

# HEALTHY BROOKLINE

## VOLUME VII



*Communicable Disease Indicators*

Brookline Department of Public Health

2003

## ACKNOWLEDGMENTS

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## EXECUTIVE SUMMARY

The *Healthy Brookline* series represents our continuous community health needs assessment of Brookline. Volume VII gives a more in-depth look at the data collected by Brookline's Division of Public Health Nursing and Epidemiology. Included in the report are facts and figures on reportable communicable diseases among Brookline residents over a one-year period (July 1, 2001 to June 30, 2002). Also included are data on the division's disease control services, such as immunizations, vaccine distribution, refugee health, and screening for blood pressure, tuberculosis, and elevated lead levels. Information on sexually transmitted diseases and HIV/AIDS in Brookline are not presented here, but can be found in *Healthy Brookline: Volume VI*. In addition, the Massachusetts Department of Public Health posts current HIV/AIDS surveillance reports on its website: [www.state.ma.us/dph/cdc/aids/aidsprog.htm](http://www.state.ma.us/dph/cdc/aids/aidsprog.htm). Data from the *Healthy Brookline* series helps provide a baseline from which to measure progress over time, and helps inform the creation of policies and programs to address the changing health-related needs of the town.

The Brookline Health Department (BHD) keeps confidential records of communicable diseases in accordance with Massachusetts state laws. Tracking infectious diseases allows Brookline and state health department staff to investigate possible sources of disease, implement control measures, detect trends and outbreaks, and create effective programs and policies. The recent emergence of new infectious diseases and bioterrorist threats has boosted general interest in the workings of the public health infrastructure. With this *Healthy Brookline* volume, we hope to provide residents with a better understanding of how Brookline and the state of Massachusetts work together to protect the public from communicable diseases.

## **Key Findings for Fiscal Year 2002 (July 1, 2001 to June 30, 2002)**

Brookline experienced a low incidence of communicable diseases between July 1, 2001 and June 30, 2002. Overall, Brookline remains a healthy community, as can be seen from the following key findings:

### **Communicable Disease Surveillance**

- *Communicable Diseases: Rates and Frequencies.*
  - In 2002, a total of 105 cases of communicable diseases were reported in Brookline. The most frequently reported diseases were hepatitis C (21 cases), hepatitis B (15 cases), and campylobacter enteritis (14 cases).
  - Brookline's rate of communicable diseases in 2002 was 189.2 cases per 100,000 people. Newton's rate was 219.5 cases per 100,000 people, and Wellesley's was 255.5 cases per 100,000 people.
  - The rate of communicable diseases in Brookline has declined by 13.7% over the last five years.
- *Hepatitis C.* The rate of hepatitis C increased from 1.8 cases per 100,00 people in 1997 to 37.8 cases per 100,000 in 2002. This dramatic increase may reflect improved reporting of hepatitis C by health care providers, and/or an actual rise in cases.
- *Lyme Disease.* The rate of Lyme disease has also increased since 1997 (from 4 cases per 100,000 persons to 11 cases per 100,000 in 2002). As with hepatitis C, this increase may reflect improved reporting by health care providers, and/or an actual rise in cases.
- *Rabies.* In 2002, 54 bats were tested for rabies, but only one tested positive. In addition, a raccoon and a coyote tested positive for rabies. No humans developed rabies.
- *Active Tuberculosis Disease.*
  - Five Brookline residents had active tuberculosis (TB) disease in FY 2002.
  - Brookline's average five-year case rate for active TB is 6.7 cases per 100,000 population, compared to 4.3 cases per 100,000 population for the entire state of Massachusetts.
- *Latent Tuberculosis Infection.* In FY 2002, 102 new cases of latent tuberculosis infection were reported in Brookline. Persons with latent TB infection have a small number of TB bacteria living in their bodies, but have no clinical symptoms and are not contagious.

- *Tuberculosis Screening.* The Brookline Public Health Nurse administered 204 tuberculin skin tests in FY 2002 to check persons exposed to active cases of TB, and to screen persons who need the test as a pre-employment requirement.
- *West Nile Virus.* West Nile virus (WNV) was first found in birds and mosquitoes in Brookline during the summer of 2000. In 2002, four birds and one mosquito pool tested positive for WNV. Brookline has had no human cases of WNV; however Massachusetts had 25 cases, including 3 fatalities, in 2002.
- *Outbreaks.* BHD investigated four communicable disease outbreaks in FY 2002. Three outbreaks involved gastrointestinal symptoms and one involved a body rash of unknown etiology.

### **Communicable Disease Control**

- *Flu clinics.* A total of 2528 residents and town employees received influenza vaccinations from BHD's flu clinics during FY 2002. Per national recommendations, the majority of BHD's flu clinic visitors were over the age of 50 (74% of all clients).
- *Immunization clinics.* BHD also held child immunization clinics, as needed. In total, 403 shots of vaccine were given to 276 clients during the year. The most frequently administered immunizations were for hepatitis B (137 shots), measles, mumps, rubella (64 shots), and tetanus-diphtheria (92 shots).
- *Bioterrorism.* During the fall of 2001, bioterrorism became a new area of concern for Brookline. In response to the national anthrax scare during FY 2002, 47 Brookline residents and businesses sent samples of suspicious white powders for laboratory testing. All samples tested negative for anthrax.

### **Health Monitoring**

- *Blood pressure clinics.* BHD served 833 clients in 60 Blood Pressure Clinics during FY 2002. An additional 65 people received BP checks during walk-in visits to the health department. Attendance at blood pressure clinics has nearly doubled since 1999.
- *Lead testing.* BHD tested 24 children for lead in their bloodstream; all 24 children were within normal limits. The number of children presenting for lead tests has increased from 7 to 24 since FY 2000. This growth is due to increased referrals from daycare centers serving children without insurance.

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## SECTION 1: COMMUNICABLE DISEASE SURVEILLANCE

Communicable diseases (also known as infectious diseases) are caused by microorganisms, such as bacteria and viruses. A person can contract a communicable disease from an infected person, an infected animal, and/or another infected source, such as water or food. The Brookline Health Department (BHD) keeps track of the number of persons infected by different communicable diseases throughout the year. BHD also collects information on infected people's relevant demographic characteristics, as well as their exposure to potential sources of disease. Confidentiality of information is protected by law. By collecting this data, BHD staff is able to investigate potential sources of disease, quickly implement control measures, detect trends and outbreaks, and create targeted policies and programs to maintain the health of the community.

Readers should be aware, however, that the data presented here do not represent all cases of communicable diseases in Brookline. This is due to the Massachusetts system of infectious disease reporting, which is typical of most state systems. The state requires that only certain communicable diseases be reported to state and local health departments, and that only confirmed cases are recorded. Since some infections do not cause symptoms severe enough for a person to visit a physician and get a laboratory test or diagnosis, the true number of communicable disease cases is likely to be higher than the reported number.

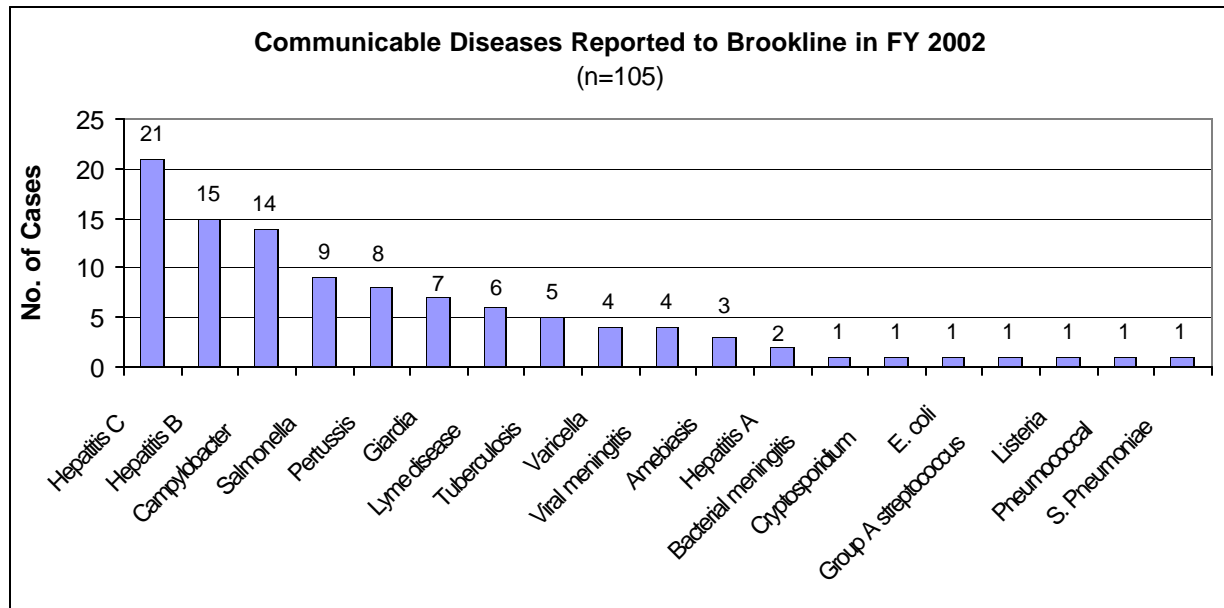
Despite these limitations, the data presented here should provide a reasonable portrayal of Brookline's communicable disease rates. For more information about the state's surveillance procedures, see the *Guide to Surveillance and Reporting*, by the Massachusetts Department of Public Health (MDPH) Division of Epidemiology and Immunization, available at [www.state.ma.us/dph/cdc](http://www.state.ma.us/dph/cdc). For data on sexually transmitted diseases and HIV/AIDS in Brookline and Massachusetts overall, see *Healthy Brookline: Volume VI*, or visit the MDPH HIV/AIDS Surveillance Program webpage at [www.state.ma.us/dph/cdc/aids/aidsprog.htm](http://www.state.ma.us/dph/cdc/aids/aidsprog.htm).



