New York City Department of Health and Mental Hygiene
Bureau of Communicable Disease

and

New York City Department of Environmental Protection
Bureau of Water Supply

Waterborne Disease Risk Assessment Program

2003 Annual Report

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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 2003 program achievements and results are presented.

Prepared by: The Waterborne Disease Risk Assessment Program Team

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ACTIVE DISEASE SURVEILLANCE

Active disease surveillance for giardiasis and cryptosporidiosis began in July 1993 and November 1994, respectively. Between 2002 and 2003, the number of giardiasis cases decreased from 1,422 to 1,212, and the number of cases of cryptosporidiosis decreased from 148 to 125. With respect to immune status, the number of cases of cryptosporidiosis among persons living with HIV/AIDS decreased from 94 in 2002 to 75 in 2003. 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.

SYNDROMIC SURVEILLANCE/OUTBREAK DETECTION

Gastrointestinal (GI) disease trends in the general population can be monitored via tracking of sentinel populations or surrogate indicators of disease. Such tracking programs provide greater assurance against the possibility that an outbreak would be undetected. In addition, such programs can play a role in limiting the extent of an outbreak by providing an early indication of a problem. Over the past several years, the City has established and maintained a number of distinct and complementary outbreak detection systems. One system monitors and assists in the investigation of GI outbreaks in sentinel nursing homes. Another monitors the number of stool specimens submitted to clinical laboratories for microbiological testing, and a third system utilizes hospital Emergency Department chief complaint logs to monitor for outbreaks. NYC also now utilizes three systems for monitoring sales of anti-diarrheal medication: one tracks the weekly volume of sales of non-prescription anti-diarrheal medications at a major NYC drug store chain; an additional pharmacy system now in place tracks daily sales of non-prescription anti-diarrheal medications; and a new system tracks retail pharmacy data obtained from the National Retail Data Monitor. Year 2003 findings for these systems pertaining to gastrointestinal illness are summarized.

INFORMATION SHARING AND PUBLIC EDUCATION

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 and Mental Hygiene's websites, including annual reports on program activities, fact sheets on giardiasis and cryptosporidiosis, and results from the Department of Environmental Protection's source water protozoa monitoring program.

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 and Mental Hygiene (DOHMH). In addition to participation by staff from both agencies, a special interagency unit, the Parasitic Disease Surveillance Unit, was established to implement major components of this program. In the year 2001, the staff of the Parasitic Disease Surveillance Unit was merged with staff from the DOHMH Bureau of Communicable Disease. Staff members employed by DEP and DOHMH now jointly work on Parasitic Disease Surveillance Program (PDSP) activities as well as on other communicable disease activities. This merger increases the efficiency of the office but does not affect the Parasitic Disease Surveillance Program operations.

Following below is a summary of program highlights and data for the year 2003. Variations in data between this report and previous reports may be due to several factors, including disease reporting delays, correction of errors, and refinements in data processing (for example, the removal of duplicate disease reports). For this report, for calculation of rates, the base population figures used (i.e., denominators) were obtained from year 2000 U.S. Census data. In addition, case rates from prior years have been adjusted in this report to reflect 2000 U.S. Census data, utilizing intercensal population estimates for years 1994-1999. All rates are annual case rates. Caution must be exercised when interpreting rates based on very small case numbers.

In this annual report, for the geographic breakdown of data, United Hospital Fund (UHF) neighborhood of case-patient residence was used. New York City is divided on the basis of zip code into 42 UHF neighborhoods. Maps illustrating annual rates by UHF neighborhood are included in this report.

Year 2000 U.S. Census data include two additional race/ethnicity categories that have not been used in the collection of City disease surveillance data for giardiasis and cryptosporidiosis. These race/ethnicity categories are: "Non-Hispanic of Single Race, other than White, Black/African American, Asian, Pacific Islander, American Indian and Alaskan Native" and "Non-Hispanic of Two or More Races." In this report, race/ethnicity-specific case rates are based upon year 2000 Census data for the proportion of New York City residents who were categorized into one of the remaining four racial/ethnic groups (7,724,354 of 8,008,278 total population, or 96.5%). Because disease surveillance data categorizes all case-patients into one of four race/ethnicity categories, only four of six U.S. census race/ethnicity denominator categories

were used to calculate race/ethnicity-specific rates. Race/ethnicity-specific case rates presented may therefore be somewhat elevated above the true rates.

PART I: ACTIVE DISEASE SURVEILLANCE

Giardiasis

New York City implemented a program of active surveillance for giardiasis in July 1993 to ensure complete reporting of all laboratory-diagnosed cases. Active laboratory surveillance continued in 2003. 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 were compiled and reported on a quarterly basis through July 2002. Beginning January 2003, rates and demographic findings were compiled on a semi-annual basis.

During 2003, a total of 1,212 cases of giardiasis were reported to DOHMH and the annual case rate was 15.1 per 100,000. The case rate decreased 54% from 1994 to 2003 (see Table 1 below, and Chart 1).

Table 1: Number of Cases and Case Rates* for Giardiasis, Active Disease Surveillance, New York City, 1994 - 2003.

Year	*Number of Cases*	*Case Rate per 100,000*
1994	2,514	33.1
1995	2,523	32.9
1996	2,288	29.6
1997	1,788	22.9
1998	1,961	24.9
1999	1,896	23.9
2000	1,771	22.1
2001	1,530	19.1
2002	1,422	17.8
2003	1,212	15.1

* For 1994-1999, rates were calculated using intercensal population estimates. For 2000-2003, 2000 Census data were used.

The following provides some highlights from the active surveillance data for giardiasis among New York City residents from January 1 through December 31, 2003. Additional data is presented in the tables that appear later in this report.

Location of case-patient residence

Location of case-patient residence was known for all 1,212 giardiasis case-patients who resided in New York City. In addition, there were 3 giardiasis case-patients whose city of residence was unknown, and who are not included in this report. Manhattan had the highest borough-specific annual case rate (35.1 cases per 100,000 population) (Table 2). The highest UHF neighborhood-specific case rate was found in the Chelsea-Clinton neighborhood in Manhattan (103.3 cases per 100,000) (Map 1 and Table 3).

Sex

Information regarding sex was available for 1,207 of 1,212 cases (99.9%). The number and rate of giardiasis cases were higher in males than females, with 832 males (21.9 cases per 100,000) and 375 females (8.9 cases per 100,000) reported. The highest sex- and borough-specific case rate was observed among males residing in Manhattan (55.0 cases per 100,000) (Table 2).

Age

Information regarding age was available for 1,202 of 1,212 cases (99.2%). The highest age group-specific annual case rates were among children under 5 years old (29.8 cases per 100,000), and children 5-9 years old (28.9 cases per 100,000) (Table 4). The highest age group- and sex-specific case rates were among males under 5 years old (34.7 cases per 100,000), males 5-9 years old (32.8 cases per 100,000), and males 20-44 years old (25.4 cases per 100,000). The highest age group- and borough-specific case rates were among children less than 5 years old in Manhattan (46.0 cases per 100,000), persons 20-44 years old in Manhattan (44.1 cases per 100,000), and children 5-9 years old in the Bronx (41.7 cases per 100,000) (Table 5).

Race/Ethnicity

Information regarding race/ethnicity was available for 1,048 of 1,212 cases (86.5%). The racial/ethnic group-specific case rate was highest among white non-Hispanics (18.2 cases per 100,000) (Table 6). The highest borough- and racial/ethnic group-specific case rate occurred among non-Hispanic whites in Manhattan (47.3 cases per 100,000). The highest age group- and race/ethnicity-specific case rates were among children 5-9 years old in the grouping that includes Asian/Pacific Islanders and American Indian/Alaskan Natives (64.4 cases per 100,000) and children less than 5 years old in this racial/ethnic grouping (47.8 cases per 100,000) (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 2003. Case interviews for demographic and risk factor data were initiated in January 1995 and are ongoing. Case rates and basic demographic findings were compiled and reported on a quarterly basis through July 2002. Beginning January 2003, rates and demographic findings were compiled on a semi-annual basis.

During 2003, a total of 125 cases of cryptosporidiosis were reported to DOHMH and the annual case rate was 1.6 per 100,000. The case rate has declined 74% from 1995 to 2003 (See Table 8 below, and Chart 2). The most substantial decline occurred in the first three full years of active surveillance (i.e., 1995 through 1997), coinciding with the introduction of highly active antiretroviral therapy (HAART) for persons living with HIV.

Table 8: Number of Cases and Case Rates* for Cryptosporidiosis, Active Disease Surveillance, New York City, 1994 - 2003.

Year	*Number of Cases*	*Case Rate per 100,000*
1994	297**	3.9**
1995	472	6.2
1996	334	4.3
1997	172	2.2
1998	208	2.6
1999	261	3.3
2000	172	2.1
2001	123	1.5
2002	148	1.8
2003	125	1.6

* For 1994-1999, rates were calculated using intercensal population estimates. For 2000-2003, 2000 Census data were used.
** Active disease surveillance began in November 1994.

