

Prevalence of Linkage Between Cryptosporidiosis and HIV/AIDS Infected Persons in Louisiana, U.S.A.

Yasuyuki RAKUE¹⁾ and Takatoshi KOBAYAKAWA²⁾

¹⁾Department of Tropical Medicine, School of Public Health and Tropical Medicine,
Tulane University Medical Center

²⁾Department of International Affairs and Tropical Medicine,
Tokyo Women's Medical University, School of Medicine

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Cryptosporidiosis is the most common causes of diarrhea in acquired immunodeficiency syndrome (AIDS) patients in the United States. First human case was diagnosed in 1976. Cryptosporidiosis persisted for 4 weeks in human immunodeficiency virus (HIV)-positive person confers the Centers for Disease Control and Prevention (CDC) defined diagnosis of AIDS. Cryptosporidiosis is most particularly a danger for the immunocompromised, especially HIV-positive persons and AIDS patients. About 2.2% of all patients whose cases of AIDS are reported to CDC have cryptosporidiosis as their AIDS-defining illness. Hospital-based studies indicate that cryptosporidiosis is diagnosed in 10~20% of AIDS patients who have diarrhea. Because diarrhea occurs in about half of all AIDS patients each year, which is estimated that the annual rate of cryptosporidial infection among all AIDS patients may approach 5~10%. *Cryptosporidium parvum* causes self-limited disease in immunocompetent hosts. In immunocompromised persons including HIV disease, profuse chronic watery diarrhea develops and leads to malabsorption, malnutrition, dehydration and cachexia. In the recent CDC HIV/AIDS Surveillance Report (Vol. 9, No. 2), Louisiana ranked 9th highest in state AIDS case rates and 12th in number of AIDS cases reported in 1997. Statewide during 1997, 904 new AIDS cases were diagnosed, and 1,338 new HIV cases were detected and reported. There were 9,830 persons living with HIV/AIDS in Louisiana, of which 4,414 had been diagnosed with AIDS at the end of 1997. The analysis data come from Adult/Adolescent Spectrum of HIV Disease (ASD) study. Cryptosporidiosis can occur at any time in the course of HIV infection. Data reported here suggest that among HIV-positive patients, cryptosporidiosis occurred more frequently among those with depleted CD4⁺ cell counts and among those who developed AIDS-related opportunistic infections (AIDS-OIs). A strong association between cryptosporidiosis and depleted CD4⁺ cell counts (≤ 200 cells/ μ l) has been established in previous report.

Introduction

Cryptosporidium parvum (Apicomplexa: Eucocci: Cryptosporidiidae), a common enteric protozoan, is an important emerging waterborne

pathogen in the United States¹⁾ and a cause of severe life-threatening disease in patients with acquired immunodeficiency syndrome (AIDS)²⁾. No effective medical treatment for Cryptosporidiosis

has been identified nowadays. The parasite is transmitted by ingestion of oocysts excreted in the feces humans or animals. *Cryptosporidium parvum* causes self-limited disease in immunocompetent hosts²⁾³⁾. In immunocompromised persons including patients with advanced human immunodeficiency virus (HIV) disease, profuse chronic watery diarrhea develops and leads to malabsorption, malnutrition, dehydration, and cachexia³⁾⁴⁾. Cryptosporidiosis persisted for 4 weeks in HIV-positive person confers the Centers for Disease Control and Prevention (CDC) defined diagnosis of AIDS⁵⁾. Cryptosporidiosis is most particularly a danger for the immunocompromised, especially HIV-positive persons and patients with AIDS. Persons with CD4 cell counts below 200 cells/ μ l are most likely to experience severe complications including prolonged diarrhea, dehydration, and possible death. These with CD4 counts above 200 cells/ μ l may recover from the symptoms of cryptosporidiosis yet maintain the infection asymptotically, with symptoms potentially returning if their CD4 counts drops⁴⁾⁵⁾.

Cryptosporidium parvum is a zoonotic pathogen first noted to cause disease of turkeys in 1955 and of calves in 1971. *Cryptosporidium* infects the respiratory or gastrointestinal tracts of a large number of hosts including fish, birds, reptiles, and mammals⁶⁾. The first report of human case of cryptosporidiosis was in 1976, followed over the next few years by reports of disease in immunosuppressed hosts. CDC documented the importance of *Cryptosporidium parvum* as a major human pathogen in 1982 in reporting outbreaks of cryptosporidiosis diarrhea in 21 patients with advanced HIV disease and in 12 immunologically normal hosts who had been exposed to cryptosporidium from infected calves⁵⁾⁷⁾. The relative risk for a patient with advanced HIV disease of acquiring cryptosporidium infection during exposure to asymptomatic or clinically infected hu-

mans or animals or to contaminated food or water is not known⁶⁾. The risk of nosocomial spread, however, is likely to increase with increasing numbers of patients with advanced HIV disease and chronic cryptosporidium infection being admitted to hospitals and dedicated HIV disease care units. Because there is currently no treatment for cryptosporidiosis and epidemiologic investigation to define these risks are extremely important.