## 1.1 Frequency of Reportable Diseases

In Fiscal Year (FY) 2002,<sup>1</sup> 105 cases of communicable diseases were reported to the Brookline Health Department. The most frequently reported diseases were hepatitis C (21 cases), hepatitis B (15 cases), and campylobacter enteritis (14 cases).

Figure 1



Definitions of communicable diseases can be found in the Health Topic Index on the Massachusetts Department of Public Health website at [www.state.ma.us/dph](http://www.state.ma.us/dph), and on the Centers for Disease Control and Prevention website at [www.cdc.gov/health](http://www.cdc.gov/health).

<sup>1</sup> Fiscal Year 2002 covers the time period of July 1, 2001 to June 30, 2002.

## 1.2 Communicable Disease Rates and Frequencies: Brookline, Newton, and Wellesley

Figure 2 provides the communicable disease case rates for Brookline and the nearby, socioeconomically similar towns of Newton and Wellesley. The formula used to calculate case rates is:  $(\text{Number of reported cases of disease} / \text{Town population}) \times 100,000$ .

Figure 2

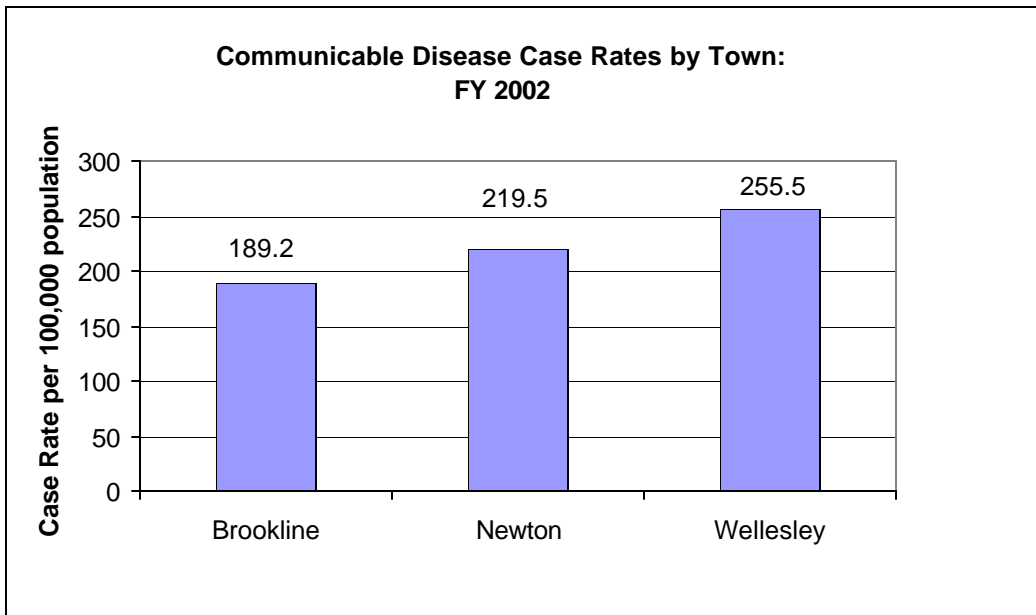


Table 1 provides the frequencies and case rates for each communicable disease reported in Brookline, Newton, and Wellesley during FY 2002. Due to the small number of cases for each disease, it is advisable to avoid drawing conclusions about differences between towns.

**Table 1: Reported Communicable Diseases in Brookline, Newton, and Wellesley, MA for FY 2002**

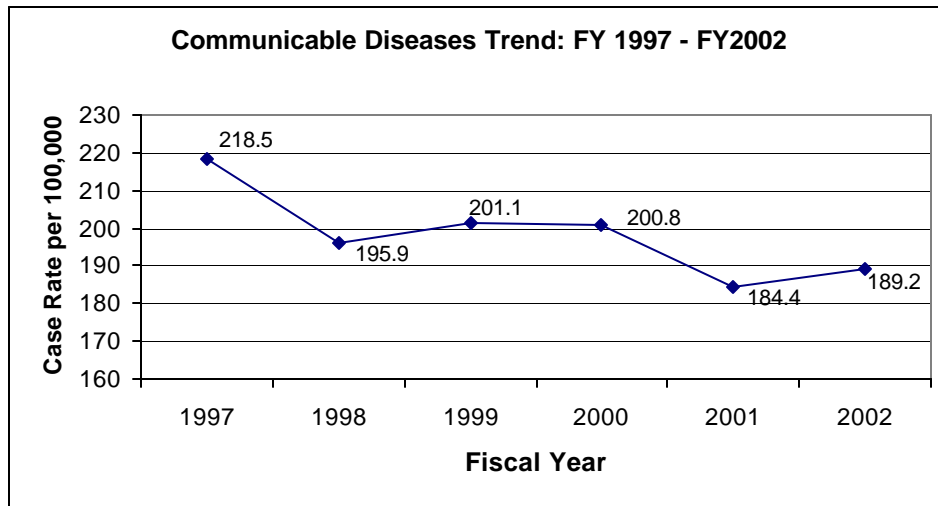
<i>Disease</i>	<i>Brookline</i>		<i>Newton</i>		<i>Wellesley</i>	
	<b>Number of Cases</b>	<b>Case Rate*</b>	<b>Number of Cases</b>	<b>Case Rate*</b>	<b>Number of Cases</b>	<b>Case Rate*</b>
Amebiasis	3	5.4	0	0.0	0	0.0
Babesiosis	0	0.0	1	1.2	1	3.8
Bacterial						
Meningitis	1	1.8	0	0.0	0	0.0
Campylobacter						
Enteritis	14	25.2	27	32.2	6	22.6
Cryptosporidium	1	1.8	0	0.0	11	41.33
Cyclosporidium	0	0.0	1	1.2	0	0.0
E. Coli	1	1.8	2	2.4	1	3.8
Ehrlichiosis	0	0.0	0	0.0	1	3.8
Group A						
Streptococcus	1	1.8	0	0.0	0	0.0
Giardia	7	12.6	14	16.7	8	30.1
Hepatitis A	2	3.6	17	8.4	1	3.8
Hepatitis B	15	27.0	33	39.4	5	18.8
Hepatitis C	21	37.8	44	52.5	7	26.3
Legionella	0	0.0	0	0.0	1	3.8
Listeria	1	1.8	0	0.0	0	0.0
Lyme Disease	6	10.8	17	20.3	11	41.3
Malaria	0	0.0	1	1.2	0	0.0
Pertussis	8	14.4	4	4.8	2	7.5
Pneumococcal						
Pneumonia	1	1.8	0	0.0	0	0.0
Psittacosis	0	0.0	1	1.2	0	0.0
Salmonella	9	16.2	27	32.2	4	15.0
Shigella	0	0.0	3	3.6	0	0.0
Streptococcal						
Pneumonia	1	1.8	1	1.2	3	11.3
Tuberculosis	5	9.0	1	1.2	3	11.3
Varicella	4	7.2	0	0.0	3	11.3
Viral Meningitis	4	7.2	0	0.0	0	0.0
<b>TOTAL</b>	<b>105</b>	<b>189.2</b>	<b>184</b>	<b>219.5</b>	<b>68</b>	<b>255.5</b>

\* Case rate is per 100,000 population.

### 1.3 Communicable Disease Trends

The case rate of total reported communicable diseases in Brookline has been declining gradually over the past five years. (See Figure 3.) In 1997, the case rate was 218.5 per 100,000 population, compared to 189.2 per 100,000 in 2002.

Figure 3



At the same time, the past five years have seen changes in the types of diseases most frequently reported. The case rates of both Lyme disease and hepatitis C, for example, have increased since 1997. (See Figures 4 and 5.) These increases may reflect increased reporting of these diseases by health care providers (per changes in the Massachusetts Department of Public Health protocols), and/or an actual increase in cases.

Figure 4

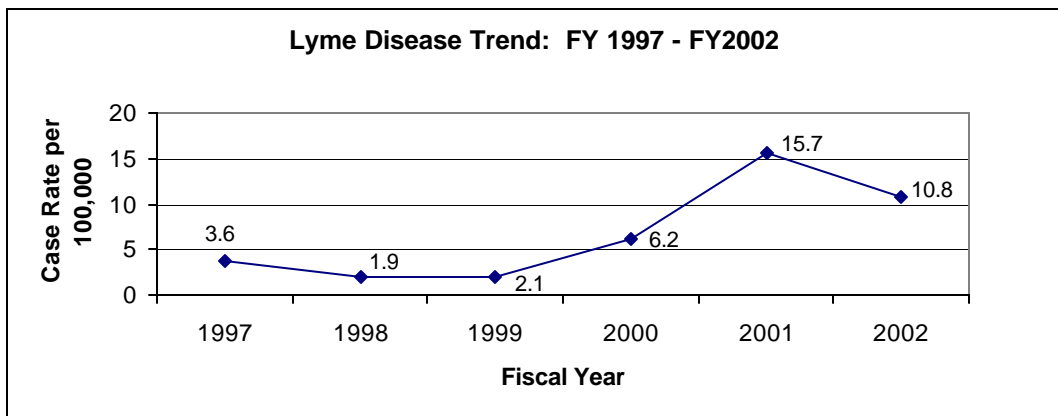
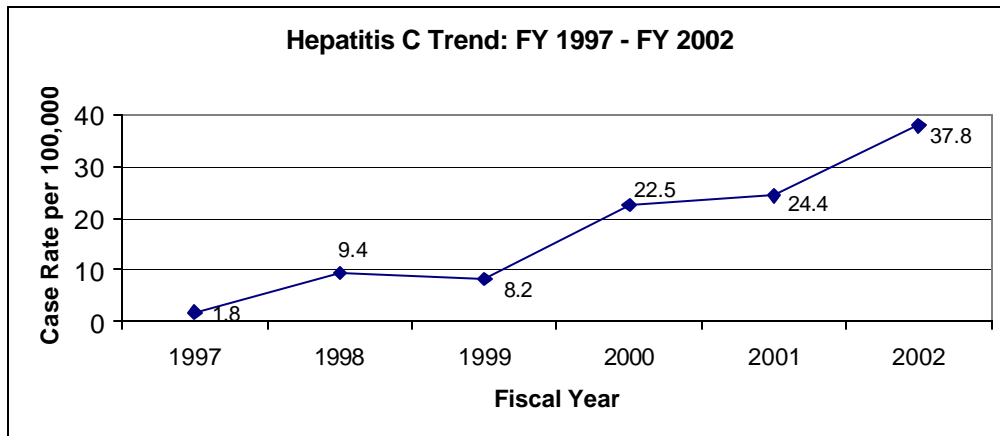


