

Asthma in San Francisco

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November 2000

Introduction

Asthma is characterized by chronic inflammation of the airways leading to bronchoconstriction (narrowing of the airways) in response to “triggers”. This bronchial constriction causes the symptoms of asthma that can include wheeze, shortness of breath, and chronic cough in the absence of a respiratory infection. The proportion of people with symptomatic asthma has been increasing since the 1980’s. While there are several national reports that monitor trends in asthma prevalence, office and emergency room visits, hospitalizations and deaths, little of this information is available at the state or local level. Below, the available information for San Francisco is reviewed and evaluated.

Asthma Prevalence in San Francisco

Background:

The prevalence of asthma, the proportion of people with the disease, varies greatly depending on the definition of asthma used. Table 1, taken from a World Health Organization (WHO) report, compares prevalence estimates from several studies worldwide using several definitions of asthma. In all of these studies, active asthma was defined as the percent of children with wheeze in the past 12 months and evidence of airway hyper-responsiveness. This is compared with the percent of children ever diagnosed with asthma, the percent who ever wheezed, and the percent who were atopic (had high circulating levels of IgE antibodies reflecting a predisposition to allergies, and/or eczema). For example, in Australia in 1991, in 8 to 11 year old children, the prevalence of active asthma was 9.9%, while the prevalence of ever diagnosed asthma was more than 3-fold higher even though this was a population of young children. Almost 41% of children had “ever wheezed”. This table also shows that the prevalence of asthma varies greatly among certain subpopulations. For example, only 1.4% of Aborigines aged 7 to 12 from Australia had ever wheezed.¹ So, we expect the percent of children in a population who have ever been diagnosed with asthma to be much larger than the percent who have had active disease in the past year. This is important to remember when reviewing prevalence reports. Wheeze is often used to estimate the prevalence of undiagnosed asthma in children. When proxy symptoms are used such as “ever wheezed” the proportion of children is even greater since young children wheeze for reasons other than asthma. Studies that use active or ever wheezed will likely overestimate asthma prevalence. Studies that restrict their estimates to children with diagnosed asthma will likely underestimate the prevalence of asthma.

In the United States, there is no routinely collected information on asthma prevalence in children at the state or local level. However, each year, the National Health Interview Survey (NHIS) produces national estimates of asthma prevalence.² For this survey, active asthma was defined as “asthma in the past 12 months”. The prevalence of active asthma *doubled* between 1980 and 1992 and continued to rise until 1995. Whether increased prevalence of active asthma is a reflection of increased incidence (new diagnoses of asthma), increased duration of asthma due to exposure to triggers such as tobacco smoke, dusts and molds, or increased severity due to poor medical or environmental management is unknown. In 1997, the asthma questions were modified. They now asked who in the family had been diagnosed with asthma and for each person, if they still had asthma, if they had taken prescription medications for asthma in the past year and if they had a wheeze episode in the past year. A yes response to any of the follow-up

questions is defined as active asthma. The Council of State and Territorial Epidemiologists (CSTE) also recommends the use of these questions in state and local surveys so that information on asthma prevalence can be compared.³

In San Francisco, the Bayview Hunters Point Health and Environmental Assessment Task Force (BVHP HEATF) researchers conducted a community health survey (in collaboration with the University of California at San Francisco and the San Francisco Department of Public Health). Adults from each household were asked how many people in the household had asthma. In this survey, 1 in 6 children (15.5%, 95% CI 11.7-19.3%) were reported as having asthma. Prevalence was lower in non-elderly adults (7.4%, 95% CI 4.6-10.3%) and seniors (8.0%, 95% CI 2.3-13.7%). Overall, 10.0% (95% CI 7.8-12.4%) of people in Bayview Hunters Point have asthma.⁴ Because the question did not ask about people who had asthma in the past year, the results are not directly comparable to the National Health Interview Survey (NHIS). However, we would expect a lower prevalence nationally because of the more restrictive definition of asthma used in that survey.

What We Know:

- In 1995, the national prevalence of self-reported active asthma was 5.6% across all ages and 7.4% in 5-14 year olds.
- Nationally, prevalence was higher in African-Americans (6.9%), people living in large cities (5.9%) and people with household incomes less than \$10,000 (7.9%).² NHIS does not provide estimates for the prevalence of asthma in African-American or poor children.
- Using 1995 NHIS data, Centers for Disease Control and Prevention (CDC) estimated that 7.1% of California residents would have symptomatic asthma in 1998⁵.
- Special studies in children have shown much higher asthma prevalence in Chicago, the Bronx, and San Diego, indicating the importance of collecting local data.⁶
- To measure the prevalence of asthma in San Francisco, special studies of city residents are necessary. To determine prevalence, a study must use a representative random sample and have a good response rate (generally 70% or greater). In order to understand prevalence trends, information needs to be collected every few years. These special studies should include the asthma questions recommended by CSTE³ so that local prevalence can be directly compared with state and national data.

The BVHP HEATF study in San Francisco meets these requirements. This study found that 1 in 10 people in Bayview Hunters Point (10.0%) had asthma nearly double the prevalence seen in large cities nationally although the definition of asthma in this neighborhood study was less restrictive than what is used nationally.⁴ A little fewer than 1 in 6 children (15.5%) were reported as having the disease.

Office and Emergency Room Visits for Asthma in San Francisco

Background:

In the past, rates of outpatient and emergency room visits for asthma could be determined for people on Medi-Cal. These data were used to estimate the prevalence of symptomatic asthma in a poor population. Unfortunately, with the advent of Medi-Cal managed care plans, these data are of poor quality partly because with capitation, managed care plans do not always track or report diagnoses for each encounter. Medi-Cal data after 1994 will likely underestimate the percent of children requiring outpatient and emergency room visits for asthma.

National data on office and emergency room visits for asthma are routinely collected as part of the National Ambulatory Medical Care Survey (NAMCS).⁶ These data are reported below.

What We Know:

- In the NAMCS, the annual rate of office visits for asthma was 54.3 per 1,000 in children aged 0 to 14 in 1995.
- Nationally, only 62.5 % of asthma visits by African-American persons were to physician offices, 11.5% were to hospital outpatient departments and 26.1% to hospital emergency rooms.
- The NAMCS found much higher rates of visits to hospital emergency rooms for asthma in African-American children than in white children (19.6 per 1,000 children vs. 4.5 per 1,000).