Material and Method

Study population

The analysis data come from Adult/Adolescent Spectrum of HIV Disease (ASD) study, which is funded by CDC, conducted by Louisiana Office of Public Health, and approved by Louisiana Department of Health and Hospital Review Board and Louisiana State University Research Review Committee. The patients who were tested for HIV disease at hospitals or clinics were consented. Those patients' medical records which are diagnosed HIV-positive are reviewed by Louisiana Office of Public Health. They are also confidential and regulated by the *Public Health Service Act 42 USC 242K and 242M (d)*.

Statistical analysis

Cryptosporidiosis is demonstrated with acid fast staining for detection of *Cryptosporidium parvum*. Bivariate analysis was calculated using the parsons' age, race, sex, history of AIDS-related opportunistic infections (AIDS-OIs), antiretroviral use, CD4⁺ cell counts, and the risk of developing cryptosporidiosis. Logistic regression analysis was considered to control for potential confounding variables. The Pearson chi-square test was carried out the difference in the monthly cryptosporidiosis occurrence. The percentage of the annual cryptosporidiosis was computed to analyze the trends. Time series analysis was not carried out for the data.

Results

HIV/AIDS Trends from Louisiana HIV/AIDS Surveillance Report (1999)

This profile summarizes the status of the HIV/AIDS epidemic in Louisiana for cases diagnosed through 1997 and reported through April 1998. Because each data source has its limitations and is extremely important to integrate information from several sources of data in order to get a comprehensive picture of the epidemic.

(1) Across the U. S., it could see a substantial drop in the number of AIDS cases diagnosed and reported, however, the number of HIV-infected cases reported to CDC remained stable across states in 1997. In the recent CDC HIV/AIDS Surveillance Report (Vol. 9, No. 2), Louisiana ranked 9th highest in state AIDS case rates and 12th in number of AIDS cases reported in 1997. The metro New Orleans area continues to have the highest AIDS rates in the state, ranking 11th highest among large cities in the U.S. and the metro Baton Rouge area case rates was 19th.

(2) Statewide during 1997, 904 new AIDS cases were diagnosed, and 1,338 new HIV cases were detected and reported. The cumulative total of cases ever reported to Louisiana Office of Public Health is 16,112 persons with HIV, of which 10,320 have been diagnosed with AIDS. At the end of 1997, there were 9,830 persons living with HIV/AIDS in Louisiana, of which 4,414 had been diagnosed with AIDS.

(3) Since 1996, AIDS-related mortality has declined drastically, coinciding with the emergence of more effective treatments. AIDS dropped to the second leading cause of death among 25~44 year old men in Louisiana in 1996. However, the death rate continued to increase among 25~44 year old women.

(4) Although the AIDS epidemic in men who had sex with men (MSM) remains the largest of the exposure groups, the numbers are declining.

Adjusted estimates suggest that the decline is occurring primarily among white MSM, whereas the number of AIDS cases is remaining steady among African-American MSM. For cases recently detected with HIV, MSM is also the largest exposure category, however, exposure has not been classified for about half of the cases detected in 1997.

(5) In the MSM outreach survey, roughly one-third of MSM reported having unprotected receptive anal sex within the past 30 days.

(6) Injection drug use (IDU) remains the second-greatest exposure category among AIDS cases. Adjusted trends indicate that for AIDS cases among African-Americans, the exposure categories of IDU and high risk heterosexual transmission (HRH) have increased to the same level as that of MSM.

(7) In study of new cases of HIV infection in a New Orleans STD clinic, the highest infection rates continued to be in MSM, IDU, and female sex partners of injection drug users.

(8) During 1997, 73% of new detected HIV/AIDS cases and 70% of new diagnosed AIDS cases were in African-Americans. The HIV/AIDS case rates for African-American men and women remain disproportionately high.