The following provides some highlights from the active surveillance data for cryptosporidiosis among New York City residents from January 1 through December 31, 2003. Additional data is presented in the tables that appear later in this report.

Location of case-patient residence

Information on location of residence was available for all cases of cryptosporidiosis. Manhattan had the highest borough-specific annual case rate (4.2 cases per 100,000) (Table 9). The highest UHF neighborhood-specific case rate was found in the Chelsea-Clinton neighborhood in Manhattan (8.9 cases per 100,000) (Map 2 and Table 10).

Sex

Information regarding sex was available for all cases. The number and rate of cryptosporidiosis cases were higher in males than females, with 91 males (2.4 cases per 100,000) and 34 females (0.8 cases per 100,000) reported. The borough- and sex-specific case rate was highest for males in Manhattan (6.6 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 children less than 5 years old (3.1 cases per 100,000) and persons 20-

44 years old (2.1 cases per 100,000) (Table 11). The highest age group- and sex-specific case rates occurred among males under 5 years old (3.6 cases per 100,000) and males 20-44 years old (3.5 cases per 100,000). The highest age group and borough-specific case rates were among children less than 5 years old in Manhattan (9.2 cases per 100,000) and persons 45-59 years old in Manhattan (5.6 cases per 100,000) (Table 12).

Race/Ethnicity

Race/ethnicity information was recorded for all cases. The racial/ethnic group-specific case rate was highest among Hispanics (2.0 cases per 100,000) (Table 13). Non-Hispanic blacks in Manhattan had the highest race/ethnicity- and borough-specific case rates (5.1 cases per 100,000). The highest age group- and race/ethnicity-specific case rate was in children less than 5 years old in the grouping that includes Asian/Pacific Islanders and American Indian/Alaskan Natives (10.0 cases per 100,000) (Table 14). However, this rate only represents 5 cases in that age group and racial/ethnic category.

Cryptosporidiosis and Immune Status

Trends observed over the years in reported number of cryptosporidiosis cases have differed between persons living with HIV/AIDS and those who are immunocompetent. Reported cryptosporidiosis cases among persons living with HIV/AIDS decreased considerably, from 392 in 1995 to 75 in 2003, thus causing a decline in the overall number of cryptosporidiosis cases in New York City (see Table 15 below, and Charts 3 and 4). This decrease coincides with the introduction of HAART, as noted previously.

Table 15: Number of Cases of Cryptosporidiosis by Year and Immune Status, New York City, 1995-2003.

Immune Status	YEAR								
	1995	1996	1997	1998	1999	2000	2001	2002	2003
Persons with HIV/AIDS	392	244	80	79	118	91	66	94	75
Immunocompetent	71	83	83	122	139	79	54	47	48
Immunocompromised Other Than HIV/AIDS	4	3	7	2	3	2	2	7	2
Unknown Immune Status	5	4	2	5	1	0	1	0	0
Total	472	334	172	208	261	172	123	148	125

Cryptosporidiosis and Potential Risk Exposures

Summary data for 1995 through 2003 on commonly reported potential risk exposures, obtained from case-patient interviews, are presented in Table 16. Information has also been collected and presented regarding type of tap water consumption (Table 17). 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 May 2001 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). In addition, many individuals consume water from more than one water consumption category. Beginning May 2001, patients diagnosed with cryptosporidiosis were asked to quantify the total number of eight-ounce cups of New York City tap water they consumed on average per day. Case-patients were then asked to specify how many of the total daily cups were directly from the tap without being first boiled or filtered, how many were boiled, and how many were filtered. Findings for interviewed case-patients diagnosed in 2003 are presented in Table 18.

PART II: SYNDROMIC SURVEILLANCE/OUTBREAK DETECTION

Introduction

Gastrointestinal (GI) disease trends in the general population can be monitored via tracking of sentinel populations or surrogate indicators of disease. Such tracking programs provide greater assurance against the possibility that an outbreak would be undetected. In addition, such programs can play a role in limiting the extent of an outbreak by providing an early indication of a problem. Over the past several years, the City has established and maintained a number of distinct and complementary outbreak detection systems. One system monitors GI disease observed in sentinel nursing homes. Another monitors the number of stool specimens submitted to clinical laboratories for microbiological testing, and a third system monitors the weekly volume of sales of non-prescription anti-diarrheal medication. In 2001, a fourth outbreak detection system was added utilizing hospital Emergency Department visit reports. All systems rely upon the voluntary participation of the institutions providing the syndromic data.

In 2003 enhanced anti-diarrheal medication tracking systems were added to the syndromic surveillance system, and efforts were made to improve the clinical lab submissions system. Further details are provided below.

Nursing Home Sentinel Surveillance

The nursing home surveillance system began in March of 1997 and was modified significantly in 2002, at which time nine New York City nursing homes were participating. Under the current system, when a given nursing home notes an outbreak of gastrointestinal illness that is legally reportable to the New York State Department of Health, the nursing home also notifies DOHMH. Such an outbreak is defined as onset of diarrhea and/or vomiting involving 3 or more patients on a single ward/unit within a 7-day period, or more than the expected (baseline) number of cases within a single facility. All participating nursing homes have been provided with stool collection kits in advance. When such an outbreak is noted, specimens are to be collected for bacterial culture and sensitivity, ova and parasites, *Cryptosporidium* and viruses. DOHMH Bureau of Communicable Disease staff will facilitate

transportation of the specimens to the City's Public Health Laboratory. Testing for culture and sensitivity, ova and parasites, and *Cryptosporidium* occurs at the Public Health Laboratory. If preliminary tests for bacteria and parasites are negative, specimens are sent to the New York State Department of Health laboratories for viral testing. All nine nursing homes have switched to the current system. As feedback, nursing homes are provided with copies of Waterborne Disease Risk Assessment Program semi-annual and annual reports.

From January through December 2003, five outbreaks were reported among five of the nine participating nursing homes. Two of five nursing homes are in Manhattan, one is in the Bronx, one is in Brooklyn, and one is in Queens. Onset dates for the five outbreaks ranged from January 5 to February 14. Total stool specimens submitted by the five nursing homes were as follows: 26 specimens were submitted for culture and sensitivity, 24 specimens were submitted for ova and parasites, 23 specimens were submitted for *Cryptosporidium* testing, and 17 specimens were submitted for viral testing. Thirteen of the 17 viral specimens were submitted by four nursing homes and sent to the New York State Department of Health Virus Isolation Laboratory. A fifth nursing home sent four specimens for viral testing to a commercial laboratory. All specimens submitted for culture and sensitivity, ova and parasites, and *Cryptosporidium* testing were found to be negative. All 13 of the specimens submitted for viral testing to the New York State Department of Health Virus Isolation Laboratory were found to be positive for calicivirus by polymerase chain reaction (PCR) assay. The four specimens submitted for viral testing to a commercial laboratory were found to be negative. However, this commercial laboratory does not perform PCR assays for calicivirus. No gastrointestinal outbreaks were reported after February 14, 2003.

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 2003. Data was transmitted by fax (by two labs) and by telephone report (by one lab) to DOHMH's Bureau of Communicable Disease reporting the number of stool specimens examined per day for: (a) bacterial culture and sensitivity, (b) ova and parasites, and (c) *Cryptosporidium parvum.*

Clinical Laboratory Monitoring results are reviewed upon receipt. Reviewers compare the current results to previous data to assess whether number of submissions is unusually high. Currently a computer model to establish statistical cut-offs for significant increases in clinical submissions is being piloted.

In 2003, one of the three participating clinical laboratories had no increases in stool specimen submissions that were considered unusually high. Between the other two laboratories, unusual increases in stool specimen submissions occurred on 24 dates. For all 24 dates, the increase was not sustained during the days immediately following the increase. As part of the investigation of specimen submission increases, DOHMH Bureau of Communicable Disease staff made calls to participating laboratories. In one instance, a laboratorian reported that an August 19 increase in ova and parasite submissions was due to delays in the transportation of

stool specimens as a result of the New York City blackout of August 14–15. Of the 324 specimens submitted on August 19 for ova and parasite testing to this laboratory, 25 specimens were tested for *Cryptosporidium*. All *Cryptosporidium* results were negative. In all other instances when laboratories were called, the laboratories reported that were no internal changes in business practice (such as mergers with other laboratories) that would account for submission increases. On eight of the 23 dates during which there was an increase in specimen submissions, the increase occurred in specimens submitted for *Cryptosporidium* testing at one laboratory. On these eight, non-consecutive dates, a total of 283 specimens were tested for *Cryptosporidium*, and all were found to be negative.

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. New York City now utilizes three systems for tracking ADM sales.