Asthma Hospitalizations in San Francisco

Background

Severe asthma can result in a hospitalization; however, as an outcome measure, hospitalizations do not necessarily reflect the proportion of people with asthma. Without prevalence data, it is difficult to understand whether higher asthma hospitalization rates are a reflection of greater prevalence, greater severity or poorer medical and environmental management of disease. Asthma is considered to be an ambulatory care sensitive condition because with consistent and effective ambulatory care, a large proportion of hospitalizations are preventable.

Hospitalization discharge diagnoses for all conditions are routinely reported to the State of California's Office of Statewide Planning and Development. These data include information on age, county of residence and ZIP code of all people who were hospitalized for asthma. Emergency room visits are not currently reported.

National estimates of asthma hospitalization rates are produced as part of the National Hospital Discharge Survey (NHDS), a representative sample of hospitalization discharges from each state. Asthma hospitalization rates for the city have been produced as part of 5 different reports. Table 2 describes the characteristics of each of these reports. All of the reports include data from overlapping years. Only the unique contributions of each report will be described below.

What We Know:

1. National Hospital Discharge Survey (1979-1994)

Table 3 shows asthma hospitalization rates overall and for certain subgroups from 1979 to 1994. This table serves as a point of comparison for San Francisco hospitalization rates discussed in this report. Nationally, asthma hospitalization rates have not increased since 1979 except in young children aged 0-4 years and African-Americans.⁵ Rates have declined slightly in whites. The average annual hospitalization rate in the nation is 181 admissions per 100,000 people. Hospitalization rates are highest in African-Americans (355/100,000) and children younger than 5 (497/100,000).

2. CDHS County Chartbook (1991-1994)

The California Department of Health Services compared age-adjusted asthma hospitalization rates for each California county for the years 1991 to 1994.⁷ Rates were given for four ethnic groups and two age groups (0-14 years and all ages), but county hospitalization rates were not calculated. In this report, Asians were included with "Other Race/Ethnicity". All rates were compared to the state average rate (130 hospitalizations per 100,000 population per year) and Healthy People 2000 National Health Promotion and Disease Prevention Objective for asthma hospitalizations (160 per 100,000). These target goals, produced by the U.S. Public Health Service, are based on the input of thousands of clinicians, public health professionals, community activists as well as the staff of numerous federal agencies.

The rates in San Francisco are shown in Tables 4 and 5. Note that the statewide asthma hospitalization rate from 1991-1994 is much lower than the national rate. An update of the chartbook which reports on hospitalization rates from 1995-1997 was released in August, 2000. Results from the updated chartbook are also reviewed in this report.

- In San Francisco, the highest rates were found in African American children (805 per 100,000). Rates in this group were higher than in 24 counties of 30 for which rates could be calculated.
- From 1991-1994, San Francisco had higher hospitalization rates than any other county for Hispanic (556 per 100,000) and Asian/other children (443/100,000) aged 0-14 years, and had the 2nd highest hospitalization rates in non-Hispanic white children (345 per 100,000).
- Statewide rates in African-Americans were more than triple that of non-Hispanic whites, the same pattern that is seen in national hospitalization rates.

3. Community Health Mini-Profile (1991-1992)

In 1997, S.F. asthma hospitalization rates from 1991 to 1992 were presented in a report on community health in San Francisco.⁸ These data were originally collected as part of a larger study of preventable hospitalizations. Rates for 9 Medical Service Areas (groups of ZIP codes that were labeled as neighborhoods on plots) were presented for 3 age groups. Rates were not age-adjusted and confidence intervals were not presented, so differences in neighborhood rates due to chance or differences in age composition cannot be determined from the data provided. Hospitalizations in which asthma was not a primary or "first-listed" condition were also included. This is different from all other reports mentioned in Table 2.

- The highest hospitalization rates in children aged 0-18 years were found in Medical Service Study Areas (groups of ZIP codes) containing Bayview Hunters Point and the Tenderloin.
- Non-elderly adults (19-64) living in Bayview Hunters Point had the highest hospitalization rates in the city.⁸
- In San Francisco children, rates were higher than the state average in all Medical Service Study Areas. This is consistent with the CDHS chartbook reports.

4. San Francisco Department of Public Health Analysis (CHEDC) (1996)

The San Francisco Department of Public Health calculated 1996 hospitalization rates for three age groups for each ZIP code in the city.⁹: 0-14 years, 15-64 years and 65 and older. Rates were not age-adjusted, but confidence intervals were presented. The results are presented in Figures 1-3.

- In adults (ages 15 to 64 years), the highest rates were in 94124, Bayview Hunters Point. Other ZIP codes with high rates were 94102 (Tenderloin), 94115 and 94134. In elderly people, no one ZIP code clearly had higher rates. In the youngest age group (0 to 14 years), no ZIP code clearly had the highest rates when chance differences were considered. However, ZIP codes with higher rates included 94110 (Mission), 94115 (Western Addition, Japantown, Pacific Heights), 94124 (Bayview Hunters Point) and 94134 (Visitacion Valley/Sunnydale).
- Since rates in Bayview Hunters Point were only highest in the 15 to 64 year age group, elevated rates seem to be explained by excess hospitalizations in this group.
- To be able to more clearly identify ZIP codes with higher rates, it was decided to analyze three years of hospitalization data (see RAMP analysis)

5. RAMP Analysis (1994-1996)

The Bay Area Regional Asthma Management and Prevention Initiative (RAMP) compared San Francisco hospitalization rates for the period 1994 to 1996 with those of Alameda, Contra Costa and Solano counties.¹⁰ Age-adjusted rates were calculated for four ethnic groups and for each ZIP code. Two age groups were analyzed: children (ages 0 to -14 years) and all ages. San Francisco is part of the RAMP 4-county collaborative.

- From 1994-1996, San Francisco and Alameda counties had almost identical hospitalization rates overall. In both counties hospitalization rates were more than double those of Solano and Contra Costa counties.
- In African-American children (who nationally have far higher rates of hospitalization than any other group), Alameda County had the highest hospitalization rates for asthma; 1001 children per 100,000 were hospitalized. African-American children living in San Francisco also had very high hospitalization rates, 785 per 100,000.