Figure 5



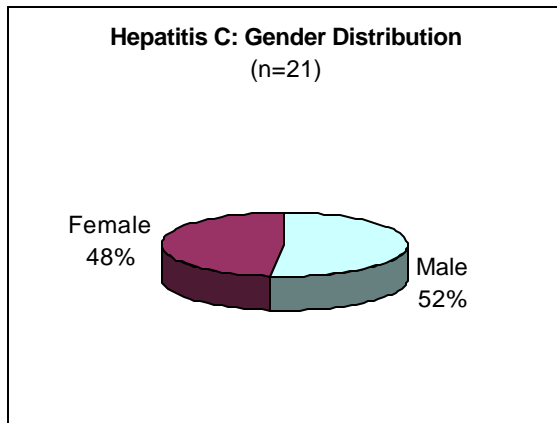
## 1.4 Hepatitis C

### 1.4a Demographic Characteristics

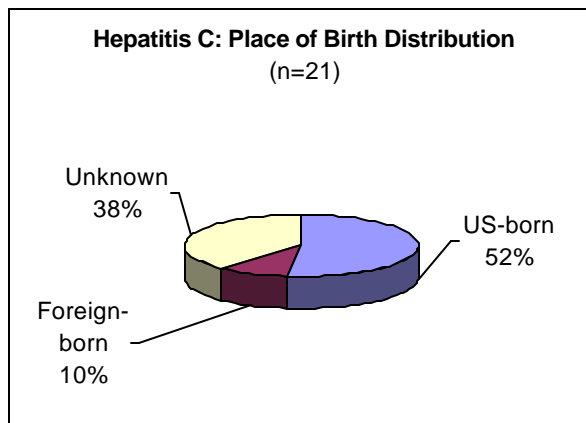
Twenty-one cases of hepatitis C were reported to the Brookline Health Department in FY 2002.

The average age of hepatitis C cases was 46 years; 52% of cases were male. Additional demographic data can be found in Figures 6-8.

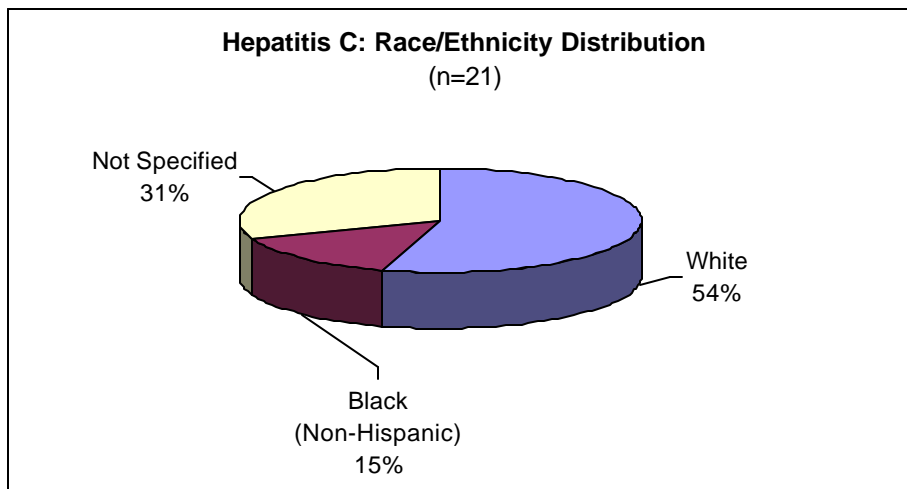
**Figure 6**



**Figure 7**



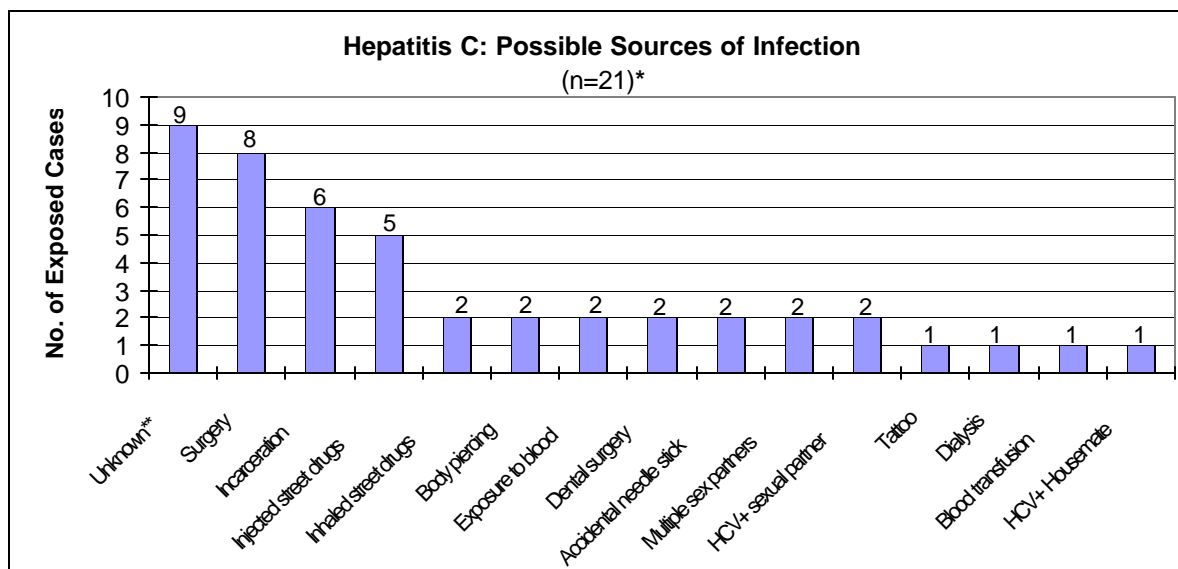
**Figure 8**



### 1.4b Possible Sources of Hepatitis C Infection

The hepatitis C virus (HCV) is transmitted when an opening in the skin or other tissue comes in contact with infected blood (or fluids containing blood). HCV is not spread through casual contact, such as hugging, kissing, or sharing utensils. Individuals diagnosed with hepatitis C are asked to report their possible sources of exposure to the virus. Figure 8 displays the potential infection sources reported by Brookline residents with hepatitis C. The most frequently reported potential exposures were surgery (8 cases), incarceration (6 cases), and injected street drugs (5 cases). Note that some persons were exposed to more than one source and that these exposures could have taken place at any point in a person's lifetime. Note also that blood transfusions and surgery have posed little or no risk of transmission since 1992 (the year the blood supply began being carefully checked for hepatitis C). Body piercings and tattoos also pose little or no risk of transmission if performed by a licensed practitioner using sterilized instruments.

Figure 9

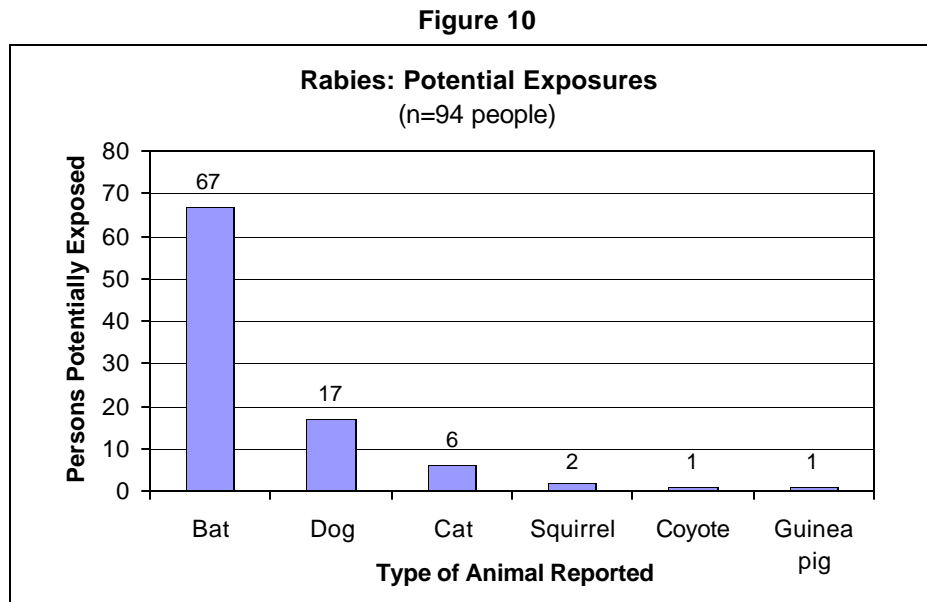


\*Some cases reported exposure to more than one source.