In the first program, volume-of-sales information of non-prescription ADMs is obtained on a weekly basis from a major drug store chain. Information is also obtained on the chain's promotional sales. Weekly sales volume data (i.e., electronic point-of-sale data for loperamide and non-loperamide ADMs) is graphed and visually compared to data collected since the program's inception in 1996. In interpreting the data, consideration is given to the weekly promotions on monitored products. In 2003, no increases in weekly sales volume were observed above the general variability of the historical data.

Prior to September 11, 2001, the DOHMH started discussions with a second large pharmacy chain to set up a more comprehensive monitoring system for prescription and non-prescription drugstore sales. The goal was to develop a new system that would provide more timely and comprehensive data than the existing ADM tracking system. The new system was also intended to better serve bioterrorism surveillance. Following the events of September 11, 2001, the pharmaceutical chain was more understanding of the importance of their data, and became more willing to share their proprietary information. In August 2002 daily electronic transmission began of approximately 6,000 prescription and 32,000 non-prescription medication sales that occur daily at this pharmacy chain. Daily data analysis began in mid-December 2002. Non-prescription drugs are categorized into key syndromes, and trends are analyzed for citywide increases in sales of anti-diarrhea and cold medications. Prescription drug sales are compiled and analyzed for aberrations in sales of medications for non-gastrointestinal-related illnesses such as asthma. Electronic point-of-sale data is provided daily on non-prescription ADMs. This system was in a pilot phase in the first half of 2003 as modifications and improvements were being made to the statistical model used to detect aberrations in the data. There were no statistically significant increases in ADM sales ("signals") detected from January 1-June 30th, 2003. However, these results should be considered preliminary, as additional work was being done on the model.

From July 1 to December 31, 2003, the model for gastrointestinal illness medications detected 7 days when sales were significantly above baseline trends. The first four of these signals could not be correlated with signals in any other surveillance systems or with any other

evidence of community-wide illness and were most likely due to a problem with high sensitivity from the statistical model in use at that time. Additional work is being done to improve the statistical model. Two of the signal days occurred on August 17 and August 18 following the citywide blackout of August 14–15. A citywide signal in the diarrheal syndrome was also noted in the Emergency Department System at this time. A follow-up case-control study was done following the blackout and is described in the Hospital Emergency Department Monitoring section below. The final signal date occurred on December 31 during a citywide increase in all Emergency Department signals. Retrospective review of pharmacy data back to August of 2001 has revealed similar signals during influenza season in the past.

In the third ADM tracking program, added in mid-2003, DOHMH receives data from the National Retail Data Monitor (NRDM). The NRDM is a system operated by the University of Pittsburgh which gathers retail pharmacy data from national chains for use in public health surveillance. The NRDM provides daily anti-diarrheal medications and electrolytes sales data from retail stores located in New York City. Citywide counts are adjusted for day-of-week variability and analyzed using the CUSUM (cumulative sums) method with a two-week baseline. Results for the period from June to December 2003 showed an increase in sales of electrolyte solutions and "stomach remedies" (bismuth subsalicylate, attapulgite, and loperamide) in December. Sales returned to baseline during the first few weeks of January 2004.

Hospital Emergency Department Monitoring

Two days after the 2001 September 11th attacks, DOHMH and the Centers for Disease Control and Prevention (CDC) established the precursor to the current Emergency Department (ED) system. In 2003, DOHMH received electronic data from 44 (66%) of New York City's 67 emergency departments, reporting 7,000 visits per day, roughly 75% of ED visits citywide. Hospitals transmit electronic files each morning containing chief complaint and basic demographic information for patient visits during the previous 24 hours. Patients are classified into syndrome categories (the two syndromes for gastrointestinal illness are vomiting and diarrhea), and daily analyses are conducted to detect any unusual patterns in ED chief complaint data. Data is analyzed for both temporal/citywide trends and spatial clusters within the city seven days a week. Temporal ("citywide") analyses assess whether the frequency of ED visits for the syndrome has increased in the last one, two or three days compared to the previous fourteen days. The spatial analyses scan the data for "clustering" of syndrome visits by two geographic variables, hospital and residential zip code. A single day of ED visit data is compared by syndrome and geographic variable to the previous fourteen days. Unusual clusters are denoted as signals and statistically this is determined by ranking the cluster in question alongside 999 simulated distributions of the data to produce a Monte Carlo estimate of the probability. Significant signals are defined as a probability of the clustering occurring fewer than 10 times out of 1000 (equivalent to $p < 0.01$).

From January 1, 2003 to December 31, 2003, there were 37 spatial (hospital or zip code) gastrointestinal signals. Seventeen of these signals were for vomiting and 20 signals were for diarrhea. There were 30 citywide signals, 18 for diarrhea and 12 for vomiting. Of these signals, six of them were sustained for two or more days, as described below:

1. There was a three-day citywide diarrhea signal January 19-21. As the number of cases began to decline after the second day, this was not actively investigated.

2. There was a three-day citywide vomiting signal March 16-18. Over the three-day period there were 548 cases where 461 were expected. A spatial signal was also detected on March 18 involving four hospitals in northern Manhattan and the Bronx. Investigation focused on those hospitals. The laboratory at one hospital reported large numbers of positive specimens for rotavirus starting in late February. The increase was predominantly in children and was consistent with the seasonal pattern observed in 2002 when there was a similar citywide increase predominantly in children associated with an increased detection of rotavirus.

3. There was one sustained two-day hospital signal for the vomiting syndrome on February 27-28, 2003. The signal involved two hospitals in the Bronx. There were 62 patients who reported vomiting over two days when 33 were expected. Twenty-seven patients were contacted by phone, and 23 were interviewed regarding their illness. Nineteen patients met the case-definition of illness-onset within four days. All patients reported vomiting and 68% reported diarrhea; 37% reported fever. The median duration of illness was 3 days (ranging from 1-8 days). The median age was 8 years (range 1-60). Six were admitted to the hospital. Only one case-patient provided a stool specimen and results were negative for bacterial pathogens. There were no common exposures to restaurants, gatherings, travel, and group activities. While DOHMH was unable to identify the causative agent of these cases, the predominance of vomiting and relatively short duration of symptoms (three days) make it likely that these patients had viral gastrointestinal illness.

4. There was a three-day citywide diarrhea signal August 16-18. This signal followed a citywide blackout that occurred on August 14 and continued for 12 to 30 hours in parts of the city. A follow-up case-control study was done using case-patients who presented to emergency departments with non-GI complaints as controls. The focus of this study was diarrheal disease and consumption of food held at inappropriate temperatures following the disruption of power. During the DOHMH blackout response, DEP was consulted regarding the safety of the city water supply. DEP reported that essential water system operations remained intact and that there was no disruption to disinfection. As drinking water quality was not a concern, the questionnaire included only one question on drinking water. Cases and controls were asked whether their tap water ran out during the blackout, but they were not specifically ask whether or not they drank tap water before it ran out. There were 116 cases and 171 controls included in the investigation. Twenty-three percent of cases and twenty-seven percent of controls reported that their tap water ran out during the blackout, indicating that there was no association between case status and losing access to drinking water (OR 0.9, 95% CI 0.5-1.6). As there was no disruption in disinfection of the water supply, it was decided not to focus on water consumption during this investigation, given the need to ask detailed questions regarding food histories, and recognizing the importance of not over-extending the time required for the interview. A write-up of this study is in preparation.

5. and 6. There was a citywide vomiting signal December 21–25. Also, On December 25 and December 26 there were diarrheal signals. There were simultaneous fever and respiratory signals. While there was concern that this indicated the start of the annual norovirus season,

there were no spatial signals, no institutional outbreaks and the sustained vomiting and diarrheal signals resolved. While DOHMH was unable to identify the causative agent of the December vomiting and diarrheal signals, the predominance of vomiting suggests that these patients had viral gastrointestinal illness. Additionally, there was an overall increase in visits to Emergency Departments for diarrhea and vomiting beginning in November. This is a seasonal trend that DOHMH has seen in past years and is most likely related to the winter viral season.

DOHMH surveillance data did not indicate an outbreak of cryptosporidiosis during periods when signals were detected in any of these syndromic surveillance systems.