- Rates among Latino children were much higher in San Francisco than in any of the other counties. The asthma hospitalization rate in Latino children in San Francisco was higher than the rate in African-American children in Solano county.
- All ages were used when comparing rates across ZIP codes (see Figure 1). In San Francisco, 94124 (Bayview Hunters Point) had the highest hospitalization rates (491 per 100,000, 95% CI 441-541) (see Figure 1). Other ZIP codes with higher rates included 94102 (Tenderloin), 94103 (SoMa), 94115 (Western Addition) and 94134 (Vis. Valley / Sunnydale). Several ZIP codes in Alameda County had rates equivalent to those seen in Bayview Hunters Point (see Figure 2). Hospitalization rates in these ZIP codes were consistent with rates found in several ZIP codes in Alameda County.
- The hospitalization rates in Bayview Hunters Point were equivalent to those seen for African Americans in San Francisco (478 per 100,000).
- The RAMP report also compared asthma hospitalization rates to Healthy People 2000 National Health Promotion and Disease Prevention Objectives. In San Francisco, 9 of 21 ZIP codes had rates above the target of 160 hospitalizations per 100,000 population per year. In Alameda County, 19 of 39 ZIP codes were above the goal. By comparison, only one ZIP code of 8 was above the goal in Solano County. In all but Solano County, hospitalization rates in African-American children were above Healthy People 2000 target goals.
- Hospitalization rates in children aged 14 years and under by ZIP code for each participating county were produced but not presented in the final report because of instability in the estimates using only 3 years of data. However, these plots indicated that in this age group, hospitalization rates for asthma were substantially higher in the following zip codes: 94115 (includes Western Addition), 94124 (Bayview Hunters Point), 94134 (Visitacion Valley) and 94107 and 94103 (includes the Tenderloin). Only 7 of 18 ZIP codes in San Francisco had asthma hospitalization rates consistent with Healthy People 2000 objectives (225 per 100,000).

6. CDHS County Chartbook Update (1995-1997)

The California Department of Health Services compared age-adjusted asthma hospitalization rates for each California county for the years 1995 to 1997.¹¹ This report is similar in structure to the first chartbook but includes overall county rates. In this report, rates for Asians are presented separately.

- Of all California counties, San Francisco had the 6th highest hospitalization rates. Alameda County had the 5th highest.
- In the All Ages analysis, San Francisco's race-specific rates were statistically significantly higher than state rates for each ethnic group and overall.
- In children 14 years and under, San Francisco had the 4th highest hospitalization rates. Alameda County ranked #2 for all California counties.

- Hospitalization rates for African-American children in San Francisco County (664 per 100,000) were not significantly different from statewide rates (678 per 100,000).
- As in the previous chartbook report, the statewide rate in African-Americans was about three times that of non-Hispanic whites. This is the same pattern that is seen in national hospitalization rates.
- The CDHS report recommends that prevention strategies focus on African-Americans, particularly black boys (age 0 to 14 years) who had the highest statewide hospitalization rates (850 per 100,000).

Comparison of Asthma Hospitalization Rates over Time, 1991-1994⁷ and 1995-1997^{6, 11}

Hospitalization rates in each ethnic group declined. In whites and Hispanics the declines were significant for both children and all ages (see Tables 4 and 5). In fact in the later report, Latinos and whites had very similar rates (134 vs. 128 per 100,000). However, disparities between African-American and white rates increased in the second period (Table 6).

In Table 6, changes in San Francisco's "rank" among all California Counties is compared for both time periods. In the all ages analysis, San Francisco's rank was similar from one period to the other for each ethnic group. However, in African-American children, San Francisco's rank fell from 6th to 9th and rates in white non-hispanic children fell from #2 to #6. The sharp decline in rates in Asian children (from 443 to 213 per 100,000) is probably due to a change in the category in the 2 reports. Asian hospitalizations were combined with "other race/ethnicity" in the first chartbook report but not in the second.

Comparison of San Francisco , U.S. and Statewide Hospitalization Rates

From 1993-1994⁶, the average hospitalization rate in the U.S. was 181 per 100,000 compared to 190 per 100,00 in San Francisco from 1994 to 1996⁹ (the time interval that most closely corresponds with the national data for which county-level data is available). During this time period, hospitalization rates among non-hispanic whites were almost identical to the national average (107 per 100,000 vs. 109/100,000). Among African-Americans, rates were 34% higher in San Francisco (477 vs. 355 per 100,000). National data from other ethnic groups were not presented.⁷

In both time periods in which San Francisco was compared to all other counties in the state, San Francisco had rates that exceeded the state average for each ethnic group. In fact, San Francisco ranked in the top 10 of California Counties for each ethnic group (see Tables 4 and 5). However, statewide asthma hospitalization rates were much lower than the national average (130 and 120 per 100,000 vs. 181 per 100,000).

Asthma Mortality in San Francisco

Background:

Information on asthma deaths is available from the State of California, Department of Vital Statistics.¹² The most recent mortality data available is for 1997 (see Table 7). In adults over 35, it is hard to distinguish deaths due to asthma and deaths due to other chronic obstructive pulmonary diseases such as emphysema so asthma mortality data in adults 35 and older is much less reliable.

What We Know:

- There were 281 asthma deaths between 1987 and 1997; over half of the deaths were in people aged 65 and older.
- According to vital statistics data, between 1987 and 1997, only one person under the age of 18 died from asthma; an 8-year old child who died in 1987.¹² (See footnote of table).

Conclusion

Since there is no routinely collected prevalence data at the state or local level, we are dependent on national data to determine groups that have a higher burden of asthma. National data indicate that African-Americans and children have the highest prevalence of asthma. A recent CDC report estimated that the prevalence of active asthma (asthma diagnosis and symptoms in the past 12 months) in California is 7.1%.⁵ Assuming San Francisco is like the rest of California, the best estimated prevalence of asthma would be 7.1%; that is, about 1 in 15 people have the disease. Since rates are generally higher in children, it is conceivable that 1 in 10 children, on average, in San Francisco have active asthma.

Hospitalization data indicate that San Francisco County has a higher than average hospitalization rate relative to other counties in the State, but that the rate is only slightly higher than the national average. The San Francisco ZIP code with the highest rate of asthma hospitalizations is 94124 (Bayview Hunters Point). Since Bayview Hunters Point rates are equivalent to several other ZIP codes when children and elderly are examined, these rates appear to be due to excess hospitalizations among non-elderly adults (ages 15 to 64 years). In 1996, the ZIP code with the highest asthma hospitalization rate in children 14 years and under is 94115 that contains the Western Addition. Even when 3 years of data were examined, estimates were too imprecise to determine if hospitalization rates were truly higher in this zip code than in Bayview Hunters Point, the Tenderloin and the Mission districts.

