WORKING
PAPER

Assessing Health and Health Care in the District of Columbia

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HEALTH

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Executive Summary

S.1 Background

As a result of the recent settlement of tobacco litigation, the District of Columbia has more than $200 million available to invest in the health of the city's residents. A Health Care Task Force, convened in 2006 by then-Mayor Anthony Williams, considered alternative ways to invest the available funds. The Task Force crafted several options that included investment in additional or improved hospital capacity, ambulatory care, and health care system improvement, but agreed that research was needed before final investment decisions could be made. The District contracted with the RAND Corporation to perform a study of health and the health care delivery system in the District. The goals of RAND's evaluation are to:

(1) Conduct a comprehensive health needs assessment for Washington DC;
(2) Assess the quality and accessibility of the District's health care delivery system for individuals with urgent or emergent medical needs; and
(3) Use information from those assessments to identify and assess various policy options for improving the health care delivery system.

This report summarizes the findings related to the first two goals. The George Washington University, through a subcontract with RAND, performed research related to goal (2). A final report, to be issued in Spring 2008, will include findings relevant to goal (3).

Legislation passed in December 2006 allocated some of the tobacco settlement funds, including $20 million for cancer prevention, $10 million for anti-smoking efforts, $10 million for chronic disease treatment, $6 million for establishing a regional health information exchange, and $2 million to buy new ambulances; legislation passed in 2007 further authorized the use of $79 million for a public/private partnership between the District and Specialty Hospitals of America for the revitalization of Greater Southeast Community Hospital. Allocation of the remaining funds, to be invested in hospital and/or ambulatory care improvements, was reserved until this study was completed.

S.2 Approach

Our approach is two-fold; we focus on (1) characterizing health outcomes and (2) characterizing health and medical care. Our focus on health outcomes and health care reflects the specific interest of the District in identifying gaps in health and medical care needs so that investments in the hospital and ambulatory care service systems can be optimized.

We conducted new analyses of existing survey and administrative data, and reviewed findings from previous studies. In our assessment of emergency services, we interviewed key stakeholders, conducted a focus group with emergency medical services (EMS) providers, and completed a survey of the eight acute care centers in the District.

In what follows, we first summarize socio-demographic characteristics of the District for key geographical constructs that we use throughout the report—the District's eight wards and five

Public Use Microdata Areas (PUMAs). (PUMAs are created by the U.S. Census Bureau and comprise areas that contain at least 100,000 people and are wholly enclosed within a state or territory). This demographic profile is helpful in understanding the results of our analysis. We then highlight our key findings, provide tables and figures related to the key findings, identify a number of important gaps in knowledge, and draw preliminary implications from our findings.

S.3 Socio-Demographic Characteristics of the District by Ward and PUMA

Table S.1 presents demographic characteristics of each of the District's 8 wards using data from the 2000 Census.

Table S.1 Socio-Demographic Characteristics by Ward, 2000

Characteristic	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8
Population (in thousands)	80.0	82.8	79.6	71.4	66.5	65.5	64.7	61.5
Age 0 to 17 years (%)	17.0	10.6	12.9	20.6	21.8	19.1	27.9	36.7
Age 65 years and older (%)	7.7	9.1	13.8	17.1	17.8	11.4	14.0	6.4
African American (%)	43.2	30.4	6.3	77.9	88.2	68.7	96.9	91.8
Caucasian (%)	35.2	56.2	83.6	10.3	7.9	27.2	1.4	5.8
Hispanic (%)	23.4	8.6	6.5	12.8	2.5	2.4	0.9	1.5
Family income <FPL (%)	20.0	10.9	2.7	7.9	14.3	19.2	21.6	33.2
Family income< 1.85xFPL (%)	37.8	21.5	5.5	18.0	28.1	31.8	36.5	51.7
Median family income (in $1000s)	58	132	191	81	55	68	45	35

Source: Census 2000. FPL is Federal poverty line.

The District is composed of five PUMAs, as depicted in Figure S.1. Table S.2 summarizes changes in socio-demographics of the District at the PUMA level between 2000 and 2006.

Figure S.1 DC PUMAs and Wards

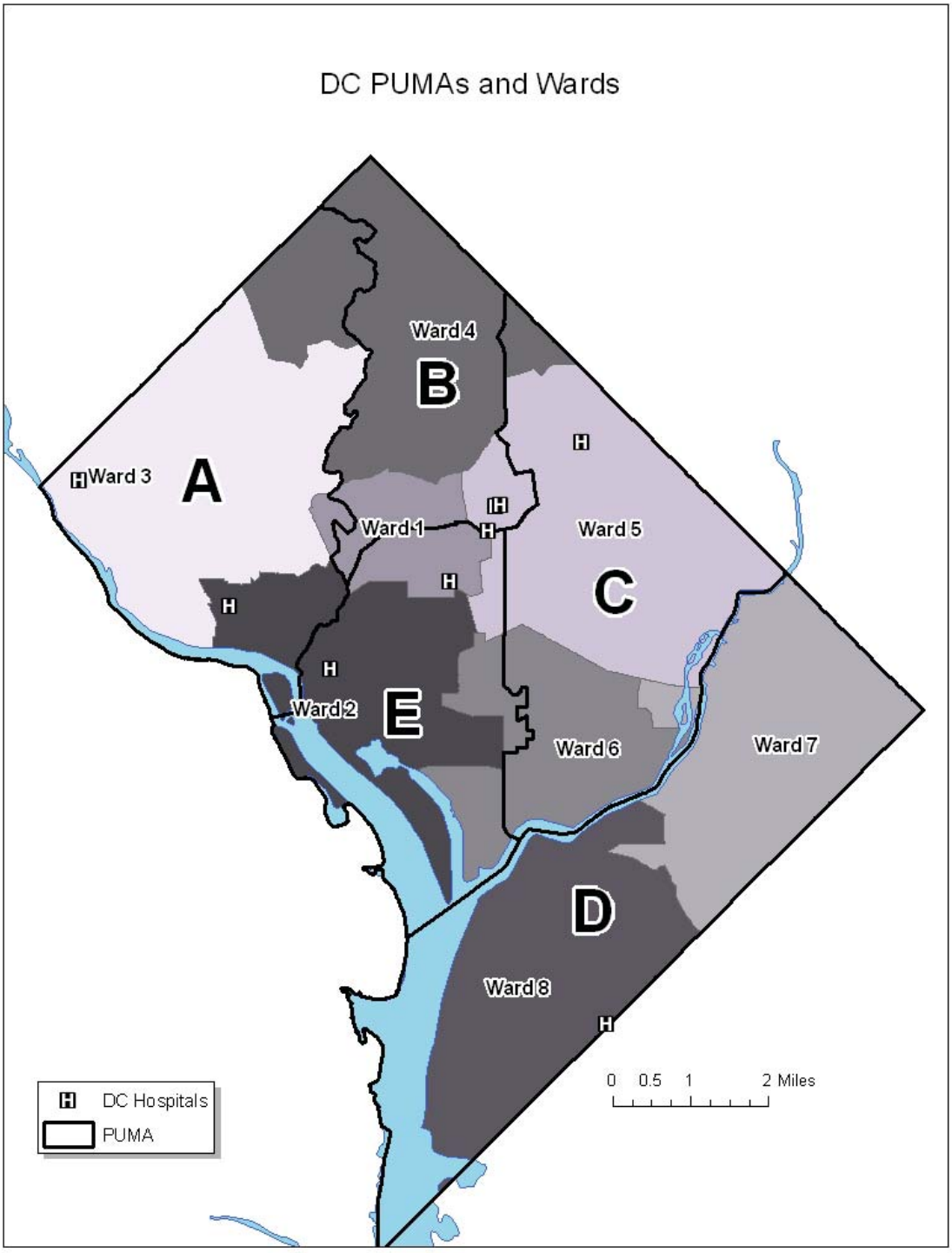


Table S.2 Socio-Demographic Changes in the District, 2000-2006

Characteristic	DC		PUMA A		PUMA B		PUMA C		PUMA D		PUMA E	
	2000	2006	2000	2006	2000	2006	2000	2006	2000	2006	2000	2006
0 to 17 years	20.1	19.7	11.7	**15.9**	20.3	**15.6**	19.3	**16.4**	31.8	**34.4**	13.5	**10.7**
18 to 39 years	38.5	37.6	43.4	**39.8**	36.3	37.9	34.7	35.3	30.8	**28.8**	50.4	49.6
40 to 64 years	29.2	**30.4**	30.9	29.7	30.5	**33.2**	31.2	**33.0**	27.3	27.6	26.4	**29.6**
65 years and older	12.2	12.3	14.0	14.6	13.0	13.3	14.8	15.4	10.1	9.2	9.7	10.1
High school graduate or higher	77.8	**84.3**	95.9	97.3	71.9	**77.2**	76.2	**83.8**	68.9	**78.0**	77.5	**87.0**
Bachelors degree or higher	39.1	**45.9**	79.0	**83.4**	32.0	**38.0**	31.1	**41.5**	10.5	**13.8**	47.1	**58.5**
Caucasian	27.8	**31.6**	80.2	79.1	14.2	**19.7**	18.4	**25.1**	3.1	2.8	34.1	**44.0**
African American	59.4	**54.9**	5.6	6.7	60.8	**53.9**	76.2	**66.3**	94.2	92.1	45.7	**39.0**
Asian	2.6	**3.4**	5.3	5.5	2.1	3.3	1.0	2.1	0.3	0.5	5.4	6.6
Two or more races	1.7	1.3	1.9	**1.1**	2.1	1.7	1.4	1.1	0.9	1.4	2.3	1.4
Hispanic or Latino	7.9	**8.2**	6.1	6.7	20.2	20.8	2.5	**4.9**	1.2	2.9	11.9	**7.8**
Foreign-born, in U.S.> 5 years	8.6	8.5	11.8	11.1	17.1	17.8	3.5	4.4	1.3	--	12.4	**9.5**
Foreign-born, in U.S. < 5 years	4.2	4.2	6.3	5.7	7.6	8.8	1.4	1.7	0.4	--	7.1	5.9
Native-born	87.1	87.3	81.9	83.2	75.3	73.4	95.1	93.8	98.3	97.4	80.5	84.5
Language other than English at home	16.8	**15.3**	22.0	19.8	28.0	27.3	8.3	9.2	4.6	4.7	24.8	19.2
Income < 100% poverty level	20.2	19.6	8.0	8.8	16.3	13.5	18.8	**14.4**	30.5	32.0	22.9	23.6
Income 100-185% poverty level	13.6	**11.8**	5.1	3.7	14.9	13.5	13.2	11.2	17.0	18.5	15.6	**8.4**
Income > 185% poverty level	66.2	68.6	86.9	87.4	68.9	73.0	67.9	**74.5**	52.4	49.5	61.5	**67.9**

Notes: Income is individual level; bolded figures indicate statistically significant change from 2000 to 2006 (with 95 percent confidence), 2000 data are from the 2000 Census; 2006 data are from the 2006 American Community Survey. Cells with dash marks indicate not estimable.

S.4 Key Findings

Findings from our study of health, health care, and the emergency care system in the District of Columbia include the following:

(1) Among adult District residents, more than one in four adults reported having hypertension, making it the most common among the chronic diseases reported.

- Following hypertension, in order of prevalence, are asthma (10 percent), diabetes (8 percent), heart disease (5 percent), and cerebrovascular disease (3 percent).
- Over half of adult District residents qualify as overweight or obese, and nearly one-quarter qualify as obese.

(2) District-wide, mortality rates from heart disease and cancer were higher than those from other causes, although cancer and HIV/AIDS contribute the most to rates of premature mortality.

(3) Measured health outcomes among District residents are comparable to those among residents of other "benchmark" cities that are socio-demographically similar to D.C (such as Baltimore, Maryland and Atlanta, Georgia); although rates of mortality from diabetes are higher in the District compared to those in other cities.

(4) Among District children, 36 percent between ages 6 and 12 were overweight, based on reported height and weight, while 17 percent between ages 13 and 17 were overweight. Twelve percent were reported to have asthma.

- 9 percent of DC children were reported to have a dental health problem.
- 11 percent of parents reported that their children require services for a behavioral health issue.
- 8 percent of children in DC were estimated to have a serious emotional disturbance (in 2000).

(5) Among adults, residents of Wards 7 and 8 had generally higher rates of chronic disease, poor health status, and premature mortality.

- However, other areas of the city also have poor health outcomes. Among adults, Ward 5 had rates of hypertension and overweight/obesity that exceeded the city-wide average.
- Breast and prostate cancer incidence rates among adults were highest in Wards 4 and 8. The cervical cancer incidence rate was highest in Ward 7 and for colon cancer, Ward 6.

(6) Among children, health outcomes were better among those in Ward 3 than in other wards.

- Asthma prevalence among children was highest in **Ward 7,** with 18 percent of children reported to have asthma of any severity.

(7) Rates of health insurance coverage among adults were higher in the District than in comparable cities, probably largely as a result of the Alliance.

(8) Despite a relatively high rate of insurance coverage, about 20 percent of District residents—children and adults—reported no usual source of care.

- Lack of a usual source of care was greater among uninsured compared to insured adults.
- Among adults, PUMA C (which includes Wards 5 and 6) was associated with having a relatively low probability of having a usual source of care among adults.
- Among children, those with public insurance were less likely to report having a usual source of care compared to those with private insurance.
- Among children, PUMAs D (which includes Wards 7 and 8) and B (which includes most of Ward 4 and some of Wards 1 and 5) were associated with relatively low rates of having a usual source of care, compared to other PUMAs.

(9) Rising rates of admissions for ambulatory care sensitive conditions[1] over time among youth and adults aged 40-64 suggest worsening access to non-hospital-based care in recent years. Similarly, rates of emergency department visits for conditions that are primary care sensitive have risen for adults 18-64.

(10) Admissions for ambulatory care sensitive conditions were highest in 2006 among adults in PUMA D (which includes Wards 7 and 8) and among children in PUMA B (which includes most of Ward 4 and some of Wards 1 and 5).

- Among children, PUMA D (which includes Wards 7 and 8) was associated with a low probability of having a well child visit or dental care. PUMA C (which includes Wards

[1] These are conditions, such as asthma or heart failure, which can usually be treated by timely access to high quality outpatient care, thereby preventing the need for hospitalization

5 and 6) was associated with having a low probability of any well child visit, any acute care visit, or any dental care.
- Among adults, the probability of having a check-up in the last two years was relatively low among residents of PUMA B (which includes most of Ward 4 and some of Wards 1 and 5) compared to those in other locations.

(11) Rates of primary care use among individuals enrolled in public insurance programs are low, as are rates of specialty use among those with chronic conditions. Rates of inpatient hospital stays and ED visits are relatively high.

- Among children enrolled in Medicaid managed care, rates of primary care use ranged from about one third among older children to just over half among children 0-5 years old. Between 2 and 4 percent had an inpatient stay during the course of a year. Among children 0-5 years who are covered by Medicaid, 42 percent had an ED visit during the year. Approximately one-quarter of children 6-17 years old who are enrolled in Medicaid had an ED visit during the year .
- Among adults covered by Medicaid, 40 percent had an ED visit during a year period. Approximately 14 percent of adult Medicaid enrollees had an inpatient stay during a one-year period.
- While the majority of individuals with chronic conditions who are enrolled by Medicaid or the Alliance have at least one visit to a primary care provider, few see a specialist with expertise in treating their condition. Between about half and three-fourths of these individuals use the ED at least once. Rates of inpatient hospital use among with those with selected chronic conditions (such as heart disease, HIV/AIDS, asthma or diabetes) ranged from 23 to 34 percent.

(12) From 2000-2006, rates of inpatient hospital use by DC residents remained fairly steady, while rates of ED use by District residents increased 7 percent between 2004 and 2006, with most of the increase driven by greater use among District residents ages 40-64.

(13) Overall primary and specialty care supply measures are not appreciably different from benchmark rates, but the distribution of providers does not appear commensurate with population need, and the availability of providers for vulnerable populations was difficult to measure.