PART III: INFORMATION SHARING AND PUBLIC EDUCATION

Information pertaining to New York City's Waterborne Disease Risk Assessment Program and related issues continues to be available on both the DEP and DOHMH websites, including results from the City's source water protozoa monitoring program. Documents on the websites include:

DOHMH Webpages:

- *Giardiasis fact sheet*
  http://www.nyc.gov/html/doh/html/cd/cdgia.html

- *Cryptosporidiosis fact sheet*
  http://www.nyc.gov/html/doh/html/cd/cdcry.html

DEP Webpages:

- *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.nyc.gov/html/dep/html/pathogen.html

- *1997, 1998, 1999, 2000, 2001, and 2002 Waterborne Disease Risk Assessment Annual Report*
  http://www.nyc.gov/html/dep/html/wdrap.html

- *1997, 1998, 1999, 2000, 2001, 2002, and 2003 New York City Drinking Water Supply and Quality Statement*
  http://www.nyc.gov/html/dep/html/wsstate.html

Chart 1: Giardiasis by Month of Diagnosis, New York City, July 1993-December 2003

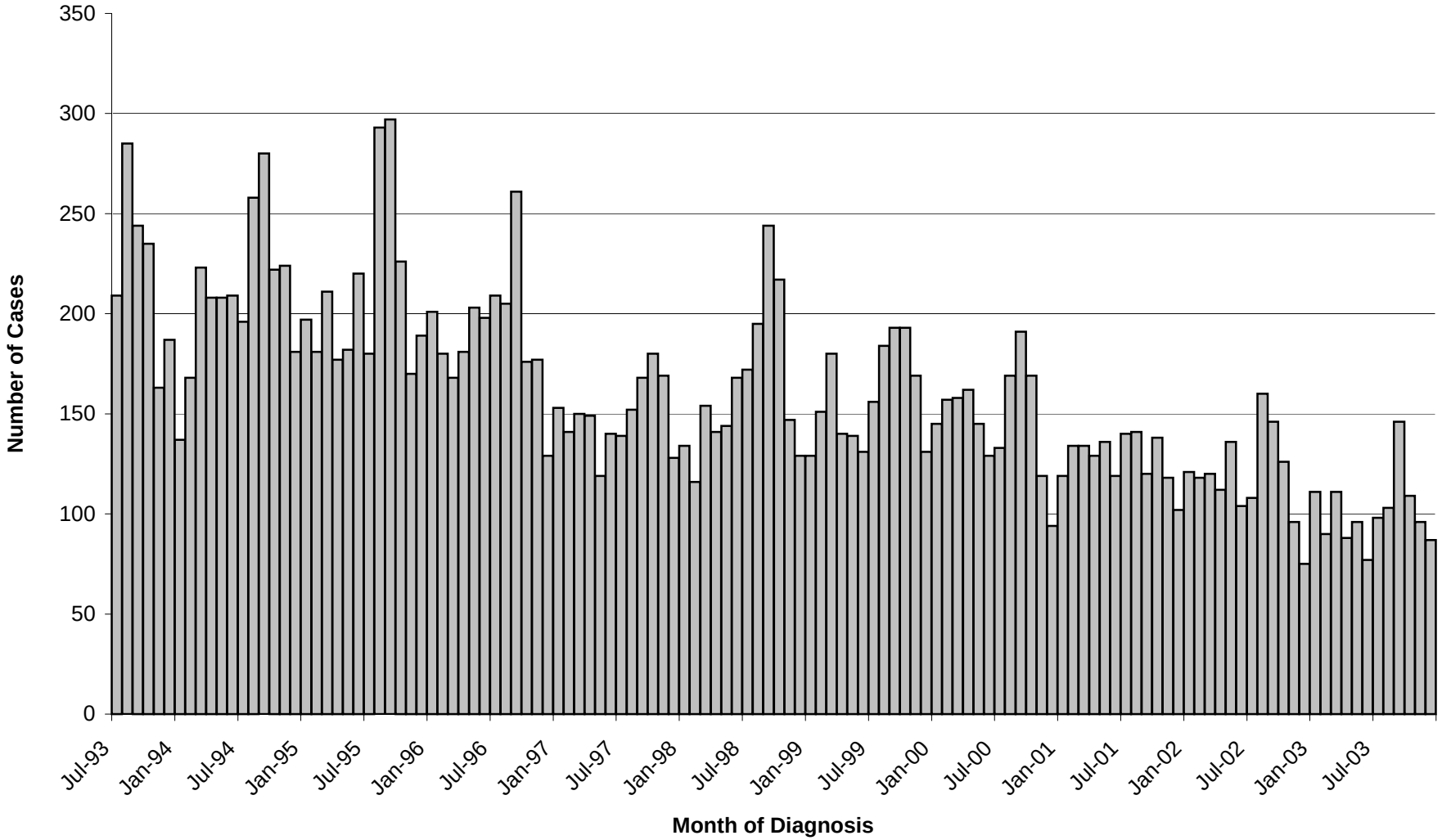

TABLE 2: Number of cases and annual case rate per 100,000 population by sex and borough of residence - Active surveillance for **giardiasis** in New York City (2003)

	Borough of residence					
Sex	Citywide number (rate)	Manhattan number (rate)	Bronx number (rate)	Brooklyn number (rate)	Queens number (rate)	Stat Is number (rate)
Male	832	401	128	137	148	18
	(21.9)	(55.0)	(20.6)	(11.8)	(13.8)	(8.4)
Female	375	137	84	72	73	9
	(8.9)	(17.0)	(11.8)	(5.5)	(6.3)	(3.9)
Unknown	5	1	1	1	2	0
Total	1212	539	213	210	223	27
	(15.1)	(35.1)	(16.0)	(8.5)	(10.0)	(6.1)

Map 1

Giardiasis annual case rate per 100,000 population by UHF neighborhood - Active surveillance data for New York City (2003)

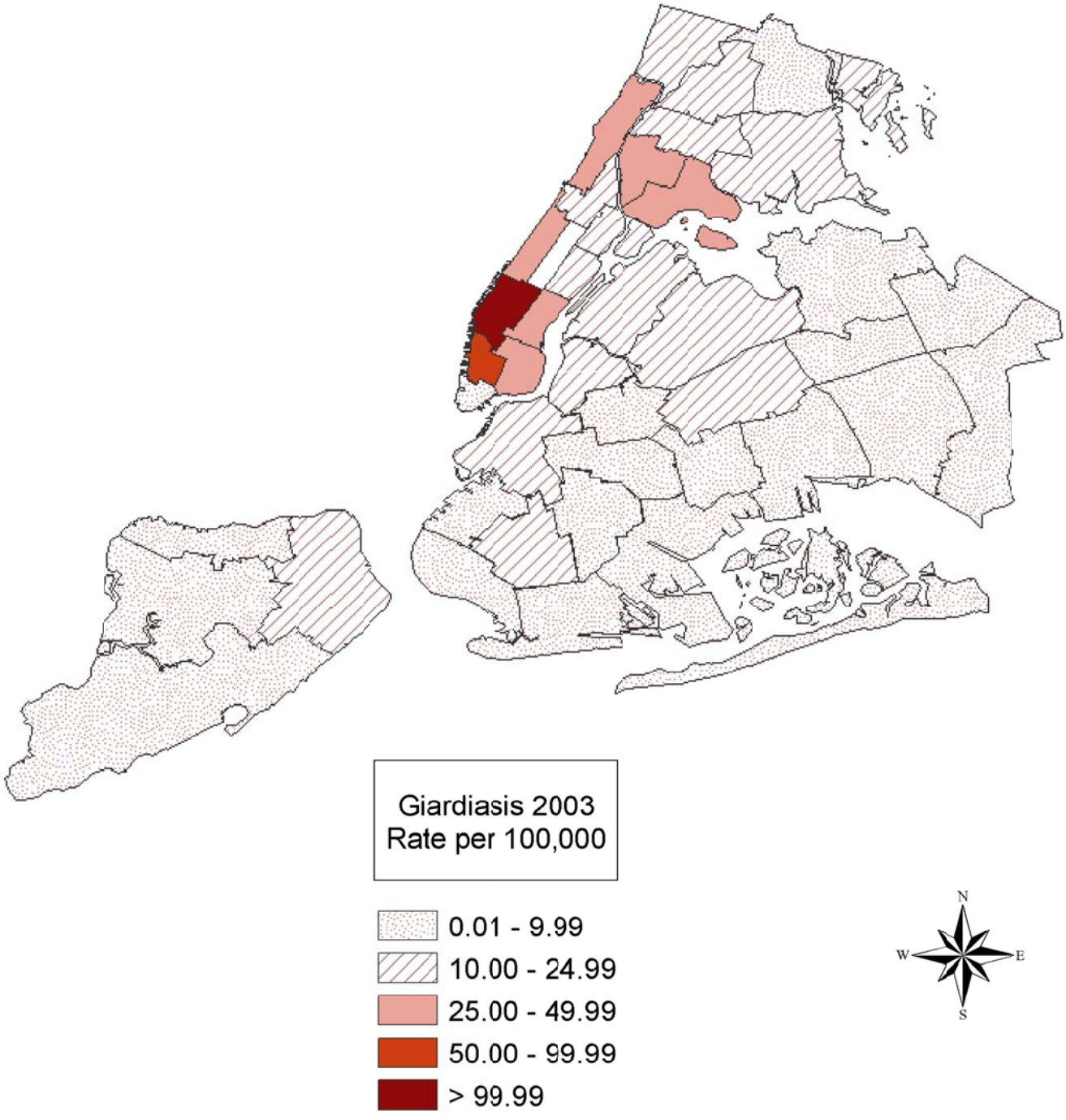

Table 3: Number of cases and annual case rate per 100,000 by UHF neighborhood of residence - Active surveillance for **giardiasis** in New York City (2003)*