RAMP and California Department of Health Services data indicate that San Francisco has a very similar profile to Alameda County^{7,10,11}. Regional collaboration for both asthma surveillance and interventions is warranted.

Citywide hospitalization rates have declined from 1991 to 1997. Still, while rates in all ethnic groups have declined, the gap in rates between African-American and white children has increased.

Hospitalizations are a rare, severe, and costly outcome of asthma. Without prevalence data, it is impossible to determine whether the source of higher hospitalization rates is higher prevalence, greater disease severity, or poor environmental or medical management.

There has been one death due to asthma in a child since 1987. Since all asthma deaths are theoretically preventable, the 281 deaths that were observed in the last 11-year period could be reduced substantially.

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Table 1. Prevalence of Asthma in Children in Studies Using Airway Hyperresponsiveness as a Test

Country	Year	Age	Number	Current Asthma [#]	Ever Diagnosed Asthma	Ever Wheeze	Airway Hyper.	Atopy
Australia	1982	8-10	1487	5.4	11.1	21.7	10.1 (H)	29.3
	1988	8-11	1217	6.7	17.3	26.5	10.0 (H)	31.9
	1991	8-11	1575	9.9	30.8	40.7	16.0 (M)	37.9
New Zealand	1981	9	813	11.1*	27.0	---	22.0 (M)	45.8
	1988	6-11	1084	9.1	14.2	27.2	22.0 (H)	----
	1989	12	873	8.1*	16.8	26.6	12.0 (E)	----
England	1980	----	1613	8.0*	----	14.8	----	----
Wales	1989	----	965	5.3	12.0	22.3	8.0 (E)	----
Indonesia	1981	7-15	406	1.2	2.3	14.5	2.2 (H)	24.1
China	1988	11-17	3067	1.9	2.4	6.3	4.1 (H)	~30
Papua, New Guinea	1985	6-20	257	0	0	1.7	1.0 (H)	17
Kenya	1991	9-12	402	3.3	11.4	----	10.7 (E)	----
Australia (Aborigines)	1991	7-12	215	0.1	0	1.4	2.8 (H)	20.5

SOURCE: Global Initiative for Asthma, "Global Strategy for Asthma Management and Prevention: NHLBI/WHO Workshop Report"¹

[#] Current asthma is defined as airway hyperresponsiveness + wheeze in the last 12 months.

* Indicates a figure calculated from published data. H = Histamine challenge; M = Methacholine challenge; E = Exercise challenge

Table 2. Reports of Asthma Hospitalization Rates

Report	Years Used	Age Groups	Geography, Race/Ethnicity Groups	Age Adjustment	C.I. or S.E.
California County Asthma Hospitalization Chartbook ⁷	1991-1994	0-14; All Ages	State, Race-specific rates for each county in California	✓*	✓
Community Health Mini-Profile ^{8#}	1991-1992	0-18; 19-64; 65+	Medical Service Areas (groups of ZIP codes), S.F. only	NONE	NONE
S.F. DPH Analysis ^{9**}	1996	0-14; 15-64; 65+	Zip Codes in S.F.	NONE	✓
RAMP – 4 County Analysis ¹⁰	1994-1996	0-14; All Ages	County, Race/County, Zip-codes in Alameda, SF, Contra Costa and Sonoma counties	✓*	✓
Update of California County Asthma Hospitalization Chartbook ¹¹	1995-1997	0-14; All Ages	State, County, Race-specific rates for each county in California	✓*	✓
National Hospitalization Discharge Survey ⁶	1979-1994	0-4, 5-14, 15-34, 35-64, 65+, All Ages	National, Race (African-American, White, Other), Sex, Time Trends	✓#	✓

Rates for all California studies were calculated using population data from the 1990 Census; *Age-adjusted using 1990 Census data. # Age-adjusted using 1970 Census data; # This report included hospitalizations where asthma was listed as a secondary condition; **Replaced by RAMP-4 County Analysis; C.I.= Confidence Interval, S.E.= Standard Error, either conveys the stability of the estimate.

Table 3. Estimated average rates* of hospitalizations for asthma as the first-listed diagnosis by race, sex, and age group – United States, National Hospital Discharge Survey, 1979-1984

Category	1979-1980	1981-1983	1984-1986	1987-1989	1990-1992	1993-1994
Race						
White	142	162	159	141	119	109
African-American	260	348	332	381	401	355
Age group (years)						
0-4	343	428	485	522	583	497
5-14	159	192	189	187	206	180
15-34	87	95	95	95	93	100
35-64	182	203	190	167	154	152
>=65	315	336	375	352	297	256
Total	176	200	205	198	197	181

Source: Asthma Surveillance Summaries⁵; *Per 100,000 population. ; Age-adjusted to the 1970 US Population

Table 4. Comparison of Rates per 100,000, 1991-1994 and 1995-1997 (Preliminary Results)

Ethnic Group	Children (0-14)				All Ages			
	1991-1994	RR*	1995-1997	RR*	1991-1994	RR*	1995-1997	RR*
White, non-hispanic	345	1.00	221	1.00	151	1.00	128	1.00
African-American	805	2.33	664	3.00	515	3.41	463	3.62
Hispanic	556	1.61	351	1.59	208	1.37	134	1.05

Source: California Dept. of Health Services County Asthma Hospitalization Chart Book, 1997⁷; 2000¹¹

*RR=relative rate, relative to white, non-hispanic children.

Table 6. Comparison of Rates per 100,000 and Ranks, 1991-1994 and 1995-1997 (Prelim. Results), All Ages

Ethnic Group	1991-1994			1995-1997		
	Rate	Rank	# Counties*	Rate	Rank	# Counties*
White, non-hispanic	151 (143, 158)	7	57	128 (119-173)	8	55
African-American	515 (490, 540)	5	35	463 (435-492)	5	29
Hispanic	208 (195, 222)	2	39	134 (122-147)	4	34
Asian/Other**	177 (168, 186)	1	36	113 (106-121)	1	23

Source: California Dept. of Health Services County Asthma Hospitalization Chart Book, 1997⁷; 2000¹¹.

* Rates were not computed for counties with fewer than 20 cases. ** Category was defined as Asian/Other in 1991-1994 and Asian/PI in 1995-1997 report.