(14) The average occupancy rate was at or below 70 percent at four hospitals in 2006, and was between 73 and 85 percent for three other hospitals. Only one hospital, Children's National Medical Center, had occupancy rates at or near 100 percent.

- In all areas of the city, residents appear to have a choice in which hospital they go to, as residents from every zip code (or ward) used a variety of hospitals.
- The supply of hospitals and hospital beds in the District was in the range of other benchmark cities.

(15) About one-fourth of inpatient admissions among children and among adults 40-64 are ambulatory care sensitive. More than half of ED visits (that did not result in an inpatient admission) are classified as primary care sensitive across all age groups, and the percentage of ED visits that are PCS is highest among children.

(16) The overall demand for District emergency services has increased only modestly in recent years.

- The volume of EMS runs was approximately eight percent greater in 2006 than 2000.
- The number of ED visits appears to have increased between 2000 and 2001, although data from DC General, which are included in ED visit estimates, may be incomplete for these years. Since 2004, ED utilization at District hospitals increased 6.5 percent.
- We were unable to fully explain the increase in diversion, which nearly doubled between 2000 and 2006.[2]

(17) Patients with serious, acute conditions, such as heart conditions, strokes, and major trauma, are sometimes transported to hospitals that are not best suited to meet their needs.

- This is a particular problem for residents in Wards 7 and 8 transported to Greater Southeast.

(18) There is little evidence of a single, unified vision of high quality pre-hospital and hospital emergency services and there are few available measures of the quality of emergency care in the District.

- Hospital and DC Fire and Emergency Medical Services leaders appear to know little of each other's challenges.

S.5 Selected Tables and Figures

Tables S.3 and S.4 provide selected indicators of health outcomes among adult and youth District residents, city-wide and by Ward.

[2] Diversion is when a hospital can only accept the sickest "priority 1" patients.

Table S.3 Selected Indicators of Adults' Health (2004-2006)

Health Outcome	DC	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8
Chronic Conditions									
Heart disease (%)	4.8	3.1*	3.1**	3.9	6.0	5.6	4.8	6.4	3.4
Hypertension (%)	27.1	22.7*	15.4**	13.9**	30.4	32.5**	28.2	37.6**	35.5**
Cerebrovascular Disease (%)	2.8	1.8	1.6**	1.2**	4.2	3.2	2.8	4.8	2.9
Diabetes (%)	8.1	6.0*	5.0**	3.3**	9.8	10.3	9.2	12.2**	11.0*
Current Asthma (%)	10.0	8.4	9.7	8.3	11.6	10.8	8.2	12.2	9.9
Any chronic condition(%)^	37.1	30.0**	23.4**	24.6**	39.0	43.5**	39.4	51.2**	45.1**
Obese (%)	22.5	17.4**	13.7**	9.3**	30.5**	29.4**	23.3	29.4**	33.3**
Overweight or obese (%)	54.6	47.9*	39.1**	38.1**	62.3**	61.4*	58.0	65.4**	71.2**
Disability (%)	16.3	17.0	14.2	16.3	19.6	16.9	15.3	16.6	14.9
Premature Mortality (age adjusted, per 100k, among those 18-64 years old) [(a)]									
All cause	515	505	476	140	461	652	509	696	789
Heart disease	45	45	73	16	67	76	84	103	128
Cancer	109	133	114	57	114	98	83	166	118
Hypertension	26	20	27	4	25	31	33	29	45
HIV/AIDS	59	81	60	4	28	99	44	77	104
Cerebrovascular Disease	16	16	13	2	15	18	20	18	33
Diabetes	14	16	14	6	6	20	10	24	17
Accidents	38	29	36	17	34	51	28	47	71

*Notes: Authors' analyses of BRFSS data unless otherwise noted; ** Significantly different from the city mean at the .05 level, * at the .10 level; ^Includes asthma, diabetes, stroke, heart disease, and hypertension; (a)Analysis of mortality data from DC Department of Health. Mortality rates are population- based; thus standard errors and statistical significance not shown.*

Table S.4 Selected Indicators of Children's Health (2003)

	DC	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8
Current asthma (any severity) (%)[†]	11.9	7.6*	5.0**	3.9**	9.1	14.9	12.6	17.9**	12.1
Overweight among 6-12 yrs. (%)	36.3	35.4	25.5	10.8**	30.4	36.5	49.7	36.4	44.2
Overweight among 13-17 yrs (%)	17.2	10.3*	16.4	7.6	10.4	20.3	27.0	13.7	20.6
Limitation in activity or function (%)	7.4	4.8	2.9**	2.8**	5.7	5.0	10.2	10.8	8.6
Any chronic condition among 6-12 years (%)[(a)]	52.5	39.5*	40.8	48.3	45.1	57.9	54.9	62.1*	52.2
Any chronic condition among 13-17 years (%)[(a)]	52.4	38.5	46.4	47.2	54.4	62.7	40.8*	55.3	58.6
Behavioral health issue needing treatment (%)	10.5	10.6	8.0	8.0	7.1	14.7	11.7	12.0	7.9
Dental problem (%)	8.5	11.3	9.3	2.1**	8.7	9.2	10.4	8.6	5.8*

*Authors' analyses of data from the National Survey of Children's Health. ** statistically significant difference from city-wide mean at .05 level; * statistically significant difference form city-wide mean at .10 level; [†] Asthma rates are among all children. (a)Includes asthma, bone or joint problems, diabetes, developmental delay or physical impairment, respiratory allergy, food or digestive allergy, eczema, severe headaches, stuttering or speech problems, chronic ear infections, attention deficit disorder, depression, anxiety, behavioral or conduct problems, or autism.*

Table S.5 Access to Health Care Among District Residents

Measure	Adults (2006) %	Children (2003) %
Insured (any source)	91.3	95.5
Uninsured	8.7	4.5
Insured—private	--	47.2
Insured-public	--	48.3
No regular source of care	19.9	19.8
No regular source of care among the uninsured	63.6	--
No regular source of care, among insured	15.7	--
No regular source of care among publicly insured	--	22.6
No regular source of care, among privately insured	--	14.2

Source: Authors' analyses of 2006 BRFSS data for adults and 2003 NSCH data for children. Dashes indicate data are not available or not sufficient for estimation.

Figures S.2 and S.3 depicts trends in ambulatory care sensitive inpatient hospital admission rates for District youth and for District adults ages 40-64.

Figure S.2 Trends in Ambulatory Care Sensitive Admission Rates by PUMA Among District Residents Ages 0-17

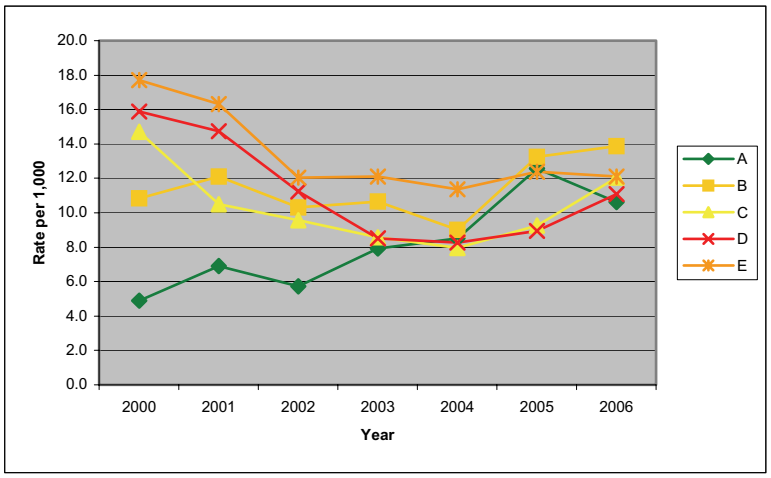


Figure S.3 Trends in Ambulatory Care Sensitive Admission Rates by PUMA Among District Residents Ages 40-64

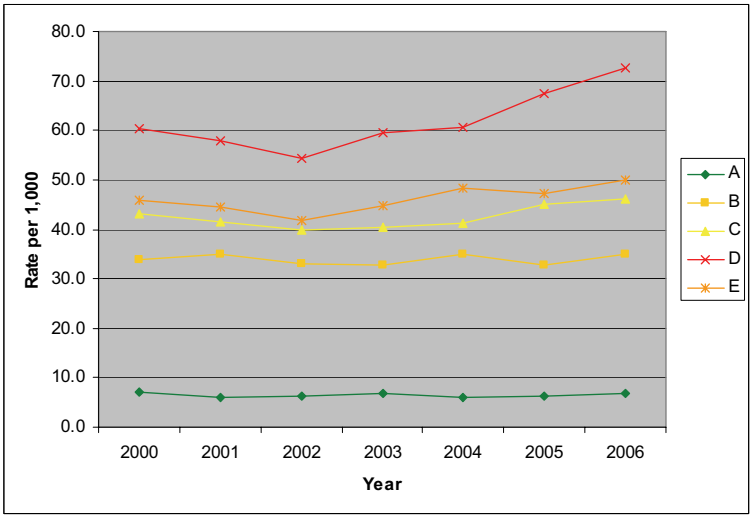


Table S.6 classifies inpatient admissions into those that are ambulatory care sensitive and those that are not.

Table S.6 Classification of Inpatient Admissions Among DC Residents (2006)

Classification	0-17	18-39	40-64	65+
Non Ambulatory Care Sensitive	73%	88%	75%	70%
Ambulatory Care Sensitive	27%	12%	25%	30%

**Source: Authors analyses of DCHA data.*

Table S.7 classifies emergency department visits into a variety of categories.

Table S.7 Classification of ED Visits Among District Residents (2006)

Classification	0-17	18-39	40-64	65+
Non-emergent **(a)**	23.9	25.1	23.5	21.3
Emergent, primary care treatable **(b)**	24.1	22.6	21.7	21.3
Emergent, preventable/avoidable **(c)**	9.7	6.9	9.1	9.0
Emergent, not preventable/avoidable	6.2	10.2	11.6	14.0
Injury	24.5	23.3	18.5	18.8
Mental Health Related	1.7	1.9	2.4	1.2
Alcohol Related	0.1	1.4	2.8	1.1
Drug Related (excluding alcohol)	0.1	0.2	0.3	0.0
Total	*90.3*	*91.6*	*89.9*	*86.7*
Unclassified	*9.7*	*8.3*	*10*	*13.3*
Primary care sensitive (sum of a-c)	***57.7***	***54.6***	***54.3***	***51.6***

**Source: Authors analyses of DCHA data. Excludes ED visits that result in an inpatient admission.*

Table S.8 summarizes the distribution across hospitals of EMS transports for various conditions.

Table S.8 Distribution of EMS Transports for Stroke, High Acuity Cardiac and High Acuity Trauma Calls, 2005

Hospital	Stroke (%)	High Acuity Cardiac / Chest Pain (%)	High Acuity Trauma (%)
Children's National Medical Center	0.5	1.3	6.9
George Washington University Hospital	15.4	16.8	17.4
Georgetown University Hospital	4.4	6.2	4.7
Greater Southeast Community Hospital	13.7	15.7	14.3
Howard University Hospital	10.0	15.0	23.7
Providence Hospital	20.2	16.4	7.7
Sibley Memorial Hospital	4.9	3.6	2.9
Washington Hospital Center /MedStar	25.5	21.5	23.0
Other		3.5	5.5

Source: DC FEMS CAD Data, CY 2005.

S.6 Gaps in Knowledge

In what follows, we highlight a number of gaps in knowledge. These knowledge gaps are largely due to gaps in data.

♦ **Little is known about children's health status and access to care**. The only available data are from the 2003 National Survey of Children's Health (NSCH), for which we needed to conduct analysis at the secure Research Data Center in Hyattsville, Maryland. While the 2007 wave of the NSCH is nearly complete, the District should consider a more regularly collected and accessible mechanism to gather information on access to care and health status for children.

♦ **Available information about insurance status among adults in the District is inadequate**. The Behavioral Risk Factor Surveillance System (BRFSS) only asks about whether an individual has insurance but about not type of insurance. Further, the failure to ask about specific insurance sources by program name likely results in some misreporting by Alliance enrollees.

♦ **Little is known about the quality of emergency medical services in DC.** Response times have been an important metric historically. But quality in health care has moved beyond just a question of timeliness. Quality is now thought to include six domains: safety, timeliness, efficiency, effectiveness, equity and patient-centeredness. Currently, some data exist on EMS timeliness and a little is known about hospital emergency care effectiveness. Not much in the way of quality of emergency services is measured in the District, and we have seen no imminent plans to do so, despite the District government's major role in financing these services

♦ **Available data on mental health prevalence and mental health and substance abuse service use are extremely limited**. Data from the National Survey of Drug Use and Health provide sub-city estimates of the prevalence of substance abuse disorders, but no comparable data exist for mental health. As a result, we had to rely on indirect estimates of mental health prevalence from outdated sources. Given the importance of these problems for the District's population and their implications for health care and for quality of life, productivity, employability and safety, the District would benefit from developing mechanisms to regularly monitor mental health needs and access to mental health and substance abuse services.

♦ **Provider supply could be measured with more precision if reliable data on practice time in the District and population served by type of insurance were available.**

♦ **Differences in data formats and availability of Medicaid and Alliance data from managed care organizations make it less useful than it could be.** The District should, as part of its managed care organization (MCO) contracting process, work with MCOs to ensure that progress is made towards standardization of data in the future.

♦ **The lack of timely analysis of data with which to monitor the health of the District should be addressed**. Such data clearly exist (e.g., vital statistics, cancer statistics and BRFSS), but analysis of them are often several years out of date.

S. 7 Preliminary Implications

Our forthcoming final report will address policy approaches to the problems identified. However, we offer some preliminary insights from our findings.

1. **The relatively high rates of use of ED and inpatient hospital services among Medicaid/Alliance enrollees and rates of ambulatory care sensitive admissions and primary care sensitive emergency department visits may reflect inadequacies in the supply or effectiveness of primary and specialty care, inappropriate care-seeking patterns, or supply-sensitive demand.** Reducing hospital use by addressing these issues may provide additional hospital and emergency department capacity. Planning for any new hospital capacity must consider whether efforts to reduce use could be successful and the extent to which supply-sensitive demand could generate more hospital use.[3]

2. **The District's hospital system does not appear to be operating on the brink of saturation**. Over the last six years, inpatient admission rates to District hospitals have been relatively flat; rates of ED visits to District hospitals have increased only moderately since 2004; hospital occupancy rates have averaged about 75% with only one hospital operating at near 100 percent capacity (Children's); patients from each zip code within the District appear to have a choice in hospital destination, as shown by the diversity of hospitals which they use; and the supply of hospital beds and hospitals per population and per square mile are within the range of benchmark cities. However:
    a. Disruption at Prince George's Hospital Center could have a dramatic regional impact; and
    b. Steps need to be taken to ensure that District residents in emergency situations are taken to hospitals with the appropriate facilities to care for them, and/or that hospitals they are taken to develop broader capacities for treating conditions requiring emergency care.

3. **There appears to be considerable room for improvement in quality of care and its measurement across the various types of care—emergency, inpatient, or outpatient—and for particular providers**.

4. **Addressing problems in the availability of outpatient care—both primary care and specialty services—will need to consider not only the appropriate location for those providers, but what incentives might help patients use care appropriately and what will increase provider willingness to serve populations in greatest need**.

5. **Coordination of efforts between hospitals and Fire and Emergency Medical Services (FEMS) has the potential to better serve District residents**. Further, while DC FEMS has aggressive plans for reducing demand for EMS, other initiatives to address core aspects of quality, such as pain management, trauma management, advanced airway management and cardiac arrest survival are also needed.

[3] Supply-sensitive care is care whose frequency of use is not determined by well-articulated medical theory or scientific evidence (Center for the Evaluative Clinical Sciences, Dartmouth Atlas Project, www.dartmouthatlas.org). .