\*\*"Unknown" refers to cases who could not recall or did not report their exposures.

## 1.5. Rabies

Rabies is spread when an infected animal bites or scratches a human or animal. It may also be spread when the saliva of the infected animal touches an open wound, broken skin, or mucous membrane. In 2002, bats continued to find their way into Brookline homes, raising concerns about rabies. Sixty-seven people reported exposure to a potentially rabid bat, and 27 people reported contact with other potentially rabid animals. (See Figure 10.) No humans developed rabies.



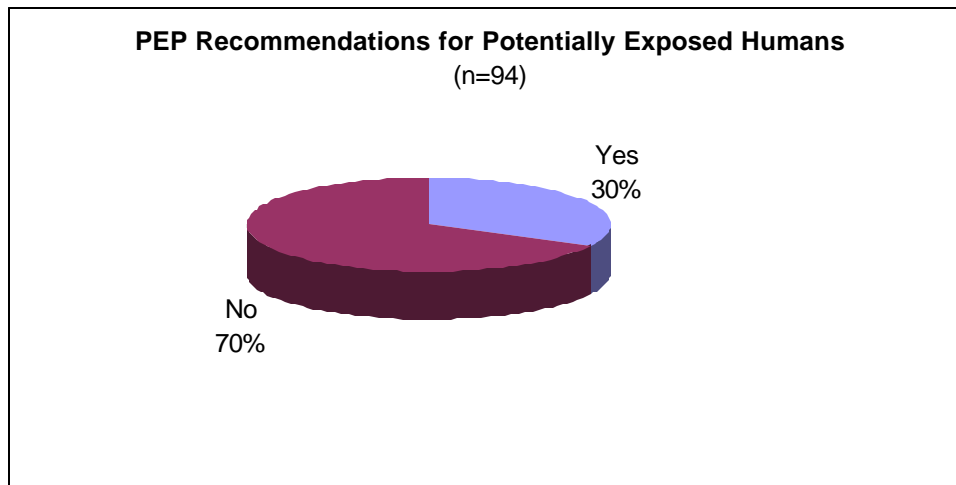
When an animal is suspected to have rabies, the recommended protocol is to either monitor the animal for symptoms, or to test it for rabies. In 2002, 54 reported bats (80%) were available for testing; of these, only one tested positive for rabies. A coyote also tested positive for rabies.

Approximately 82 Brookline pets also had contact with potentially rabid animals. Of these, one pet was found to be exposed to a rabid raccoon.



Medications to prevent the onset of rabies in potentially exposed humans are referred to as postexposure prophylaxis (PEP). BHD recommended PEP for 28 (30%) of the 94 people reporting exposure to potentially rabid animals. (See Figure 11.) In most cases, PEP was recommended because it was not possible to test or monitor the animal for rabies.

**Figure 11**



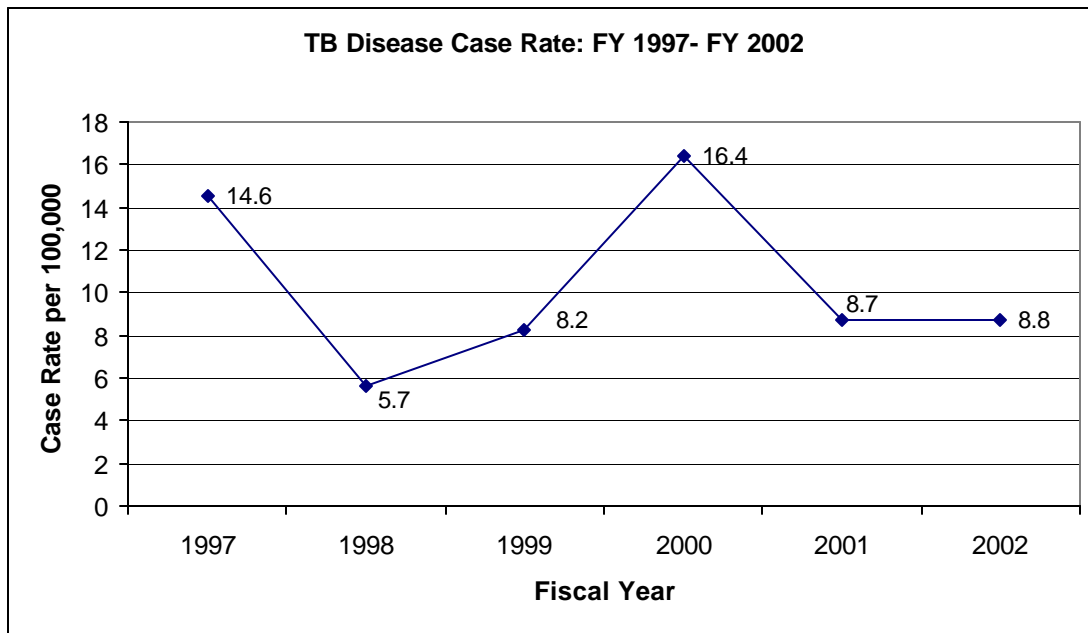
## 1.6. Tuberculosis

### 1.6a Active Tuberculosis Disease

Brookline had five cases of confirmed, active tuberculosis (TB) disease in FY 2002. Of the five cases, three were male and two were female. TB cases ranged in age from 18 to 76 years, with a mean age of 47 years. Three of the five cases were born outside the United States in countries where TB is more common.

In 2002, the case rate for confirmed active TB was 8.8 cases per 100,000 population. This is half the rate of TB reported in 2000 (16.4 per 100,000). (See Figure 12.) The differences between years are not likely to be significant, however, given the small number of cases.

Figure 12



Brookline's average five-year case rate for active TB is 6.7 cases per 100,000 population. In comparison, the average five-year TB case rate for the state of Massachusetts is 4.3 cases per 100,000 population.

The distribution of the primary sites of TB infection can be found in Table 2.

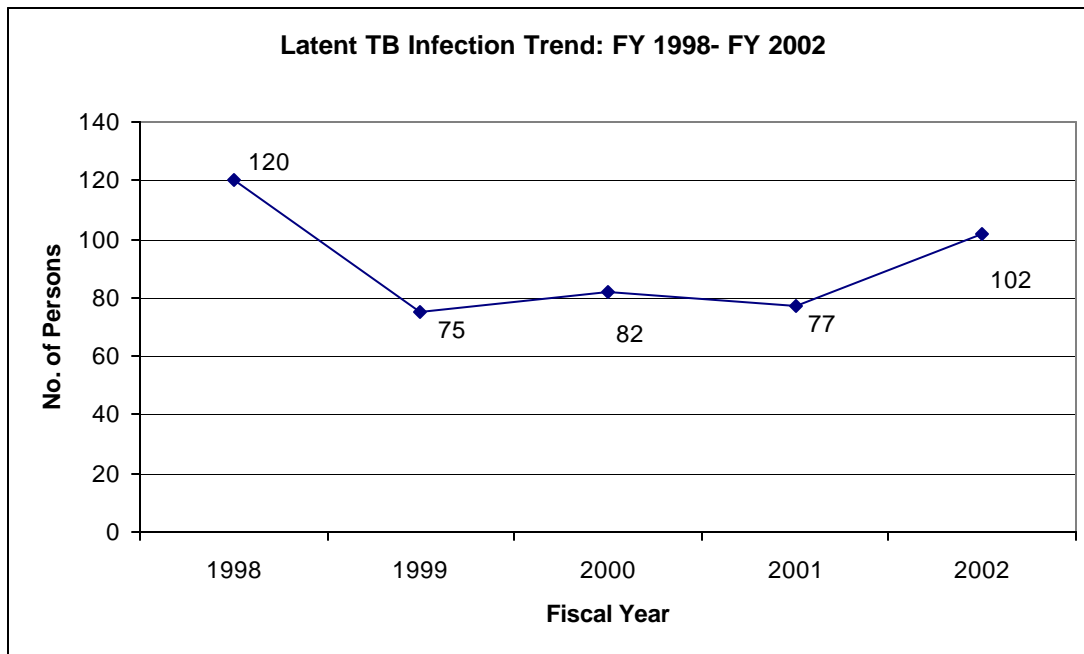
**Table 2: Primary Site of Infection for Active TB Cases**

<i>Primary Site of Infection</i>	<i>Cases</i>
Pulmonary	2
Clinical pulmonary	1
Pleura/extra pulmonary	1
Clinical/extra pulmonary	1

*1.6b Screening for Latent Tuberculosis Infection (LTBI)*

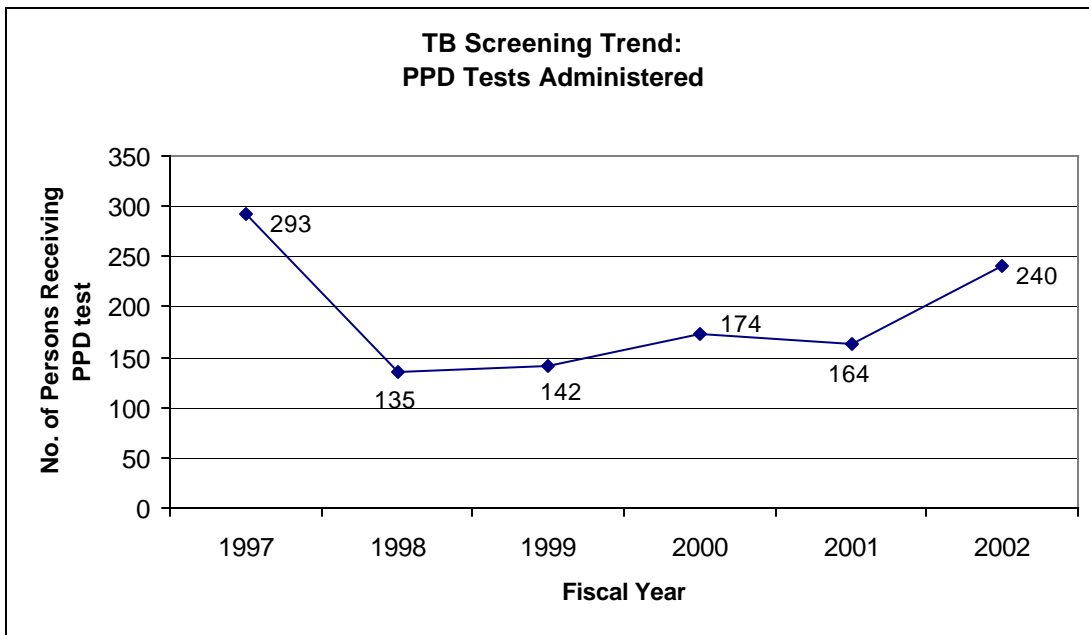
A person is diagnosed with latent tuberculosis infection (LTBI) if he/she has a positive skin test for TB but does not exhibit any symptoms. Persons with latent TB infection are not contagious. Because latent infection can develop into TB disease if the immune system becomes weakened, preventive therapy is recommended. In FY 2002, 102 new cases of LTBI were reported for Brookline. Brookline receives notice of most latent TB cases from the Massachusetts Department of Public Health.