(9) A street outreach behavior survey, which predominantly samples from African-Americans, found that 75% of men and 50% of women had 2 or more sex partners in the last year. A little over half of those persons used a condom at the last sexual encounter. The rates of condom use were consistent with those found by Behavior Risk Factor Surveillance System (BRFSS) conducted in 1996.

(10) Although the number of HIV/AIDS cases detected in women has dropped over 10% since the previous year, women continue to represent an increasing proportion of persons with HIV/AIDS (30% in 1997).

Table 1 Bivariate analysis of demographic and clinical factors and cryptosporidiosis among human immunodeficiency virus-infected patients, New Orleans, Louisiana, 1989~1998

Factors	Total (n=6,913)	No.(%) with cryptospori- diosis	RR ^a	95%CI ^b	p
Age (years)					
≤ 34	3,871	197 (5.1)	1.0		
35~44	2,220	28 (1.3)	0.26	0.17~0.38	<0.01
>44	822	14 (1.7)	0.35	0.20~0.54	<0.01
Race					
White	2,839	99 (3.5)	0.69	0.40~1.18	0.17
African-American	3,803	126 (3.3)	0.65	0.30~1.12	0.12
Others	271	14 (5.2)	1.0		
Mode					
IDU ^c	754	22 (2.9)	1.0		
MSM ^d	2,981	129 (4.3)	1.46	0.94~2.28	0.09
MSM/IDU	1,125	30 (2.7)	0.92	0.53~1.58	0.75
Heterosexual	805	30 (3.7)	1.27	0.74~2.18	0.38
Transfusion/Hemophilia	119	5 (4.2)	1.42	0.55~3.69	0.46
Unknown	1,129	22 (1.9)	0.67	0.38~1.21	0.18
Sex					
Male	5,456	194 (3.6)	1.0		
Female	1,457	45 (3.1)	0.87	0.63~1.20	0.40
CD4+ cell counts (cells/μl)					
<200	3,124	217 (6.9)	11.25	7.27~17.40	<0.01
≥200	3,789	22 (0.6)	1.0		
Use of protease inhibitors					
Yes	1,904	59 (3.1)	1.0		
No	5,009	180 (3.6)	1.15	0.86~1.54	0.33
AIDS OIs ^e					
Yes	2,805	203 (7.2)	7.77	5.47~11.04	<0.01
No	4,108	36 (0.9)	1.0		

^a: relative risk, ^b: confidence interval, ^c: injecting drug use, ^d: men who have sex with men, ^e: acquired immunodeficiency syndrome-related opportunistic infections.

This data summarizes the status of HIV/AIDS epidemic at HIV Outpatient Clinic, New Orleans, Louisiana.

(11) Due to increased use of zidovudine during pregnancy and delivery, perinatal transmission rates have dropped dramatically from over 25% in 1993 to under 10% in 1996.

(12) Over recent years, the syphilis epidemic in Louisiana has experienced a significant decline. Although the rate is approaching the national rate for primary and secondary syphilis, the Louisiana rate (9 per 100,000) is still over twice the national rate (4 per 100,000). The HIV seroprevalence survey in a New Orleans clinic indicates

persons with early syphilis are at higher risk for having HIV infection.

Cryptosporidiosis with HIV/AIDS in Louisiana

During the study period, 6,913 HIV-positive patients were enrolled, of those 5,456 (78.9%) of the patients were male, 3,803 (55.0%) of those were African-Americans, and 4,106 (59.4%) of those were MSM. Two hundred thirty-nine (3.5%) of the patients developed cryptosporidiosis after an average follow-up of 43 months. Bivariate analy-

Table 2 Major opportunistic infection among AIDS patients adult spectrum of disease study (New Orleans Metro Area)

	Among AIDS cases diagnosed in 1997	Among cumulative AIDS cases
	Total (n = 239) No. (%) ^a	Total (n = 4,011) No. (%) ^a
Immunosuppression ^b	214 (89.5)	3,288 (82.0)
Pneumocystis carinii pneumonia	30 (12.6)	1,218 (30.4)
Esophageal candidiasis	18 (7.5)	705 (17.6)
HIV wasting syndrome	13 (5.4)	639 (15.9)
Pulmonary tuberculosis	9 (3.8)	219 (5.5)
Mycobacterium avium complex	6 (2.5)	468 (11.7)
Kaposi' s sarcoma	6 (2.5)	322 (8.0)
Cytomegalovirus retinitis	5 (2.1)	283 (7.1)
Extrapulmonary cryptococcosis	4 (1.7)	234 (5.8)
Cytomegalovirus	3 (1.3)	146 (3.6)
HIV encephalopathy (dementia)	2 (0.8)	292 (7.3)

^a: Percents of AIDS cases may not add up to 100% because people may have more than one AIDS defining condition.