6. **The dynamics of change since 2004 need to be better understood**. For many of the measures we studied, 2004 was a turning point. Additional study is required to understand what forces led to the changes in 2004 and beyond.

Future analysis will be aimed at identifying a set of recommendations to improve access to appropriate care that meets population needs and to promote care-seeking at the kinds of locations that are most appropriate. Our subsequent report will also make recommendations about the use of tobacco settlement funds to strengthen the health care system in the District.

1. Introduction

1.1 Overview

As a result of the recent settlement of tobacco litigation, the District of Columbia has more than $200 million available to invest in the health of the city's residents. A Health Care Task Force, convened in 2006 by then-Mayor Anthony Williams, considered alternative ways to invest the available funds. The Task Force crafted several options that included investment in additional or improved hospital capacity, ambulatory care and health care system improvement, but agreed that further work needed to be undertaken before final investment decisions could be made. The District contracted with the RAND Corporation to perform a study of health and the health care delivery system in the District. The study's goals are to:

(1) Conduct a comprehensive health needs assessment for Washington DC;
(2) Assess the quality and accessibility of the District's health care delivery system for individuals with urgent or emergent medical needs; and
(3) Use information from those assessments to identify and assess various policy options for improving the health care delivery system.

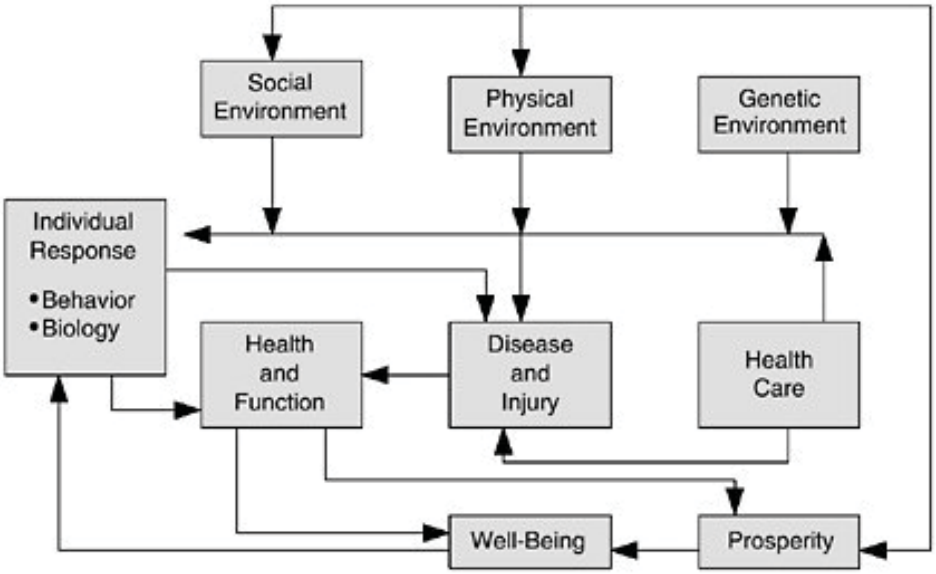
Legislation passed in December 2006 allocated some of the tobacco settlement funds to various efforts, including $20 million for cancer prevention, $10 million for anti-smoking efforts, $10 million for chronic disease treatment, $6 million for establishing a regional health information exchange, and $2 million to buy new ambulances. Legislation passed in 2007 further authorized the use of $79 million for a public/private partnership between the District and Specialty Hospitals of America for the revitalization of Greater Southeast Community Hospital. Allocation of the remaining funds, to be invested in hospital and/or ambulatory care improvements, was reserved until the findings of this study were completed.

This report summarizes the findings related to the first two goals. The George Washington University, through a subcontract with RAND, performed research related to goal (2). A final report, to be issued in Spring 2008, will include findings relevant to goal (3).

1.2 Setting a Conceptual Focus

The health of a population is the product of a multitude of factors. Evans and Stoddart (1990) classify health outcomes into three categories—disease and injury, health and function, and well-being—and the determinants of health into six categories—social environment, physical environment, genetic environment, individual response, health care, and prosperity. Social environment includes family structure, education and employment, for example; physical environment includes the availability of "green" space, air quality, and water quality; and individual response includes health behaviors such as tobacco use, seat belt use, and exercise. These relationships are shown in Figure 1A.

Figure 1A Conceptual Model of the Determinants of Health



Source: Evans and Stoddart (1990)

Our focus is two-fold; we focus on (1) characterizing health outcomes and (2) characterizing health and medical care. These are represented by the three boxes in the middle of the figure (health and function, disease and injury, health care). Our focus on a single, particular determinant of health is not meant to understate the importance of other factors on health outcomes. Indeed, as described in the Introduction, the District has invested a portion of tobacco settlement funds in cancer prevention, anti-smoking programs, and chronic disease management, which span determinants such as the physical environment and individual behavior. Rather, our focus on health outcomes and health care reflects the specific interest of the District in understanding where gaps in the health care service delivery system exist so that investments in the hospital and ambulatory care service systems can be optimized.

Earlier studies—including some by the DC Department of Health and its agencies, the DC Department of Mental Health, the DC Primary Care Association (DCPCA), the DC Hospital Association (DCHA), and researchers from organizations like the Urban Institute and Brookings Institution—have described various health outcomes and characterized certain aspects of health and medical care in the city. Our research builds on these previous studies.

Our analyses are not intended to provide a comprehensive compilation of all available health outcomes data or all measures of health care, but rather to highlight a range of key health indicators, markers of individuals' access to health care, and measures of health care capacity. Wherever possible, we provide an update on key health and health care measures using the most recent data available and an assessment of changes in health outcomes and health care over time.

Emergency Services

A particular area of concentration in this report is analysis of emergency care, which is among the most critical services that a community can provide to its residents. In the event of an emergency, people want to know that help will come quickly, that trained individuals will begin the process of administering emergency services and transport them to the most appropriate health care facility safely and that highly skilled health care professionals will treat them effectively and with appropriate equipment. Residents expect excellence from emergency services, regardless of where they live, what they earn, where they work or whom they know.

Unfortunately, emergency services often do not live up to these lofty goals. Communities across the country struggle with ways to improve emergency care and the District of Columbia is no exception. The challenge is to identify precisely where the strengths and weaknesses are in the system of emergency services and to construct strategies that support these strengths and ultimately resolve the weaknesses.

A recent tragedy renewed interest in improving emergency services in the District of Columbia. The untimely death of David Rosenbaum identified weaknesses in DC emergency services and emergency department (ED) care as well as systemic problems that cannot be resolved fully through adjustments to the individual components. As a result, the District has wisely taken a comprehensive approach to improvement, requesting a wholesale, independent review of emergency care in the District of Columbia.

This report examines three aspects of emergency care: (1) pre-hospital emergency services, (2) hospital-based emergency services, and (3) the interaction between the two as a "system" of emergency care in the District of Columbia. For individuals with emergent needs, a failing in any one of these aspects of service delivery can quite literally be a matter of life or death. Thus, this report addresses many problems with the delivery of pre-hospital services and hospital-based care as well as issues central to the coordination and communication between these two services. Our report includes information on the distribution and accessibility of services, utilization and capacity within the system, and the timeliness and quality of care.

1.3 Approach

There are significant challenges to providing a comprehensive assessment of health needs and access to care in DC. These challenges are not unique to the District, and they would be faced in any effort to provide such estimates for relatively "small" geographical units, i.e., below the state level. One issue is that many commonly used data sources on health are engineered to provide national-level estimates (e.g., the National Health Interview Survey or Medical Expenditure Panel Survey) or state-level estimates (e.g., the Behavioral Risk Factor Surveillance Study).

Another issue is that while surveys can be used to collect new data on a specific locality, the process is resource-intensive, and there is often a significant lag between the time the data are collected and the time they are available for analysis. Non-survey data such as administrative data can sometimes be used to fill in information gaps, but such data are not always available, and when they are, they must be thoroughly examined and "cleaned" prior to use.

Statistical techniques can be used to construct local-area or small-area estimates for certain types of data. For example, indirect estimation uses information about the relationship between individual socio-demographic characteristics and the prevalence of a health outcome in one location to develop an estimate for the prevalence of the health outcome in another location (also using information about the socio-demographic characteristics of the other location). However, to be implemented, such techniques require particular types of data and are sensitive to the assumptions underlying them.

In our assessment, we conducted new analyses of existing survey data and administrative data, and reviewed findings from previous studies that have helped to lay the foundation of knowledge to which our report contributes. In our assessment of emergency services, we conducted interviews with key stakeholders and a focus group with emergency medical services (EMS) providers, and completed a survey of the eight acute care centers in the District. (Results from the hospital survey will be provided in our second report.) We describe the data sources used in the new analyses in Table 1.1.

Table 1.1 Data Sources

Data Source	Time Period	Description
Behavioral Risk Factor Surveillance System (BRFSS)	2005-2006	The BRFSS is an annual survey conducted by the Centers for Disease Control and Prevention (CDC) in conjunction with states. The survey collects data on a number of factors ranging from sociodemographic characteristics such as race and health insurance to disease burden and health care behavior. BRFSS samples adults aged 18 and older (one per household sampled) by telephone and then weights data based on Current Population Survey Estimates.
National Survey of Children's Health (NSCH)	2003	The NSCH is part of the CDC State and Local Area Integrated Telephone Survey (SLAITS) system. The NSCH is based on parental report of child health status and use of health services. The sample for DC included 2,049 respondents. RAND obtained special permission from the National Center for Health Statistics (NCHS) to analyze ward-level data, using the secure data center in Hyattsville, Maryland.
Claims data from three managed care organizations serving DC Medicaid and Alliance programs	January 2006-December 2006 for Medicaid; June 2006-May 2007 for Alliance	Chartered Health Plan, Amerigroup, and HealthRight each provided information on inpatient, ED, and office-based claims for calendar year 2006 for Medicaid enrollees and for Jan. 1 2006-May 31 2006 for Alliance enrollees. Individuals were included in the file if they were enrolled for at least 6 months during the year period. Enrollee information (age, gender, race, language, zip code of residence) and enrollment information (months enrolled, type of enrollment) were merged with utilization data, including date of utilization, diagnosis, and procedures.
DC Hospital Association Inpatient Discharge Data	2000-2006	DCHA provided inpatient discharge information for every patient discharged from DCHA hospitals from 2000 to 2006. Data include diagnosis, date of service, procedure codes, patient age, patient zip code of residence, and payer status. Hospital identifiers are available for 2004-2006.
DC Hospital Association ED Discharge Data	2004-2006	DCHA provided information about all ED discharges, including diagnosis, date of service, hospital identifier procedure codes, patient age, patient zip code of residence, and payer status.
Maryland Healthcare Cost and Utilization Project (HCUP) data	2003-2005	HCUP data are a family of health care databases sponsored by the Agency for Healthcare Research and Quality (AHRQ). The HCUP data include State Inpatient Databases (SID) and State Emergency Department Databases (SEED), which contain, respectively, the universe of inpatient discharge abstracts from participating states and hospital-affiliated EDs for visits that do not result in hospitalizations. We obtained SID and SEED data for Maryland.
DC Cancer Registry	2004	The DC Department of Health maintains a registry of new cancer cases, including information on the type of cancer, stage of presentation, and resident location for all DC residents except those who received their diagnosis at a Veterans Administration facility.
DC Health Professional Licensing Administration	2007	The Licensing Administration maintains a database of all physicians (MDs and DOs) with active licenses in the District. We cross-checked this data with information from the Washington Physician Directory.
Emergency services stakeholder interviews	2007	Interviews included 60 key stakeholders in pre-hospital emergency services and hospital based emergency care, government agencies with oversight of emergency services; and additional interviews with FEMS, DOH, DCHA, OCA, OUC, and hospital leadership
EMS Focus Group	2007	One focus group was conducted that included active EMS providers.
FEMS Computer Aided Dispatch (CAD) data	2002-2005	CAD data provide information on timeliness, cardiac survival rates, frequency and duration of diversion and closure of EDs.
American Hospital Association Annual Survey	2000/2005	AHA data contain information about the services offered by hospitals.

CMS Hospital Quality Alliance Data	Oct 2005-Sept 2006	Includes audited performance data on clinical quality in hospitals
Hospital Survey	2006-2007	Includes a survey of the eight acute care centers in the District of Columbia on emergency department demand and capacity.

Notes: FEMS=Fire and Emergency Medical Services; DOH=Department of health, DCHA=DC Hospital Association; OCA=Office of the City administrator; OUC=Office of Unified Communications.

1.4 Organization of the Report

The report findings are presented in the following sections: Section 2 describes health outcomes among District residents. Sections 3, 4, and 5 describe access to health care, with Section 3 focusing on facilitators of access to health care, Section 4 summarizing use of health care among District residents, and Section 5 describing measures of health care quality. Section 6 turns to a description of outpatient health care capacity and infrastructure in the District. Section 7 does the same for inpatient health care. Sections 8-11 explore emergency services in the District, with Section 8 focusing on hospital emergency departments, Section 9 on emergency medical transport, Section 10 on transitions from emergency medical services to the hospital, and Section 11 on broad themes related to emergency care issues as identified through stakeholder interviews. Section 12 benchmarks health status and access to health care among District residents to other cities. Section 13 concludes the report by highlighting key findings, identifying knowledge gaps, and providing preliminary implications from our findings.

2. Health Outcomes

2.1 Overview

In this section, we report on health outcomes among District residents. This discussion draws upon previously published studies and also presents the results of new analyses conducted for this assessment. We separately discuss adults and children, given intrinsic differences in the nature and frequency of health outcomes among them. We report findings for the District overall, and also provide ward-to-ward comparisons, when possible.

We begin with a brief overview of the socio-demographic characteristics of the city and describe changes in socio-demographic characteristics since the 2000 U.S. Census. These descriptions are based on 2000 US Census data and on 2006 American Community Survey (ACSY) data.[4]

The findings for adult health come from the 2004 Cancer Control Registry, the 2002-2004 Substance Abuse and Mental Health Services Administration (SAMSHA) National Survey on Drug Use and Health (NSDUH), as well as the results of new analyses of the 2005-2006 Behavioral and Risk Factor Surveillance Survey (BRFSS). Although the DC Department of Health analyzes various indicators of BRFSS on a yearly basis, existing analyses are publicly available only through 2004. Technical Appendix 2 provides more detailed information about BRFSS design and our analyses.

While HIV/AIDS is a key health issue for District residents (HIV/AIDS was the fourth leading cause of death in DC in 2003), we refer readers to a recent report which addresses HIV/AIDS in the District (DC Department of Health, 2007).

Our children's health findings are from new analyses of the 2003 National Survey of Children's Health (NSCH). Data are only available for 2003, although data from a second wave of the survey is expected to be available in late 2008. Because these data were collected in 2003, there may have been changes in child health status since that time that we are unable to observe.

2.2 Socio-Demographic Characteristics of District Residents

Table 2.1 presents socio-demographic characteristics of each of the District's eight wards as of 2000.

[4] The ACSY collects data on samples of people for each year between the decennial census and allows the sociodemographic characteristics of District residents to be summarized at the Public Use Microdata Area or "PUMA" level.