**Figure 13**



Throughout the year, Brookline Public Health Nurses administer tuberculin reactivity skin tests (Mantoux PPD) to check persons exposed to active cases of TB, and to screen persons who need the test as a pre-employment requirement. In FY 2002, Brookline nurses administered 240 PPD tests, approximately 10% of which were positive. Figure 14 shows the TB screening trend over the last six years.

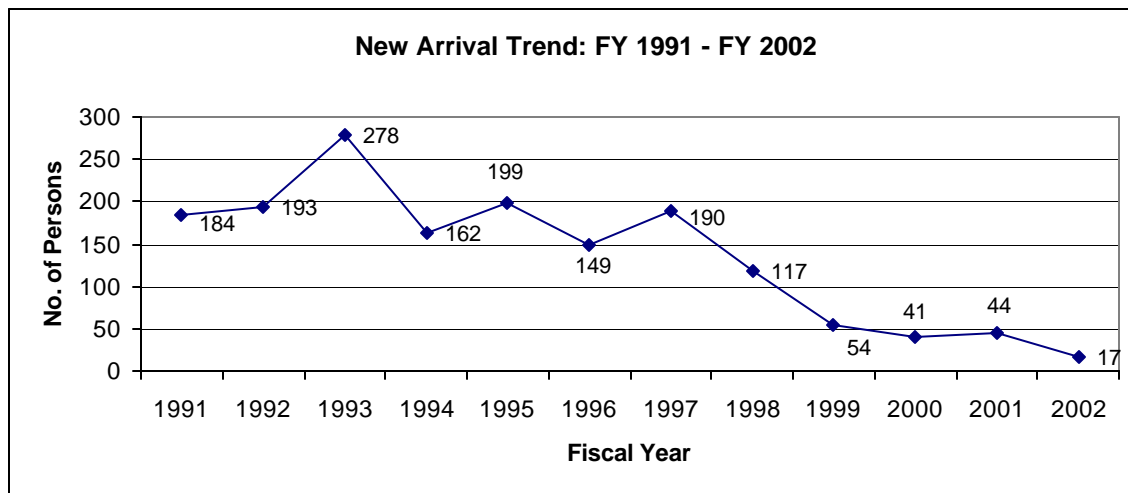
Figure 14



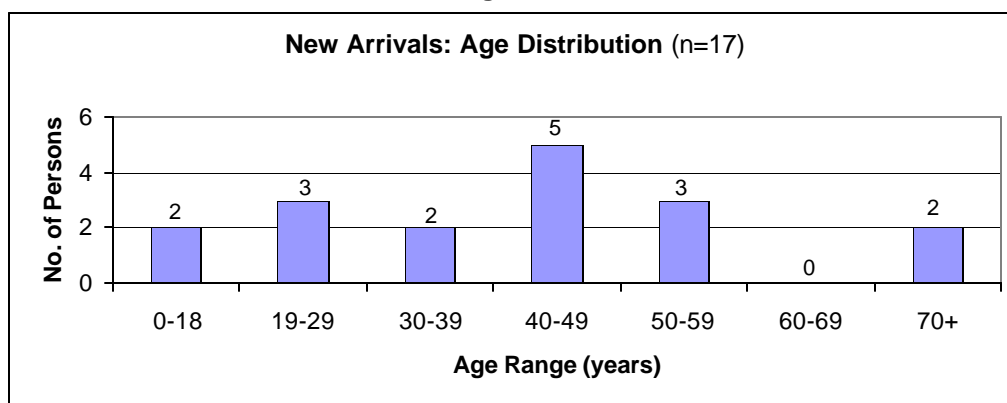
*1.6c New Arrivals to Brookline: Demographics and Tuberculosis Screening*

Each year, BHD receives data from MDPH on two types of immigrant groups settling in Brookline. These groups, referred to as “new arrivals,” include: 1) refugees, and 2) immigrants with latent or active TB. In FY 2002, Brookline reported the lowest number of new arrivals (17 total) since 1991. (See Figure 15). The majority of new arrivals were male (59%) and over 40 (59%). (See Figure 16).

**Figure 15**



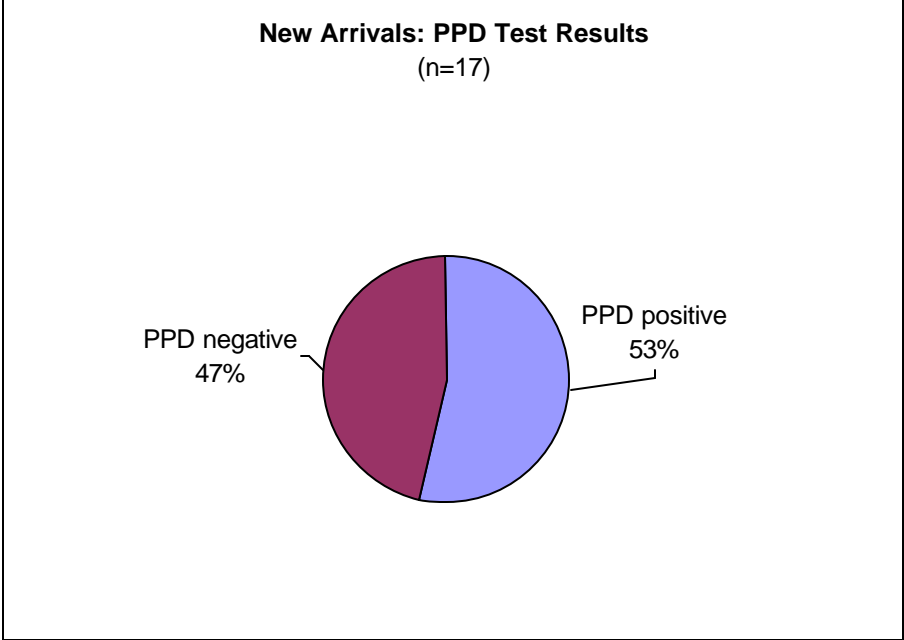
**Figure 16**



New arrivals came from countries of the former Soviet Union (76.5%) and China and Taiwan (24.5%). Those from the former Soviet Union usually arrive as cross-generational family units.

When tested for TB infection, 9 (53%) of the new arrivals had a positive PPD skin test result; all infections were latent.

**Figure 17**



## 1.7 West Nile Virus

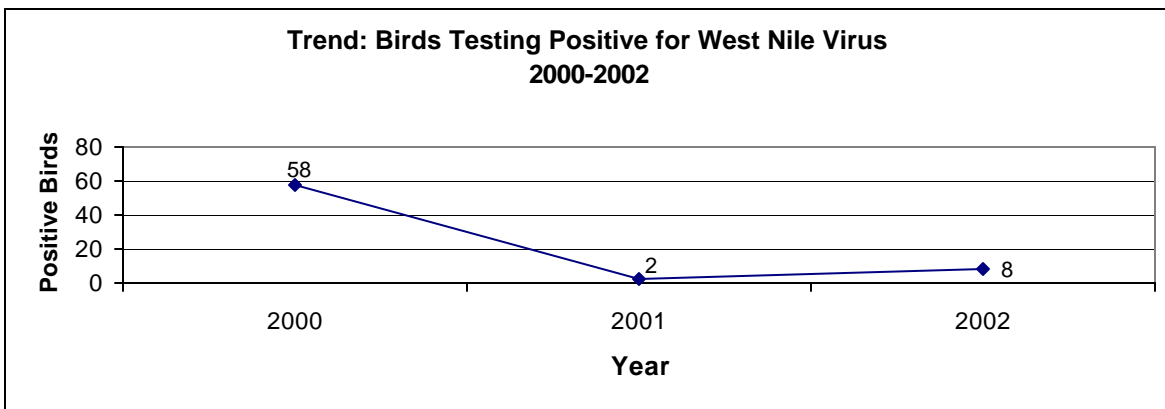
West Nile virus (WNV) was first detected in birds and mosquitoes in Brookline during the summer of 2000. In 2002, eight birds and one mosquito pool tested positive for WNV.

Table 3 and Figure 18 below show an apparent decline in WNV among birds since 2000.