Table 7. Comparison of Rates per 100,000, 1991-1994 and 1995-1997, Children 0-14 Years

Ethnic Group	1991-1994			1995-1997		
	Rate	Rank	# Counties*	Rate	Rank	# Counties*
White, non-hispanic	345 (313-378)	2	52	221 (193-252)	6	44
African-American	805 (740-872)	6	30	664 (594-737)	9	23
Hispanic	556 (505-610)	1	35	351 (310-393)	2	30
Asian/Other** or Asian	443 (410-177)	1	29	213 (189-239)	1	16

Source: California Dept. of Health Services County Asthma Hospitalization Chart Book, 1997⁷; 2000¹¹.

* Rates were not computed for counties with fewer than 20 cases

Table 8. Asthma Deaths in San Francisco, 1987-1997¹²

AGE	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Total
0-18*	1	0	0	0	0	0	0	0	0	0	0	1
19-24	0	1	0	0	0	0	0	1	0	1	0	3
25-44	3	4	3	2	2	4	3	4	4	0	6	35
45-64	13	10	9	6	7	4	7	6	10	7	7	86
65+	15	10	15	8	18	17	14	14	19	13	13	156
total	32	25	27	16	27	25	24	25	33	21	26	281

*A widely publicized death in 1997 in which a 15-year old died at a bus stop in front of a high school was due to cardiomyopathy and not asthma. According to the Medical Examiner's office, asthma was not listed as an underlying or contributing condition in the autopsy report.

Figure 1. 1996 S.F. Asthma Hospitalization Rates by Zip Code (0-14 Years)

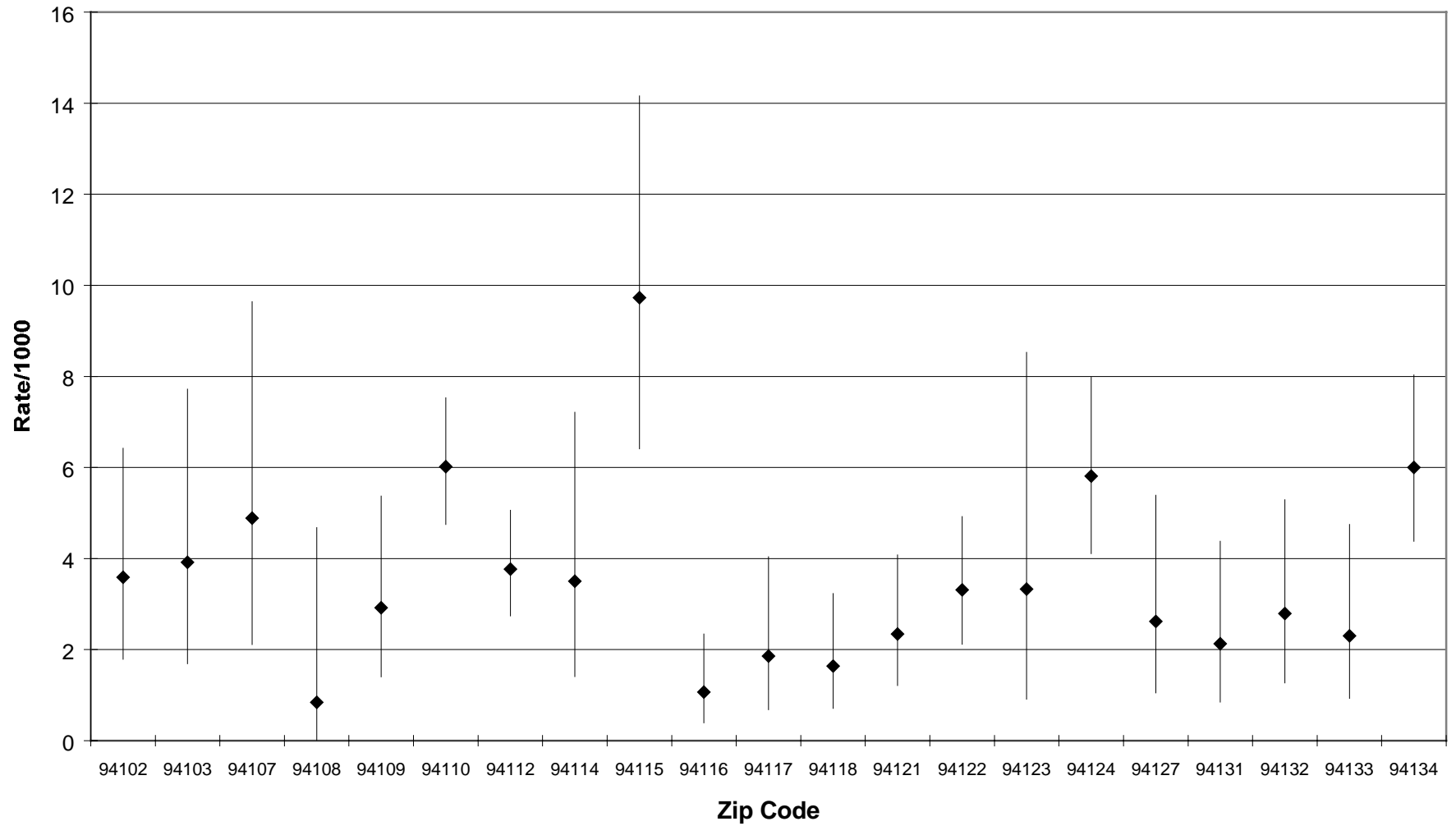


Figure 2. 1996 S.F. Asthma Hospitalization Rates by Zip Code (15-64 Years)

