VIRGINIA DEPARTMENT OF HEALTH
DIVISION OF EPIDEMIOLOGY

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EPIDEMIOLOGY BULLETIN

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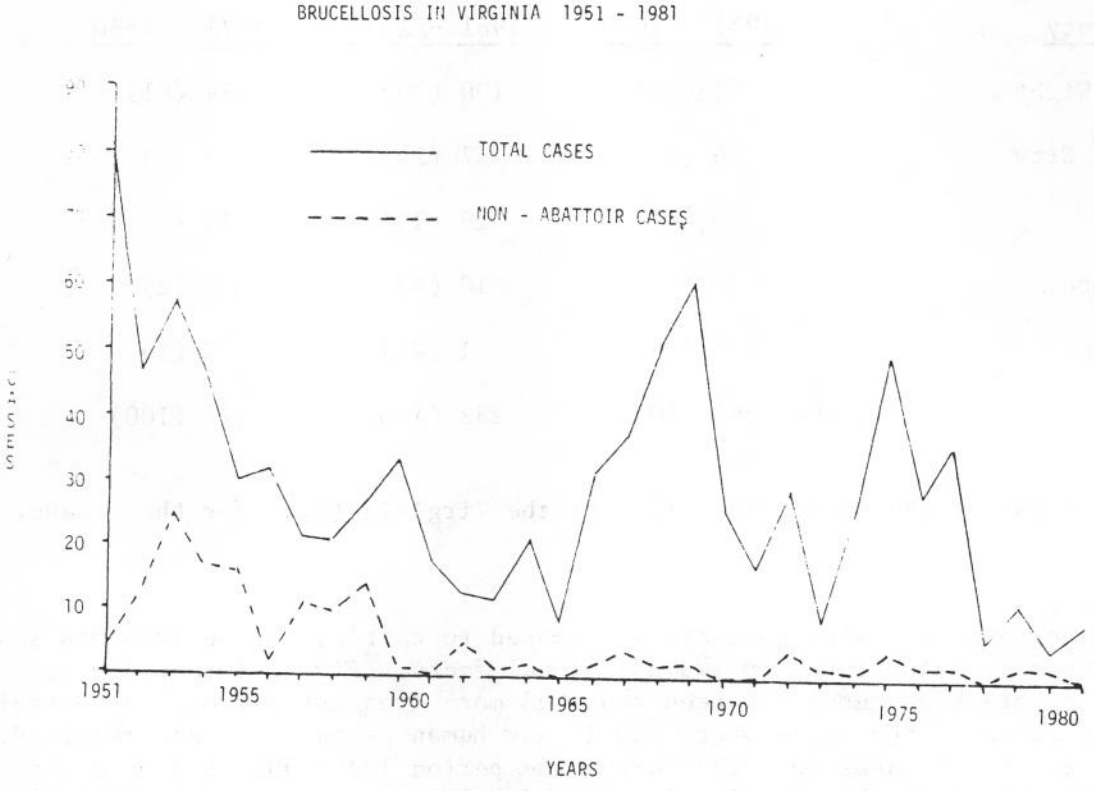
HOG FEVER

Brucellosis ("hog fever") is one of the zoonotic diseases required to be reported to Virginia's Division of Epidemiology. A reported case is considered confirmed if the patient's blood culture(s) yields one of the Brucella organisms, or if acute and convalescent serologic tests reveal a 4-fold rise or fall in antibody titer.

Confirmed cases by year, for the period 1951-1981, are shown in the figure below.



There has been a downward trend in the total number of cases from 1951 through 1965. The peak in cases between 1967 and 1969 was produced, in part, by an outbreak of brucellosis (45 cases) at a meat packing plant in Richmond City.[1] The second peak in 1975 was correlated with both a prospective epidemiologic study of brucellosis at a meat packing plant in Isle of Wight County and a national increase in bovine brucellosis during that same year.[2] This figure also reflects a national trend towards a greater percentage of brucello-

sis cases being abattoir-associated.[3] Most abattoir-associated cases in Virginia are reported from Isle of Wight County where there are two large pork processing and packing plants. Non-abattoir-associated cases in Virginia have traditionally been associated with consumption of unpasteurized milk and living on farms with infected cattle. As the number of non-abattoir-associated cases has diminished over the years, cases reported from Isle of Wight County have become a greater proportion of the Virginia total (Table 1).