**Table 3. West Nile Virus (WNV) among Dead Birds in Brookline, 2000-2002**

Year	Birds Reported	Birds Submitted for Testing	Birds WNV Positive
2000	175	85	58
2001	98	21*	2
2002	163	14*	8

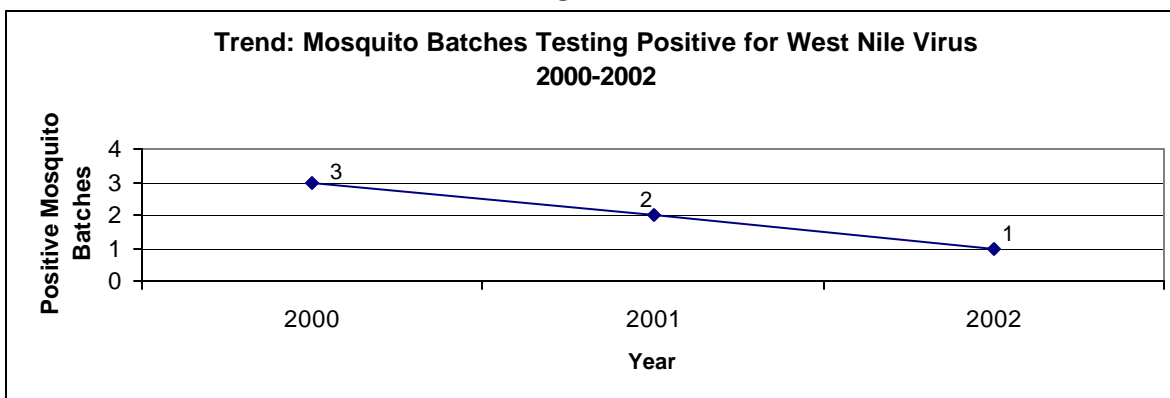
**Figure 18**



\* Refined reporting and testing procedures resulted in fewer birds being submitted for testing after 2000.

Likewise, Figure 19 demonstrates a decline in the number of mosquito pools testing positive for WNV. Brookline has had no human cases of WNV; however Massachusetts reported 25 cases, including 3 deaths, in 2002.

**Figure 19**



BHD has implemented several preventive measures to reduce the number of mosquitoes in Brookline. These measures include treating mosquito catch basins with larvicide, and reducing the amount of standing water found in parks, fields, yards, etc. Anecdotal evidence suggests a decline in the mosquito population since the implementation of these measures. BHD also disseminates educational messages about mosquito protection to all residents through mailings, hand-outs, and media coverage. Visit the BHD website for more information on WNV prevention: [www.townofbrooklinemass.com](http://www.townofbrooklinemass.com).



## **1.8 Outbreaks**

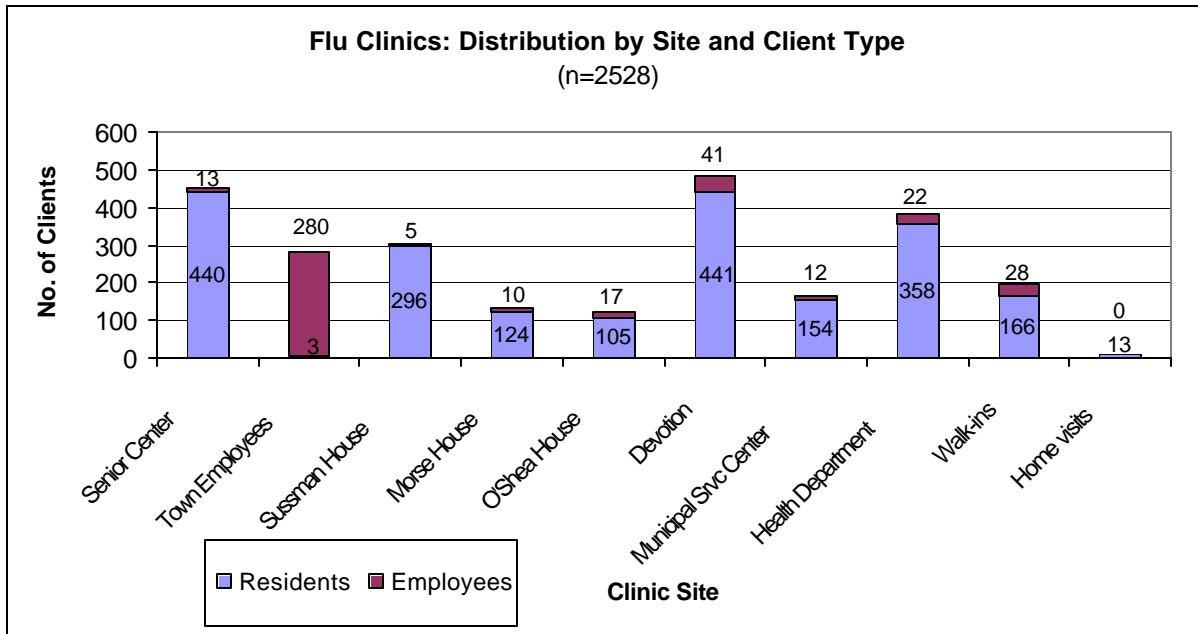
BHD investigated four disease outbreaks in Brookline in FY2002. Three outbreaks involved gastrointestinal (GI) symptoms and one involved a body rash of unknown etiology. The rash outbreak afflicted children and teachers in several schools across the nation, including two Brookline schools. The source of the rash remains a mystery. The GI outbreaks occurred among staff and students in a school, among residents and staff of a long-term care facility, and among guests at a private party. Inquiries into the GI outbreaks suggested viral, rather than bacterial or parasitic causes. Norovirus (previously known as Norwalk Virus), which causes the majority of viral GI outbreaks in the U.S., was the probable (though not confirmed) source of these outbreaks.

## SECTION 2: COMMUNICABLE DISEASE CONTROL

### 2.1 Flu Clinics

BHD held eight flu vaccine clinics for town residents and employees during the fall of 2001. The first four clinics targeted those at highest risk for flu (including the elderly, pregnant women, and the immunocompromised); one clinic was exclusively for town employees, and the other three clinics welcomed all residents. A total of 2321 people were vaccinated during these clinics. An additional 207 people were given vaccines at their homes or during a “walk-in” visit to the public health nurse’s office.

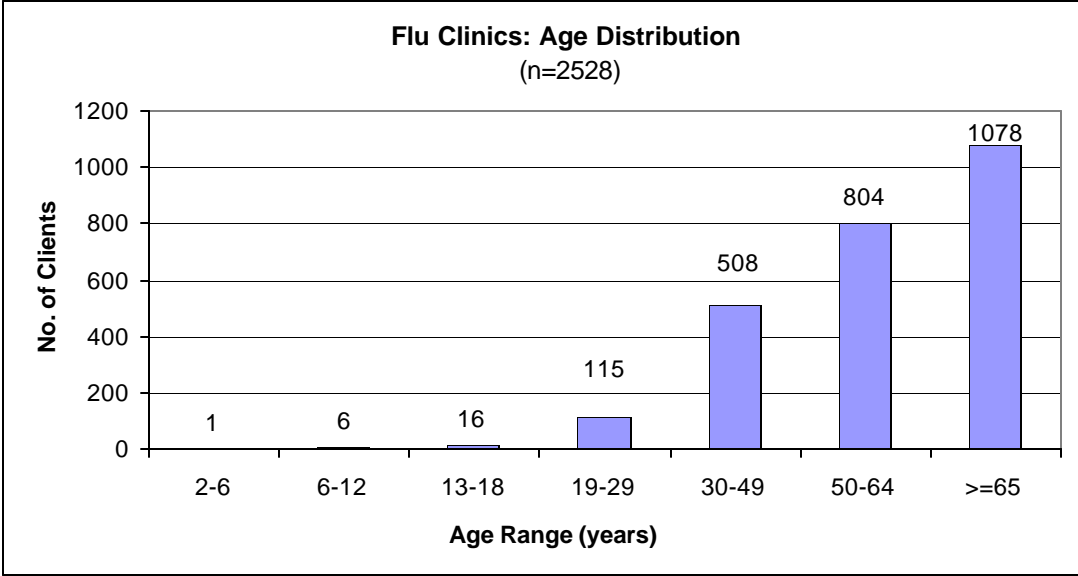
**Figure 20**



Overall, the flu clinics served 428 town employees (17% of all flu clinic clients) and 2100 town residents (83% of all clients). Although some town employees were also residents, they were counted only as employees.

The Centers for Disease Control and Prevention recommends giving priority vaccination to persons over 50 years, as they are at higher risk for developing influenza. Accordingly, the majority of Brookline’s flu clinic clients were over the age of 50 (74% of all clients). Age 65 and older was the most represented age group (43% of all clients).

**Figure 21**

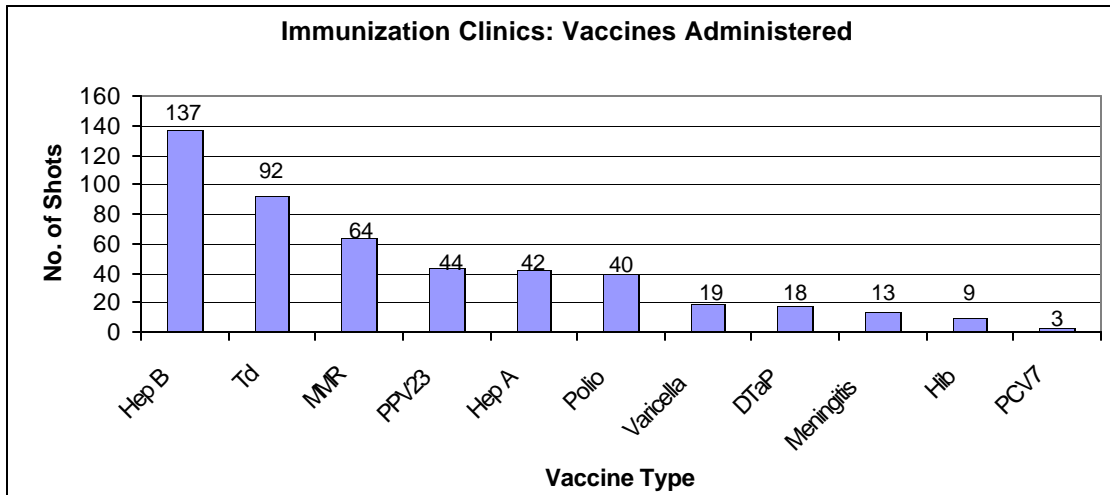


## 2.2 Other Immunization Clinics

In addition to flu clinics, BHD held other immunization clinics as needed during FY 2002.