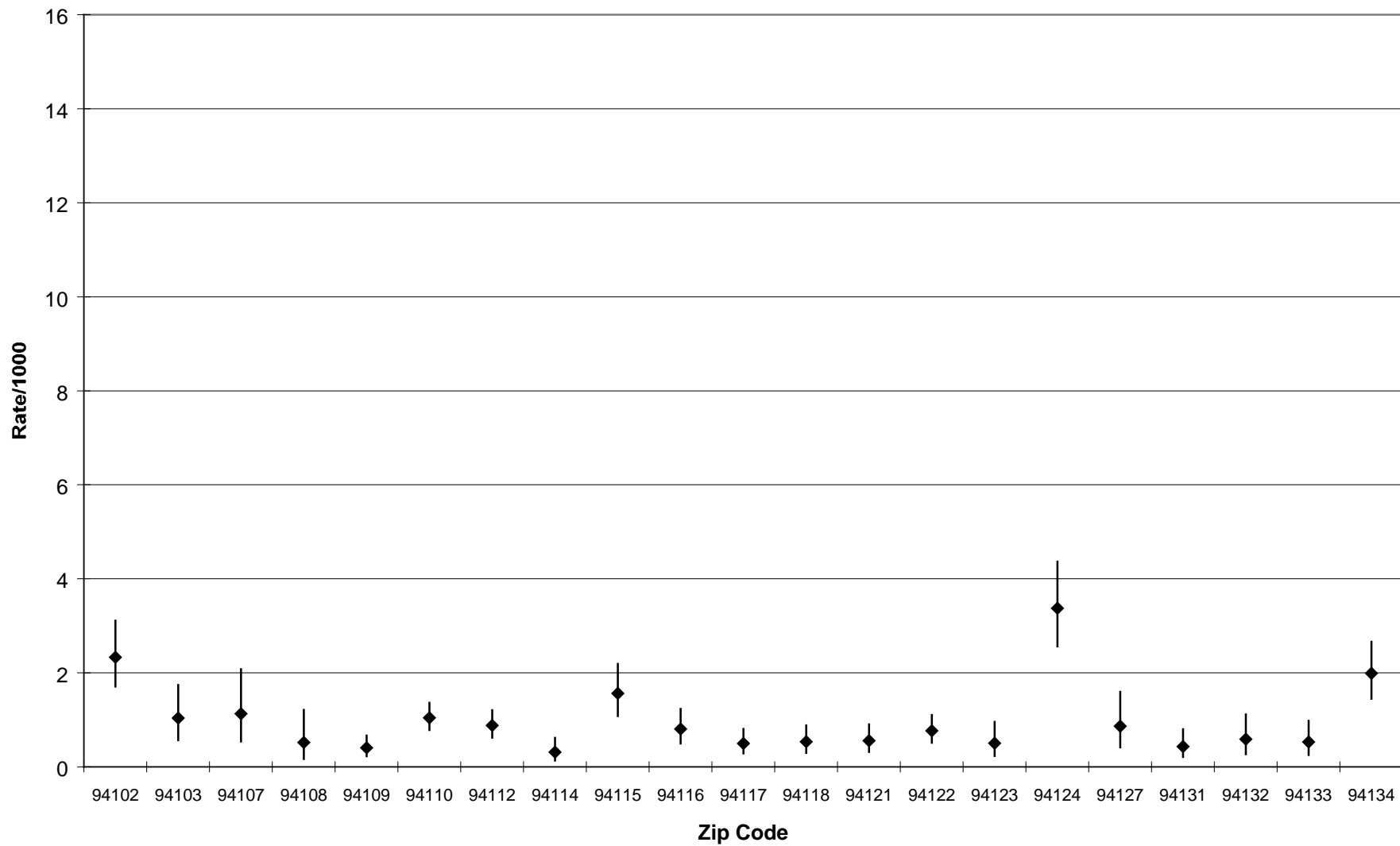
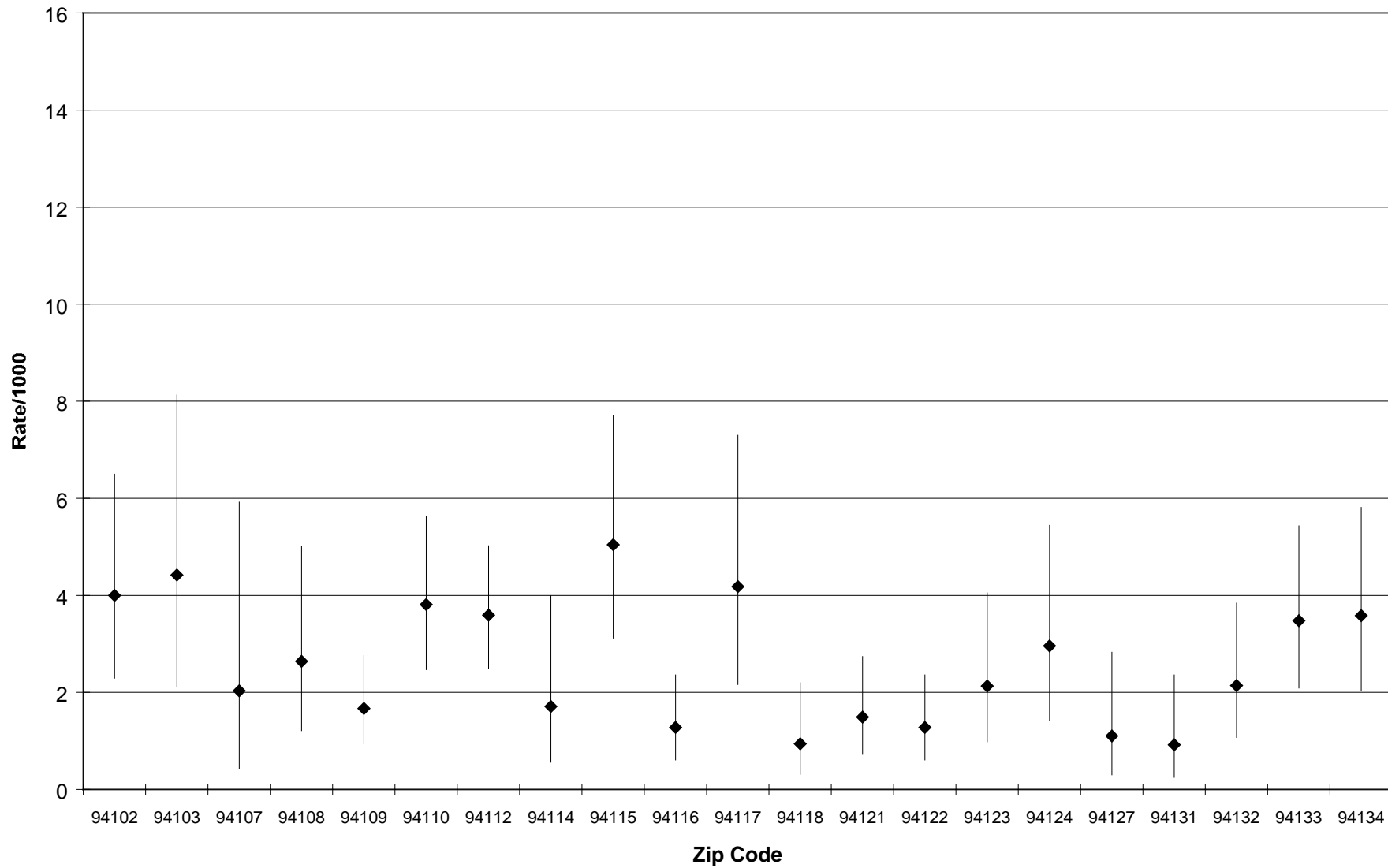
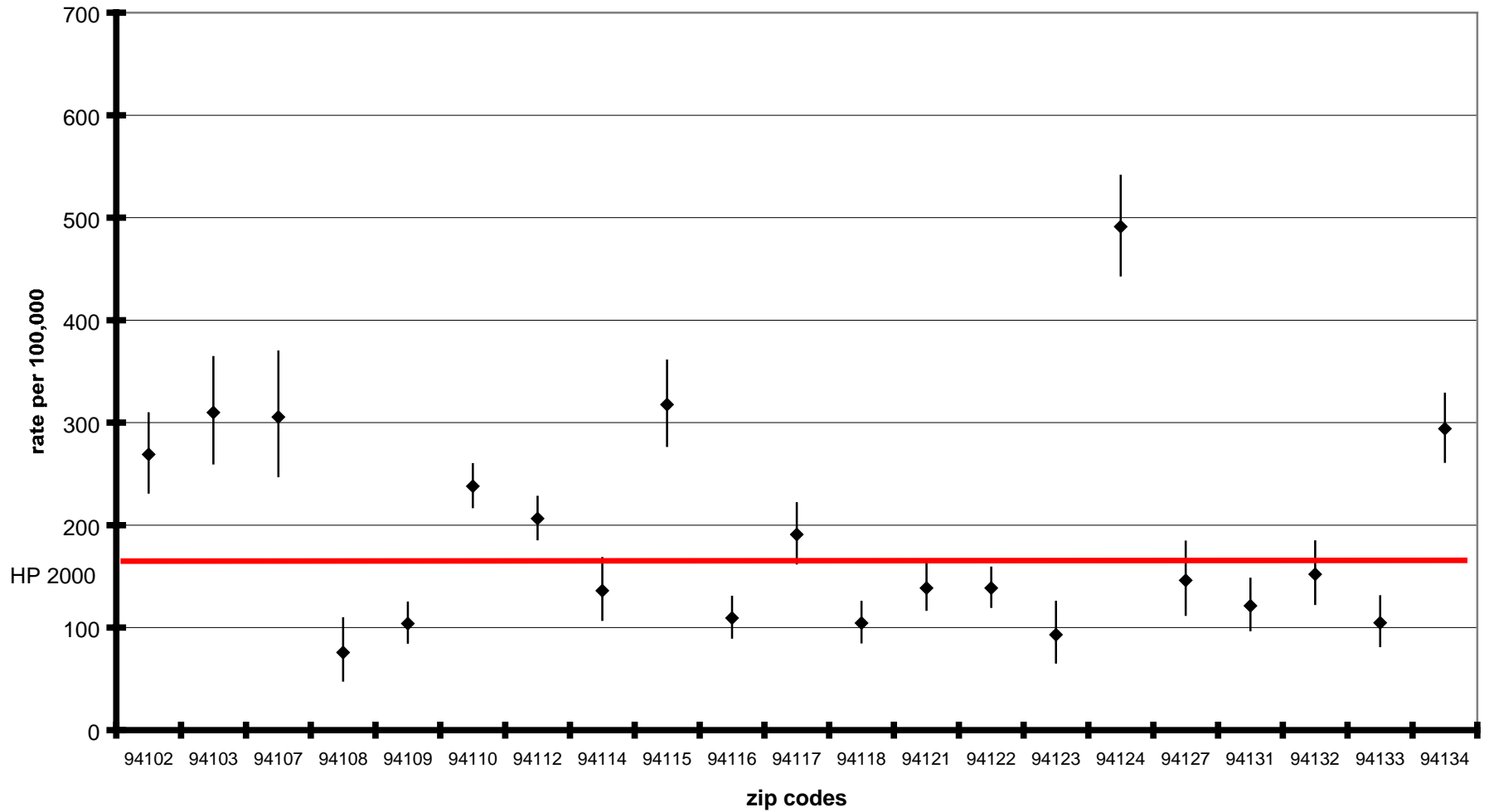


