

New York City Department of Environmental Protection

Waterborne Disease Risk Assessment Program

2000 Annual Report

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Prepared in accordance with condition **704a** of the United States Environmental Protection Agency Filtration Avoidance Determination of May 1997.

The New York City Waterborne Disease Risk Assessment Program was developed and implemented to: (a) obtain data on the rates of giardiasis and cryptosporidiosis, along with demographic and risk factor information on case patients; (b) provide a system to track diarrheal illness to assure rapid detection of any outbreaks; and (c) determine the contribution (if any) of tap water consumption to gastrointestinal disease. The 2000 program achievements and results are presented.

Prepared by: The Waterborne Disease Risk Assessment Program Team

The Waterborne Disease Risk Assessment Program is an interagency program involving the New York City Departments of Environmental Protection and Health. This year 2000 Annual Report was prepared by Dan Cimini², Anne Seeley¹, James R. Miller² and Don Weiss³.

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The authors wish to acknowledge the dedication of the other members of the Waterborne Disease Risk Assessment Program Team, and the continuing assistance of Fran Guerriero¹, Lorraine Smith², Giselle Merizalde², and Maria Osorio¹.

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TABLE OF CONTENTS

	Page
Executive Summary	
Introduction	1
Active Disease Surveillance	1
Giardiasis	1
Cryptosporidiosis	3
Diarrheal Disease Monitoring (Outbreak Detection Program)	6
Anti-diarrheal medication monitoring	6
Clinical laboratory monitoring	6
Nursing home monitoring	7
Epidemiological Studies	7
Additional Data Gathering Efforts	8
New York City DOH Public Health Laboratories - Stool testing	8
Information Sharing and Public Education	8

Tables

Table 1:	Number of Cases and Case Rates for Giardiasis , Active Disease Surveillance, New York City, 1994-2000.	2
Table 2:	Number of Cases and Annual Case Rate per 100,000 Population by Borough and Gender - Active Surveillance for Giardiasis in New York City (2000).	11
Table 3:	Number of Cases and Annual Case Rate per 100,000 Population By Zip Code, in Rank Order by Annual Case Rate, Upper Ranking Case Rates - Active Surveillance for Giardiasis in New York City (2000).	13
Table 4:	Number of Cases and Annual Case Rate per 100,000 Population by Age Group and Gender - Active Surveillance for Giardiasis in New York City (2000).	14
Table 5:	Number of Cases and Annual Case Rate per 100,000 Population by Age Group and Borough - Active Surveillance for Giardiasis in New York City (2000).	15
Table 6:	Number of Cases and Annual Case Rate per 100,000 Population by Borough and Race/Ethnicity - Active Surveillance for Giardiasis in New York City (2000).	16
Table 7:	Number of Cases and Annual Case Rate per 100,000 Population by Age Group and Race/Ethnicity - Active Surveillance for Giardiasis in New York City (2000).	17
Table 8:	Number of Cases and Case Rates for Cryptosporidiosis , Active Disease Surveillance, New York City, 1994-2000.	4
Table 9:	Number of Cases and Annual Case Rate per 100,000 Population by Borough and Gender - Active Surveillance for Cryptosporidiosis in New York City (2000), including Staten Island Cluster.	19

Table 10:	Number of Cases and Annual Case Rate per 100,000 Population by Zip Code, in Rank Order by Annual Case Rate, Upper Ranking Case Rates - Active Surveillance for Cryptosporidiosis in New York City (2000).	21
Table 11:	Number of Cases and Annual Case Rate per 100,000 Population by Age Group and Gender - Active Surveillance for Cryptosporidiosis in New York City (2000), including Staten Island Cluster.	22
Table 12:	Number of Cases and Annual Case Rate per 100,000 Population by Age Group and Gender - Active Surveillance for Cryptosporidiosis in New York City (2000), excluding Staten Island Cluster.	23
Table 13:	Number of Cases and Annual Case Rate per 100,000 Population by Age Group and Borough - Active Surveillance for Cryptosporidiosis in New York City (2000), including Staten Island Cluster.	24
Table 14:	Number of Cases and Annual Case Rate per 100,000 Population by Borough and Race/Ethnicity - Active Surveillance for Cryptosporidiosis in New York City (2000), including Staten Island Cluster.	25
Table 15:	Number of Cases and Annual Case Rate per 100,000 Population by Borough and Race/Ethnicity - Active Surveillance for Cryptosporidiosis in New York City (2000), excluding Staten Island Cluster.	26
Table 16:	Number of Cases and Annual Case Rate per 100,000 Population by Age Group and Race/Ethnicity - Active Surveillance for Cryptosporidiosis in New York City (2000), including Staten Island Cluster.	27
Table 17:	Number of Cases of Cryptosporidiosis by Year and Immune Status, New York City, 1995-2000.	5
Table 18:	Percentage of Interviewed Cryptosporidiosis Case-Patients Reporting Selected Potential Risk Exposures in the Month Before Disease Onset, by Immune Status, New York City, 1995-2000	30
Table 19:	Percentage of Interviewed Cryptosporidiosis Case-Patients by Type of Tap Water Exposure Reported in the Month Before Disease Onset, by Immune Status, New York City, 1995-2000	31
Table 20:	Cryptosporidium Testing of Specimens Submitted by Child Health Clinics and the School Health Program to the NYCDOH Public Health Laboratories, 1996-2000.	8

Charts

Chart 1:	Giardiasis by Month of Diagnosis, New York City, July 1993-December 2000	10
Chart 2:	Cryptosporidiosis by Month of Diagnosis, New York City, November 1994-December 2000	18
Chart 3:	Cryptosporidiosis Among Persons with HIV/AIDS by Month of Diagnosis, New York City, January 1995-December 2000	28
Chart 4:	Cryptosporidiosis Among Immunocompetent Persons by Month of Diagnosis, New York City, January 1995-December 2000	29

Maps

Map 1:	Annual Case Rate per 1000,000 Population by Zip Code - Active Surveillance Data for Giardiasis in New York City (January through December 2000)	12
Map 2:	Annual Case Rate per 100,000 Population by Zip Code - Active Surveillance Data for Cryptosporidiosis in New York City (January through December 2000)	20

EXECUTIVE SUMMARY

New York City's Waterborne Disease Risk Assessment Program was established to: (a) obtain data on the rates of giardiasis and cryptosporidiosis, along with demographic and risk factor information on case patients, (b) provide a system to track diarrheal illness to assure rapid detection of any outbreaks, and (c) determine the contribution (if any) of tap water consumption to gastrointestinal disease. The program, jointly administered by the Departments of Health and Environmental Protection, began in 1993. This report provides an overview of program progress made, and data collected, during 2000.

ACTIVE DISEASE SURVEILLANCE

Active disease surveillance for giardiasis and cryptosporidiosis began in July 1993 and November 1994, respectively. In 2000, the number of cases of giardiasis and cryptosporidiosis decreased relative to 1999 and 1998. The number of cases of cryptosporidiosis among persons with HIV/AIDS decreased from 118 in 1999 to 90 in 2000. Demographic information for cases of giardiasis and cryptosporidiosis was gathered and is summarized in this report. Telephone interviews of cryptosporidiosis case patients to gather potential risk exposure information continued and selected results are presented.

DIARRHEAL DISEASE MONITORING (Outbreak detection program)

Gastrointestinal (GI) disease incidence in the general population can be monitored via tracking of sentinel populations, or surrogate indicators of disease. Such tracking programs can play a significant role in limiting the extent of an outbreak of gastrointestinal illnesses by providing a rapid indication of a problem. Three distinct and complementary outbreak detection systems are in operation in New York City. One system monitors the sales of anti-diarrheal medication. The second monitors the number of stool specimens submitted to clinical laboratories for microbiological testing. The third system monitors reports of new cases of GI disease observed by health care professionals in sentinel nursing homes.

EPIDEMIOLOGICAL STUDIES

During 2000, data analysis was completed on a case-control study of risk factors for cryptosporidiosis among immunocompetent persons diagnosed during April-May 1999. A report of findings was finalized and issued in January 2001.

OUTREACH AND EDUCATION

Outreach and education efforts have continued. Presentations were made to health care providers and at professional meetings. Information on *Cryptosporidium* and *Giardia* continues to be available on New York City Department of Environmental Protection's and New York City Department of Health's websites, including annual reports on program activities, fact sheets on giardiasis and cryptosporidiosis, and results from the City's source water protozoa monitoring program from the Department of Environmental Protection's Pathogen Laboratory.

INTRODUCTION

New York City's Waterborne Disease Risk Assessment Program was developed and implemented to:

- ! obtain data on the rates of giardiasis and cryptosporidiosis, along with demographic and risk factor information on case patients;
- ! provide a system to track diarrheal illness to assure rapid detection of any outbreaks; and
- ! determine the contribution (if any) of tap water consumption to gastrointestinal disease.