UHF Neighborhood	Borough	Number	Population	Rate
Chelsea-Clinton	Manhattan	127	122998	103.3
Greenwich Village-Soho	Manhattan	51	83709	60.9
Gramercy Park-Murray Hill	Manhattan	51	124468	41.0
Upper West Side	Manhattan	76	220706	34.4
Washington Heights-Inwood	Manhattan	83	270677	30.7
High Bridge-Morrisania	Bronx	56	189755	29.5
Union Sq-Lower East Side	Manhattan	57	197138	28.9
Hunts Point-Mott Haven	Bronx	31	122875	25.2
Upper East Side	Manhattan	52	216441	24.0
Long Island City-Astoria	Queens	44	220960	19.9
Crotona-Tremont	Bronx	38	199530	19.0
Downtown-Heights-Slope	Brooklyn	35	214696	16.3
East Harlem	Manhattan	17	108092	15.7
Greenpoint	Brooklyn	19	124449	15.3
C Harlem-Morningside Hgts	Manhattan	23	151113	15.2
Fordham-Bronx Park	Bronx	35	250491	14.0
West Queens	Queens	66	477516	13.8
Kingsbridge-Riverdale	Bronx	10	88989	11.2
Stapleton-St. George	Stat Is	13	116227	11.2
Ridgewood-Forest Hills	Queens	26	240901	10.8
Borough Park	Brooklyn	35	324411	10.8
Pelham-Throgs Neck	Bronx	31	290052	10.7
Sunset Park	Brooklyn	12	120441	10.0
Southwest Queens	Queens	24	269952	8.9
Flushing-Clearview	Queens	22	255542	8.6
East New York	Brooklyn	14	173716	8.1
Coney Island-Sheepshead Bay	Brooklyn	22	286901	7.7
East Flatbush-Flatbush	Brooklyn	24	316734	7.6
Bed Stuyvesant-Crown Hgts	Brooklyn	23	317296	7.2
Williamsburg-Bushwick	Brooklyn	14	194305	7.2
Lower Manhattan	Manhattan	2	29266	6.8
Jamaica	Queens	19	285339	6.7
Rockaway	Queens	7	106738	6.6
Northeast Bronx	Bronx	12	185998	6.5
Fresh Meadows	Queens	5	93148	5.4
South Beach-Tottenville	Stat Is	9	179892	5.0
Bayside-Littleneck	Queens	4	88164	4.5
Bensonhurst-Bay Ridge	Brooklyn	8	194558	4.1
Willowbrook	Stat Is	3	84821	3.5
Port Richmond	Stat Is	2	62788	3.2
Southeast Queens	Queens	6	198846	3.0
Canarsie-Flatlands	Brooklyn	3	197819	1.5

*Excludes one case with a NYC zip code not assigned to a UHF neighborhood.

TABLE 4: Number of cases and annual case rate per 100,000 population by age group and sex - Active surveillance for **giardiasis** in New York City (2003)

	Sex			
Age group	Male number (rate)	Female number (rate)	Unknown	Total number (rate)
<5 years	96 (34.7)	65 (24.6)	0	161 (29.8)
5-9 years	94 (32.8)	65 (23.6)	3	162 (28.9)
10-19 years	88 (16.4)	49 (9.5)	1	138 (13.1)
20-44 years	396 (25.4)	123 (7.4)	0	519 (16.1)
45-59 years	126 (19.8)	36 (4.8)	0	162 (11.7)
60 years +	24 (4.8)	35 (4.7)	1	60 (4.8)
Unknown	8	2	0	10
Total	832 (21.9)	375 (8.9)	5	1212 (15.1)

TABLE 5: Number of cases and annual case rate per 100,000 population by age group and borough of residence - Active surveillance for **giardiasis** in New York City (2003)

	Borough of residence					
Age group	Citywide number (rate)	Manhattan number (rate)	Bronx number (rate)	Brooklyn number (rate)	Queens number (rate)	Stat Is number (rate)
<5 years	161	35	39	34	45	8
	(29.8)	(46.0)	(35.5)	(18.6)	(31.5)	(26.9)
5-9 years	162	29	50	33	44	6
	(28.9)	(39.5)	(41.7)	(17.4)	(30.3)	(18.2)
10-19 years	138	32	48	28	28	2
	(13.1)	(22.1)	(23.0)	(7.8)	(10.1)	(3.3)
20-44 years	519	313	51	79	70	6
	(16.1)	(44.1)	(10.0)	(8.4)	(7.8)	(3.7)
45-59 years	162	94	16	27	22	3
	(11.7)	(33.1)	(7.8)	(6.5)	(5.6)	(3.5)
60 years +	60	32	7	6	13	2
	(4.8)	(12.8)	(3.9)	(1.6)	(3.5)	(2.9)
Unknown	10	4	2	3	1	0
Total	1212	539	213	210	223	27
	(15.1)	(35.1)	(16.0)	(8.5)	(10.0)	(6.1)

TABLE 6: Number of cases and annual case rate per 100,000 population by race/ethnicity and borough of residence - Active surveillance for **giardiasis** in New York City (2003)*

	Borough of residence					
Race/Ethnicity	Citywide number (rate)	Manhattan number (rate)	Bronx number (rate)	Brooklyn number (rate)	Queens number (rate)	Stat Is number (rate)
Hispanic	319	83	128	39	65	4
	(14.8)	(19.9)	(19.9)	(8.0)	(11.7)	(7.5)
White non-Hispanic	510	333	22	86	57	12
	(18.2)	(47.3)	(11.4)	(10.1)	(7.8)	(3.8)
Black non-Hispanic	116	35	31	30	14	6
	(5.9)	(14.9)	(7.4)	(3.5)	(3.3)	(15.1)
Asian, Pac Islander, Amer	103	19	16	11	55	2
Indian, Alaska Native	(12.9)	(13.0)	(37.6)	(5.8)	(13.9)	(7.8)
Unknown	164	69	16	44	32	3
Total	1212	539	213	210	223	27
	(15.1)	(35.1)	(16.0)	(8.5)	(10.0)	(6.1)

* Because year 2000 U.S. Census data include race/ethnicity categories not included in disease surveillance data, 3.5% of the total population was not included in the denominator used to calculate rates by race/ethnicity. Rates pertaining to race/ethnicity may therefore be inflated.

TABLE 7: Number of cases and annual case rate per 100,000 population by race/ethnicity and age group - Active surveillance for **giardiasis** in New York City (2003)*

	Age group							
Race/ ethnicity	< 5 years number (rate)	5-9 years number (rate)	10-19 years number (rate)	20-44 years number (rate)	45-59 years number (rate)	60 + years number (rate)	Unk.	Total number (rate)
Hispanic	62 (33.4)	70 (35.6)	71 (20.2)	81 (8.9)	25 (7.9)	8 (3.9)	2	319 (14.8)
White non-Hispanic	39 (29.1)	23 (18.3)	19 (7.6)	286 (26.7)	104 (18.9)	36 (5.4)	3	510 (18.2)
Black non-Hispanic	14 (9.6)	17 (10.2)	9 (2.9)	57 (7.6)	14 (4.2)	5 (1.9)	0	116 (5.9)
Asian, Pac. Is., Amer. Indian, Alaska Native	24 (47.8)	32 (64.4)	15 (15.5)	22 (5.9)	6 (4.2)	4 (4.5)	0	103 (12.9)
Unknown	22	20	24	73	13	7	5	164
Total	161 (29.8)	162 (28.9)	138 (13.1)	519 (16.1)	162 (11.7)	60 (4.8)	10	1212 (15.1)

* Because year 2000 U.S. Census data include race/ethnicity categories not included in disease surveillance data, 3.5% of the total population was not included in the denominator used to calculate rates by race/ethnicity. Rates pertaining to race/ethnicity may therefore be inflated.