^b: CD4⁺ helper T-lymphocyte count is less than 200 cells/ μ l or the CD4⁺ percentage is less than 14.

This Louisiana HIV/AIDS Surveillance Report was published by Louisiana Office of Public Health in 1977.

sis showed that patients with CD4⁺ cell counts < 200 cells/ml were significantly at higher risk for cryptosporidiosis than those with CD4⁺ cell counts \leq 200 cells/ml [relative risk (RR) = 11.25, $p < 0.01$] (Table 1). Most patients were diagnosed during the spring months (March ~ May), the peak was in March which had 48 patients. Cryptosporidium infection in New Orleans, Louisiana increased from 7 patients (2.9%) in 1989 to 48 patients (20%) in 1994.

Discussion

Cryptosporidiosis is the most common causes of diarrhea in AIDS patients in the United States. About 2.2% of all patients whose cases of AIDS are reported to CDC have cryptosporidiosis as their AIDS-defining illness, of which 3.5% are children. Hospital-based studies indicate that cryptosporidiosis is diagnosed in 10 ~ 20% of patients with AIDS who have diarrhea^{2,4)}. Because diarrhea occurs in about half of all patients with AIDS each year, which is estimated that the an-

nual rate of cryptosporidiosis among all patients with AIDS may approach 5 ~ 10%. The persons with AIDS or hypogammaglobulinemia and those receiving immunosuppressive chemotherapy, diarrhea accompanied by malabsorption is frequently torrential and a major factor leading to death. Passage of up to 17 litter of fluid feces daily has been recorded. Anorexia, abdominal pain, vomiting, weakness, malaise, low-grade fever, and marked weight loss may also be present. In the immunodepressed, infection is not always confined to the gastrointestinal tract⁸⁾.

Cryptosporidiosis can occur at any time in the course of HIV infection. However, cryptosporidiosis is not a reportable disease in all states. Laboratories and physicians may fail to report all cases, not all persons with diarrheal illness seek medical care, not all providers request stool examinations. In spite of the public health importance of cryptosporidiosis, good estimates of the number of persons who become infected each year are not

Table 3 Cryptosporidiosis outbreaks in the United States

Year	Locality	Est. cases	Suspected cause
1984	Bexar Couty, TX	2,006	Sewage contaminated well
1987	Carrollton, GA	12,960	Treatment deficiencies of river water
1988	Los Angeles, CA	44	Contaminated swimming pool
1991	Pennsylvania	511	Treatment deficiencies of well water
1992	Jackson Co., OR	15,000	Treatment deficiencies of spring/river
1992	Lane Co., OR	55	Contaminated wave pool
1992	Idaho	26	Contaminated water slide
1993	Dane Co., WI	85	Contaminated swimming pool
1993	Milwaukee, WI	120	Contaminated swimming pool
1993	Milwaukee, WI	403,000	Treatment deficiencies of lake water
1993	Las Vegas, NV	103	Unknown; perhaps tap water
1993	Central Maine	150	Contaminated apple cider
1994	Lake Nummy, NJ	2,070	Contaminated shallow lake park
1994	Missouri	101	Contaminated swimming pool
1994	Walla Walla, WA	104	Sewage contaminated well
1995	Gainesville, FL	77	Contaminated tap water at day camp
1995	Minnesota	50	Contaminated chicken salad
1996	Ft. Lauderdale, FL	22	Contaminated wading pool
1996	Clovis, CA	500	Contaminated water park
1996	Eagle Harbor, FL	16	Unknown
1996	New York	30	Contaminated apple cider
1997	Minnesota Zoo, MN	359	Contaminated decorative fountain
1997	Spokane, WA	54	Unknown food source at banquet; possibly unwashed green onions
1998	Brushy Creek, TX	32	Sewage contamination of creek/well
1998	Sellwood, OR	51	Contaminated swimming pool

Cryptosporidiosis was first recognized as a cause of human illness in 1976.

available. Severe and persistent disease correlates well with CD4 counts of less than 200 cells/ μ l. Only 5 out of 39 patients infected with *Cryptosporidium parvum* and CD4 counts of less than 200 cells/ μ l were self-limiting disease. However, all 8 patients with *Cryptosporidium parvum* and CD4 counts of greater than 200 cells/ μ l were cured and did not relapse during a follow-up period of 1 ~24 months⁴⁾. Data reported here suggest that among HIV-positive patients, cryptosporidiosis occurred more frequently among those with depleted CD4⁺ cell counts and among those who developed AIDS-OIs (Table 2). A strong association between cryptosporidiosis and depleted CD4⁺ cell counts has been established in previous report²⁾⁴⁾. According to the previous reports, most cases of cryptosporidiosis in New Orleans, Louisi-

ana occurred among MSM. Unprotected anal intercourse or oral-anal sexual contact may have been concerned in *Cryptosporidium parvum* transmission among MSM patients⁹⁾.