Two City agencies are involved in this effort: the Department of Environmental Protection (DEP) and the Department of Health (NYCDOH). In addition to participation by staff from both agencies, an interagency unit, the Parasitic Disease Surveillance Unit, was established to implement major components of this program.

Following below is a summary of program highlights and data for the year 2000. Beginning this year, the WDRAP Annual Report is being published in May rather than January, in order to allow for the inclusion of more complete data. Variations in data between this report and previous reports may be due to several factors, including disease reporting delays, corrections of errors, and refinements in data processing (for example, the removal of duplicate disease reports). Because complete year 2000 U.S. Census data were not available as of this writing, 1990 U.S. Census data were used to calculate rates (consistent with prior Annual Reports). All rates are annual case rates. Caution must be exercised when interpreting rates which are based on very small case numbers.

ACTIVE DISEASE SURVEILLANCE

Giardiasis

New York City implemented a program of active surveillance for giardiasis in July 1993. Active laboratory surveillance to ensure complete reporting of cases by laboratories continued in 2000. Also, telephone calls continued to be made to physicians, laboratories, and/or patients to obtain basic demographic information missing from case reports. Case rates and basic demographic findings are compiled and reported on a quarterly basis.

During 2000, a total of 1,768 cases were reported to NYCDOH and the annual case rate was 24.1 per 100,000. The number of cases and the case rate in 2000 were similar to the figures for 1997 and were lower than other years since 1994 (see Table 1 below, and Chart 1).

Table 1: Number of Cases and Case Rates for Giardiasis, Active Disease Surveillance, New York City, 1994 - 2000.

<i>Year</i>	<i>Number of Cases</i>	<i>Case Rate per 100,000</i>
1994	2,456	33.5
1995	2,485	33.9
1996	2,289	31.2
1997	1,786	24.3
1998	1,963	26.8
1999	1,895	25.9
2000	1,768	24.1

The following provides highlights from the active surveillance data for giardiasis among New York City residents from January 1 through December 31, 2000. Additional data will be found in the tables.

Location

Manhattan had the highest borough-specific annual case rate (60.2 cases per 100,000 population) (Table 2). The highest postal zip code-specific case rate was found in two adjacent zip codes in lower Manhattan with small populations (population range:120-154) (Map 1 and Table 3). One giardiasis case was reported in each zip code. Following these two zip codes, the highest annual case rates were found in postal zones in the Chelsea section of Manhattan (229.6 cases per 100,000), in the Times Square area (182.4 cases per 100,000), in the West Village in Manhattan (159.6 cases per 100,000), and in the area of Manhattan bordered by 5th Avenue and 1st Avenues to the west and east, and by East 20th Street and East 4th Street to the north and south (120 cases per 100,000).

Gender

Information regarding gender was available for 1,767 of 1,768 cases (99.9%). The number and rate of giardiasis cases were higher in males than females, with 1,184 males (34.4 cases per 100,000) and 583 females (15.0 cases per 100,000) reported. The highest gender- and borough-specific case rate was observed in males in Manhattan (91.2 cases per 100,000) (Table 2).

Age

Information regarding age was available for 99.9% of all cases. The highest age group-specific annual case rates were among 1-4 year olds (51.9 cases per 100,000), followed by 5-9 year olds (45.2 cases per 100,000) (Table 4). The highest age group- and gender-specific case rates were among males 1-4 years old (54.5 cases per 100,000), followed by males 5-9 years old (51.1 cases per 100,000). Females 1-4 and 5-9 years old, and males 20-44 and 45-59 years old, also had higher case rates than other age/gender groups. The highest age group- and borough-specific case rates were among persons 1-4 years old in Manhattan (107.0 cases per 100,000),

20-44 years old in Manhattan (72.8 cases per 100,000), and 45-59 years old in Manhattan (70.2 cases per 100,000) (Table 5).

Race/Ethnicity

Information regarding race/ethnicity was available for 1,739 of 1,768 cases (98.4%). The racial/ethnic group-specific case rate was highest among persons in the grouping that includes Asian/Pacific Islanders and American Indian/Alaskan Natives (31.4 cases per 100,000), followed closely by whites (30.0 cases per 100,000), and then Hispanics (27.9 cases per 100,000) (Table 6). The highest borough- and racial/ethnic group-specific case rate occurred among whites in Manhattan (91.0 cases per 100,000). The highest age group- and race/ethnicity-specific case rates were among 1-4 year olds in the grouping that includes Asian/Pacific Islanders and American Indian/Alaskan Natives (122.0 cases per 100,000), followed by 5-9 year olds in this racial/ethnic grouping (101.0 cases per 100,000), and by 1-4 and 5-9 year old Hispanic children (87.7 and 76.3 cases per 100,000, respectively) (Table 7).

Cryptosporidiosis

Cryptosporidiosis was added to the list of reportable diseases in the New York City Health Code, effective January 1994. Active disease surveillance for cryptosporidiosis (including regular visits or telephone contact with laboratories) began in November 1994 and continued during 2000. Case interviews were initiated in January 1995 and are ongoing. Case rates and basic demographic findings continued to be compiled and reported on a quarterly basis.

During 2000, a total of 172 cases were reported to NYCDOH and the annual case rate was 2.3 per 100,000. The number of cases and the case rate in 2000 were equal to the case number and rate for 1997, and were lower than in other years since 1994, (see Table 8 below, and Chart 2).

In 2000, a cluster of 14 cases of cryptosporidiosis among Staten Island residents that was associated with common exposure at a swimming pool in a resort in Florida occurred. The outbreak investigation was led by the local health department in Florida, the Nassau County Department of Health, which identified cases of cryptosporidiosis among individuals who were not New York City residents and who stayed at the resort at the same time as the Staten Island case-patients. Results of a case-control study indicated a strong, statistically significant association between risk for cryptosporidiosis and resort pool exposure. There were no other cases of cryptosporidiosis reported among Staten Island residents during 2000. The 14 Staten Island cases account for 29% of the 49 reported cases of cryptosporidiosis diagnosed in August and September 2000 among New York City residents (Chart 2).

Table 8: Number of Cases and Case Rates for Cryptosporidiosis, Active Disease Surveillance, New York City, 1994 - 2000.

<i>Year</i>	<i>Number of Cases</i>	<i>Case Rate per 100,000</i>
1994	289*	3.9*
1995	472	6.5
1996	332	4.5
1997	172	2.3
1998	208	2.8
1999	261	3.6
2000	172	2.3

* Active disease surveillance began in November 1994.

The following provides highlights from the active surveillance data for cryptosporidiosis among New York City residents from January 1 through December 31, 2000.

Location

Manhattan had the highest borough-specific annual case rate (5.6 cases per 100,000) (Table 9). The highest postal zip code-specific case rate was found in the Staten Island zip code in which 10 of the 14 case-patients in the above-described cluster resided (30.6 cases per 100,000) (Map 2 and Table 10). The next highest case rate occurred in the Chelsea section of Manhattan (30.0 cases per 100,000). The third highest case rate occurred in the Bowling Green section of lower Manhattan (28.6 cases per 100,000); one case was reported in this area. The fourth highest case rate occurred in the West Village in Manhattan (16.0 per 100,000).

Gender

Gender information was available for all cases. The number and rate of cryptosporidiosis cases were higher in males than females, with 111 males (3.2 cases per 100,000) and 61 females (1.6 cases per 100,000) reported. The borough- and gender-specific case rate was highest for males in Manhattan (8.7 cases per 100,000) (Table 9).

Age

Information regarding age was available for all cases. The highest age group-specific case rates were observed in persons 5-9 years old and 20-44 years old (3.1 cases per 100,000 in each age group) (Table 11). When the 14 cases comprising the Staten Island cluster were excluded from the total number of cases for the year the highest case rate occurred among persons 20-44 years old (3.0 cases per 100,000) (Table 12). With the inclusion of all year 2000 cases, the highest age-group and gender-specific case rate occurred among 20-44 year old males (4.7 cases per 100,000), followed by 45-59 year old males (4.4 cases per 100,000). Rates continued to be highest for these two age/gender groups with the exclusion of the Staten Island cluster. The highest age-group and borough-specific case rates were among Staten Island residents ages 10-19 years old (15.6 cases per 100,000) and 5-9 years old (11.9 cases per 100,000) (Table 13). As previously noted, all 14 Staten Island cases reported in 2000 comprised the described cluster. The next highest age-group and borough-specific case rate occurred among

children 5-9 years old in Manhattan (10.6 cases per 100,000). The fourth highest age-group and borough-specific case rate occurred among children 1-4 years old in Manhattan (9.9 cases per 100,000).