Table 1. BRUCELLOSIS REPORTED BY SELECTED CITIES AND COUNTIES IN VIRGINIA

1951 - 1980

Cases Reported

City/County	1951 - 1960	1961 - 1970	1971 - 1980
Isle of Wight	55 (14)*	100 (36)	184 (81)
Richmond City	16 (4)	67 (24)	3 (1)
Suffolk	25 (6)	29 (10)	11 (5)
Southampton	30 (8)	10 (4)	4 (2)
Rockingham	20 (5)	1 (<1)	2 (1)
Virginia Total	398 (100)	282 (100)	227 (100)

* Numbers in parentheses are percentages of the Virginia total for the decade.

The importance of swine contact, as opposed to cattle, in the transmission of brucellosis is illustrated by two additional facts. First, infected cattle herds in Virginia have generally been reported more frequently from the central and western areas of the state where few if any human cases have been reported. Second, of 244 human cases reported during the period 1970-1981, 112 were confirmed by isolation of the organism from blood cultures. As shown in Table 2, B. suis was by far the most commonly isolated species. The preferential host for B. suis is swine, while for B. abortus it is cattle.

Table 2. POSITIVE BLOOD CULTURES FOR *BRUCELLA SP.* 1970 - 1981.

Species Isolated	Number
Brucella suis	109
Brucella abortus	3
Brucella melitensis	0
Brucella canis	0

Editor's comment: Virginia, Iowa, and Texas have traditionally reported more cases of human brucellosis than other states.[4] The decrease in the annual number of reported cases in Virginia between 1951-1965 coincides with the same trend nationally. Since 1965 there has been little change in the annual number of cases in the United States, with approximately 200-500 cases reported per year.[5] The decline in human brucellosis can be attributed in large part to a successful bovine brucellosis control program established in 1934. At that time, more than 11% of the cattle and 45% of the dairy herds in the U.S. were infected with brucellosis. By 1977, however, the dairy herd infection rate had fallen to 4.33 per 1000 herds.[2]

It is impossible to reliably diagnose human brucellosis using only clinical findings. For this reason, appropriate laboratory testing must be used. When blood cultures are performed, the clinician must notify the laboratory that brucellosis is suspected because blood cultures must be retained for a longer than usual period of time, at least 3-4 weeks, in order to consistently isolate the organism when present. Cultures must also be incubated in a 10% CO_2 environment, a growth requirement for *B. abortus*.

Serologic techniques may also be useful in confirming the diagnosis. The standard tube agglutination test (STD) is the most sensitive and frequently used technique. The STD test does not distinguish between IgM and IgG antibody. Brucella agglutinins are usually detected by this test as early as one week after the onset of illness and they usually persist for at least twelve months in spite of antibiotic therapy.[6] Single or stable titers of $\geq$ 1:160 are not considered confirmative evidence for brucellosis, but, in conjunction with a compatible illness, are supportive evidence in presumptive cases. The 2-mercaptoethanol agglutination test (2-ME) measures only IgG antibody, and elevated brucella agglutinins by this method are suggestive of recent, active infection since they are only detected during approximately a six month period after initiation of therapy.[6]

Physicians should be aware that false-negative brucella agglutination titers may be produced by an inhibition prozone. This phenomenon will result in agglutination at higher serum dilutions with absent agglutination at lower dilutions (generally < 1:640). The inhibition prozone is due to the presence of blocking antibody and is not due to agglutinating antibody excess.[7] To avoid false-negative titers, it is important that all serum from patients with suspected brucellosis be diluted to at least 1:1,280 regardless of the presence or absence of agglutination at lower titers. False-positive brucella titers may be observed in serum from patients with tularemia, cholera, or after cholera vaccination or brucellin skin testing.

References:

1. Archives Environmental Health 1974; 28:263-271.

2. JAMA 1980; 244:2318-2322.

3. Medicine 1974; 53:403-413.

4. Smith, I.M. Brucella Species. In: Principles and Practice of Infections Diseases. Mandell, G.L., Douglas, R.G., Jr., Bennett, J.E. (Eds.). Wibey & Sons, N.Y. 1979. pp 1772-1784.

5. Centers for Disease Control. Annual Summary 1980: reported morbidity and mortality in the United States. Morbidity Mortality Weekly Rep. 1981; 29 (54).

6. Medicine 1974; 53:415-425.

7. Spink, W.W. Brucella. In: Medical Microbiology and Infectious Diseases. Braude, A.I., Davis, C.E., Fierer, J. (Eds). W.B. Saunders Co. Phil. 1981. pp 374-379.