Table 2.1 Socio-Demographic Characteristics of D.C. Residents by Ward (2000)

	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8
Population (in thousands)	80.0	82.8	79.6	71.4	66.5	65.5	64.7	61.5
Age 0 to 17 years (%)	17.0	10.6	12.9	20.6	21.8	19.1	27.9	36.7
Age 65 years and older (%)	7.7	9.1	13.8	17.1	17.8	11.4	14.0	6.4
African American (%)	43.2	30.4	6.3	77.9	88.2	68.7	96.9	91.8
Caucasian (%)	35.2	56.2	83.6	10.3	7.9	27.2	1.4	5.8
Hispanic (%)	23.4	8.6	6.5	12.8	2.5	2.4	0.9	1.5
Family income <FPL (%)	20.0	10.9	2.7	7.9	14.3	19.2	21.6	33.2
Family income<1.85xFPL (%)	37.8	21.5	5.5	18.0	28.1	31.8	36.5	51.7
Median family income (in $1000s)	58	132	191	81	55	68	45	35

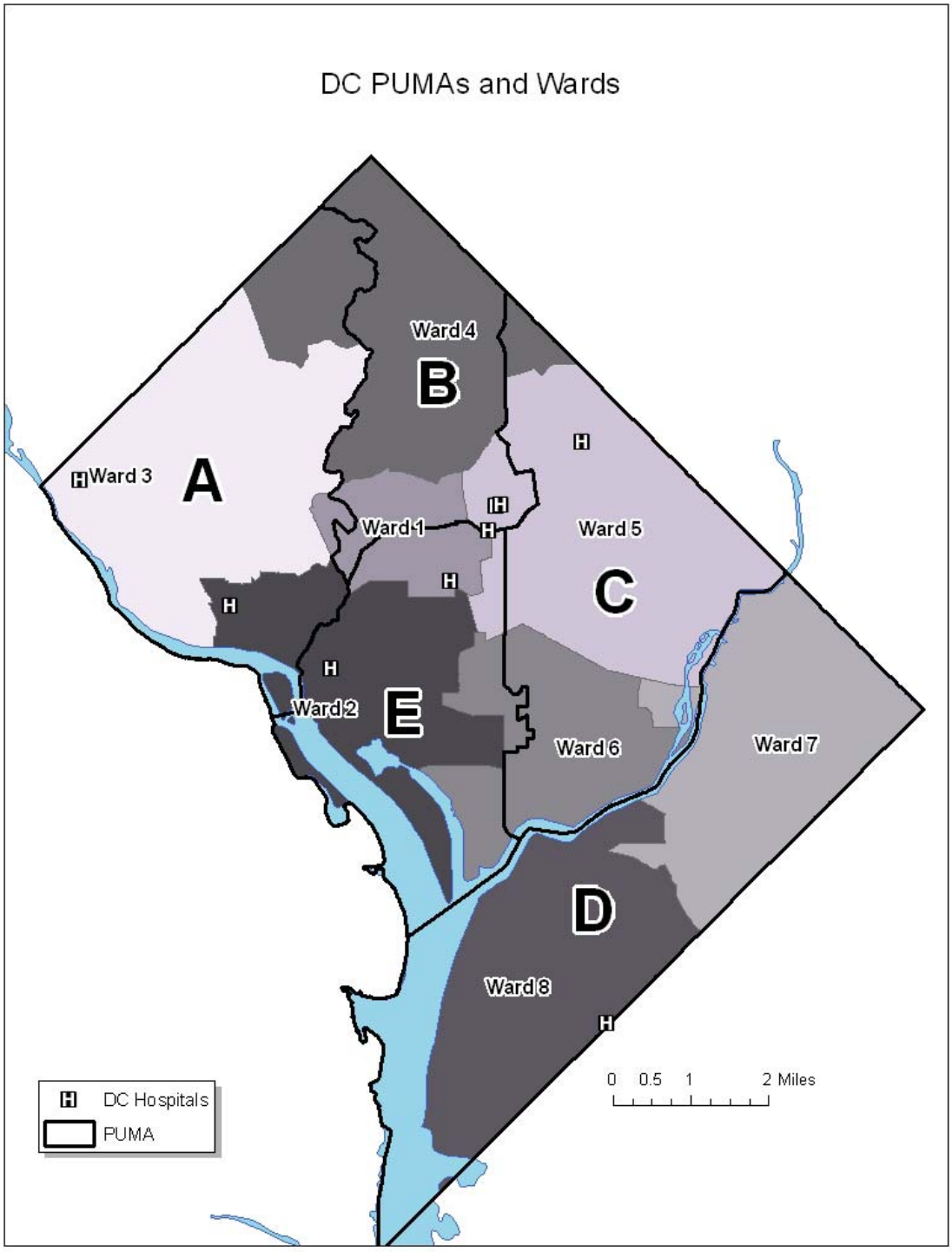
Source: Census 2000. FPL= Federal poverty line.

Wards 1, 2, and 3 are the largest wards, each with roughly 80,000 residents. Residents of Ward 3 are the most well-off economically with the fewest families in poverty and the highest median family income of all the wards. Conversely, Wards 7 and 8 have the greatest percentages of residents living in poverty (22 and 33 percent, respectively) and the lowest median family incomes. In Wards 1 and 6, approximately 20 percent of residents live in poverty, although median family incomes are substantially higher than in Wards 7 and 8, reflecting more income diversity. Wards 4, 5, 6, 7, and 8 are predominantly African-American, and Wards 5, 7 and 8 have the highest percentages of African-Americans. Ward 1 has the greatest proportion of Hispanics (nearly a quarter of the population). Approximately one-third of residents of Wards 7 and 8 are children, while the elderly (65 and older) comprise approximately 17-18 percent of the population in Wards 4 and 5.

While wards are a useful catchment for describing outcomes at a sub-city level, data are not always available at the ward level. Another useful catchment is the Public Use Microdata Area, or PUMA, created by the U.S. Census Bureau. PUMAs comprise areas that contain at least 100,000 people and are wholly enclosed within a state or statistically equivalent entity. The District comprises five PUMAs, as depicted in Figure 2A. In the figure, we have labeled PUMAs using letters of the alphabet to avoid confusion with wards. The relation of PUMAs to wards is as follows:

- PUMA A covers most of Northwest DC and encompasses Ward 3 and part of Wards 2 and 4.
- PUMA B contains most of Ward 4 and parts of Wards 1 and 5.
- PUMA C contains most of Wards 5 and 6.
- PUMA D contains Wards 7 and 8.
- PUMA E comprises parts of Wards 1, 2, and 6.

Figure 2A DC PUMAs and Wards



The sociodemographics of PUMAs correspond to the wards they encompass: Median family income is highest and the percentage of children living in poverty is lowest in PUMA A; conversely, median family income is lowest and the percentage of families in poverty is highest in PUMA D. African-Americans comprise three fourths of PUMA C, nearly two-thirds of PUMA B, and over 90 percent of PUMA D. PUMA D has the highest percentage of children, at about 34 percent of the population.

Below, we describe socio-demographic changes in the District between 2000 and 2006 using data from the 2000 Census and the 2006 American Community Survey (ACSY). Changes for DC overall and by PUMA are summarized in Table 2.2. Statistically significant changes are bolded. Among the key changes are:

- **Age distribution.** City-wide, the age distribution of residents changed little during the 2000-2006 period; however, the percentage of the residents aged 0-17 changed for particular PUMAs, with an increase in the proportion of children in PUMAs A and D and a decline in PUMAs B, C and E.
- **Education.** Between 2000 and 2006, the percentage of DC residents with a high school education and the percentage with a college education increased from 78 to 84 percent and from 39 to 46 percent, respectively.
- **Racial/ethnic composition.** African-Americans made up a larger portion of the population in 2000 compared to 2006 (59 compared to 55 percent). Over the same period, the percentage of the population that is white increased from 28 to 32 percent, and the Hispanic population increased from 7.9 to 8.2 percent.

Table 2.2 Socio-Demographic Changes in the District, 2000-2006

	DC		PUMA A		PUMA B		PUMA C		PUMA D		PUMA E	
Characteristic	2000	2006	2000	2006	2000	2006	2000	2006	2000	2006	2000	2006
0 to 17 years	20.1	19.7	11.7	**15.9**	20.3	**15.6**	19.3	**16.4**	31.8	**34.4**	13.5	**10.7**
18 to 39 years	38.5	37.6	43.4	**39.8**	36.3	37.9	34.7	35.3	30.8	**28.8**	50.4	49.6
40 to 64 years	29.2	**30.4**	30.9	29.7	30.5	**33.2**	31.2	**33.0**	27.3	27.6	26.4	**29.6**
65 years and older	12.2	12.3	14.0	14.6	13.0	13.3	14.8	15.4	10.1	9.2	9.7	10.1
High school graduate or higher	77.8	**84.3**	95.9	97.3	71.9	**77.2**	76.2	**83.8**	68.9	**78.0**	77.5	**87.0**
Bachelors degree or higher	39.1	**45.9**	79.0	**83.4**	32.0	**38.0**	31.1	**41.5**	10.5	**13.8**	47.1	**58.5**
Caucasian	27.8	**31.6**	80.2	79.1	14.2	**19.7**	18.4	**25.1**	3.1	2.8	34.1	**44.0**
African American	59.4	**54.9**	5.6	6.7	60.8	**53.9**	76.2	**66.3**	94.2	92.1	45.7	**39.0**
Asian	2.6	**3.4**	5.3	5.5	2.1	3.3	1.0	2.1	0.3	0.5	5.4	6.6
Two or more races	1.7	1.3	1.9	**1.1**	2.1	1.7	1.4	1.1	0.9	1.4	2.3	1.4
Hispanic or Latino	7.9	**8.2**	6.1	6.7	20.2	20.8	2.5	**4.9**	1.2	2.9	11.9	**7.8**
Foreign-born, in US < 5 years	8.6	8.5	11.8	11.1	17.1	17.8	3.5	4.4	1.3	--	12.4	**9.5**
Foreign-born, in US > 5 years	4.2	4.2	6.3	5.7	7.6	8.8	1.4	1.7	0.4	--	7.1	5.9
Native-born	87.1	87.3	81.9	83.2	75.3	73.4	95.1	93.8	98.3	97.4	80.5	84.5
Language other than English at home	16.8	**15.3**	22.0	19.8	28.0	27.3	8.3	9.2	4.6	4.7	24.8	19.2
Income < 100% poverty level	20.2	19.6	8.0	8.8	16.3	13.5	18.8	**14.4**	30.5	32.0	22.9	23.6
Income 100 - 185% poverty level	13.6	**11.8**	5.1	3.7	14.9	13.5	13.2	11.2	17.0	18.5	15.6	**8.4**
Income > 185% poverty level	66.2	68.6	86.9	87.4	68.9	73.0	67.9	**74.5**	52.4	49.5	61.5	**67.9**

Notes: Income is individual level; bolded figures indicate a statistically significant change from 2000 to 2006 (with 95 percent confidence), 2000 data are from the 2000 Census; 2006 data are from the 2006 American Community Survey. Dash marks indicate not estimable.

2.3 Adult Health

Table 2.3 profiles health outcomes among adult District residents for D.C. as a whole and by Ward.

Table 2.3 Health Outcomes Among Adult District Residents

Health Outcome	Year	DC	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8
Self-Rated Health										
Fair/poor (%)	2006	12.9	15.7	7.7**	5.3**	13.5	14.9	11.6	23.3**	14.2
Chronic Conditions										
Heart disease (%)	2006	4.8	3.1*	3.1**	3.9	6.0	5.6	4.8	6.4	3.4
Hypertension (%)	2005	27.1	22.7*	15.4**	13.9**	30.4	32.5**	28.2	37.6**	35.5**
Cerebrovascular disease (%)	2006	2.8	1.8	1.6**	1.2**	4.2	3.2	2.8	4.8	2.9
Diabetes (%)	2006	8.1	6.0*	5.0**	3.3**	9.8	10.3	9.2	12.2**	11.0*
Current asthma (%)	2006	10.0	8.4	9.7	8.3	11.6	10.8	8.2	12.2	9.9
Any chronic condition(%)^	2005	37.1	30.0**	23.4**	24.6**	39.0	43.5**	39.4	51.2**	45.1**
Obese (%)	2006	22.5	17.4**	13.7**	9.3**	30.5**	29.4**	23.3	29.4**	33.3**
Overweight or obese (%)	2006	54.6	47.9*	39.1**	38.1**	62.3**	61.4*	58.0	65.4**	71.2**
Disability (%)	2006	16.3	17.0	14.2	16.3	19.6	16.9	15.3	16.6	14.9
Alcohol or Illicit Drug Abuse or Dependence[a]										
Among 18-25(%)	02-04	21.1	21.5	23	25.3	18.7	20	22.7	17.4	16.3*
Among 26+ (%)	02-04	10.5	12.6	12.1	10.2	9.2	9.5	10.7	9.9	10.1
Mental Health [b]										
Severe mental illness(%)	2000	5.6	6.1	5.4	4.3	5.1	5.8	5.6	6.3	7.3
Severe & persistent mental illness(%)	2000	2.5	2.7	2.3	2.1	2.3	2.6	2.5	2.7	3.2
Cancer Incidence (age-adjusted)[c]										
Breast cancer per 100k women	2004	135	111	106	118	127	109	114	104	145
Cervical cancer per 100k women	2004	19	34	20	7	13	11	15	44	23
Prostate cancer per 100k men	2004	139	118	94	97	161	139	132	126	151
Colon cancer per 100k	2004	26	27	18	15	18	29	33	21	31
Cancer: Stage of Presentation [c]										
Local (%)	2004	70	70	68	78	68	69	65	68	69
Regional/Distant(%)	2004	23	23	24	19	24	22	26	25	27
Unknown (%)	2004	7	7	8	3	8	9	8	8	4
Mortality (per100k, age-adjusted)[d]										
All cause	2004	951	938	1143	624	853	1032	906	1103	1208
Heart disease	2004	231	217	279	184	204	222	217	263	321
Cancer	2004	202	228	266	161	203	188	177	218	182
Hypertension	2004	58	71	91	36	44	644	51	57	101
HIV/AIDS	2004	39	50	43	3	20	63	30	49	69
Cerebrovascular disease	2004	35	26	33	24	36	34	30	40	51

Diabetes	2004	33	30	25	15	23	41	31	60	60
Accidents	2004	37	30	35	21	37	43	35	45	58
Premature Mortality (age-adjusted mortality per 100k among those 18-64) [(d)]										
All cause	2004	515	505	476	140	461	652	509	696	789
Heart disease	2004	45	45	73	16	67	76	84	103	128
Cancer	2004	109	133	114	57	114	98	83	166	118
Hypertension	2004	26	20	27	4	25	31	33	29	45
HIV/AIDS	2004	59	81	60	4	28	99	44	77	104
Cerebrovascular disease	2004	16	16	13	2	15	18	20	18	33
Diabetes	2004	14	16	14	6	6	20	10	24	17
Accidents	2004	38	29	36	17	34	51	28	47	71

*Notes: Authors' analyses of 2005-2006 BRFSS data unless otherwise noted; ** Significantly different from the city mean at the .05 level, * at the .10 level; ^Includes asthma, diabetes, stroke, heart disease, and hypertension; (a)Source: NSDUH; (b) Source: Holzer (2003), household estimates using P5 series. Standard errors and statistical significance not available; (c) Source: Authors' analyses of 2004 DC Cancer Control registry. Ward level rates are derived from zipcode level estimates. Zipcode was missing for 10 percent of cases.. (d)Analysis of mortality data from DC Department of Health.†Rates are population based; thus standard errors and statistical significance not shown.*

Self-reported health status is one way to evaluate the population's overall health and has been found to be predictive of population mortality (McGee et al, 1999). Respondents indicated whether their overall health was excellent, very good, good, fair, or poor. Among adult residents of the District, 13 percent reported having only fair or poor health status.

Over one-third (37 percent) of adult District residents reported having one or more chronic conditions and more than one in four adults reported having hypertension, making it the most common chronic disease reported. Following hypertension, in order of prevalence, are asthma (10 percent), diabetes (8 percent), heart disease (5 percent), and cerebrovascular disease (3 percent). Based on self-reported height and weight, over half of District residents qualify as overweight or obese, and nearly one-quarter qualify as obese.[5] Sixteen percent of adults reported having a disability.

City-wide, the percentage of 18-25 year olds estimated to be either dependent on or abusing alcohol or illicit drugs is 21 percent, compared to 11 percent among adults aged 26 or older. Approximately 6 percent of District residents were estimated to have a serious mental illness, and 3 percent to have serious and persistent mental illness.[6,7]

Among the four (age-adjusted) incidence rates analyzed, incidence rates were highest for breast and prostate cancer among DC residents. In 2004 (the most recent year for which data are available), there were 418 newly diagnosed cases of breast cancer in the District, 318 new cases of prostate cancer, 144 new cases of colon cancer, and 63 new cases of cervical cancer.