Race/Ethnicity

Race/ethnicity information was recorded for all cases. The racial/ethnic group-specific case rate was highest among Hispanics (2.7 cases per 100,000) (Table 14). Blacks in Manhattan had the highest race/ethnicity- and borough-specific case rate (8.0 cases per 100,000). When the Staten Island cluster was excluded from the count of total cases for the year, Hispanics remained as the group with the highest race/ethnicity specific case rate (Table 15). Of total year 2000 cases, the highest age group- and race/ethnicity-specific case rate was found among children less than 1 years old in the grouping that includes Asian/Pacific Islanders and American Indian/Alaskan Natives (16.7 cases per 100,000), though this rate is based on only one case (Table 16). The next highest age group- and race/ethnicity-specific case rate occurred among 1-4 year olds in this racial/ethnic grouping (6.2 cases per 100,000).

Cryptosporidiosis and Immune Status

Trends observed over the years in reported number of cryptosporidiosis cases have differed between those persons with HIV/AIDS and those who are immunocompetent. Reported cryptosporidiosis cases among persons with HIV/AIDS decreased significantly from 392 in 1995 to 80 in 1997, thus causing a decline in the overall number of cryptosporidiosis cases in New York City (see Table 17 below, and Chart 3). Cases among persons with HIV/AIDS increased to 118 in 1999, and decreased to 90 in 2000. Reported cases among immunocompetent persons increased from 1995 to 1999, and decreased in 2000 (Table 17 below, and Chart 4).

Table 17: Number of Cases of Cryptosporidiosis by Year and Immune Status, New York City, 1995-2000.

Immune Status	YEAR					
	1995	1996	1997	1998	1999	2000
Persons with HIV/AIDS	392	243	80	79	118	90
Immunocompetent	71	83	83	122	139	79
Immunocompromised Other Than HIV/AIDS	4	3	7	2	3	2
Unknown Immune Status	5	3	2	5	1	1
TOTAL	472	332	172	208	261	172

Cryptosporidiosis and Potential Risk Exposures

Summary data for 1995 through 2000 on commonly reported potential risk exposures are presented in Table 18. Information has also been collected and presented regarding tap water consumption (Table 19). It must be noted that the significance of risk exposures reported by cryptosporidiosis case-patients cannot be determined without reference to a suitable control population (i.e., non-*Cryptosporidium*-infected controls). Also, a limitation of the questionnaires that were used from 1995 through 2000 to collect information regarding tap water consumption is that they did not collect quantitative information concerning the volume of tap water consumed for each water consumption category (i.e., unfiltered/unboiled tap water, filtered tap water and boiled tap water). Many individuals consume water from more than one water consumption category. In May 2001 the questionnaire was changed to collect quantitative information for each tap water consumption category.

DIARRHEAL DISEASE MONITORING (OUTBREAK DETECTION PROGRAM)

The City has implemented three independent and complementary systems to monitor for outbreaks using sentinel populations or surrogate indicators. All three systems are ongoing, however some program modifications have occurred, specifically with regard to anti-diarrheal medication tracking.

In addition to the ongoing programs, NYCDOH has finalized a contract with the New York Academy of Medicine to perform an evaluation of the outbreak detection program. Work under this contract has begun. NYCDEP and NYCDOH continue to review the program to determine any need, or opportunities, for program improvements.

Anti-Diarrheal Medication Monitoring

The monitoring of sales of anti-diarrheal medication (ADM) is a useful source of information about the level of diarrheal illness in the community. In New York City's program, volume-of-sales information of over-the-counter ADMs has, in the past, been obtained from two medication distribution networks: a regional distributor to independent drugstores, and a chain of drugstores. Unfortunately, this information is no longer available from the regional distributor. This distributor dropped out of the anti-diarrheal medication monitoring system apparently due to significantly diminished business resulting from the replacement of many independent stores by drugstore chains. The tracking of ADM sales continues through the drugstore chain system. While it is preferable to obtain data through more than one system (for comparison purposes), the remaining system has the advantage of providing more direct and more timely indications of actual customer purchases, as this system provides store check-out scanner data.

Clinical Laboratory Monitoring

The number of stool specimens submitted to clinical laboratories for bacterial and parasitic testing also provides information on the incidence of gastrointestinal illness in the population. Participation of three clinical laboratories (including the largest laboratory in the metropolitan area) continued during 2000. Daily data is transmitted by fax (by two labs) and by telephone report (by one lab) to NYC's Parasitic Disease Surveillance Unit on the number of stool specimens examined for: (a) bacterial culture and sensitivity, (b) ova and parasites, and (c) *Cryptosporidium parvum*.

Nursing Home Monitoring

Nursing home surveillance continued throughout the year. The ten nursing homes participating during year 2000 were representative of:

- four of five boroughs (a nursing home in Staten Island declined continued participation in April 2000);
- different resident populations (HIV/AIDS, non-AIDS, and mixed);
- different types of drinking water (untreated tap water, and filtered and bottled water);
- different sources of water serving the New York City water supply (the Croton, Catskill/Delaware, and groundwater systems).

Each nursing home provides, by fax, the daily number of new cases of gastrointestinal disease among residents on each ward. Surveillance for 2000 has shown the daily number of new cases of gastrointestinal disease to be very low (often no new cases).

EPIDEMIOLOGICAL STUDIES

During 2000, data analysis was completed on an epidemiologic study conducted in NYC. The report, entitled “Evaluation of Cryptosporidiosis among Immunocompetent Persons in NYC during April-May 1999,” was finalized and issued in January 2001. Following is a summary of the report.

An increase in cryptosporidiosis reports among immunocompetent persons in NYC was observed during April-May 1999. This prompted investigations to determine whether the observed increase reflected an actual increase in illness in the population, and to determine risk factors associated with cryptosporidiosis during that period. Analysis of the available data did not support the occurrence of a community-wide increase in illness, but suggested that the increase in diagnosed cases was likely to have resulted from changes in testing practices from a single laboratory. The NYCDOH conducted a retrospective age and neighborhood matched case-control study enrolling immunocompetent adults diagnosed with cryptosporidiosis during April-May 1999. A standardized questionnaire was used to conduct telephone interviews; data collected included demographic information, symptom history, and information on exposures to potential risk factors for cryptosporidiosis. Of the 31 incident immunocompetent patients diagnosed in the study period, 18 adults and 47 matched controls were enrolled. Due to limitations of the retrospective case-control study including small sample size, recall bias, and the borderline statistical significance for most of the findings, definitive conclusions about risk factors for illness could not be made. The limitations encountered in this study would be considered in the design of any future epidemiologic studies of cryptosporidiosis in NYC.

ADDITIONAL DATA GATHERING EFFORTS

New York City DOH Public Health Laboratories - Stool Testing

Active disease surveillance is an effective tool for capturing all laboratory-diagnosed cases of a disease. However, it is believed that cryptosporidiosis is significantly under-diagnosed. As part of our efforts to better assess cryptosporidiosis incidence in the general population, NYCDOH conducts stool tests for *Cryptosporidium* on specimens submitted by Child Health Clinics and the School Health Program. The *Cryptosporidium* analysis is conducted by the Health Department's Public Health Laboratories. This program continued during 2000. While the clinics' population is not representative of the overall New York City population, results provide some indication of the prevalence of *Cryptosporidium* in this age group. As indicated by the results provided in Table 20 below, cryptosporidiosis is infrequently diagnosed in this group.

Table 20: *Cryptosporidium* Testing of Specimens Submitted by Child Health Clinics and the School Health Program to the NYCDOH Public Health Laboratories, 1996 - 2000.

Year	Number of Samples Submitted	Number of Samples Positive for <i>Cryptosporidium</i>	Prevalence %
1996	3,444	3	0.09
1997	4,223	0	0
1998	5,427	3	0.05
1999	5,282	0	0
2000	3,451	4*	0.12

* Of the 4 positive specimens, 3 were from 1 patient.