These clinics are designed to serve children without access to health insurance and/or a regular source of primary health care. In total, 403 shots of vaccine were given to 276 clients during the year. The most frequently administered immunizations were for hepatitis B (137 shots), measles, mumps, rubella (64 shots), and tetanus-diphtheria (92 shots).

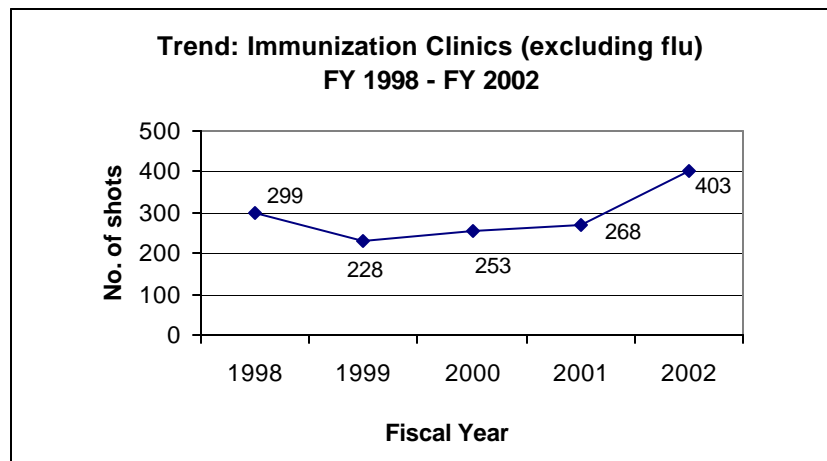
Figure 22



Key: Hep B = Hepatitis B; Td = Tetanus-Diphtheria; MMR = Measles, Mumps, and Rubella; PPV23 = Pneumococcal Polysaccharide Vaccine; Hep A = Hepatitis A; Varicella = Chickenpox; DtaP = Diphtheria, Tetanus, and Acellular Pertussis; Hib = Haemophilus influenzae serotype b; PCV7 = Pneumococcal Conjugate Vaccine

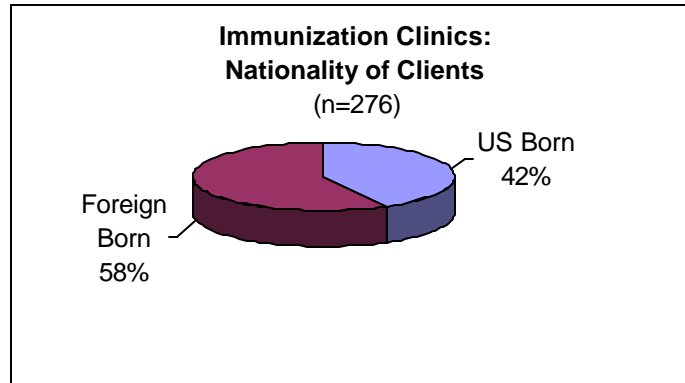
The total number of immunizations administered by BHD in FY 2002 was noticeably higher than in the previous five years, increasing from a low of 228 shots in 1999, to 403 shots in 2002.

Figure 23



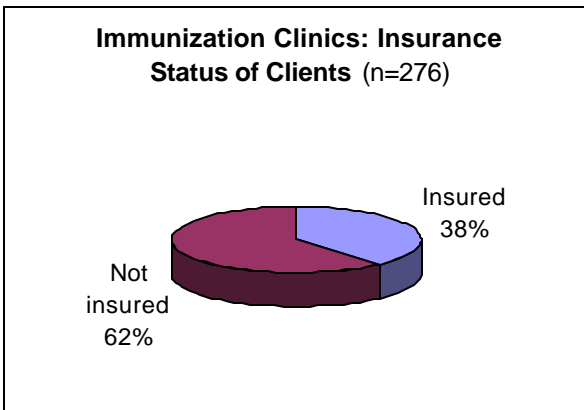
The median age of clinic clients was 15 years, with a range of 4 months to 71 years. Fifty-eight percent of clients were born in countries other than the U.S. (see Figure 24).

**Figure 24**

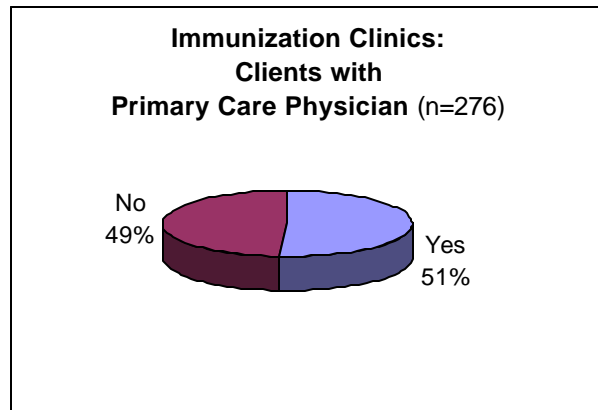


Sixty-two percent of clients had no health insurance, or had only limited coverage. In addition, 49% of clients had no usual source of primary care. (See Figures 25 and 26.)

**Figure 25**



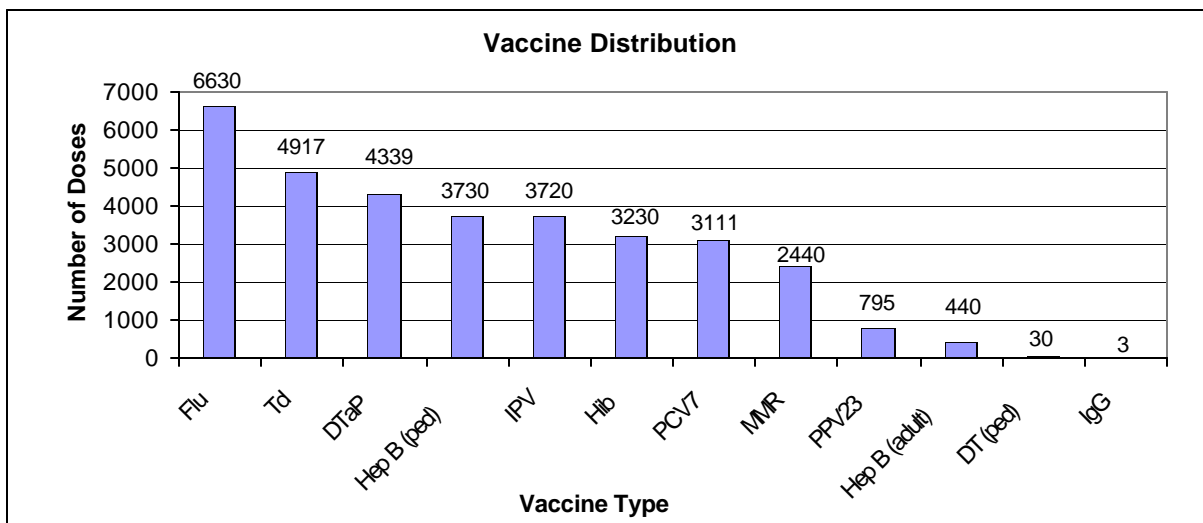
**Figure 26**



### 2.3 Vaccine Distribution

Each year, BHD, in partnership with the Massachusetts Immunization Program, distributes vaccines to Brookline health care providers as part of a community disease control program. In FY 2002, BHD gave out 33,385 doses of 12 types of vaccine to 39 health care providers. Flu represented the most frequently distributed vaccine (6630 doses). Other popular vaccines included childhood immunizations, such as tetanus-diphtheria (Td), diphtheria, tetanus, and acellular pertussis (DTaP), and poliovirus vaccine (IPV).

Figure 27



Vaccines: Td = Tetanus-Diphtheria; DTaP= Diphtheria, Tetanus, and Acellular Pertussis; Hep B = Hepatitis B; IPV = Inactivated Poliovirus Vaccine; Hib = Haemophilus influenzae serotype b; PCV7 = Pneumococcal Conjugate Vaccine; MMR = Measles, Mumps, and Rubella; PPV23 = Pneumococcal Polysaccharide Vaccine; DT = Pediatric Diphtheria-Tetanus; IgG = Immunoglobulin (Hepatitis A)

## 2.4 Anthrax Bioterrorism Response

Due to the sudden threat of anthrax bioterrorism in fall 2001, Brookline residents and business employees began to submit suspicious samples for laboratory testing. Between October 2001 and June 2002, 47 samples were submitted. No samples tested positive for *Bacillus anthracis*, the organism that causes the disease anthrax. As can be seen in Figure 28, the number of samples submitted in Brookline followed a pattern similar to that of national reports of anthrax victims. Figure 29 shows that 76% of samples were found in residences, 9% were found in businesses, and 15% were found in other locations, such as public sidewalks.

