

# World Incidence Of Anthrax in Man

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**M**AN and a wide spectrum of animal hosts are susceptible to anthrax. The disease is enzootic in many areas of the world, with concomitant contamination of the soil in those areas. The disease occurs in the economically important domestic animals—sheep, cattle, horses, goats, swine—and it is largely from contacts with these animals or with industrial raw materials derived from such animals (hair, hides, bristles) that man becomes infected.

Existing reviews of the extent of anthrax in man throughout the world (1, 2) have definite limitations. The epidemiological monographs of Simmons and co-workers (1) make what are primarily qualitative references to the incidence of anthrax in a number of countries. A recent paper by Kaplan (2) which was presented at the Symposium on Anthrax in Man held at the University of Pennsylvania in 1954 reports quantitative statistical data on the incidence of this disease but restricts its attention to the years 1951–53. A better appreciation of the world distribution of anthrax in man can be obtained by consideration of epidemiological reports covering a longer period of time. This is true because a number of nations wherein anthrax has been prevalent in recent decades currently do not submit epidemiological statistics to the World Health Organization.

The incidence of human anthrax in a number of selected countries has been tabulated for the period 1924–53 (see table). The epidemiological data have been extracted from statistics published by the World Health Organization for the years 1939–53 (3), and by the Health Organization of the League of Nations for the years 1924–38 (4), and computed as average experience per year at 3-year intervals.

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The incidence of human anthrax is probably correlated with the enzootic status of the disease in the animal population of the country or, as in the United States, with the importation and industrial use of infected animal products. There is no necessary relationship between the population of a given country and the incidence of this disease. For example, the Cape Verde Islands, with a population of approximately 148,000, has had from 52 to 105 cases per year for the last 4 years for which statistics are available (1950–53). Other examples of comparatively small countries with a high incidence of human anthrax are Kenya with an experience of 200 to 1,000 cases per year in a population of approximately 6,000,000; and Portugal with an experience of 1,174 to 2,270 cases per year in a population of approximately 8,000,000.

Inspection of the table reveals that human anthrax is prevalent in Africa (French West Africa, Kenya, Ruanda-Urundi, Tanganyika), South America (Argentina, Chile, Uruguay, Venezuela), Europe (Bulgaria, Italy, Portugal, Rumania, Spain, Yugoslavia), the Near and Middle East (Iran, Iraq, Turkey), and Eurasia (U.S.S.R.). Only a few cases are being reported currently from North America and Oceania.

It is interesting to note that, in countries where the incidence of human anthrax is high and where statistics are available over a number of years, there is no evidence of any significant change in the incidence of anthrax over the 30-year period 1924–53.

There appear to be adequate reasons to conclude that the statistics of the international health organizations relative to the incidence in man of anthrax are understatements of the actual facts. Reasons for such a conclusion are:

1. Communicable diseases in general are under-reported. Among the factors that would be of particular importance in considering the completeness of the reporting of human anthrax would be the accuracy of diagnosis of this disease. It has also been suggested that in countries where the term “charbon” is used for both anthrax and carbuncles, inaccuracies in reporting may result.

2. This disease is prevalent in many coun-

tries which do not observe the most advanced public health practices (for example, various portions of Africa). Reports from such countries cannot be expected to represent the actual number of cases occurring.

3. Anthrax is not a notifiable disease in many countries where there are a priori reasons to believe it occurs with some frequency (for example, Afghanistan, Algeria, China, Czechoslovakia, French West Africa, and Iran).

4. A significant percentage of cases of human anthrax go unreported even in countries where public health standards are high and where notification of the disease is compulsory. For example, in the United States in fiscal year 1956, a total of 29 cases of human anthrax were reported to the National Office of Vital Statistics. The Epidemiology Branch of the Communicable Disease Center, Public Health Service, has found and obtained surveillance data on nine