Screening for breast, cervical, colon and prostate cancers can help with their early detection, which is associated with better survival rates. Stage of presentation (local, regional or distant) for these cancers is thus a marker for the availability and effectiveness of cancer screening. Table 2.3 shows the stage of presentation by ward for the four cancers combined. For the District as a whole, 70 percent of new cancers were found at the local stage, compared to 23 percent at regional or distant stages.

District-wide, mortality rates from heart disease and cancer were higher than other causes, although cancer and HIV/AIDS contribute the most to rates of premature mortality.

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[5] Obesity is defined as a body mass index (BMI) of 30.0 or greater. "Overweight" is having a BMI of 25.0-29.9.

[6] Serious mental illness (SMI) includes individuals with one of the following: 1) 12-month prevalence of non-affective psychosis or mania; 2) lifetime prevalence of non-affective psychosis of mania if accompanied by evidence that the respondent would have been symptomatic if it were not for treatment (defined by either use of medication or any professional treatment in the past 12 months); or 3) 12-month prevalence of either major depression or panic disorder with evidence of severity indicated either by hospitalization or use of major psychotropic medications. Serious and persistent mental illness (SPMI) includes individuals who meet the SMI definition and who also had a 12-month DSM-III-R mental disorder and either planned or attempted suicide at some time during the past 12 months, or had a 12-month DSM-III-R mental disorder that substantially interferes with their vocational capacity.

[7] A recent survey of ten community health centers provides further detail on mental health outcomes among District residents, reporting that the most common mental health diagnoses at the clinics in order of frequency are major depression, substance abuse, bipolar disorder, post traumatic stress disorder (PTSD), and schizophrenia (DCPCA, 2007).

Health outcomes varied significantly across wards. For example:

- **Ward 7** had the highest rates of hypertension, diabetes, any chronic condition, and poor or fair self-reported health. These rates were statistically higher than the mean rate for all of DC.
- Rates of hypertension, diabetes, and overweight/obesity were also higher in **Ward 8** compared to the city-wide average.
- **Ward 5** had higher rates of hypertension and overweight/obesity compared to the city-wide average.
- The highest rate of obesity was in **Ward 8**. Rates of obesity were higher in **Wards 4, 5, 7**, **and 8** compared to the city as a whole. Nearly three out of every four adult Ward 8 residents reported a height and weight that classifies them as overweight.
- **Wards 2 and 3** had lower rates of hypertension, heart disease, cerebrovascular disease, and diabetes compared to the city as a whole.
- Breast and prostate cancer incidence rates were highest in **Wards 4 and 8. The** cervical cancer incidence rate was highest in **Ward 7** and for colon cancer **Ward 6.**[8]
- **Ward 3** had the highest proportion of cancers (78 percent) presenting locally, (and hence the lowest proportion presenting with regional or distant metastases). The proportion was appreciably higher than for other Wards (65-70 percent).[8]
- Premature mortality rates from heart disease, hypertension, HIV/AIDS, cerebrovascular disease and accidents were highest in **Ward 8**. [8]
- Premature mortality rates from cancer and diabetes were highest in **Ward 7.** [8]

2.4 Children's Health

Table 2.4 summarizes health outcomes among children in the District. The majority of estimates are from 2003, the most recent year for which data are available.

[8] Statistical significance of differences in rates across wards is not marked in the table for these results because the rates are based on the full population of cancer cases; thus, whether these are meaningful differences is a qualitative and not a statistical question

Table 2.4 Health Status Among Children in the District

	DC	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8
Parental Assessment of Children's Health									
Poor/fair health (%)	4.1	6.3	9.1*	0.6**	1.9**	4.4	3.1	4.4	4.5
Require more medical care than other children (%)	12.1	12.4	11.7	8.2*	12.9	15.2	9.6	14.1	11.3
Chronic Conditions									
Current asthma (any severity) (%)†	11.9	7.6*	5.0**	3.9**	9.1	14.9	12.6	17.9**	12.1
Moderate or severe asthma (%)†	4.3	3.7	1.6**	0.6**	5 .2	5.6	3.8	5.3	4.4
At risk for being overweight (%)	16.8	20.4	11.5	7.7**	19.2	16.5	16.4	19.4	15.6
Overweight among 6-12 yrs. (%)	36.3	35.4	25.5	10.8**	30.4	36.5	49.7	36.4	44.2
Overweight among 13-17 yrs (%)	17.2	10.3*	16.4	7.6	10.4	20.3	27.0	13.7	20.6
Limitation in activity or function (%)	7.4	4.8	2.9**	2.8**	5.7	5.0	10.2	10.8	8.6
Any chronic condition among 6-12 years (%)(a)	52.5	39.5*	40.8	48.3	45.1	57.9	54.9	62.1*	52.2
Any chronic condition among 13-17 years (%)(a)	52.4	38.5	46.4	47.2	54.4	62.7	40.8*	55.3	58.6
Mental and Cognitive Health									
Behavioral health issue needing treatment (%)	10.5	10.6	8.0	8.0	7.1	14.7	11.7	12.0	7.9
Learning disability diagnosis (%)	12.9	12.1	12.0	11.1	10.1	13.6	15.6	13.3	13.5
Serious emotional disturbance (%) (2000)(b)	7.9	8.1	7.6	6.4	7.5	7.9	8.1	8.1	8.4
Substance Abuse(c)									
Alcohol or Illicit Drug Abuse or Dependence, Among 12-17 (%)	6.0	6.1	--	8.5	5.6	5.5	5.9	5.4	5.7
Oral Health									
Dental problem (%)	8.5	11.3	9.3	2.1**	8.7	9.2	10.4	8.6	5.8*
Poor/fair dental health (%)	8.9	12.0	9.5	2.1**	9.2	9.4	10.5	9.5	5.8**
Health Behavior									
Did not engage in any physical activity in the past week (%)	16.6	18.6	18.5	5.0**	18.5	17.4	12.0	20.1	16.1

Notes:
Authors' analyses of NSCH. All estimates are for 2003 unless otherwise noted.
*** statistically significant difference from city-wide mean at .05 level*
** statistically significant difference from city-wide mean at .10 level*
† *Asthma rates are among all children.*
(a)Includes asthma, bone or joint problems, diabetes, developmental delay or physical impairment, respiratory allergy, food or digestive allergy, eczema, severe headaches, stuttering or speech problems, chronic ear infections, attention deficit disorder, depression, anxiety, behavioral or conduct problems, or autism.
(b) Holzer (2003), household estimates using P5 series. Standard errors and statistical significance not available.
(c) Source: NSDUH 2002-2004.

Among key findings for children in the District overall are the following:

- A relatively small percentage of parents (4 percent) reported that their child was in poor or fair health.
- Seven percent of children were reported to have a health issue that limits their ability to perform the activities of most children.
- Approximately 12 percent of children in DC were reported to have asthma.
- Across the city, 36 percent of children between ages 6 and 12 were overweight, while 17 percent of children between ages 13 and 17 were overweight.
- Approximately 9 percent of DC children were reported to have a specific dental health issue (e.g., dental caries, broken teeth).
- Eleven percent of parents reported that their children require services for a behavioral health issue; 13% had a diagnosed learning disability.
- Eight percent of children in DC were estimated to have a serious emotional disturbance (in 2000).[9]
- City-wide, 6 percent of children 12-17 years old were estimated to be abusing or dependent on alcohol or illicit drugs.

Table 2.4 also shows variability in health outcomes across Wards:

- The percentage of children in **Ward 2** whose health was reported to be poor or fair health was more than double that in the rest of the city (9 vs. 4 percent); the reported percentages were lowest in **Wards 3 and 4** (from less than 1 to 2 percent).
- Only 5 percent of children in **Ward 3** reported not exercising in the last week, compared to 17 percent city-wide.
- Asthma prevalence was highest in **Ward 7,** with 18 percent of children reporting asthma of any severity. Asthma rates in **Wards 1, 2, and 3** were lower than the city-wide mean.
- **Ward 3** had the lowest percentage of overweight 6-12 year olds; rates throughout the other wards ranged from 26-50 percent. While the estimated rate was highest in **Ward 6**, it was not statistically different from the city mean.
- Rates of dental health problems were lowest in **Wards 3 and 8**; all other wards were not statistically different from the city mean of about 9 percent.
- **Ward 7** had the highest percentage of younger children (6-12 years) with a chronic health issue; the rate was lowest in **Ward 1.**

[9] Children with serious emotional disturbance (SED) are defined as persons under age 18 who currently or at any time during the past year had diagnosable mental, behavioral, or emotional disorder of sufficient duration to meet diagnostic criteria specified within DSM- III-R criteria.

3. Access to Health Care: Access Facilitators

3.1 Overview

Over the next three sections, we explore several different aspects of access to care. In this section, we summarize factors that facilitate access to care; namely, insurance and having a usual source of care. In Section 4, we then summarize the care that individuals actually receive—their use of care. Finally, in Section 5, we describe the extent to which adults receive recommended preventive care and cancer screening, satisfaction with care among children, and receipt of primary and specialty care among individuals with chronic conditions. Within each topical area, we describe outcomes for adults and children.

A number of data sources provide information about access to care among children and adults in the District, including BRFSS data, NSCH data, hospital discharge data, and claims data from managed care plans serving Medicaid and Alliance enrollees. We describe each of these data sources and our analyses of them in the Technical Appendices. Finally, we calculate measures of access to care for Medicaid enrollees in managed care plans, using data from the three plans in the city that cover these enrollees.

3.2 Insurance and Usual Source of Care Among District Adults and Children

Table 3.1 describes insurance and usual source of care among DC adults and children. Table 3.2 describes insurance among District residents by ward.

Table 3.1 Access to Health Care Among District Residents

Measure	Adults (2006) %	Children (2003) %
Insured (any source)	91.3	95.5
Uninsured	8.7	4.5
Insured—private	--	47.2
Insured-public	--	48.3
No regular source of care	19.9	19.8
No regular source of care among the uninsured	63.6	--
No regular source of care, among insured	15.7	--
No regular source of care among publicly insured	--	22.6
No regular source of care, among privately insured	--	14.2

Source: Authors' analyses of 2006 BRFSS data for adults and 2003 NSCH data for children
--, Insufficient data

Table 3.2 Health Insurance Among District Residents by Ward

	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8
Adults								
Uninsured (18-64)	9.8	8.4	3.8**	8.3	10.9	12.2	11.6	13.8
Children								
Uninsured	8.3**	5.6	1.7**	7.4**	4.7	4.7	2.0	3.3
Public insurance	47.6	33.8**	2.3**	36.6**	51.0*	48.6	69.0**	58.6**
Private Insurance	44.1**	60.6*	96.0**	56.1	44.3*	45.4	29.0**	38.1**

*Source: Authors analyses of 2006 BRFSS data for adults; 2003 NSCH for children *statistically different from city-wide mean at the 10 percent level; **at the 5 percent level.*

In 2006, 91 percent of adults over age 18 in the District reported being insured; conversely, 9 percent reported no insurance. However, the extent to which respondents covered by the Alliance reported themselves to be insured or uninsured is not certain. A higher percentage of children were reported to be insured (over 95 percent). Rates of insurance vary by Ward, with the lowest rate of uninsurance among adults and children in Ward 3 (3.8 percent for adults and 1.7 percent for children). Wards 1 and 4 had the highest percentages of children who were uninsured (8 and 7 percent, respectively).

Because BRFSS only asks a general question about insurance coverage, we are unable to determine whether District adults have public or private insurance.[10] Insured children are nearly evenly split between private insurance (47 percent) and public insurance (48 percent). Wards 7 and 8 had the highest percentage of children with public insurance; Ward 3 had the highest percentage of children with private insurance.

Despite the relatively high rate of insurance coverage, about 20 percent of District residents—children and adults—reported no usual source of care. Having a usual source of care is important, as it is associated with more preventive care and better care for chronic conditions (Viera et al 2006; DeVoe et al, 2003). Not surprisingly, lack of a usual source of care was greater among the uninsured compared to the insured, with about two-thirds of the adult uninsured without a usual source compared to 16 percent among adult insured individuals. Among children, those with public insurance were less likely to report having a usual source of care (23 percent) compared to those with private insurance (14 percent).

We used regression analysis (not shown) to explore whether there were differences in the probability of having a usual source of care among individuals residing in different parts of the city, independent of other factors such as age, race, gender, income, education, insurance, and

[10] Because BRFSS only asks a single question about insurance coverage (without listing potential sources of coverage by name, for example), it is unclear whether individuals in the Alliance count themselves as insured or uninsured. BRFSS measures insurance at a particular point in time during the year rather than measuring insurance status for an entire year (as the Current Population Survey does). Further detail by insurance type, albeit for an earlier year, is available from a 2003 Kaiser Family Foundation (KFF) survey of access to care in the District (Lillie-Blanton et al, 2003). The KFF survey estimated that, in 2003, 9 percent of adult residents between the ages of 18 and 64 in Washington DC lacked any coverage, while 4 percent were covered by DC Alliance, 70 percent were covered by employer-sponsored coverage, and 11 percent were covered by Medicaid. However, insurance coverage patterns have changed since the KFF survey, in particular with the increase in Alliance coverage among adults.

health status. Among children, PUMAs D and B were associated with relatively low rates of having a usual source of care, compared to other PUMAs. PUMA C was associated with having a relatively low probability of having a usual source of care among adults. (Additional detail provided in the Technical Appendices.)

4. Access to Health Care: Use of Care

We triangulated data from three sources in order to describe use of care among adults and children in the District:

- First, we used claims data from managed care organizations that cover Medicaid and Alliance enrollees to describe use of various types of care.
- Second, we summarized reported use of care from available survey data—the BRFSS (for adults) and NSCH (for children). Both the BRFSS and NSCH contain self-reported utilization data.
- Third, we used information on inpatient and emergency department discharges from District hospitals to describe rates of use of these services. In addition, these data allow us to describe trends in hospitalizations that are sensitive to the availability and efficacy of outpatient services, such as primary and specialty care.

4.1 Use of Care Among District Medicaid and Alliance Managed Care Enrollees

We analyzed data from the three managed care organizations that enroll the universe of Medicaid and Alliance managed care enrollees (HealthRight, Chartered Health Plan, and Amerigroup). We summarize the percentage of enrollees that use any of four particular types of care: any office visit, any primary care visit, any ED visit, and any inpatient hospital stay.

Table 4.1 profiles the percentage of Medicaid and Alliance enrollees who used various types of care during a year period. We analyzed Medicaid enrollees who were enrolled a full year and Alliance enrollees who were enrolled for 6-11 months of the year or a full 12 months of the year. While the majority of Medicaid enrollees were enrolled for a full year, Alliance enrollees were split between those enrolled 6-11 months and those enrolled 12 months, so we characterized use of care among both sets of Alliance enrollees.

Table 4.1 Use of Care Among Medicaid and Alliance Enrollees, 2006

	% Enrollees with Any Office Visit	% Enrollees with Any Primary Care Visit	% Enrollees with Any ED Visit	% Enrollees with Any Inpatient Stay
Medicaid Enrollees, by Age				
Age 0-5 (n=13,503)	61	58	39	3
Age 6-12 (n=15,836)	42	39	22	2
Age 13-17 (n=10,436)	40	34	26	4
Age 18-64 (n=20,626)	61	47	39	14
Adult Alliance Enrollees				
Enrolled 12 months (n=12,479)	67	60	22	7
Enrolled 6-11 Months (n=16,640)	48	42	17	8

Source: Authors' analyses of managed care claims data.

Findings include:

- Among children enrolled in Medicaid managed care, the percentage that had any office visit during the year closely paralleled those with primary care visits. Rates of primary care use ranged from about one third among older children to 58 percent among children 0-5 years old.

- Approximately one-quarter of children 6-17 year old had an ED visit during the year; among children 0-5 the rate was 39 percent. Among adults covered by Medicaid, 61 percent had an office visit and 39 percent had an ED visit.