INFORMATION SHARING AND PUBLIC EDUCATION

Information sharing and education efforts continued during 2000. Over the year, program staff participated in meetings and presentations to discuss New York City's Waterborne Disease Risk Assessment Program and related issues. In addition, information continues to be available on both the NYCDEP and NYCDOH websites, including results from the City's source water protozoa monitoring program. Documents on the website include:

DOH Webpages:

7 *Giardiasis fact sheet*
<http://www.ci.nyc.ny.us/html/doh/html/cd/cdgia.html>

7 *Cryptosporidiosis fact sheet*
<http://www.ci.nyc.ny.us/html/doh/html/cd/cdcry.html>

DEP Webpages:

- 7 *DEP Water Supply Testing Results for Giardia and Cryptosporidium (Data is collected and entered on the website each week. Historical data is also included).*
<http://www.ci.nyc.ny.us/html/dep/html/pathogen.html>

- 7 *1997, 1998 and 1999 Waterborne Disease Risk Assessment Annual Report*
<http://www.ci.nyc.ny.us/html/dep/html/wdrap.html>

- 7 *1997, 1998, 1999 and 2000 New York City Drinking Water Supply and Quality Statement*
<http://www.ci.nyc.ny.us/html/dep/html/wsstate.html>

Chart 1: Giardiasis by Month of Diagnosis, New York City, July 1993-December 2000

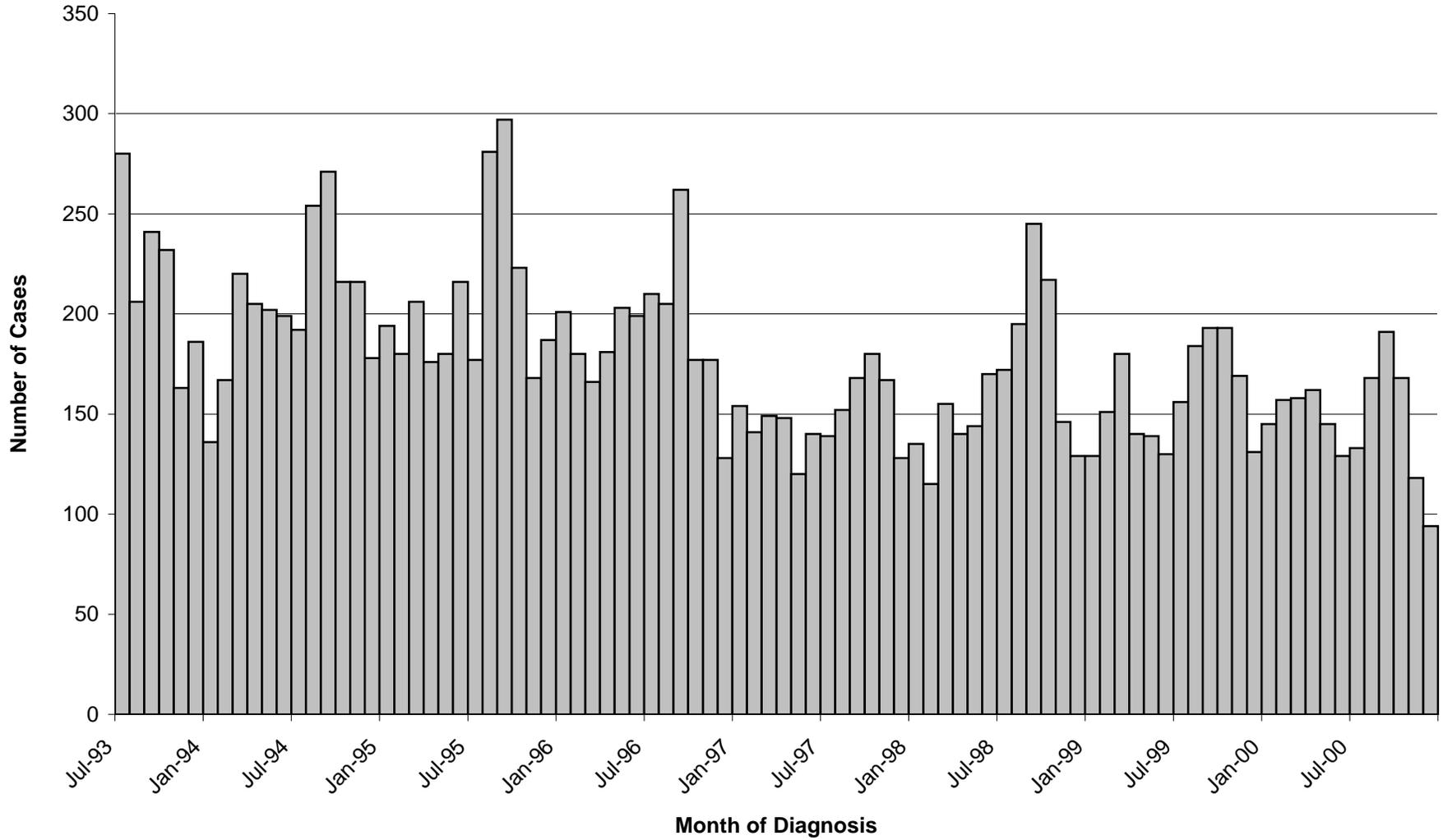


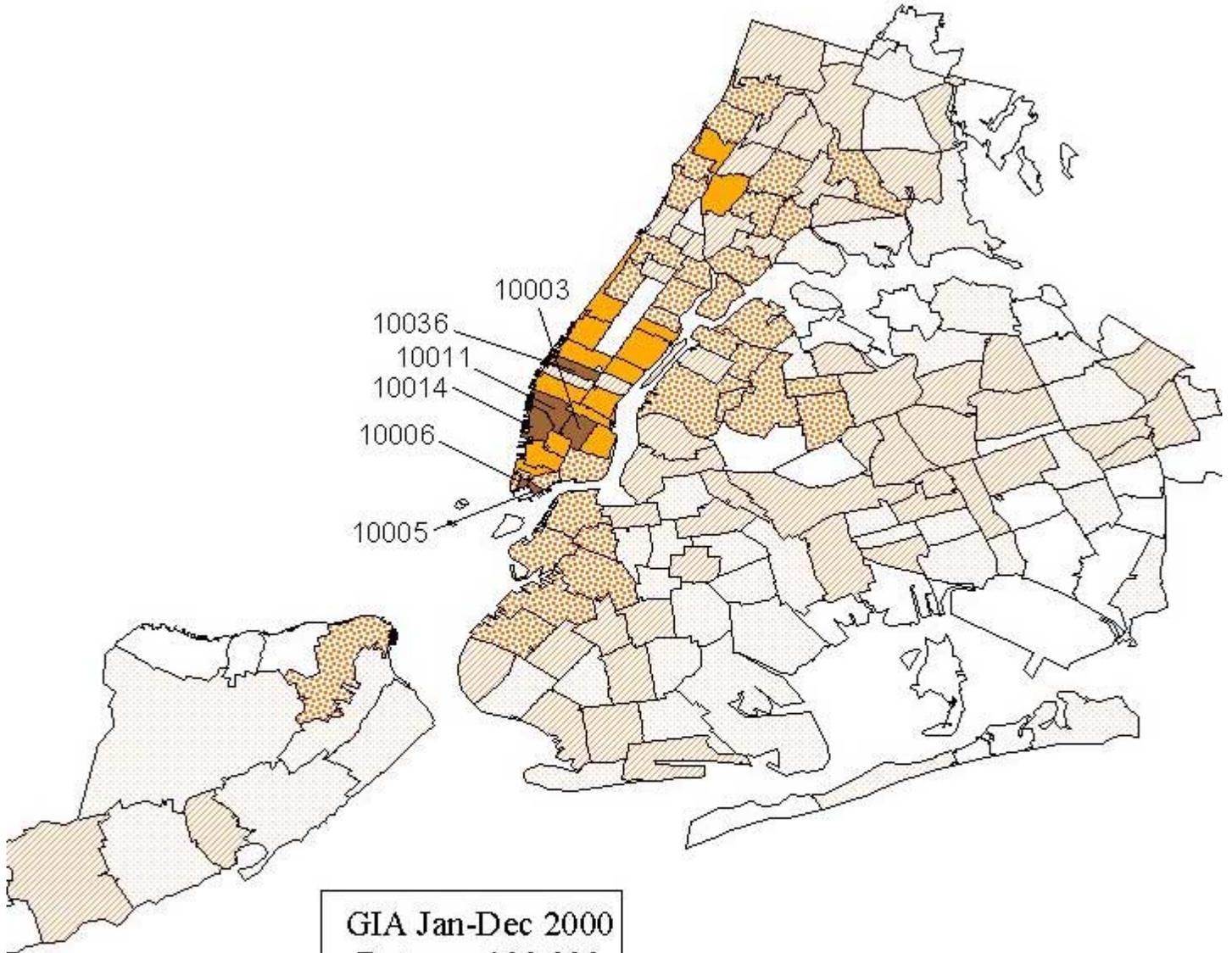
TABLE 2: Number of cases and annual case rate per 100,000 population by Borough and Gender - Active Surveillance for **giardiasis** in New York City (2000)^a.

BOROUGH	MALE		FEMALE		TOTAL	
	No.	Rate	No.	Rate	No.	Rate
Manhattan	639	91.2	257	32.7	896	60.2
Bronx	160	28.8	96	14.8	256	21.3
Brooklyn	197	18.4	103	8.4	300	13
Queens	173	18.6	118	11.5	291	14.9
Staten Island	15	8.2	9	4.6	24	6.3
Total	1184	34.4	583	15	1767	24.1

^a Information on Gender missing for 1 case.

