45	X		4170
6.	Leflore	19.1	48	X		10478
7.	Holmes	17.6	58	X		8186
8.	Tunica	15.9	77	X		6532
9.	Tallahatchie	14.6	92	X		9005
10.	Grenada	13.6	106	X		2982
11.	Yazoo	13.0	121	X		8065
12.	Panola	12.8	127		-	8371
13.	Webster	12.7	132		-	3410
14.	Warren	12.6	133		-	4243
15.	Sunflower	12.1	146	X		14485
16.	Benton	11.5	156		-	2484
17.	Rankin	11.5	158		-	5890
18.	Calhoun	10.5	180		-	5090
19.	Tate	10.4	184		-	4843
20.	LaFayette	10.3	186		-	4251
						144308
27.	(Washington)	8.9	228	X		
			MISSOURI			
1.	Dunklin	18.7	52	X		8810
2.	Pemiscot	17.1	64	X		9846
3.	New Madrid	11.1	163	X		9607
4.	Ripley	11.1	164		-	3293
5.	Butler	10.5	179		-	5626
						37182

* Contingent approval. Emergency flood control project. Houses not counted in state 1945 total.

TABLE X (Con't)

Rank Order in State	County	Average Annual Death Rate	Rank Order in S.E. States	Extended Malaria Control YES	Extended Malaria Control NO	Number of Rural Dwellings
		NORTH CAROLINA				
1.	Craven	13.4	111		-	4423
2.	Onslow	12.3	139		-	3950
3.	Beaufort	11.5	155	X*		6589
4.	Brunswick	10.5	178		-	3817
						18779
8.	Martin	6.9	289	X*		
9.	Bladen	5.9	318	X*		
10.	Wayne	5.5	343	X*		
13.	Edgecombe	4.1	423	X*		
16.	Robeson	3.9	435	X*		
20.	Halifax	3.5	470	X*		
21.	Johnston	3.4	477	X*		
25.	Duplin	2.5	543	X*		
26.	Pitt	2.3	562	X*		
29.	Northampton	2.1	590	X*		
40.	Warren	0.9	789	X*		
-	Person	0.0	-	X*		
		OKLAHOMA				
1.	McCurtain	18.9	49	X		8960
2.	Pushmataha	12.3	140		-	4798
						13758
3.	(Choctaw)	9.9	190	X		
		SOUTH CAROLINA				
1.	Colleton	39.6	2	X		5728
2.	Beaufort	27.2	3	X		4318
3.	Berkeley	32.5	8	X		5986
4.	Hampton	30.9	11	X		4420
5.	Williamsburg	29.7	15	X		7816
6.	Orangeburg	26.7	17	X		12484
7.	Calhoun	23.4	24	X		3899
8.	Allendale	19.9	43		-	3008
9.	Sumter	19.1	47	X		7577
10.	Clarendon	17.8	57	X		6518
11.	Marlboro	15.0	87		-	6531
12.	Dorchester	14.0	101		-	3836
13.	Darlington	12.8	124		-	7488
14.	Jasper	12.7	130	X		2597
15.	Bamberg	11.8	150		-	3604
						85810

* Demonstration projects. Total of 3500 homes comprises state's 1945 total operations.

TABLE X (Con't)

Rank Order in State	County	Average Annual Death Rate	Rank Order in S.E. States	Extended Malaria Control YES	Extended Malaria Control NO	Number of Rural Dwellings
		SOUTH CAROLINA (Con't)				
16.	(Georgetown)	9.9	190	X		
20	(Charleston)	6.9	289	X		
		TENNESSEE				
1.	Lauderdale	16.4	73	X		5346
2.	Lake	16.0	75	X		3271
3.	Dyer	14.9	88	X		6314
4.	Haywood	13.0	119		-	5520
						20451
5.	(Tipton)	9.3	209	X		
16.	(Shelby)	5.0	369	X		
		TEXAS				
1.	Willacy	33.3	7	X		2392
2.	Leon	19.2	46		-	4952
3.	Panola	18.6	53		-	5934
4.	Robertson	17.1	63		-	6062
5.	Red River	15.5	82	X		6649
6.	Sabine	14.7	91		-	2945
7.	Polk	14.5	94		-	5439
8.	Starr	13.5	110		-	2713
9.	San Jacinto	13.2	112		-	2454
10.	Cherokee	13.2	113		-	8210
11.	Bowie	13.1	116	X		8684
12.	Cameron	13.0	118	X		9015
13.	San Augustine	12.8	128		-	3280
14.	Hidalgo	12.4	136	X		12831
15.	Marion	12.2	142		-	2152
16.	Grimes	11.8	151		-	4272
17.	Shelby	11.6	154		-	7063
18.	Anderson	10.7	172		-	6580
						101627
45.	(Lamar)	4.8	385	X		
		DEMONSTRATION PROJECTS				
		VIRGINIA				
6.	Norfolk	1.1	474	X		
-	New Kent	0.0	-	X		
		ILLINOIS				
6.	Alexander	2.4	552	X		

Medical Division
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