#### Incidence of human anthrax in selected countries, 1924-53 <sup>1</sup>

Place	1951-53	1948-50	1945-47	1942-44	1939-41
Argentina	321				
Bulgaria			1, 525(46)	709(35)	624(40)
Cape Verde Islands	85(5)				
Chile	298(26)	359(40)	525(49)	715(84)	361(55)
French West Africa	<sup>2</sup> 324(95)	<sup>3</sup> 430(41)			
Greece	144	231	319	58	36
Hungary					
Iran			1, 524(27)	639(15)	2, 318(38)
Iraq	253(1)	157	132(1)	107	99(3)
Italy	1, 119(13)	1, 223	1, 710	826	787(85)
Kenya	807(27)	844(37)	597(30)	297(9)	214(13)
Portugal (mainland)	1, 384(13)	<sup>3</sup> 2, 270(35)			
Rumania			880(63)	674(48)	1, 089(67)
Ruanda-Urundi	451(7)	336(12)			
Spain	1, 078	1, 601(33)	(83)	(98)	(181)
Tanganyika	422(16)	203(8)	294(21)	97(10)	
Turkey	1, 555(30)	1, 405(44)	1, 421(91)	837(60)	748(52)
Uruguay	84	59	88	153	123
United States	51(2)	54(3)	50(5)	73(10)	80(8)
U.S.S.R.					
Venezuela	126	235			
Yugoslavia	1, 105(26)	1, 108(32)			

  

Place	1936-38	1933-35	1930-32	1927-29	1924-26
Argentina					
Bulgaria	914(64)	1, 026(65)	856(75)	465(52)	
Cape Verde Islands					
Chile	289(86)	223(79)	(94)	(108)	
French West Africa					
Greece				(198)	8
Hungary			(47)	(64)	
Iran					
Iraq					
Italy	1, 128(138)	1, 278(151)	1, 653	2, 053	2, 288
Kenya	132	113	110	82	
Portugal (mainland)					
Rumania	2, 228(385)	1, 293(264)			
Ruanda-Urundi					
Spain					
Tanganyika					
Turkey	769(56)	566(40)	413(42)		
Uruguay			75(17)	79(10)	126
United States	65(10)	53(13)	67(23)	80(19)	137
U.S.S.R.		2, 569	4, 542	15, 950	15, 435
Venezuela					
Yugoslavia	649(53)	744(75)			

<sup>1</sup> Number of cases are averages per year. Figures in parentheses represent number of deaths.

<sup>2</sup> Data represent 1951 only.

<sup>3</sup> Data represent 1950 only.

additional cases which apparently were unreported (Division Project No. 201-E-45).

5. Several countries which currently do not submit epidemiological statistics for inclusion in World Health Organization reports have, in reports published some time during the past 30 years, indicated that human anthrax occurs with some frequency within their borders (see entries for Bulgaria, Hungary, Rumania, and U.S.S.R. in table). The following countries did not submit data for inclusion in the most recent (1953) yearbook on epidemiological and vital statistics of the World Health Organization: Albania, Bulgaria, China (except Taiwan), Czechoslovakia, Hungary, Liberia, Poland, Rumania, Saudi Arabia, U.S.S.R., and Yemen.

The countries presently providing their statistics on the incidence of human anthrax to the World Health Organization report a total of approximately 9,000 cases per annum. When one reviews the statistical data from the League of Nations and the World Health Organization for the period 1924-53 (see table), and gives due consideration to the reported data understating the actual situation for the reasons out-

lined above, one can reasonably conclude that the incidence of human anthrax in the world in recent years has amounted to 20,000 to 100,000 cases per annum. Anthrax is thus seen to be a much more frequently occurring disease in man than one might conclude from considering only the experience in such countries as the United States. It is also worth reiterating here that the incidence of this disease in many parts of the world appears essentially constant for the years under review.

#### REFERENCES

- (1) Simmons, J. S., Whyne, T. F., Anderson, G. W., and Horack, H. M.: *Global epidemiology: A geography of disease and sanitation*. I. India and the Far East; II. Africa and the adjacent islands; III. The Near and Middle East. Philadelphia, J. B. Lippincott, 1944, 1951, 1954.
- (2) Kaplan, M. M.: A brief review of anthrax prevalence and epidemiology. *In Proceedings of the symposium on anthrax in man*. Philadelphia, 1954.
- (3) World Health Organization: *Annual epidemiological and vital statistics*. 1939-1953. Geneva, 1946.
- (4) League of Nations Health Organization: *Annual epidemiological reports*. Geneva, 1924-1938.

## Mental Health in Industry

Results of a survey of industrial mental health conducted by the National Institute of Mental Health, Public Health Service, at the request of the State and Territorial mental health authorities, have been compiled and issued under the title "A Review of Mental Health in Industry."

The review contains a summary of the recent literature, a bibliography of 150 titles dealing with psychiatry and mental health in industry, a description of representative mental health programs, and a list of films on human relations in industry. It also provides an overview of the medical aspects of industrial mental health.

The publication was prepared by the Institute's Community Services Branch, which furnishes technical assistance and consultation to the States in the conduct and development of their mental health programs.

Copies of *A Review of Mental Health in Industry* can be obtained by writing to the National Institute of Mental Health, Public Health Service, Bethesda 14, Md.