Map 1

Annual case rate per 100,000 population by zip code -
Active surveillance data for giardiasis in
New York City (January through December 2000)



GIA Jan-Dec 2000
Rate per 100,000

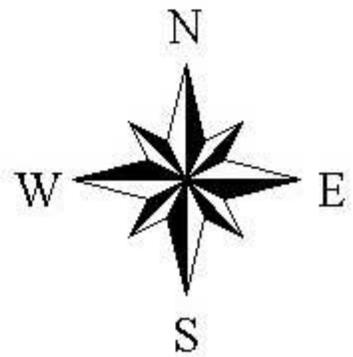
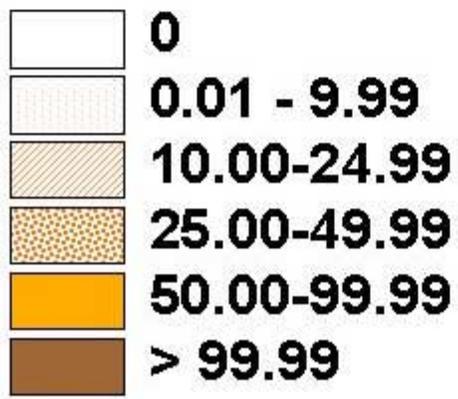


TABLE 3: Number of cases and annual case rate per 100,000 population by Zip Code, in rank order by annual case rate, upper ranking case rates - Active surveillance for **giardiasis** in New York City (2000)^a.

Rank	Zip Code	Boro	No.	Rate	Rank	Zip Code	Boro	No.	Rate
1	10006	M	1	833.3	28	10128	M	20	38.3
2	10005	M	1	649.4	29	11105	Q	14	37.9
3	10011	M	107	229.6	30	10029	M	27	36.2
4	10036	M	31	182.4	31	11201	Bk	17	36.2
5	10014	M	50	159.6	32	10038	M	5	36.2
6	10003	M	62	120.0	33	10280	M	2	36.0
7	10001	M	18	93.5	34	10456	Bx	25	35.8
8	10007	M	3	87.3	35	11104	Q	9	34.5
9	10012	M	22	85.3	36	10027	M	19	34.5
10	10019	M	30	82.5	37	10032	M	21	34.4
11	10022	M	25	79.5	38	11377	Q	26	34.0
12	10024	M	50	76.9	39	11102	Q	10	33.5
13	10023	M	43	74.8	40	10457	Bx	20	32.3
14	10452	Bx	41	73.5	41	10463	Bx	21	31.3
15	10028	M	29	68.4	42	11232	Bk	7	31.1
16	10016	M	31	60.5	43	11372	Q	17	29.8
17	10009	M	34	59.3	44	10034	M	12	29.2
18	10021	M	62	57.8	45	10035	M	8	28.1
19	10010	M	14	56.3	46	10454	Bx	10	27.7
20	10040	M	22	55.0	47	10002	M	23	27.3
21	10013	M	12	54.3	48	10462	Bx	16	26.1
22	10025	M	47	47.0	49	11220	Bk	20	26.0
23	11215	Bk	29	45.7	50	11101	Q	6	25.8
24	11217	Bk	16	44.0	51	10459	Bx	8	25.6
25	10033	M	23	39.2	52	10301	SI	9	25.3
26	11103	Q	15	38.9	53	11231	Bk	8	25.1
27	11373	Q	34	38.6					

^a Zip code not shown if annual case rate was less than 25.0 per 100,000.

TABLE 4: Number of cases and annual case rate per 100,000 population by Age Group and Gender - Active Surveillance for **giardiasis** in New York City (2000)^a.

AGE GROUP (Years)	MALE		FEMALE		TOTAL	
	No.	Rate	No.	Rate	No.	Rate
< 1	5	11.4	3	7.1	8	9.3
1 - 4	118	54.5	102	49.2	220	51.9
5 - 9	119	51.1	88	39.2	207	45.2
10 - 19	90	19.2	66	14.5	156	16.9
20 - 44	605	41	179	11.3	784	25.6
45 - 59	198	39.4	75	12.7	273	25
~ 60	49	9.8	69	8.9	118	9.2
TOTAL	1184	34.4	582	15	1766	24.1

^a Information on Age Group missing for 1 case and on Gender for 1 case.

TABLE 5: Number of cases and annual case rate per 100,000 population by Age Group and Borough - Active Surveillance for **giardiasis** in New York City (2000)^a.

AGE GROUP (Years)	Manhattan		Bronx		Brooklyn		Queens		S.I.		TOTAL	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
< 1	4	28.6	1	5.8	3	10.3	0	0	0	0	8	9.3
1 - 4	54	107	57	66.6	43	28.8	59	59	7	29.9	220	51.9
5 - 9	40	60.3	57	62.4	41	24.7	68	63	1	4	207	45.2
10 - 19	45	33.1	47	26.7	28	8.5	35	15	1	1.9	156	16.9
20 - 44	509	72.8	65	13.5	123	13.3	79	9.8	9	5.7	785	25.6
45 - 59	170	70.2	19	11.4	44	13.7	34	11	6	10.1	273	25
~ 60	74	27.9	10	5.3	18	4.7	16	4.1	0	0	118	9.2
TOTAL	896	60.2	256	21.3	300	13	291	15	24	6.3	1767	24.1

^a Information on Age Group missing for 1 case.

TABLE 6: Number of cases and annual case rate per 100,000 population by Borough and Race/Ethnicity - Active Surveillance for giardiasis in New York City (2000)^a.

BOROUGH	HISPANIC		WHITE		BLACK		OTHER ^b		TOTAL	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Manhattan	152	39.3	661	91	40	15.3	34	30.1	887	59.6
Bronx	159	30.4	41	15	34	9.2	18	46.1	252	20.9
Brooklyn	72	15.6	139	15.1	37	4.6	41	35	289	12.6
Queens	113	29.6	93	9.9	6e+87	2e+87	69	28.5	6e+87	3e+86
Staten Island	1	3.3	15	4.9	4	14.2	4	22.9	24	6.3
TOTAL	497	27.9	949	30	6e+87	3e+86	166	31.4	6e+87	8e+85

^a Information on Race Group missing for 29 cases.

^b Other is comprised of Asian/Pacific Islander and American Indian/Alaskan Native.

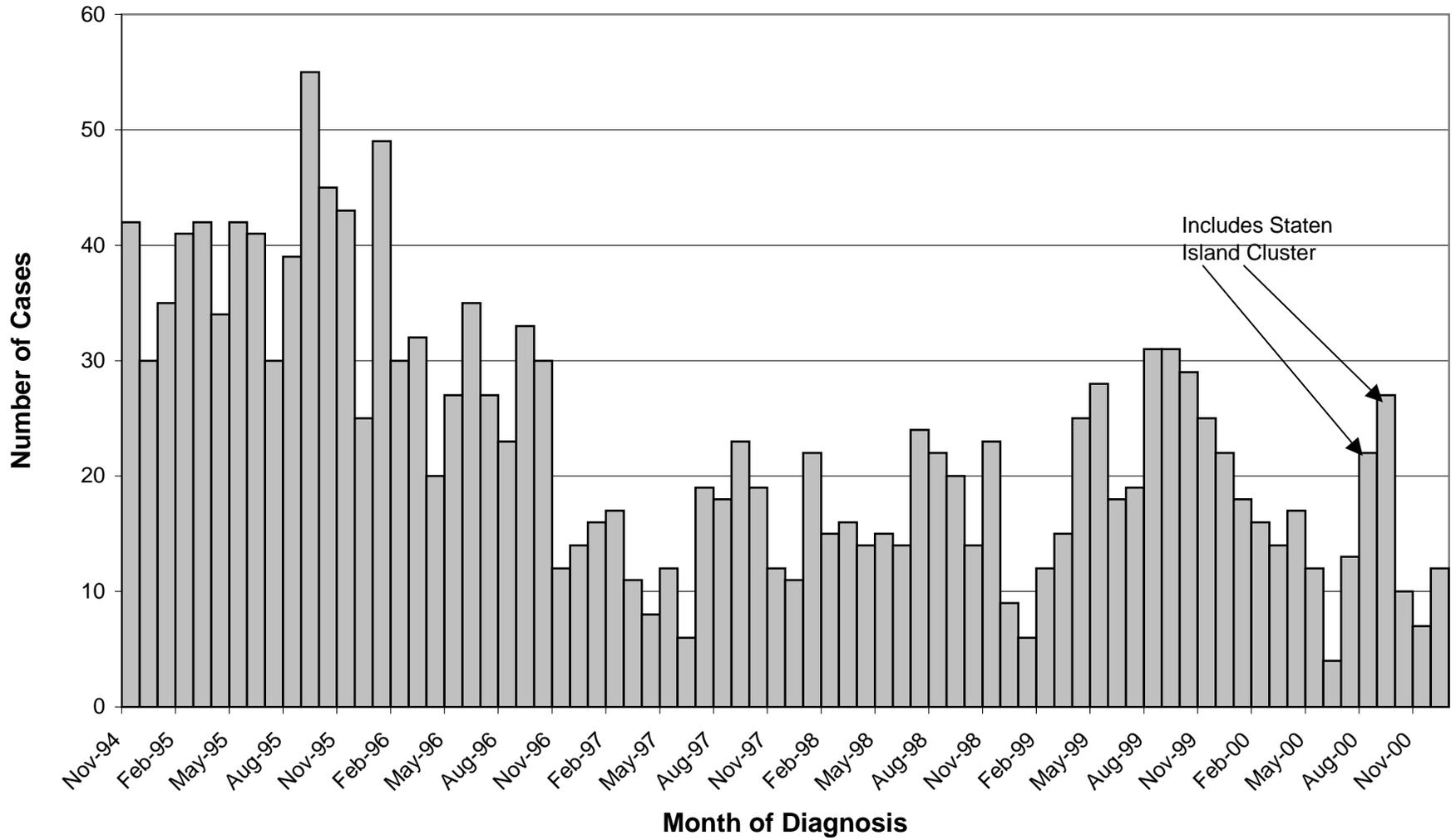
TABLE 7: Number of cases and annual case rate per 100,000 population by Age Group and Race/Ethnicity -Active Surveillance for **giardiasis** in New York City (2000)^a.