There was a seasonal trend in the number of cryptosporidiosis. The increase in the spring months corresponds to *Mardi Gras Festival* season in New Orleans area. During *Mardi Gras Festival*, there are tremendous tourists all over the nation in this area, which bring about large quantities of trashes and garbage. Contaminated water may be concerned in the transmission of cryptosporidiosis. Due to the spring is mild and comfortable climate in this area, many people participate in outdoor activities such as fishing in swamp, picnic, hunting, and gardening, which expose them to potential environmental sources of crypto-

sporidium. The occurrence of cryptosporidiosis increased between 1984 and 1998 (Table 3)¹⁰⁾. Laboratories and physicians were aware of this disease, as a result of improved laboratory diagnostic facilities for the identification of cryptosporidium oocysts. Cryptosporidium oocysts can frequently be identified in filtered samples of river water in both developing and developed countries⁶⁾. There are also reports suggesting airborne which might account for respiratory infection in AIDS and perinatal transmission. Forty-eight patients of cryptosporidiosis occurred in New Orleans, Louisiana in 1994. The massive outbreak of cryptosporidiosis in Milwaukee, Wisconsin may contribute to an increase awareness of this disease^{10)~12)}. The decrease of cryptosporidiosis after 1996 may be due to preventive measures among AIDS patients for drinking bottled water. During the study period, 239 HIV-positive patients with cryptosporidiosis diagnosed and 14 patients were diagnosed in 1998 in New Orleans.

Many AIDS-OIs can cause diarrhea, among them cytomegalovirus and *Mycobacterium avium* complex. All of these pathogens are a cause for concern, especially in individuals with advanced HIV disease and persons with CD4 counts below 200 cells/ml should consult a doctor if they develop diarrhea that persists for more than three days.

As general, a single stool specimen is usually sufficient to establish a diagnosis of cryptosporidiosis, although some physicians ask for up to three samples, each on different day. There are no medications that will cure cryptosporidiosis once infection sets in, but paromomycin does suppress the effects of infection in most people¹³⁾. Azithromycin has also been used with some success in affected patients¹⁴⁾¹⁵⁾. The recommended daily dose of paromomycin is 500 mg four times a day for a period of 14 to 28 days¹³⁾. The customary dose of azithromycin is 600 mg daily for 14 to 28 days¹⁴⁾¹⁵⁾.

Patients with heavy infections of cryptosporidiosis, those with CD4 counts below 50 cells/ μ l, and those who suffer relapses may require additional months of maintenance therapy. With treatment, diarrhea usually abates and for most patients it eventually ceases. As infection subsides, patients are often able to regain most or all of the weight they lost during the acute phase of infection. Paromomycin and azithromycin are not universally effective, however, for that reason HIV-positive persons with CD4 counts below 200 cells/ μ l may want to take these simple precautions, which will dramatically reduce the likelihood that they will become infected with cryptosporidiosis^{13)~15)}.

General precautions for *Cryptosporidium parvum*

(1) Wash hands carefully after using the bathroom and after such activities as handling dirty laundry, playing with a pet, or changing a diaper.

(2) Avoid contact with human and animal waste. This caution applies equally to cleaning litter boxes, gardening, and all sexual activities that involve oral-anal contact.

(3) Wash all fruits and vegetables well with distilled, bottled, boiled, or filtered water before eating them. The person with CD4 count is below 200 cells/ μ l may want to avoid eating raw vegetables and fruits in restaurants or other places where those items may not have been well washed.

(4) Avoid swimming in fresh water such as ponds, lakes, streams, and rivers and do not use swimming pools, because they can become contaminated, and chlorine does not kill the organism that causes cryptosporidiosis.