Chart 2: Cryptosporidiosis by Month of Diagnosis, New York City, November 1994-December 2003

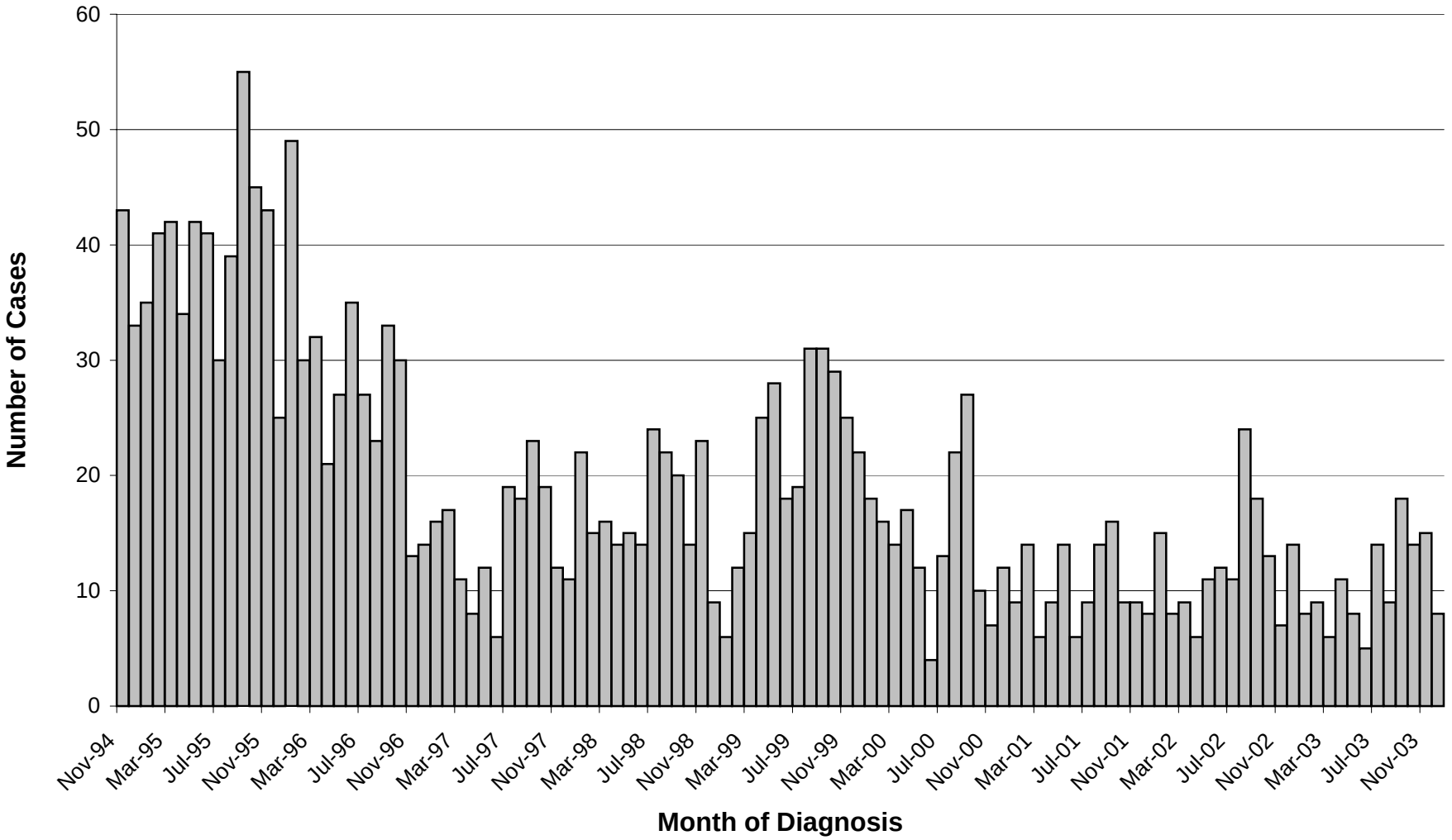

TABLE 9: Number of cases and annual case rate per 100,000 population by sex and borough of residence - Active surveillance for **cryptosporidiosis** in New York City (2003)

	Borough of residence					
Sex	Citywide number (rate)	Manhattan number (rate)	Bronx number (rate)	Brooklyn number (rate)	Queens number (rate)	Stat Is number (rate)
Male	91	48	16	17	9	1
	(2.4)	(6.6)	(2.6)	(1.5)	(0.8)	(0.5)
Female	34	17	3	9	5	0
	(0.8)	(2.1)	(0.4)	(0.7)	(0.4)	
Total	125	65	19	26	14	1
	(1.6)	(4.2)	(1.4)	(1.1)	(0.6)	(0.2)

Map 2

Cryptosporidiosis annual case rate per 100,000 population by UHF neighborhood - Active surveillance data for New York City (2003)

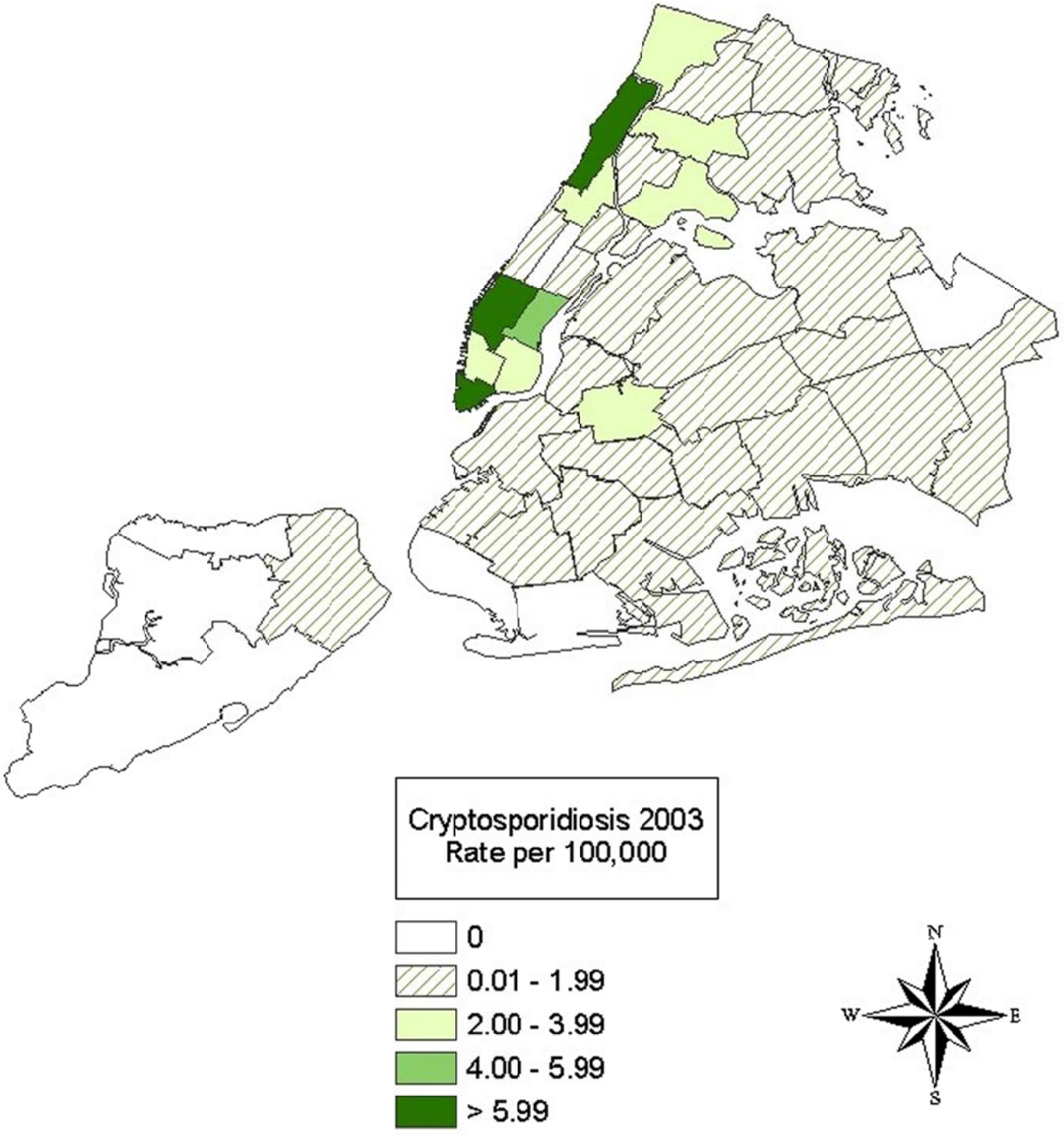

TABLE 10: Number of cases and annual case rate per 100,000 population by UHF neighborhood of residence - Active surveillance data for **cryptosporidiosis** in New York (2003)*

UHF Neighborhood	Borough	Number	Population	Rate
Chelsea-Clinton	Manhattan	11	122998	8.9
Washington Heights-Inwood	Manhattan	20	270677	7.4
Lower Manhattan	Manhattan	2	29266	6.8
Gramercy Park-Murray Hill	Manhattan	6	124468	4.8
Greenwich Village-Soho	Manhattan	3	83709	3.6
Union Sq-Lower East Side	Manhattan	7	197138	3.6
C Harlem-Morningside Hgts	Manhattan	5	151113	3.3
Williamsburg-Bushwick	Brooklyn	5	194305	2.6
Hunts Point-Mott Haven	Bronx	3	122875	2.4
Kingsbridge-Riverdale	Bronx	2	88989	2.2
Crotona-Tremont	Bronx	4	199530	2.0
Downtown-Heights-Slope	Brooklyn	4	214696	1.9
East Harlem	Manhattan	2	108092	1.9
Upper East Side	Manhattan	4	216441	1.8
Upper West Side	Manhattan	4	220706	1.8
Greenpoint	Brooklyn	2	124449	1.6
East Flatbush-Flatbush	Brooklyn	5	316734	1.6
Pelham-Throgs Neck	Bronx	4	290052	1.4
Bed Stuyvesant-Crown Hgts	Brooklyn	4	317296	1.3
Fordham-Bronx Park	Bronx	3	250491	1.2
East New York	Brooklyn	2	173716	1.2
Fresh Meadows	Queens	1	93148	1.1
High Bridge-Morrisania	Bronx	2	189755	1.1
Canarsie-Flatlands	Brooklyn	2	197819	1.0
Southeast Queens	Queens	2	198846	1.0
Rockaway	Queens	1	106738	0.9
Long Island City-Astoria	Queens	2	220960	0.9
Stapleton-St. George	Stat Is	1	116227	0.9
Sunset Park	Brooklyn	1	120441	0.8
Ridgewood-Forest Hills	Queens	2	240901	0.8
Jamaica	Queens	2	285339	0.7
Northeast Bronx	Bronx	1	185998	0.5
West Queens	Queens	2	477516	0.4
Flushing-Clearview	Queens	1	255542	0.4
Southwest Queens	Queens	1	269952	0.4
Borough Park	Brooklyn	1	324411	0.3