- Just over two-thirds (67 percent) of Alliance enrollees who were enrolled for the full year had any office visit, which is comparable to the rate among Medicaid enrollees (61 percent).

- Rates of ED and inpatient use were lower among Alliance enrollees (22 vs. 39 percent and 7 vs. 14 percent for Alliance vs. Medicaid-enrolled adults, respectively).

Table 4.2 profiles use of primary care (office-based), specialty care (office-based), ED care and inpatient care among Medicaid enrollees with specific conditions. A note of caution is that not all Medicaid enrollees who have the specified condition are included in these analyses; specifically, those who have the condition but use no care of any type are not included—claims data do not allow us to identify these individuals.[11] Further, in calculating the rates of specialist care, we do not imply that all individuals with these conditions should have received specialty care.

[11] We can interpret these as upper bounds on the true rates of use among Medicaid enrollees with the particular condition—thus, rates of primary and specialty care may be overstated (suggesting true access is worse than the figures suggest), while rates of ED use and inpatient use may also be overstated, which—assuming we interpret ED and inpatient use as negative indicators—may make access outcomes look worse than they indeed are.

Table 4.2 Use of Care among Medicaid Managed Care Enrollees with Specific Conditions, 2006

Condition (Specialist)	Age	N	% with primary care visit	% with specialist visit	% with ED visit	% with inpatient stay
Heart Disease (Cardiologist)	18-64	1895	72	15	75	32
HIV/AIDS (Infectious Disease)	18-64	316	73	41	55	30
COPD (Pulmonologist)	18-64	342	71	6	78	23
Asthma (Pulmonologist)	0-5	1545	85	1	65	10
	6 to 12	1211	78	1	50	8
	13-17	594	73	1	52	10
	18-64	1155	78	3	66	23
Neoplasms (Oncologist)	18-64	221	72	24	49	34
Diabetes (Endocrinologist)	18-64	919	81	8	51	23

Source: Authors' analyses of managed care claims data; percentages are calculated among enrollees with the specified condition who have at least some office based or hospital use

The results for Medicaid enrollees show:

- While the majority of individuals with these specific conditions had at least one visit to a primary care provider, few saw specialists with expertise in treating their condition. Rates of specialist use were highest (41 percent) among those with HIV/AIDS.

- Rates of ED use among adults (18-64) with the selected conditions ranged from 49 to 78 percent—that is, between about half and three-fourths of these individuals used the ED at least once.

- Rates of inpatient admissions among adults with the selected conditions range from 23 to 34 percent.

- Among children with asthma, between 50 and 65 percent had an ED visit (depending on age), and approximately one in ten had an inpatient stay. While the majority of children with asthma had a primary care visit, few saw a pulmonologist.

Table 4.3 repeats the previous table but for Alliance enrollees, and similar caveats apply.

Table 4.3 Use of Care among Alliance Managed Care Enrollees with Specific Conditions, 2006

Condition (Specialist)	Length of Enrollment	N	% with primary care visit	% with specialist visit	% with ED visit	% with inpatient stay
Heart Disease (Cardiologist)	12 months	1018	65	11	43	20
	6-11 months	1035	70	9	59	44
HIV/AIDS (Infectious Disease)	12 months	234	88	19	29	11
	6-11 months	315	72	26	36	30
COPD (Pulmonologist)	12 months	244	81	2	57	14
	6-11 months	210	73	2	58	35
Asthma (Pulmonologist)	12 months	526	86	1	46	10
	6-11 months	443	77	2	47	29
Neoplasms (oncologist)	12 months	196	85	12	33	26
	6-11 months	160	78	6	38	36
Diabetes (Endocrinologist)	12 months	1267	86	<1	29	16
	6-11 months	898	83	<1	30	21

Source: Authors' analyses of managed care claims data; percentages are calculated among enrollees with the specified condition who have at least some office based or hospital use.

We found:

- The patterns of use among Alliance enrollees (18-64) are similar to those among Medicaid enrollees, although rates of use of the ED and inpatient admission rates are consistently lower—though not low, with ED rates ranging from 29 to 57 percent and inpatient admission rates ranging from 10-26 percent.

- Most Alliance-enrolled adults with the selected conditions had at least one primary care visit (81-88 percent across conditions), with the exception of enrollees with heart disease. Only two-thirds of such enrollees had a primary care visit.

- Rates of use of specialty care were low for all conditions, with a high of 19 percent among those with HIV/AIDS.

4.2 Reported Use of Care Among District Adults and Children

We used the 2006 BRFSS and 2003 NSCH to describe reported use of care among adults and children (respectively). The data are summarized in Table 4.4.

Table 4.4 Use of Health Care Among District Residents

Measure	DC	Uninsured	Insured	Public Insurance	Private Insurance
Adults[(a)]					
Checkup within the last 2 years (%)	91.1	79.5**	92.2	--	--
Dental visit in last 5 years (%)	91.8	79.6**	92.9	--	--
Children[(b)]					
Well child visit in last year (all children)	87.6	--	--	86.8	89.9
Well child visit in last year (0-5)	90.0	--	--	87.1**	94.5
Well child visit in last year (6-12)	87.4	--	--	87.4	88.0
Well child visit in last year (13-17)	84.5	--	--	85.3	85.9
Dental care in last year	80.6	--	--	82.0	79.2
Problem seeing a specialist	15.5	--	--	20.8**	9.3
Any acute care visit in the last year		--	--		
Among healthy children	43.5	--	--	36.1**	51.3
Among children with a chronic illness	60.5	--	--	56.7**	65.8
Any ED visit in the last year		--	--		
Among healthy children	15.1	--	--	14.6	16.1
Among children with a chronic illness	32.7	--	--	35.8	29.4
Did not see a doctor when they needed to		--	--		
Among healthy children	14.5	--	--	16.0	12.1
Among children with a chronic illness	7.9	--	--	8.8	6.5

Notes
(a) Authors' analyses of 2006 BRFSS data
(b)Authors' analyses of 2003 NSCH data. Chronic illness includes asthma, bone or joint problems, diabetes, developmental delay or physical impairment, respiratory allergy, food or digestive allergy, eczema, severe headaches, stuttering or speech problems, chronic ear infections, attention deficit disorder, depression, anxiety, behavioral or conduct problems, autism; Healthy is defined by the absence of all of these conditions.
***statistically significant differences between insured and uninsured at the .05 level, * at the .10 level.*

Findings include the following:

- The majority of District adults reported receiving a checkup in the past two years and a dental exam in the last five years, although rates were higher among the insured compared to the uninsured. About 20 percent of the uninsured had not had a preventive care checkup within two years or dental exam within 5 years compared to 8 and 7 percent, respectively, among insured individuals.

- The majority of children are reported to have had a well-child visit in the last year. The rates are somewhat higher among younger compared to older children.

- Among children ages 0-5, privately insured children were more likely than publicly insured to have a well-child visit.

- About 80 percent of children reported having had at least some dental care in the last year; rates were statistically similar for publicly and privately insured children.

- Publicly insured children were more likely than privately insured children to report having a problem seeing a specialist (21 vs. 9 percent).

- Publicly insured children were less likely to have a reported acute care visit during the past year compared to privately insured children. This held true for both relatively healthy children and children with one or more chronic conditions.

- Rates of ED use among children were not statistically different for privately vs. publicly insured; about 15 percent of healthy children and one-third of children with a chronic condition report using the ED during the year.

The reported rates of health care use among children who are publicly insured differ from the rates of use observed in the managed care claims data. For example, the NSCH data for 2003 indicate 88 percent of publicly insured children had a well-child visit in the last year, whereas the Medicaid claims data suggest between 34 and 54 percent of children had a primary care visit in the previous year. The data cover different time periods and the NSCH are self-reported data and may be subject to recall error. Thus, the findings together suggest either that access to primary care among the publicly insured has been worsening over time or that individuals are over-reporting use of care in the NSCH. Comparing ED use, NSCH estimates show rates of use of 15% among healthy publicly insured children and 38 percent among publicly insured children with a chronic illness. These figures are not inconsistent with the claims data that show rates of ED use of between 27 and 42 percent.

We used regression analysis (not shown) to explore whether there were differences in the reported (vs. claims based) use of care among individuals residing in different parts of the city, holding constant other factors such as age, race, gender, income, education, insurance, and health status. Among children, PUMA D was associated with a low probability of having a well child visit or dental care. PUMA C was associated with having a low probability of any well child visit, any acute care visit and any dental care. Among adults, the probability of having a check-up in the last two years was relatively low among residents of PUMA B compared to other locations. The probability of receiving dental care was highest in PUMA A compared to all other PUMAs. (Additional detail provided in the Technical Appendices.)

4.3 Inpatient and ED Admissions

We analyzed 2000-2006 hospital discharge data to describe rates of inpatient and ED admissions among District residents over time.

Inpatient Admissions

Table 4.5 profiles trends over time in hospital admission rates among District residents by patient age. From 2000-2006 overall admission rates for DC residents remained fairly steady, although rates among the 40-64 year old group increased from 160 to 175 per 1000 between 2003 and 2006 while rates among 65+ fell from 359 to 312 per 1000 between 2000 and 2006.

Table 4.5 Inpatient Admissions Among District Residents (per 1000 population), 2000-2006

Age	2000	2001	2002	2003	2004	2005	2006
0-17	43	41	37	34	35	40	43
18-39	88	83	80	81	80	80	80
40-64	159	154	156	160	164	171	175
65+	359	346	333	320	316	324	312
All	133	128	125	124	125	129	129

Source: Authors' analyses of DCHA data.

ED Admissions

Table 4.6 profiles ED utilization rates among District residents by age over the 2004-2006 period. Admission rates among DC residents were steady among those 0-17 and over age 65, but rose about 6 percent among adults 18-39 and 14 percent among adults 40-64. In total, ED admission rates among District residents increased 7 percent between 2004 and 2006.

Table 4.6 ED Admissions Among District Residents (per 1000 population), 2004-2006

Age	2004	2005	2006
0-17	442	458	446
18-39	360	373	380
40-64	517	549	589
65+	518	528	521
All	442	461	472

**Source: Authors' analyses of DCHA data.*

4.4 Ambulatory Care Sensitive Inpatient Hospitalizations

We used 2000-2006 DCHA data to describe trends in hospitalizations that are sensitive to the availability and effectiveness of outpatient services, such as primary and specialty care. These are referred to as ambulatory care sensitive (ACS) hospitalizations. More detailed information about our analyses of ACS hospitalizations can be found in Technical Appendix 6.

Figures 4A-D shows trends over time in ACS hospitalizations by age group (0-17, 18-39, 40-64, 65+) and by patient residence (PUMA). ACS rates are calculated as the number of ACS admissions for a particular age group divided by the size of the population in that age group, over time from 2000-2006 for the District as a whole.

Figure 4A Trends in Ambulatory Care Sensitive Admission Rates by PUMA Among District Residents Ages 0-17

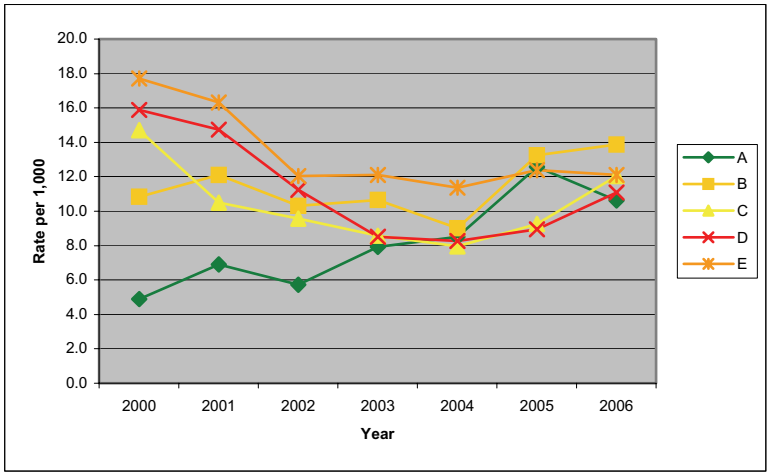


Figure 4B Trends in Ambulatory Care Sensitive Admission Rates by PUMA Among District Residents Ages 18-39

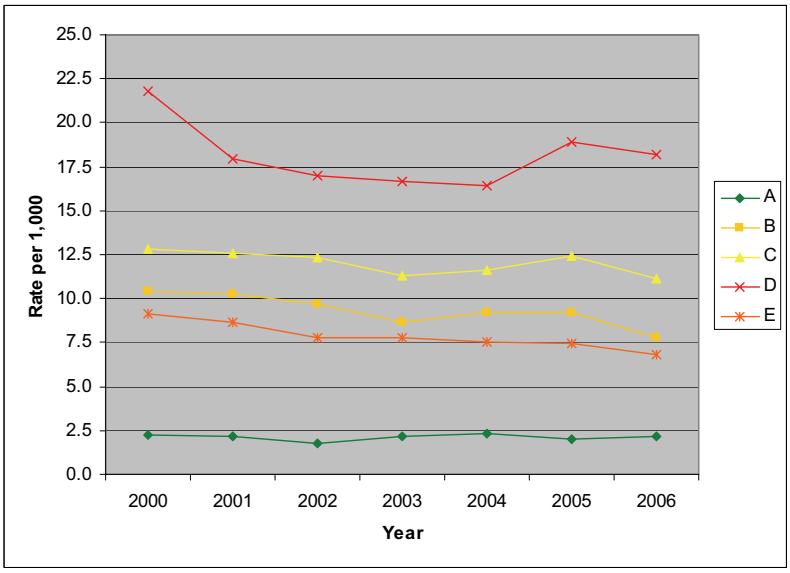


Figure 4C Trends in Ambulatory Care Sensitive Admission Rates by PUMA Among District Residents Ages 40-64

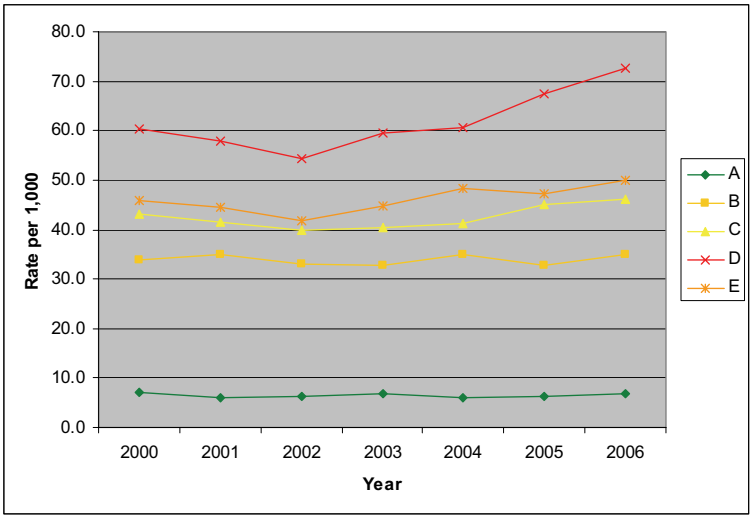
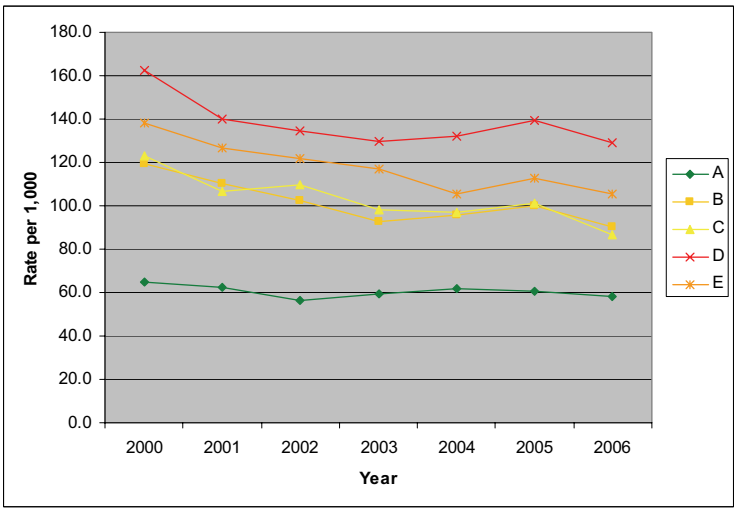


Figure 4D Trends in Ambulatory Care Sensitive Admission Rates by PUMA Among District Residents Ages 65+



The figures show the following:

- Between 2004 and 2006, children in all areas of the city, with the exception of PUMA A, experienced increasing ACS rates.
- Among 18-39 year olds, ACS rates were generally flat or falling across each of the specific areas of the city.
- Among adults 40-64, ACS rates rose in all areas of the city, although the timing of the increase varied by PUMA. For example, PUMA A saw a consistently rising ACS rate between 2003 and 2006, PUMAs C and D saw the same trend but between 2004 and 2006, and the ACS rates in PUMAs B and E fell in 2005 but rose again in 2006. The rise in ACS rates in PUMA D is particularly large in magnitude.
- ACS rates fell among individuals 65+ across the city.
- ACS rates were highest in PUMA D among adults. ACS rates were less variable across PUMAs among children compared to adults, but were highest in PUMA B.