AGE GROUP (Years)	HISPANIC		WHITE		BLACK		OTHER ^b		TOTAL	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
< 1 year	2	7	2	7.3	1	4.1	3	50.2	8	9.3
1 - 4	121	87.7	51	40.7	5	3.9	39	122	216	51
5 - 9	114	76.3	38	28.8	18	12.5	33	101	203	44.4
10 - 19	78	26.8	26	9.7	10	3.4	39	55.5	153	16.6
20 - 44	129	16.7	534	42	72	9.5	40	15.4	775	25.3
45 - 59	38	15.8	202	40.1	16	5.9	11	14.3	267	24.4
≥ 60	15	9.2	96	11.5	5	2.2	1	1.9	117	9.2
TOTAL	497	27.9	949	30	127	6.9	166	31.4	1739	23.7

^a Information on Race Group missing for 28 cases and for Race Group and Age Group for 1 case.

^b Other is comprised of Asian/Pacific Islander and American Indian/Alaskan Native.

**Chart 2: Cryptosporidiosis by Month of Diagnosis, New York City,
November 1994-December 2000**



Map 2

Annual case rate per 100,000 population by zip code -
Active surveillance data for cryptosporidiosis in
New York City (January through December 2000)

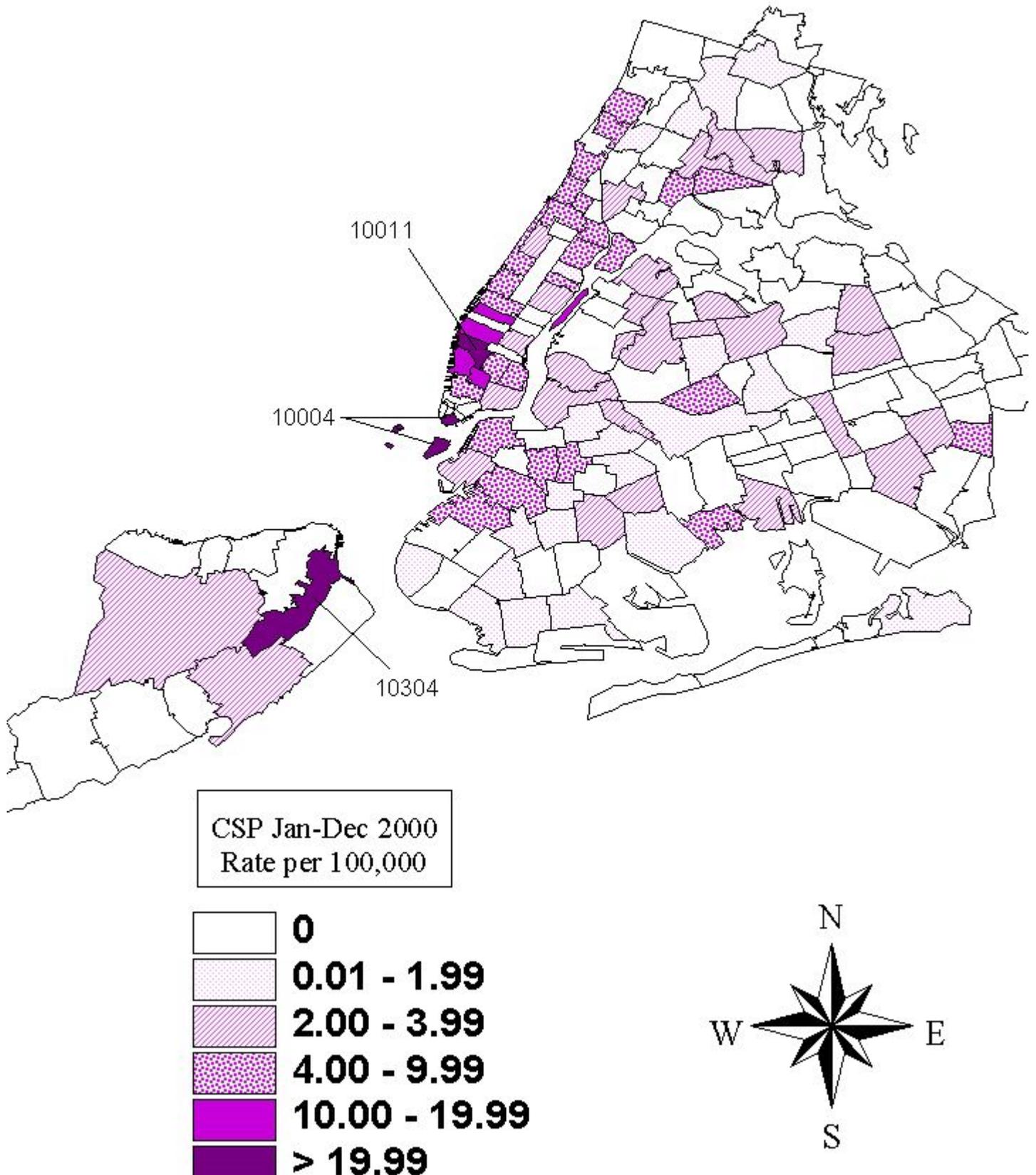


TABLE 9: Number of cases and annual case rate per 100,000 population by Borough and Gender - Active Surveillance for **cryptosporidiosis** in New York City (2000) **including Staten Island cluster.**

BOROUGH	MALE		FEMALE		TOTAL	
	No.	Rate	No.	Rate	No.	Rate
Manhattan	61	8.7	23	2.9	84	5.6
Bronx	8	1.4	7	1.1	15	1.2
Brooklyn	21	2	14	1.1	35	1.5
Queens	17	1.8	7	0.7	24	1.2
Staten Island	4	2.2	10	5.1	14	3.7
Total	111	3.2	61	1.6	172	2.3

TABLE 10: Number of cases and annual case rate per 100,000 population by Zip Code, in rank order by annual case rate, upper ranking cases - Active surveillance data for **cryptosporidiosis** in New York City (2000)^a.

Rank	Zip Code	Boro	No.	Rate	Rank	Zip Code	Boro	No.	Rate
1	10304	SI	10	30.6*	18	10032	M	4	6.6
2	10011	M	14	30.0	19	11215	Bk	4	6.3
3	10004	M	1	28.6	20	10003	M	3	5.8
4	10014	M	5	16.0	21	10019	M	2	5.5
5	10001	M	3	15.6	22	10027	M	3	5.4
6	10044	M	1	12.0	23	10023	M	3	5.2
7	10036	M	2	11.8	24	11216	Bk	3	5.1
8	10012	M	3	11.6	25	10040	M	2	5.0
9	10034	M	4	9.7	26	10472	Bx	3	4.9
10	10030	M	2	9.6	27	11411	Q	1	4.8
11	10459	Bx	3	9.6	28	10028	M	2	4.7
12	10013	M	2	9.0	29	10024	M	3	4.6
13	10031	M	5	8.9	30	11238	Bk	2	4.6
14	10035	M	2	7.0	31	11232	Bk	1	4.4
15	11379	Q	2	7.0	32	11201	Bk	2	4.3
16	10009	M	4	7.0	33	10029	M	3	4.0
17	11239	Bk	1	6.7					

^a Zip code not shown if annual case rate was less than 4.0 per 100,000.

* All year 2000 cryptosporidiosis cases in Staten Island (zip codes 10304 [shown], 10314 [3 cases, annual rate 3.9 per 100,000, and 10306 [1 case, rate 2.0 per 100,000]) were part of a cluster associated with common exposure at a swimming pool in Florida.