ANNOUNCEMENTS

On July 15 Dr. Harry C. Nottebart, Jr., left his position with the Division of Epidemiology to assume the office of Vice President for Medical Affairs at Richmond Memorial Hospital. Since 1981 Dr. Nottebart has served as Director of the Bureau of Communicable Diseases and has been responsible for tuberculosis & venereal disease control, immunization activities, and vector control.

Dr. Tom A. Sayvetz has completed a two year assignment as the Centers for Disease Control Epidemic Intelligence Service (EIS) officer with the Division of Epidemiology. During this period, Dr. Sayvetz served as editor of this bulletin and conducted numerous outbreak investigations. Dr. Sayvetz will remain at the Department of Health as a NIOSH (National Institute of Occupational Safety and Health) investigator and will be responsible for the surveillance and investigation of occupational illnesses.

Dr. Carl W. Armstrong, who served as the EIS Officer with the Division of Epidemiology from 1978 to 1980, has returned to the Department of Health. Dr. Armstrong will serve as Director of the Division of Health Hazard Control, with responsibilities in the areas of occupational, radiological & environmental health. He will carry out epidemiologic investigations in cooperation with the Division of Epidemiology, and will also assume the duties of editor of this bulletin.

Last month's issue (#6) of the VEB dealt with the recommendations for the use of the inactivated hepatitis B virus vaccine. These recommendations were reprinted from the MMWR 1982; 31: 317-332, 327-328. References were omitted in order to conserve space, but they are available upon request.

MONTH: July, 1982

DISEASE	STATE					REGIONS				
						THIS MONTH				
	THIS MONTH	LAST MONTH	TOTAL TO DATE 1982	TOTAL TO DATE 1981	MEAN 5 YEAR TO DATE	N.W.	N.	S.W.	C.	E.
CHICKENPOX	47	83	779	1540	870.8	18	16	1	5	7
MEASLES	0	0	14	6	1193.0	0	0	0	0	0
MUMPS	1	1	31	112	89.0	0	0	1	0	0
PERTUSSIS	8	2	17	3	7.2	1	4	2	0	1
RUBELLA	2	3	13	4	207.8	0	1	0	0	1
MENINGITIS – ASEPTIC	32	6	75	53	61.2	4	8	2	11	7
BACTERIAL	19	11	118	128	102.6	3	6	6	4	0
ENCEPHALITIS – INFECTIOUS	5	4	19	19	13.8	0	0	2	3	0
POST-INFECTIOUS	0	1	1	2	5.4	0	0	0	0	0
HEPATITIS A (INFECTIOUS)	14	11	111	106	153.2	1	2	2	2	7
B (SERUM)	55	36	275	269	229.2	3	23	12	12	5
SALMONELLOSIS	189	147	746	820	551.2	16	37	23	58	55
SHIGELLOSIS	13	6	86	981	259.4	1	6	2	3	1
TUBERCULOSIS – PULMONARY	57	34	334	321	-	-	-	-	-	-
EXTRA-PULMONARY	13	6	62	61	-	-	-	-	-	-
SYPHILIS (PRIMARY & SECONDARY)	57	63	371	395	324.6	0	9	2	11	35
GONORRHEA	1928	1863	11947	12199	12788.4	-	-	-	-	-
ROCKY MOUNTAIN SPOTTED FEVER	23	12	43	54	65.0	2	3	7	9	2
RABIES IN ANIMALS	67	69	317	42	13.0	1	66	0	0	0
MENINGOCOCCAL INFECTIONS	6	4	42	65	46.6	1	2	2	0	1
INFLUENZA	8	31	307	4852	2596.0	0	0	7	1	0
MALARIA	5	3	26	12	19.2	0	4	0	1	0
OTHER: Hepatitis Unspec.	7	5	62	97	97.4	1	2	0	0	4

COUNTIES REPORTING ANIMAL RABIES: Fairfax 18 rc., 1 skunk, 1 red fox, 1 bat; Fauquier 2 rc., 1 cat, 1 skunk; Loudoun 33 rc., 1 groundhog, 2 cats, 1 bat; Prince Wm. 4 rc., Frederick 1 rc.

OCCUPATIONAL ILLNESSES: Occupational pneumoconioses 6; Occupational dermatoses 1, Occupation hearing loss 9; Asbestosis 6

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