ACS Rates by Diagnosis

Figures 4E-4G show trends over time for specific diagnoses associated with ACS admissions for specific age groups.

Figure 4E Trends in ACS Rates by Diagnosis Among District Residents 0-17

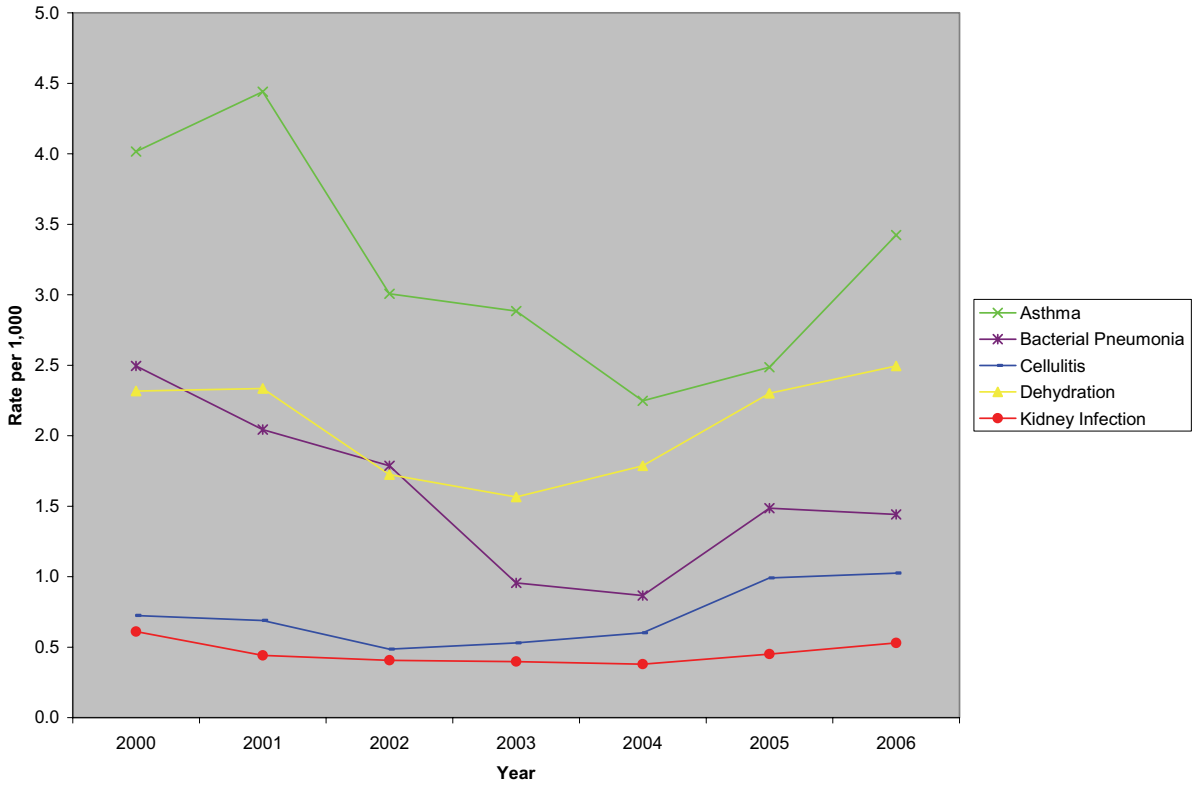


Figure 4F Trends in ACS Rates by Diagnosis Among District Residents 18-39

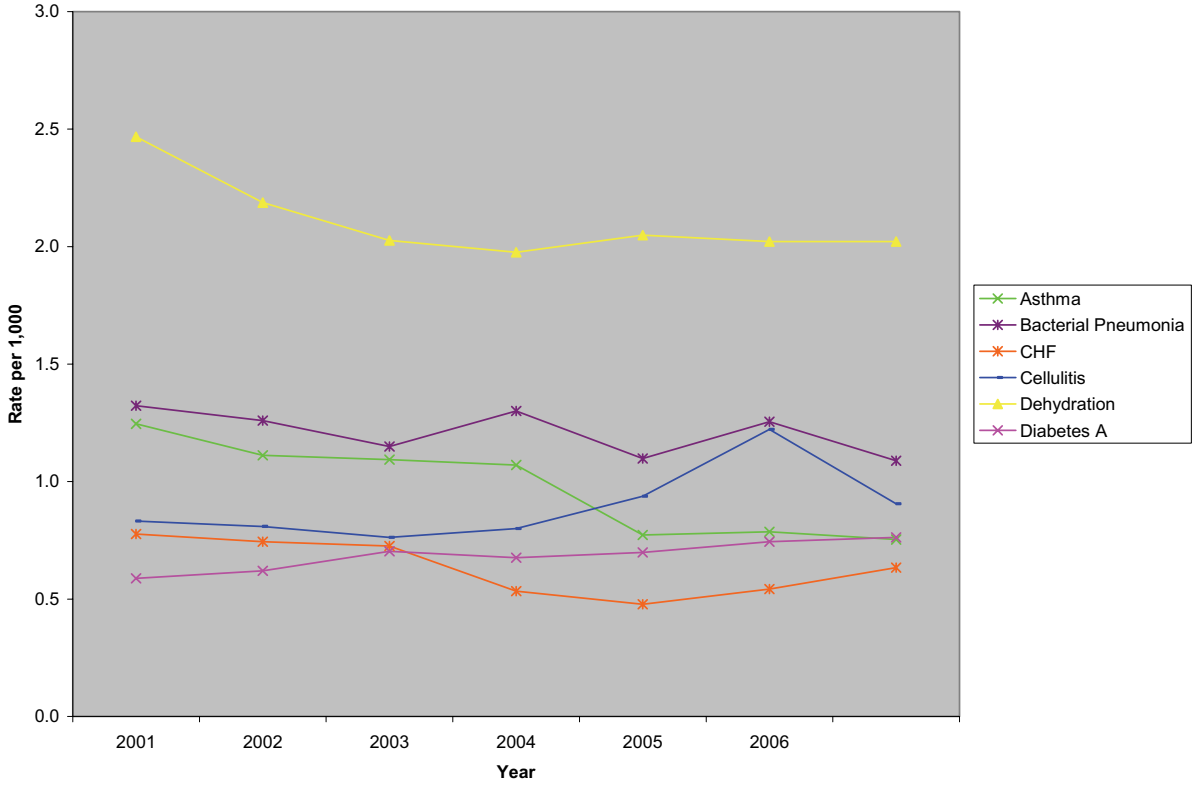
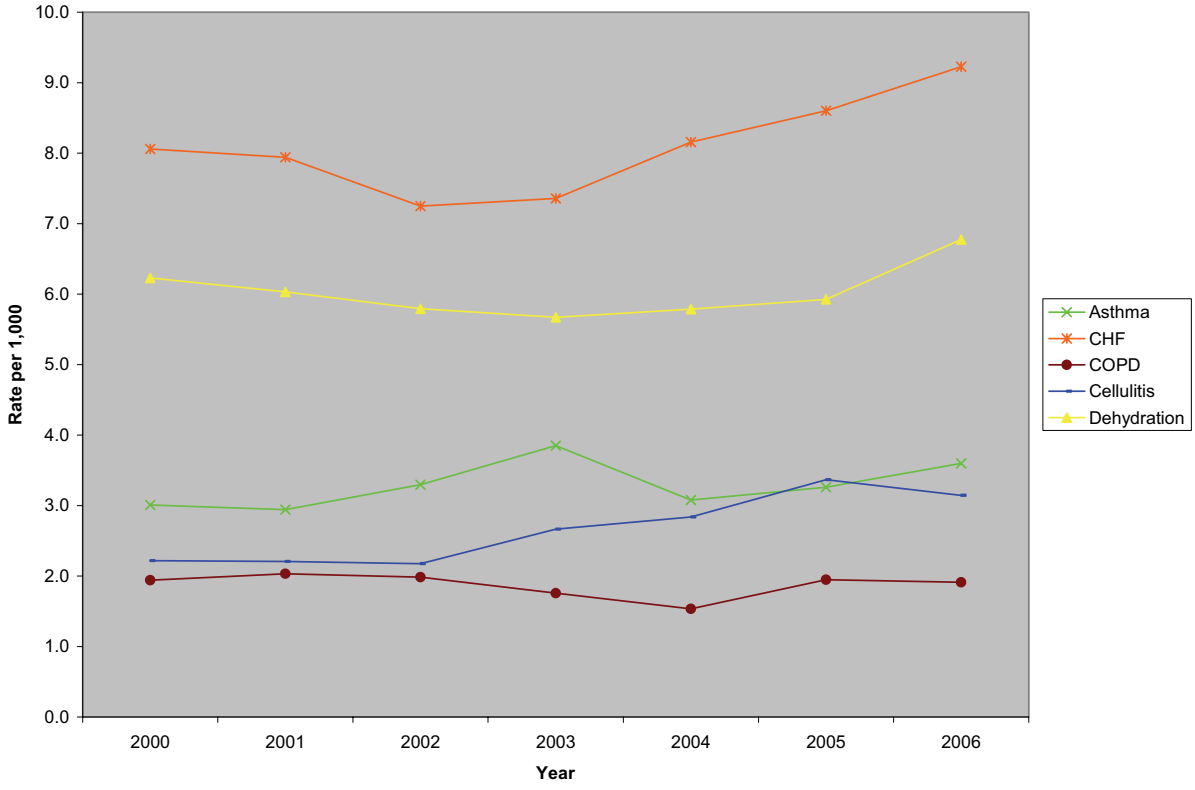


Figure 4G Trends in ACS Rates by Diagnosis Among District Residents 40-64



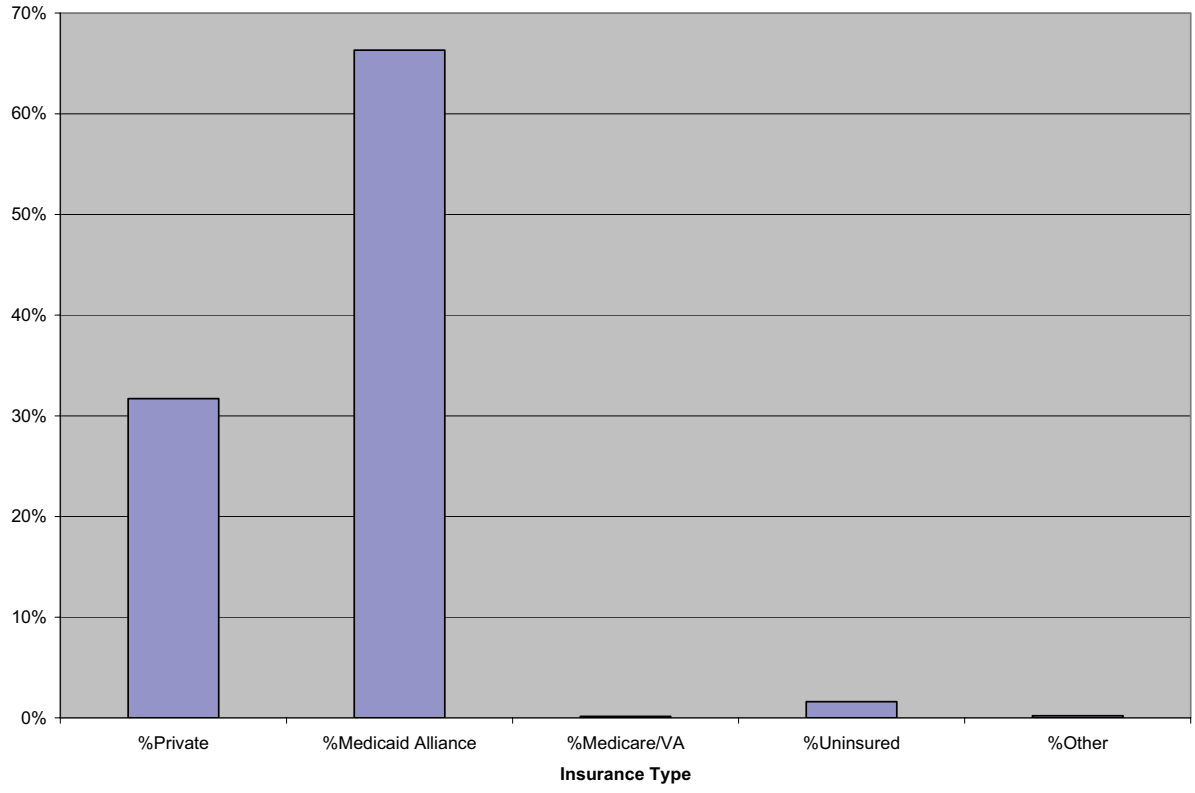
The largest increases in admission rates for children between 2004 and 2006 were for cellulitis (70.6 percent), pneumonia (66.3 percent), asthma (52.4 percent), dehydration (39.6 percent) and kidney infection (39.5 percent) (See Figure 4E).

From 2004-2006, admissions for 18-39 year olds for congestive heart failure (CHF) constituted the largest increase (32.7 percent) while there was a modest decrease in admissions for cellulitis (-3.2 percent). (Figure 4F) Among 40-64 year olds, the largest increases in admission rates were for chronic obstructive pulmonary disease (COPD), dehydration, cellulitis, asthma, and congestive heart failure. (Figure 4G) From 2004 to 2006, the diagnosis with the greatest increase in admission rates was cellulitis (22 percent).

Primary Payer for ACS Admissions

Figure 4H shows ACS admissions for children (0-17) by payer group (private insurance, Medicaid or Alliance, Medicare/VA, self-pay, or other), where the payer group is defined as the primary payer.[12] Figures 4I and 4J show the payer mix for ACS admissions among adults 18-39 and 40-64 for 2006. The "other" category includes those claims for which the primary payer is unknown.

Figure 4H ACS Admissions for Children (0-17) by Payer



[12] We are unable to calculate ACS rates by payer group because we do not have information on the size of each of the population strata in each payer group.