Precaution for cryptosporidiosis (CD4 < 200 cells/ μ l) with HIV/AIDS persons

Although the risk of acquiring cryptosporidiosis from drinking tap water is low, municipal water supplies can become contaminated. The

waterborne outbreak in Milwaukee, Wisconsin in 1993 resulted in 403,000 cases of cryptosporidiosis, of which some cases were very serious in HIV-infected persons. For guarding against waterborne infection, person with CD4 counts below 200 cells/ μ l may want to consider these precautions:

(1) Drink only tap water that has been boiled at a rolling boil for at least one minute, transferred to an airtight container, and refrigerated or allowed to cool to room temperature.

(2) Drink distilled water or water that has been properly filtered. This means water that has been passed through a so-called absolute filter, one that filters out all organisms that are greater than one micron in size. Such filters which meet the National Sanitation Foundation's standard for cyst removal will eliminate any cryptosporidiosis in the water.

(3) Drink bottled water that has been distilled or filtered. Not all bottled waters meet these criteria, and water that has not been purified by one of these methods may not be safe.

Conclusion

Cryptosporidiosis is an uncommon but unpleasant AIDS-OI. It occurs in up to 20% of persons who are infected with HIV, causing non-bloody diarrhea and less commonly, abdominal cramping and pain. Onset is generally rapid and fever is rare. Nausea, vomiting, tiredness, jaundice, and a yellow discoloration of the skin and/or the whites of the eyes have been reported in some cases. In HIV-positive persons with CD4 counts, also known as helper T cell counts above 200 cells/ μ l, cryptosporidiosis is a self-limiting condition that lasts from 5 to 14 days and resolves without medication, just as it does in HIV-negative persons. The relapse rate is fairly high about 30%, but these secondary flare-ups are less severe and usually last no more than a day or two. In HIV-positive persons with CD4 counts below 200 cells

/ μ l, however, cryptosporidiosis is a considerably more serious affliction, which can lead to permanent diarrheal illness. This unchecked diarrhea causes chronic malabsorption of fluid, nutrients, vitamins, and electrolytes. And malabsorption in turn lead to weight loss, wasting syndrome, and even death. Studies in many developing and developed countries have given estimates for the importance of cryptosporidiosis as a cause of chronic watery diarrhea in both infants and adults with HIV/AIDS persons. Physicians and other medical personnel require a higher index of suspicion for cryptosporidiosis infection with HIV/AIDS persons.

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米国ルイジアナ州における HIV/AIDS 感染者とクリプトスポリジウム症の 相関関係についての流行調査

¹⁾米国チューレーン大学医療センター 公衆衛生熱帯医学大学院 熱帯医学部

²⁾東京女子医科大学 医学部 国際環境・熱帯医学

ラク エ ヤスユキ コ バヤカワタカトシ
楽得 康之¹⁾・小早川隆敏²⁾

クリプトスポリジウム (*Cryptosporidium parvum*) の人体寄生例が初めて報告されたのは1976年であったが、病原体として本格的に認識されるに至ったのは後天性免疫不全症候群 (AIDS) に伴う日和見感染症としてである。1982年には AIDS 下痢患者にクリプトスポリジウム症の重症例が多数みとめられ、種々の抗生剤および抗原虫剤を投与しても治癒しないことが報告された。また、衛生管理先進国である米国において水質環境汚染や水道水供給システムの不備などに起因するクリプトスポリジウム症の大規模な流行が多発している。このような状況の中で全米第9位の AIDS 感染率と第12位の AIDS 患者数を抱えるルイジアナ州ではクリプトスポリジウム症の疫学的調査とそのデータ公開が感染状況の把握および予防対策に必要不可欠であるとの見地に立ち、ルイジアナ州公衆衛生局と米国疾病管理予防センター (CDC) による ASD スタディを基にした水質・環境衛生管理システムが確立されている。CDC はルイジアナ州において1997年に新たに904人の AIDS 患者、1,338人の HIV 感染者が確定診断され、同州の HIV 感染者および AIDS 患者の総計は9,830人、そのうち4,414人が AIDS 患者と診断されたと報告している。さらに CD4 値が 200cell/ μ l 以下のルイジアナ州 AIDS 患者にクリプトスポリジウム症との強い相関関係が米国他州同様にみとめられ、水質汚染が原因とされるクリプトスポリジウム症感染は1998年のルイジアナ州の疫学調査によるとニューオーリンズ市の HIV 感染者のうち14人にみとめられた。このような現況を踏まえて過去10年間 (1989~1998) に渡るルイジアナ州 HIV/AIDS サーベイランスを軸に年齢、人種、性別、抗 AIDS 治療の有無、CD4 値などを考慮した HIV 感染者と AIDS 患者に対するクリプトスポリジウム症感染の疫学調査の概略を報告する。