TABLE 11: Number of cases and annual case rate per 100,000 population by Age Group and Gender - Active Surveillance for **cryptosporidiosis** in New York City (2000), **including Staten Island cluster.**

AGE GROUP (Years)	MALE		FEMALE		TOTAL	
	No.	Rate	No.	Rate	No.	Rate
< 1	0	0	1	2.4	1	1.2
1 - 4	4	1.8	5	2.4	9	2.1
5 - 9	6	2.6	8	3.6	14	3.1
10 - 19	6	1.3	10	2.2	16	1.7
20 - 44	70	4.7	25	1.6	95	3.1
45 - 59	22	4.4	6	1	28	2.6
~ 60	3	0.6	6	0.8	9	0.7
TOTAL	111	3.2	61	1.6	172	2.3

TABLE 12: Number of cases and annual case rate per 100,000 population by Age Group and Gender - Active Surveillance for **cryptosporidiosis** in New York City (2000), **excluding Staten Island cluster.**

AGE GROUP (Years)	MALE		FEMALE		TOTAL	
	No.	Rate	No.	Rate	No.	Rate
< 1	0	0	1	2.4	1	1.2
1 - 4	4	1.8	5	2.4	9	2.1
5 - 9	4	1.7	7	3.1	11	2.4
10 - 19	5	1.1	3	0.7	8	0.9
20 - 44	70	4.7	23	1.5	93	3
45 - 59	21	4.2	6	1	27	2.5
~ 60	3	0.6	6	0.8	9	0.7
TOTAL	107	3.1	51	1.3	158	2.2

TABLE 13: Number of cases and annual case rate per 100,000 population by Age Group and Borough - Active Surveillance for **cryptosporidiosis** in New York City (2000), **including Staten Island cluster.**

AGE GROUP (Years)	Manhattan		Bronx		Brooklyn		Queens		S.I.		TOTAL	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
< 1	1	7.1	0	0	0	0	0	0	0	0	1	1.2
1 - 4	5	9.9	1	1.2	1	0.7	2	2	0	0	9	2.1
5 - 9	7	10.6	0	0	2	1.2	2	1.8	3	11.9	14	3.1
10 - 19	1	0.7	2	1.1	1	0.3	4	1.8	8	15.6	16	1.7
20 - 44	56	8	9	1.9	19	2.1	9	1.1	2	1.3	95	3.1
45 - 59	10	4.1	1	0.6	10	3.1	6	2	1	1.7	28	2.6
~ 60	4	1.5	2	1.1	2	0.5	1	0.3	0	0	9	0.7
TOTAL	84	5.6	15	1.2	35	1.5	24	1.2	14	3.7	172	2.3

TABLE 14: Number of cases and annual case rate per 100,000 population by Borough and Race/Ethnicity - Active Surveillance for **cryptosporidiosis** in New York City (2000), **including Staten Island cluster**.

BOROUGH	HISPANIC		WHITE		BLACK		OTHER ^a		TOTAL	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Manhattan	20	5.2	40	5.5	21	8	3	2.7	84	5.6
Bronx	9	1.7	1	0.4	5	1.4	0	0	15	1.2
Brooklyn	8	1.7	11	1.2	14	1.8	2	1.7	35	1.5
Queens	12	3.1	7	0.7	3	0.8	2	0.8	24	1.2
Staten Island	0	0	14	4.6	0	0	0	0	14	3.7
TOTAL	49	2.7	73	2.3	43	2.3	7	1.3	172	2.3

^a Other is comprised of Asian/Pacific Islander and American Indian/Alaskan Native.

TABLE 15: Number of cases and annual case rate per 100,000 population by Borough and Race/Ethnicity - Active Surveillance for cryptosporidiosis in New York City (2000), excluding Staten Island cluster.

BOROUGH	HISPANIC		WHITE		BLACK		OTHER ^a		TOTAL	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Manhattan	20	5.2	40	5.5	21	8	3	2.7	84	5.6
Bronx	9	1.7	1	0.4	5	1.4	0	0	15	1.2
Brooklyn	8	1.7	11	1.2	14	1.8	2	1.7	35	1.5
Queens	12	3.1	7	0.7	3	0.8	2	0.8	24	1.2
Staten Island	0	0	0	0	0	0	0	0	0	0
TOTAL	49	2.7	59	1.9	43	2.3	7	1.3	158	2.2

^a Other is comprised of Asian/Pacific Islander and American Indian/Alaskan Native.

TABLE 16: Number of cases and annual case rate per 100,000 population by Age Group and Race/Ethnicity -Active Surveillance for **cryptosporidiosis** in New York City (2000), **including Staten Island cluster.**

AGE GROUP (Years)	HISPANIC		WHITE		BLACK		OTHER ^a		TOTAL	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
< 1 year	0	0	0	0	0	0	1	16.7	1	1.2
1 - 4	4	2.9	1	0.8	2	1.6	2	6.2	9	2.1
5 - 9	6	4	5	3.8	3	2.1	0	0	14	3.1
10 - 19	5	1.7	9	3.3	2	0.7	0	0	16	1.7
20 - 44	26	3.4	42	3.3	25	3.3	2	0.8	95	3.1
45 - 59	6	2.5	12	2.4	8	2.9	2	2.6	28	2.6
> = 60	2	1.2	4	0.5	3	1.3	0	0	9	0.7
TOTAL	49	2.7	73	2.3	43	2.3	7	1.3	172	2.3

^a Other is comprised of Asian/Pacific Islander and American Indian/Alaskan Native.

Chart 3: Cryptosporidiosis Among Persons With HIV/AIDS by Month of Diagnosis, New York City, Jan 1995-Dec 2000

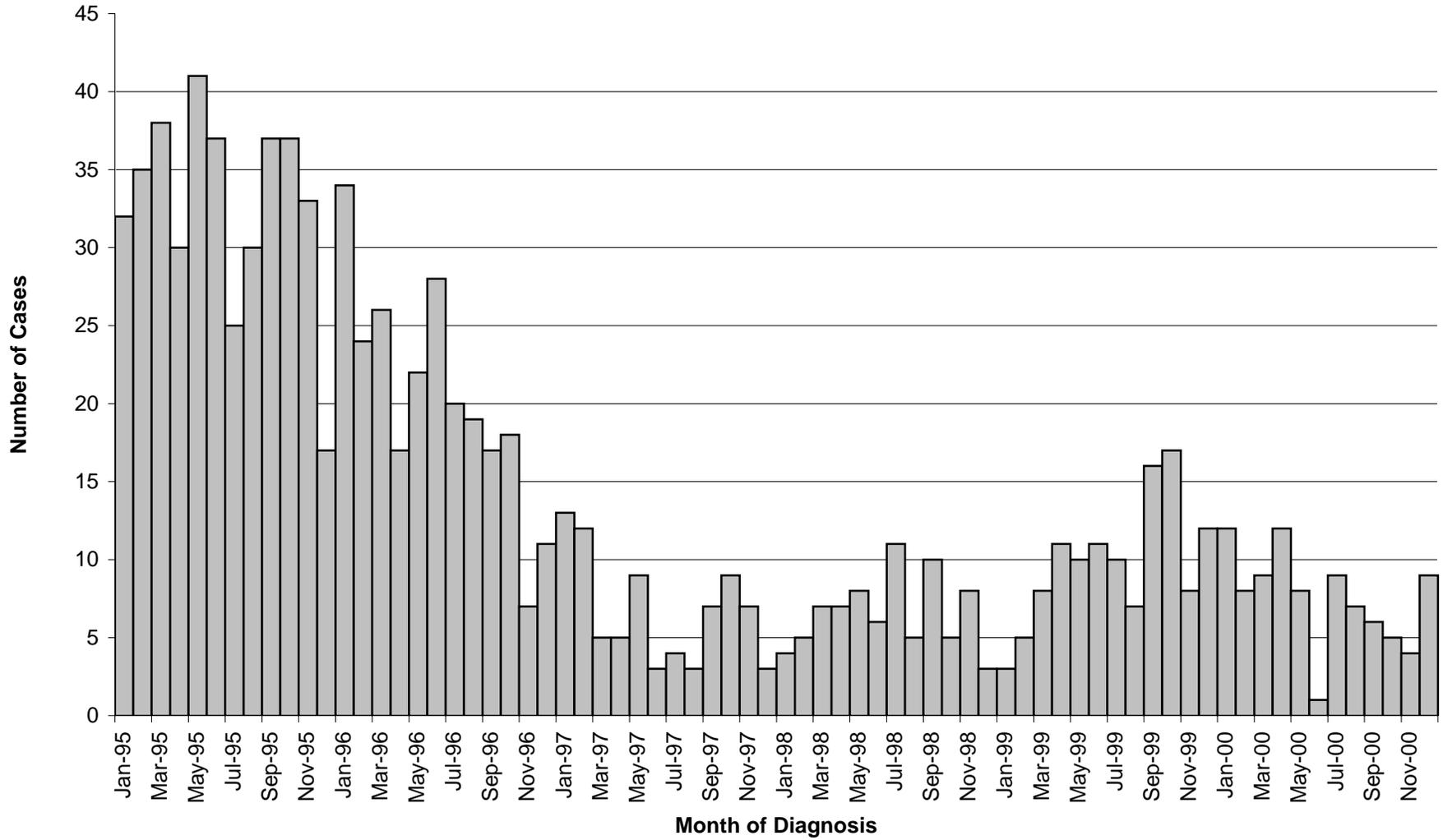


Chart 4: Cryptosporidiosis Among Immunocompetent Persons by Month of Diagnosis, New York City, Jan 1995-Dec 2000