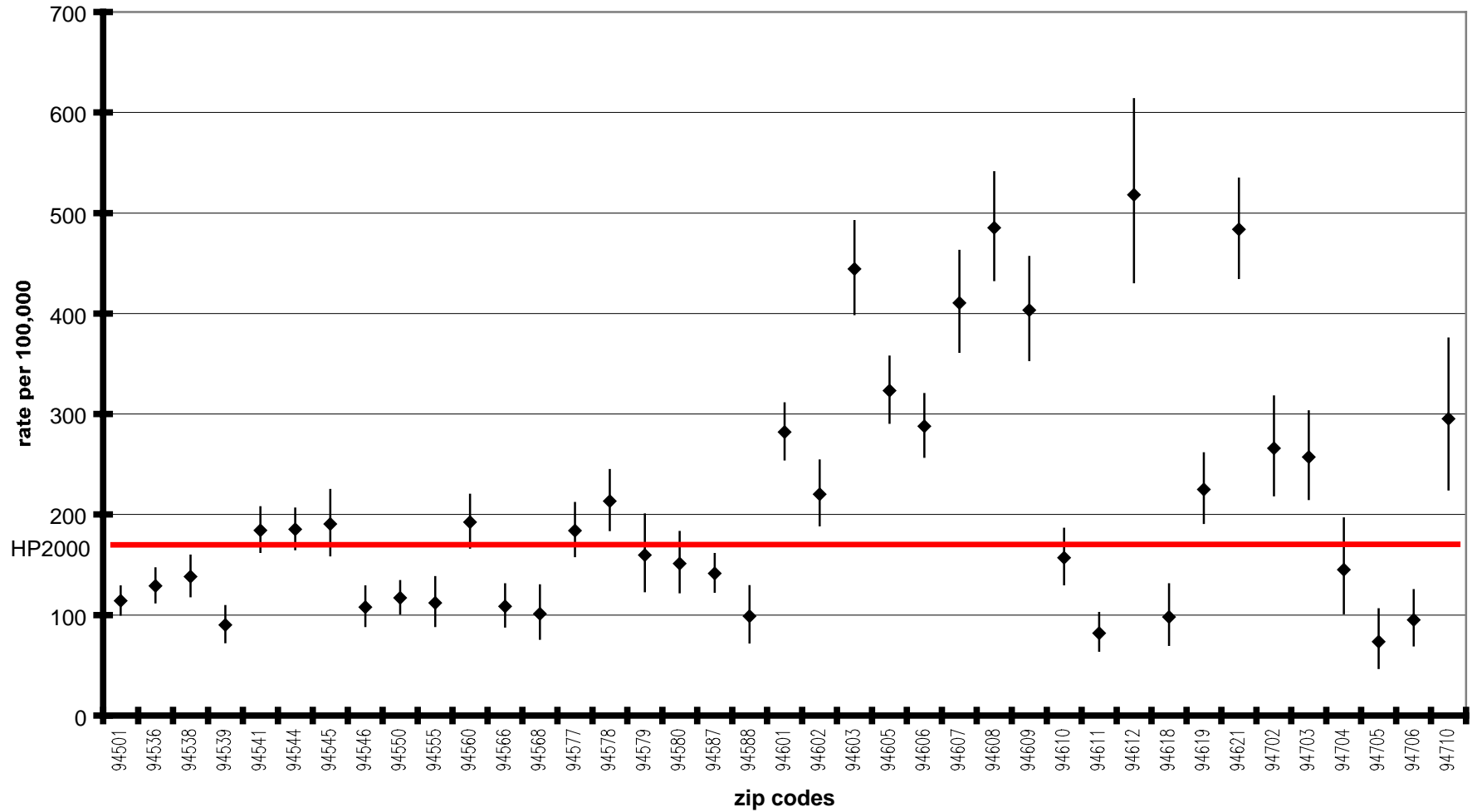
Figure 3: 1996 S.F. Asthma Hospitalization Rates by Zip Code (65 Years and Older)