***** Excludes one case with a NYC zip code not assigned to a UHF neighborhood.

TABLE 11: Number of cases and annual case rate per 100,000 population by age group and sex - Active surveillance for **cryptosporidiosis** in New York City (2003)

	Sex		
Age group	Male number (rate)	Female number (rate)	Total number (rate)
<5 years	10	7	17
	(3.6)	(2.6)	(3.1)
5-9 years	2	0	2
	(0.7)		(0.4)
10-19 years	5	3	8
	(0.9)	(0.6)	(0.8)
20-44 years	54	15	69
	(3.5)	(0.9)	(2.1)
45-59 years	18	7	25
	(2.8)	(0.9)	(1.8)
60 years +	2	2	4
	(0.4)	(0.3)	(0.3)
Total	91	34	125
	(2.4)	(0.8)	(1.6)

TABLE 12: Number of cases and annual case rate per 100,000 population by age group and borough – Active surveillance for **cryptosporidiosis** in New York City (2003)

	Borough of residence					
Age group	Citywide number (rate)	Manhattan number (rate)	Bronx number (rate)	Brooklyn number (rate)	Queens number (rate)	Stat Is number (rate)
<5 years	17 (3.1)	7 (9.2)	4 (3.6)	3 (1.6)	3 (2.1)	0
5-9 years	2 (0.4)	2 (2.7)	0	0	0	0
10-19 years	8 (0.8)	3 (2.1)	0	3 (0.8)	2 (0.7)	0
20-44 years	69 (2.1)	34 (4.8)	10 (2.0)	17 (1.8)	7 (0.8)	1 (0.6)
45-59 years	25 (1.8)	16 (5.6)	5 (2.4)	2 (0.5)	2 (0.5)	0
60 years +	4 (0.3)	3 (1.2)	0	1 (0.3)	0	0
Total	125 (1.6)	65 (4.2)	19 (1.4)	26 (1.1)	14 (0.6)	1 (0.2)

TABLE 13: Number of cases and annual case rate per 100,000 population by race/ethnicity and borough of residence - Active surveillance for **cryptosporidiosis** in New York City (2003)*

	Borough of residence					
Race/Ethnicity	Citywide number (rate)	Manhattan number (rate)	Bronx number (rate)	Brooklyn number (rate)	Queens number (rate)	Stat Is number (rate)
Hispanic	43 (2.0)	20 (4.8)	10 (1.6)	6 (1.2)	6 (1.1)	1 (1.9)
White non-Hispanic	42 (1.5)	31 (4.4)	1 (0.5)	6 (0.7)	4 (0.5)	0
Black non-Hispanic	34 (1.7)	12 (5.1)	6 (1.4)	13 (1.5)	3 (0.7)	0
Asian, Pac Islander, Amer Indian, Alaska Native	6 (0.7)	2 (1.4)	2 (4.7)	1 (0.5)	1 (0.3)	0
Total	125 (1.6)	65 (4.2)	19 (1.4)	26 (1.1)	14 (0.6)	1 (0.2)

* Because year 2000 U.S. Census data include race/ethnicity categories not included in disease surveillance data, 3.5% of the total population was not included in the denominator used to calculate rates by race/ethnicity. Rates pertaining to race/ethnicity may therefore be inflated.

TABLE 14: Number of cases and annual case rate per 100,000 population by race/ethnicity and age group - Active surveillance for **cryptosporidiosis** in New York City (2003)

	Age group						
Race /ethnicity	< 5 years number (rate)	5-9 years number (rate)	10-19 years number (rate)	20-44 years number (rate)	45-59 years number (rate)	60 + years number (rate)	Total number (rate)
Hispanic	10 (5.4)	2 (1.0)	6 (1.7)	12 (1.3)	12 (3.8)	1 (0.5)	43 (2.0)
White non-Hispanic	2 (1.5)	0	2 (0.8)	29 (2.7)	7 (1.3)	2 (0.3)	42 (1.5)
Black non-Hispanic	0	0	0	27 (3.6)	6 (1.8)	1 (0.4)	34 (1.7)
Asian, Pac Islander, Amer. Indian, Alaska Native	5 (10.0)	0	0	1 (0.3)	0	0	6 (0.7)
Total	17 (3.1)	2 (0.4)	8 (0.8)	69 (2.1)	25 (1.8)	4 (0.3)	125 (1.6)

* Because year 2000 U.S. Census data include race/ethnicity categories not included in disease surveillance data, 3.5% of the total population was not included in the denominator used to calculate rates by race/ethnicity. Rates pertaining to race/ethnicity may therefore be inflated.

Chart 3: Cryptosporidiosis Among Persons Living with HIV/AIDS by Month of Diagnosis, New York City, January 1995-December 2003

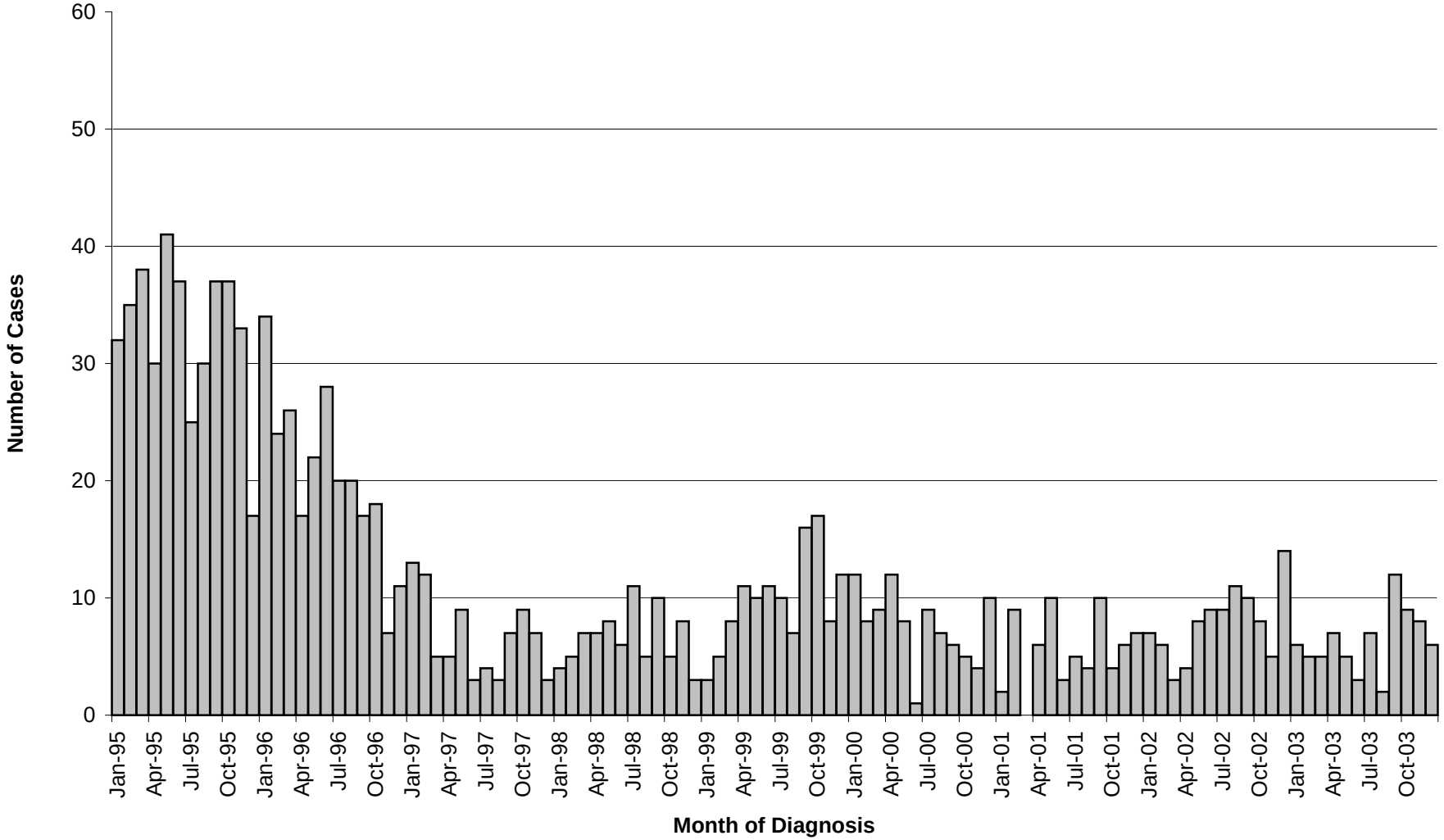

Chart 4: Cryptosporidiosis Among Immunocompetent Persons by Month of Diagnosis, New York City, January 1995-December 2003