Figure 28

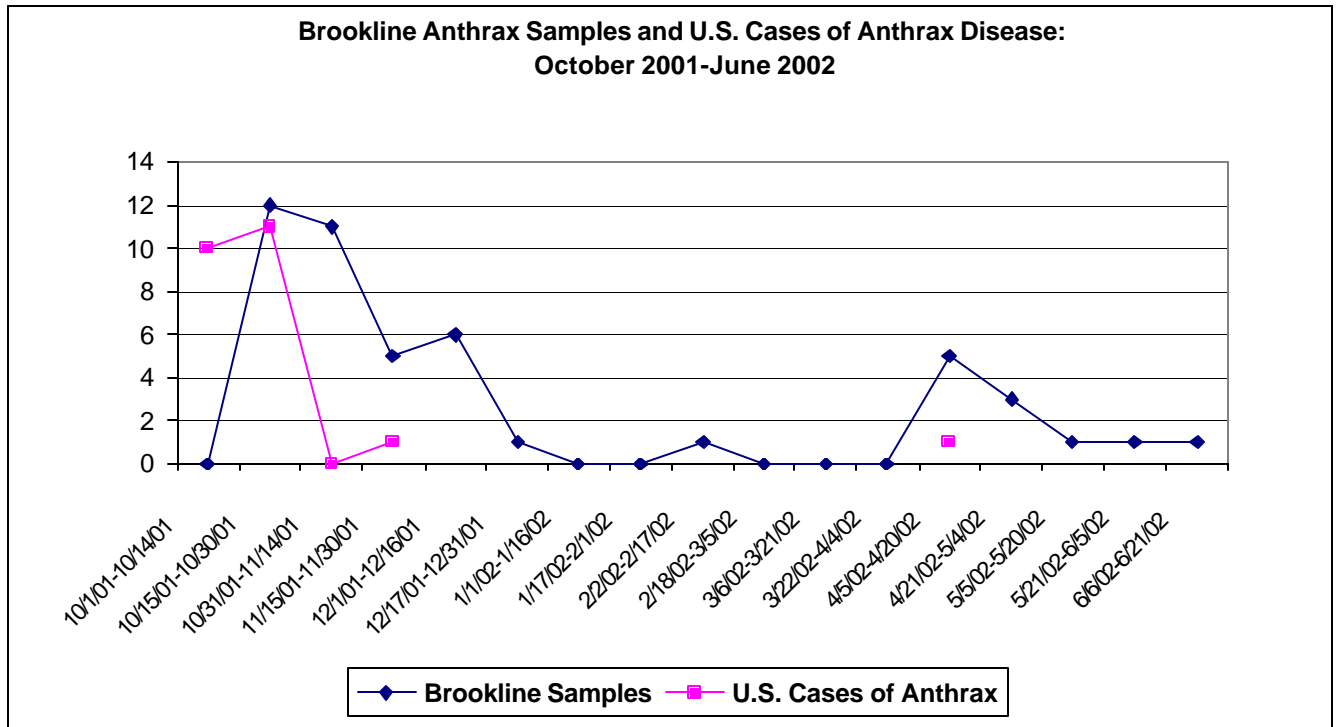
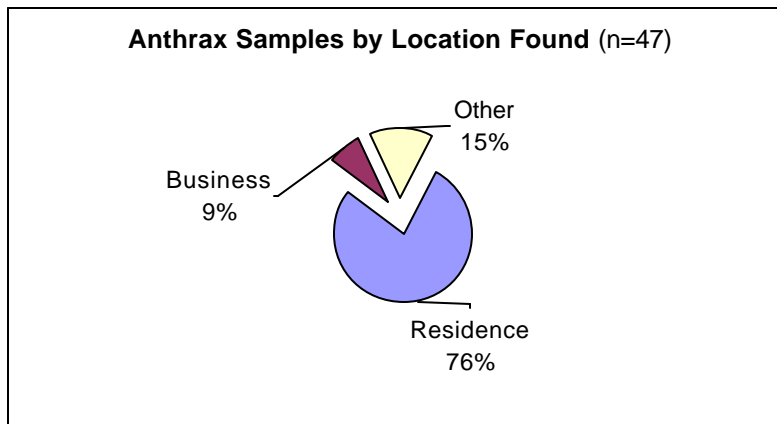


Figure 29



## SECTION 3: HEALTH MONITORING

### 3.1 Blood Pressure Clinics

BHD held 60 Blood Pressure Clinics (five sites per month) during FY 2002. Together, the clinics served a total of 833 visitors over the year. BHD provided an additional 65 blood pressure checks to walk-in visitors (see Figure 30). The majority of blood pressure clinics served returning clients (85%). (See Figure 31.)

Figure 30

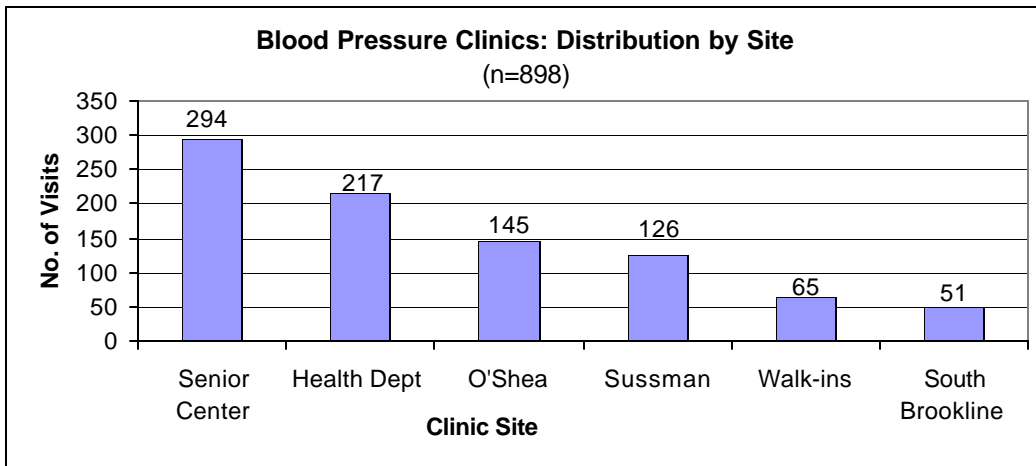
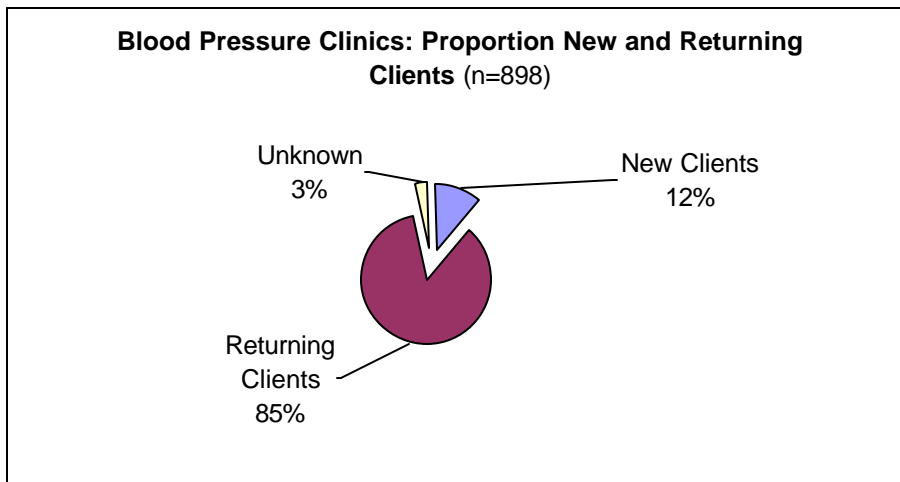


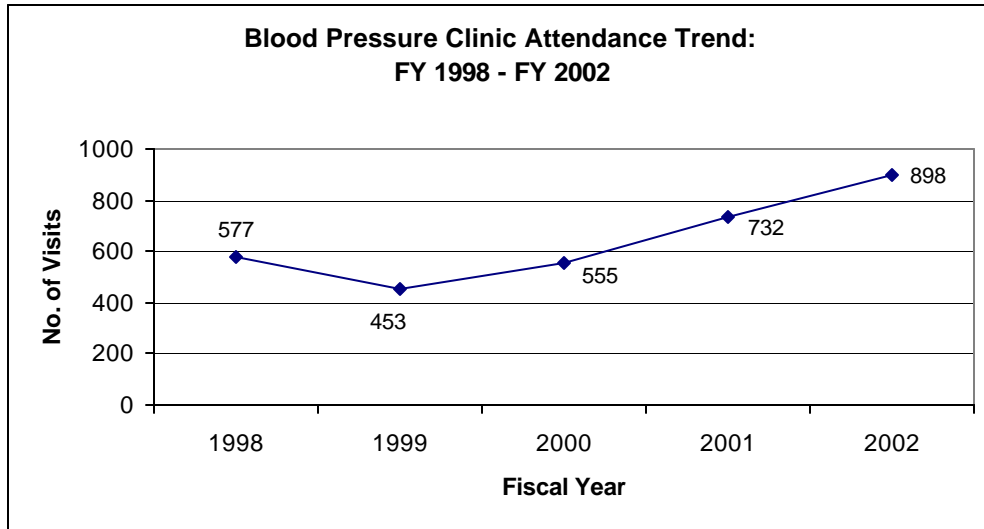
Figure 31





Attendance at blood pressure clinics has been increasing at a substantial rate over the last three years (from 453 clinic visits in 1999, to 898 visits in 2002). (See Figure 32.) The rise in attendance probably reflects an increase in referrals from health care providers, greater awareness of the program, the opening of the Senior Center, and the decision in 1999 to offer screenings at no cost.

**Figure 32**



### 3.2 Lead Testing

In FY 2002, BHD tested 24 children for lead in their bloodstream. All 24 children were within normal limits. The number of children presenting for lead tests has been increasing in recent years. In FY 2002, there were 20 more clients than in FY 2000, and 9 more clients than in FY 2001. This growth is due to increased referrals from daycare centers serving children without insurance.

Figure 33