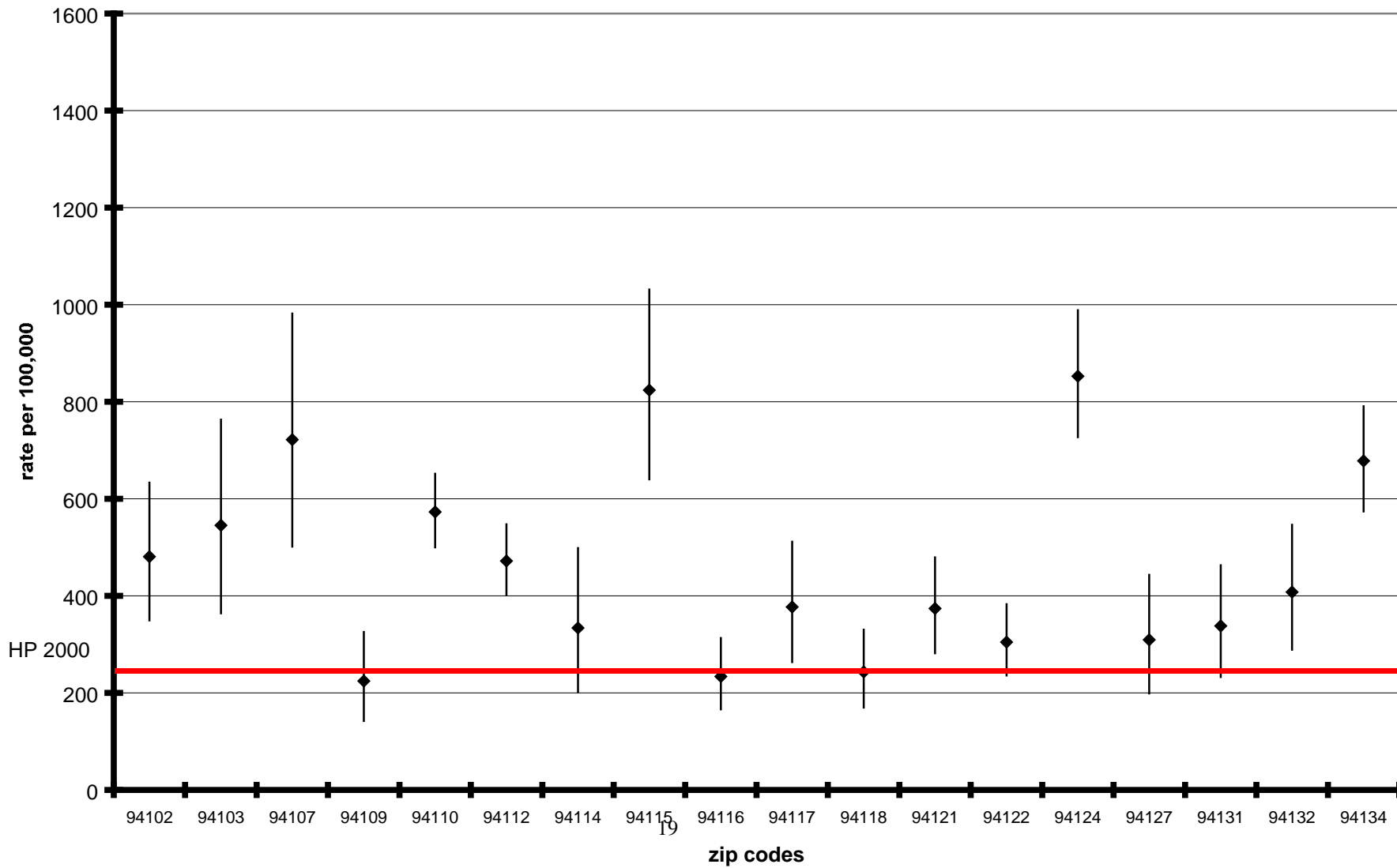
San Francisco County: 1994-1996
Age-adjusted asthma hospitalization rates by zip code, all ages
as compared to the Healthy People 2000 target rates



Alameda County: 1994-1996
Age-adjusted asthma hospitalization data by zip, all ages
as compared to the Healthy People 2000 target rates



San Francisco County: 1994-1996
Age-adjusted asthma hospitalization rates by zip code, children <15
as compared to the Healthy People 2000 target rates



Alameda County
Age-adjusted asthma hospitalization rates, children <15
as compared to the Healthy People 2000 target rates