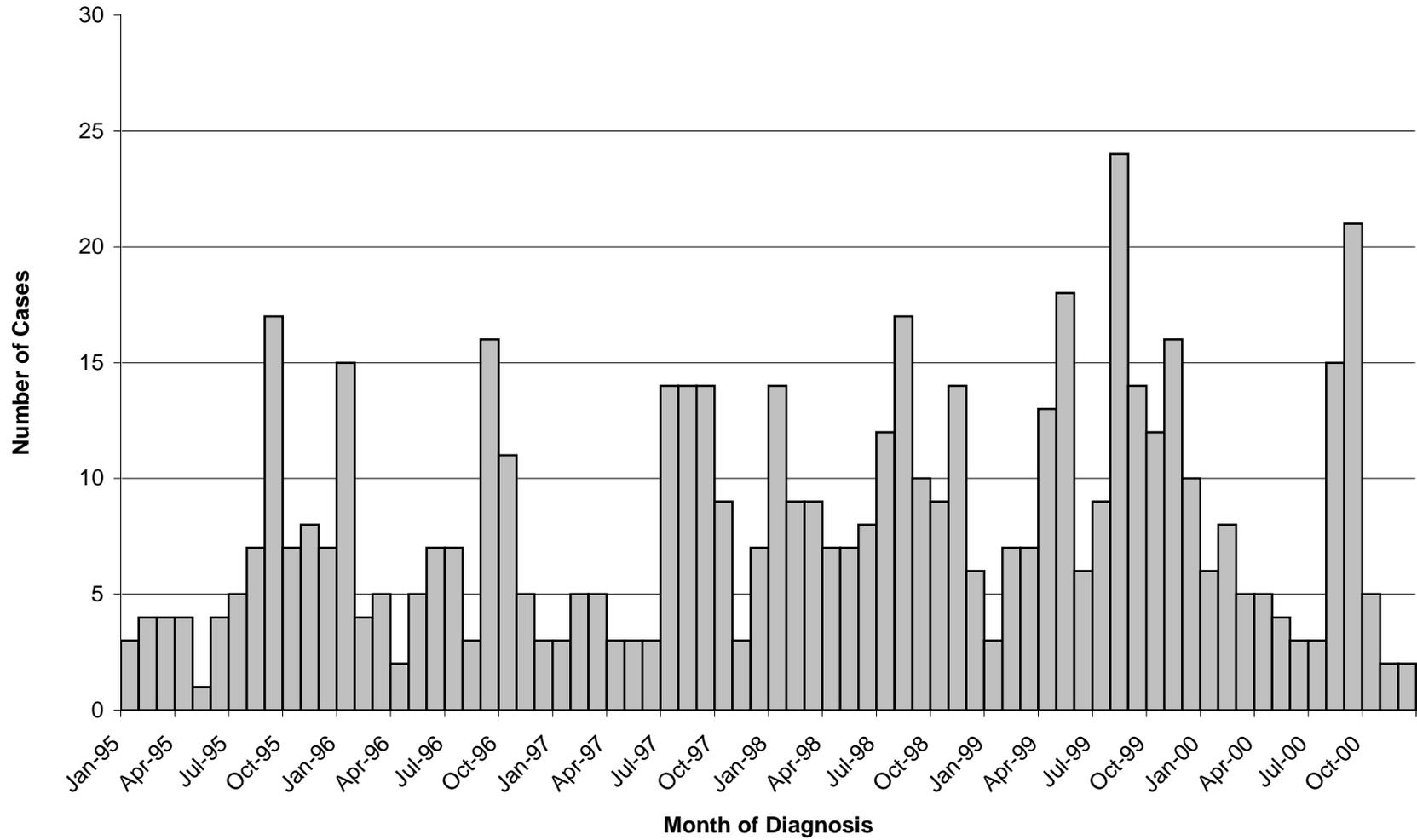


Table 18: Percentage of Interviewed **Cryptosporidiosis** Case-Patients Reporting Selected Potential Risk Exposures in the Month Before Disease Onset, by Immune Status, New York City, 1995-2000.

Exposure Type	HIV/AIDS						Immunocompetent					
	1995	1996	1997	1998	1999	2000*	1995	1996	1997	1998	1999	2000*
Contact with an Animal ^a	35%	35%	33%	36%	35%	43%	42%	41%	41%	32%	35%	26%
High-risk Sexual Activity ^b (≥ 18 years old)	22%	22%	9%	15%	20%	25%	16%	25%	12%	10%	12%	23%
International Travel ^c	9%	9%	9%	13%	18%	14%	30%	29%	26%	28%	28%	40%
Recreational Water Contact ^d	16%	8%	16%	12%	16%	15%	21%	27%	40%	24%	22%	32%

Note: • The significance of risk exposures reported by cryptosporidiosis case-patients cannot be determined without reference to a suitable control population (i.e., non-*Cryptosporidium*-infected controls).
 • Format of case interview form changed on 1/1/97. Details on Exposure Types and changes from 1995-2000 are noted below.

^a Contact with an Animal - Includes having a pet, or visiting a farm or petting zoo (1995-1996); expanded to include: or visiting a pet store or veterinarian office (1997-2000).

^b High-risk Sexual Activity - Includes having a penis, finger or tongue in sexual partner's anus (1995-2000).

^c International Travel - Travel outside the United States (1995-2000).

^d Recreational Water Contact - Includes swimming in a pool, or swimming in or drinking from a stream, lake, river or spring (1995-1996); expanded to include: or swimming in the ocean, or visiting a recreational water park (1997-2000).

* Year 2000 percentage of interviewed cryptosporidiosis cases does not include Staten Island cases associated with a point source exposure at a swimming pool in Florida.

Table 19: Percentage of Interviewed **Cryptosporidiosis** Case-Patients by Type of Tap Water Exposure Reported in the Month Before Disease Onset, by Immune Status, New York City 1995-2000.

Year	HIV/AIDS					Immunocompetent				
	Plain Tap ^a	Filtered Tap ^b	Boiled Tap ^c	Incidental Plain Tap Only ^d	No Tap ^e	Plain Tap ^a	Filtered Tap ^b	Boiled Tap ^c	Incidental Plain Tap Only ^d	No Tap ^e
1995	69%	12%	7%	11%	3%	58%	18%	11%	7%	2%
1996	70%	9%	7%	15%	2%	63%	17%	10%	9%	4%
1997	71%	10%	3%	16%	2%	58%	21%	8%	12%	4%
1998	64%	18%	5%	15%	0%	67%	21%	3%	8%	3%
1999	66%	20%	3%	8%	5%	56%	25%	4%	11%	7%
2000*	63%	20%	6%	12%	4%	56%	17%	2%	8%	17%

Note: • The significance of risk exposures reported by cryptosporidiosis case-patients cannot be determined without reference to a suitable control population (i.e., non-*Cryptosporidium*-infected controls).
 • Format of case interview form changed on 1/1/97. Details on Tap Water Exposure and changes from 1995-2000 are noted below.

^a Plain Tap - Drank unboiled/unfiltered NYC tap water (1995-2000).

^b Filtered Tap - Filtered NYC tap water (1995-2000).

^c Boiled Tap - Boiled NYC tap water (1995-2000).

^d Incidental Plain Tap Only - Did not drink any NYC tap water but did use unboiled/unfiltered NYC tap water to brush teeth, or to wash vegetables/fruits, or to make ice (1995-1996); expanded to include: or to make juice from concentrate (1997-2000).

^e No Tap - Did not drink any NYC tap water and did not use unboiled/unfiltered NYC tap water to brush teeth, or to wash vegetables/fruits, or to make ice (1995-1996); expanded to include: or to make juice from concentrate (1997-2000).

* Year 2000 percentage of interviewed cryptosporidiosis cases does not include Staten Island cases associated with a point source exposure at a swimming pool in Florida.