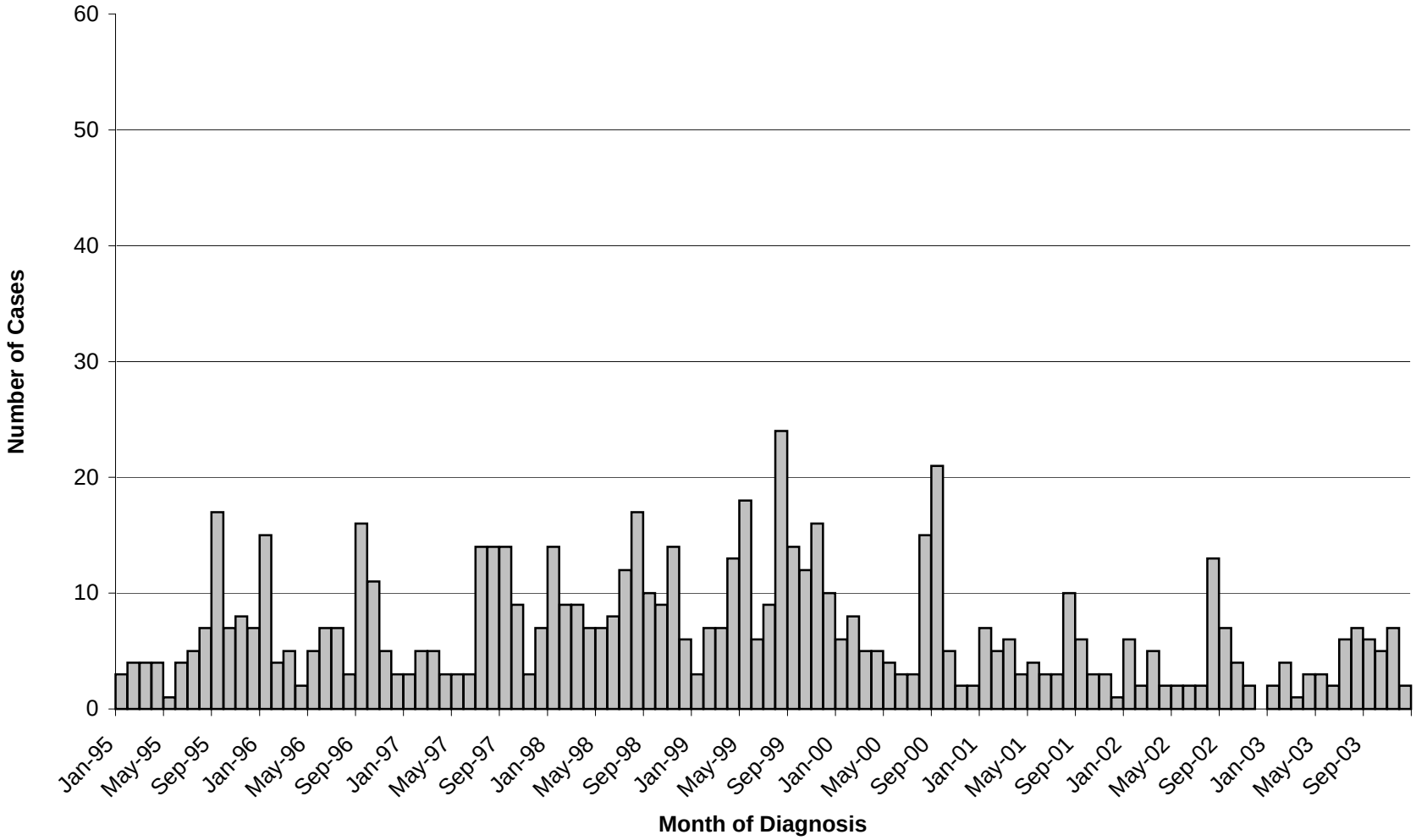

Table 16: Percentage of Interviewed **Cryptosporidiosis** Case-Patients Reporting Selected Potential Risk Exposures in the Month Before Disease Onset, by Immune Status, New York City, 1995-2003.

Exposure Type	HIV/AIDS									Immunocompetent								
	1995	1996	1997	1998	1999	2000*	2001	2002	2003	1995	1996	1997	1998	1999	2000*	2001	2002	2003
Contact with an Animal[a]	35%	35%	33%	36%	35%	43%	23%	42%	40%	42%	41%	41%	32%	35%	26%	37%	35%	23%
High-risk Sexual Activity[b] (≥ 18 years old)	22%	22%	9%	15%	20%	25%	15%	23%	24%	16%	25%	12%	10%	12%	23%	15%	30%	13%
International Travel[c]	9%	9%	9%	13%	18%	14%	10%	11%	13%	30%	29%	26%	28%	28%	40%	47%	33%	45%
Recreational Water Contact[d]	16%	8%	16%	12%	16%	15%	8%	10%	21%	21%	27%	40%	24%	22%	32%	35%	35%	34%

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 1/1/1997, 5/11/2001 and 8/21/2002. Details on Exposure Types and changes from 1995-2003 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 (1997-2003).

[b] High-risk Sexual Activity - Includes having a penis, finger or tongue in sexual partner's anus (1995-2003).

[c] International Travel - Travel outside the United States (1995-2003).

[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 (1997-2003).

* Year 2000 percentage of interviewed cryptosporidiosis cases does not include 14 cases associated with a point source exposure at a swimming pool in Florida.

Table 17: 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 1995-2003.

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%
2001	54%	14%	8%	16%	6%	43%	31%	4%	16%	6%
2002	54%	22%	0%	19%	4%	33%	44%	0%	21%	2%
2003	77%	13%	4%	4%	2%	36%	36%	2%	16%	9%

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 1/1/1997, 5/11/2001, and 8/21/2002. Details on Tap Water Exposure and changes from 1995-2003 are noted below.

[a] Plain Tap - Drank unboiled/unfiltered NYC tap water (1995-5/10/2001); or drank greater than 0 cups of unboiled/unfiltered NYC tap water (5/11/2001-12/31/2003).

[b] Filtered Tap - Drank filtered NYC tap water (1995-5/10/2001); or drank greater than 0 cups of filtered NYC tap water, and 0 or more cups of boiled NYC tap water, and no unboiled /unfiltered NYC tap water (5/11/2001-12/31/2003).

[c] Boiled Tap - Drank boiled NYC tap water (1995-5/10/2001); or drank greater than 0 cups of boiled NYC tap water, and no unboiled /unfiltered NYC tap water, and no filtered NYC tap water (5/11/2001-12/31/2003).

[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 (1997-2003)

[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 (1997-2003).

* Year 2000 percentage of interviewed cryptosporidiosis cases does not include 14 cases associated with a point source exposure at a swimming pool in Florida.

Table 18: Number of Cups of New York City Tap Water Consumed per Day in the Month before Disease Onset, Reported by Interviewed Cryptosporidiosis Case-Patients, New York City, 2003.

Drank 0 cups NYC tap water per day		Drank greater than 0 cups NYC tap water per day				
Immune status	Number (%) interviewed case-patients	Number (%) interviewed case-patients	Median (range) cups drank per day			
			Total NYC tap water	Unfiltered/unboiled NYC tap water	Filtered NYC tap water	Boiled NYC tap water
HIV/AIDS	3 (3%)	44 (47%)	4 (0.5-20)	2 (0-12)	0 (0-14)	0 (0-4)
Immunocompetent	11 (12%)	33 (35%)	4 (1-18)	0 (0-16)	1 (0-10)	0 (0-8)
Immunocompromised other than HIV/AIDS	0	2 (2%)	0.75 (0.5-1)	0 (0-0)	0.75 (0.5-1)	0 (0-0)
Total :	14 (15%)	79 (85%)	4 (0.5-20)	2 (0-16)	0 (0-14)	0 (0-8)

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).

• Interviewers notified case-patients that 1 cup = 8 ounces.

• Some patients drank more than one kind of water (e.g., both unboiled/unfiltered tap water and filtered water) and may be represented in this table more than one time.