Figure 4I Adult (18-39)ACS Admissions by Payer (2006)

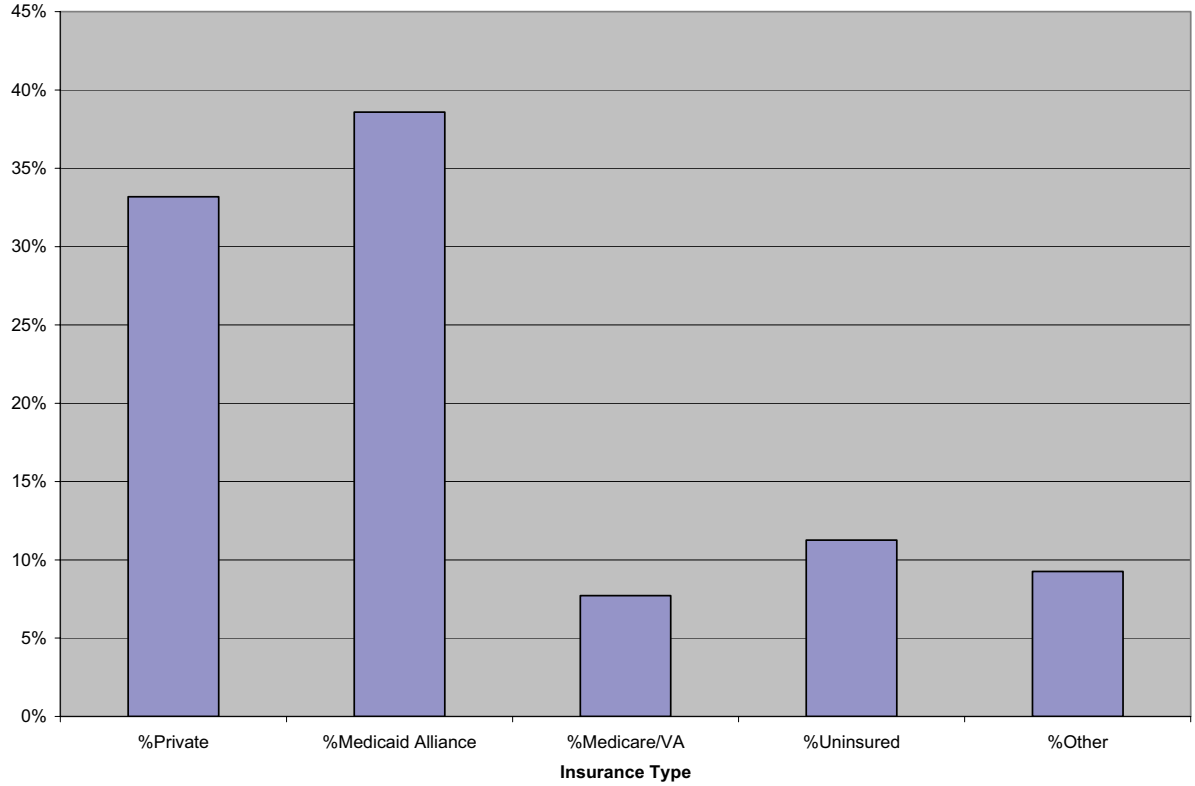


Figure 4J Adult (40-64)ACS Admissions by Payer (2006)

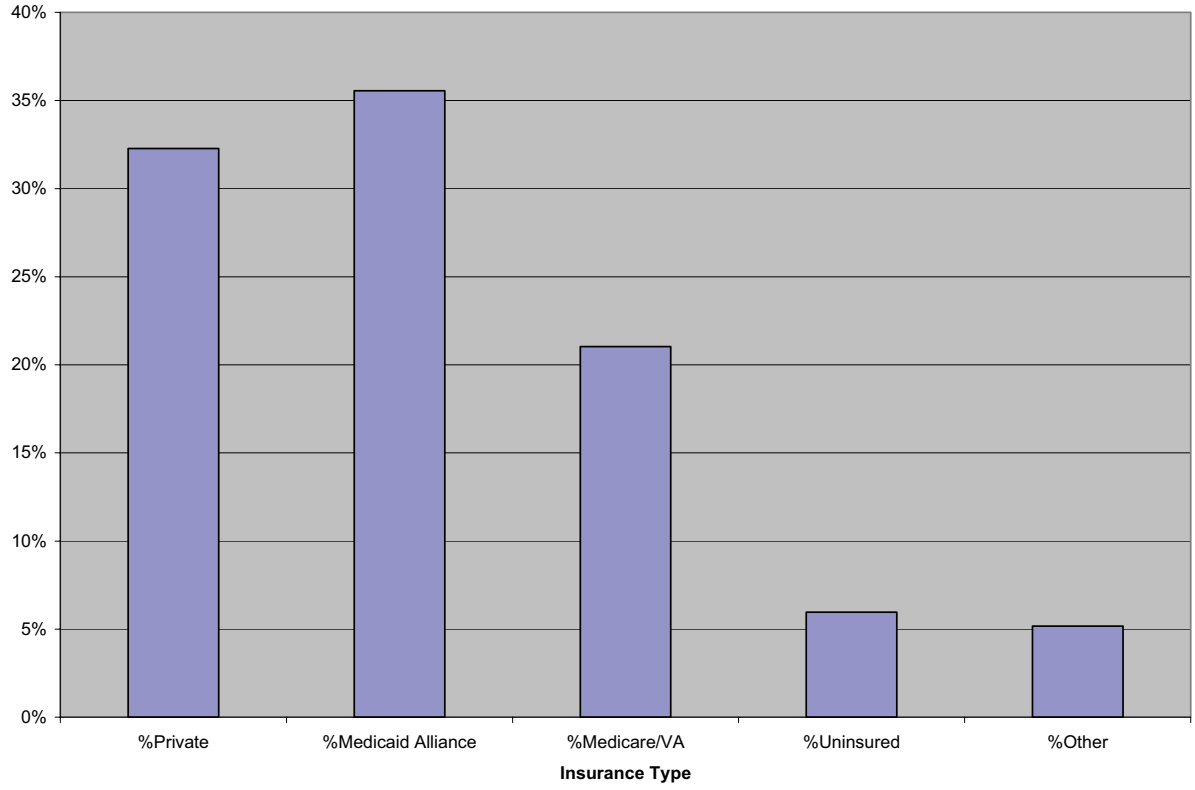
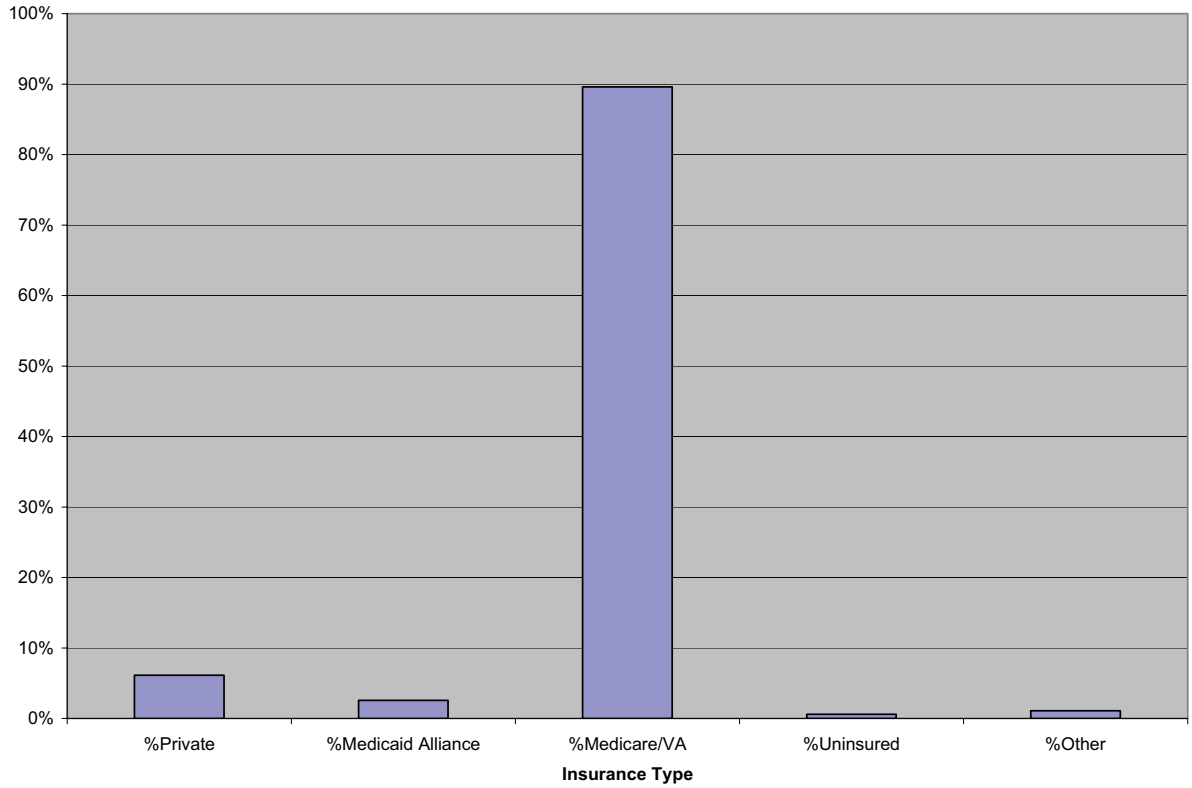


Figure 4K Adult (65+) ACS Admissions by Payer (2006)



Among children in 2006, nearly one-third of ACS admissions are for those who are privately insured, while approximately two-thirds are for children insured by Medicaid. About one-third of ACS admissions for those 18-39 and those aged 40-64 are for privately insured individuals. Between 35 and 39 percent of ACS admissions among 18-64 year olds are for Medicaid enrollees. The majority of ACS admissions are paid for by Medicare among those 65 and older (Figure 4K). The distribution by primary payer has been relatively stable over time, both for children and for adults.

ACS Admissions Among Medicaid and Alliance Enrollees

Table 4.4 summarizes use of office based care among Medicaid and Alliance enrollees who had an ACS admission related to a specific condition. Specifically, the values in the table show the percentage of such enrollees who received office based care in the 30 days prior to the admission. Given the small numbers of enrollees in the claims data with these types of admissions, the data should be viewed as suggestive.

Table 4.7 Receipt of Office Based Care Among Enrollees with an ACS Inpatient Hospital Admission (in 30 days prior to admission), by Condition, 2006

	Alliance Enrollees		Medicaid Enrollees	
	Number of ACS Admissions	% with Office Visit in 30 days Prior to ACS Admission	Number of ACS Admissions	% with Office Visit in 30 days Prior to ACS Admission
Asthma	116	35	252	39
CHF	59	59	36	50
COPD	33	52	19	32
Cellulitis	104	42	95	39
Diabetes	37	43	54	46
Kidney Infection	107	38	77	48
Pneumonia	55	38	68	53
Aggregated Conditions	102	35	103	34

Source: Authors' analyses of managed care claims data.

In total, across all conditions, approximately one-third of ACS admissions among Medicaid and Alliance enrollees were preceded by an office visit in the thirty-day window. Among Alliance enrollees, rates of office based care in the 30 day window prior to an ACS admission ranged from 35 to 59 percent. Among Medicaid enrollees, rates of office based care prior to an ACS admission ranged from 32 percent (for ACS admissions related to COPD, although the number of such cases is small) to 53 percent (for ACS admissions related to pneumonia).

ACS Admissions: Summary

In summary, the rise in ACS rates over time for children (0-17) and adults aged 40-64 suggest worsening access to non-hospital based care in recent years, although it is possible that the threshold for admitting some patients has also changed as more hospital beds have become available (see Section 7). The payer mix for hospital admissions has changed little over time, and the costs of ACS admissions are shared by both public and private payers. ACS rates were highest in PUMA D (which includes Wards 7 and 8) among adults. ACS rates were less variable across PUMAs among children compared to adults, but were highest among children in PUMA B (which includes parts of Wards 1, 4, and 5).

4.5 Primary Care Sensitive ED Use

We also analyzed primary care sensitive (PCS) ED visits, again as a marker for the availability and effectiveness of outpatient primary and specialty care services. PCS ED visits are those for conditions that are: non-emergent; emergent, but primary care treatable; or emergent but preventable or avoidable. These categories together are considered PCS ED visits. More detailed information about PCS ED visits can be found in the Technical Appendix 6. We analyzed trends over time in PCS ED visit rates, trends over time by location of patient residence, and the category of payer for PCS ED visits.

PCS ED Visit Rates by Age

Table 4.8 provides age-specific PCS rates (per 1,000), calculated as the number of PCS ED visits for a particular age group divided by the size of the population in that age group. Rates are calculated over time from 2004-2006 for the District as a whole.

Table 4.8 PCS ED Visit Rates (per 1000 population), 2004-2006

	2004	2005	2006	%Change 2004-2006
0-17	238.4	256.3	240.5	0.8%
18-39	173.2	184.6	187.0	8.0%
40-64	215.4	233.3	251.3	16.7%
65+	155.1	158.2	156.6	1.0%

Source: Authors' analyses of DCHA ED visit data.

PCS rates for children were nearly identical in 2004 and 2006, but spiked in 2005. The rates for adults aged 18-39 increased 8 percent between 2004 and 2006. Among adults, the highest rates of PCS ED visits were among persons aged 40-64. This age group also showed the largest increase in rates from 2004 to 2006, with a 16 percent growth in rates of PCS ED visits. Rates of PCS ED visits were lower in the elderly (aged 65+) relative to those of younger adults, remained essentially flat from 2004-2006.

PCS Rates by Patient Residence

Figures 4L-O show the rates of PCS ED visits (per 1,000) for DC residents, by age group and PUMA of residence.

Figure 4L PCS Rates by PUMA Among District Residents 0-17

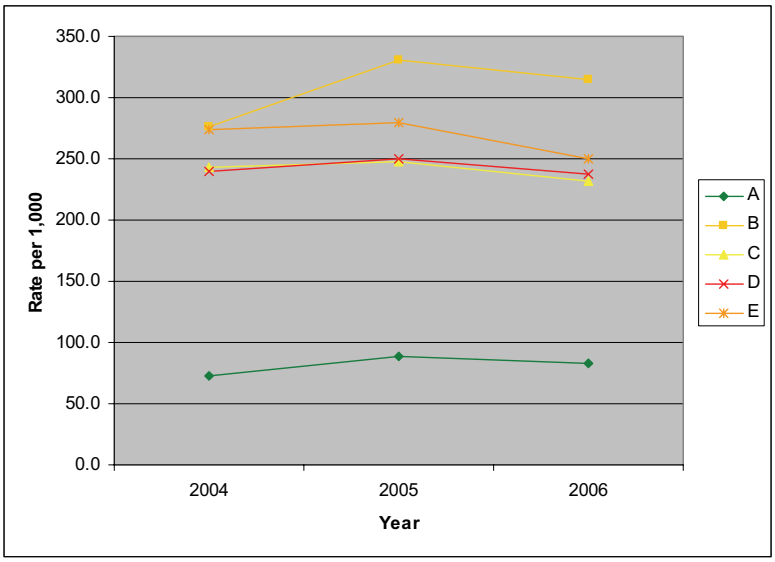


Figure 4M PCS Rates by PUMA Among District Residents 18-39

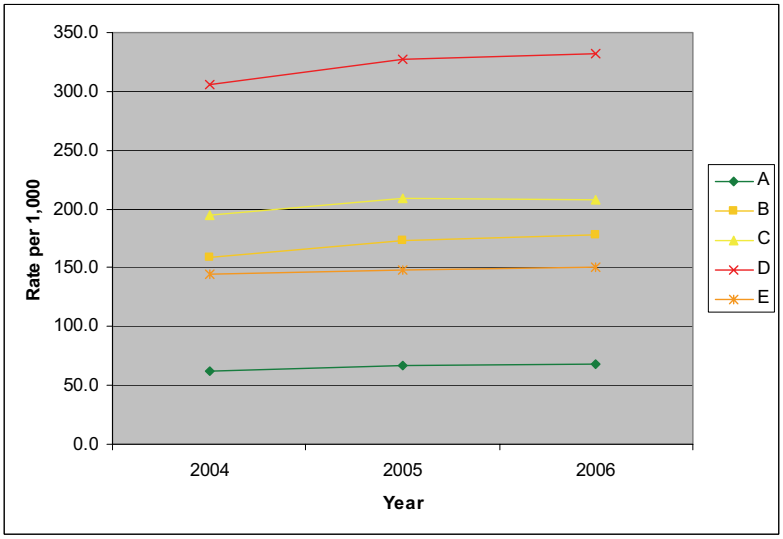


Figure 4N PCS Rates by PUMA Among District Residents 40-64

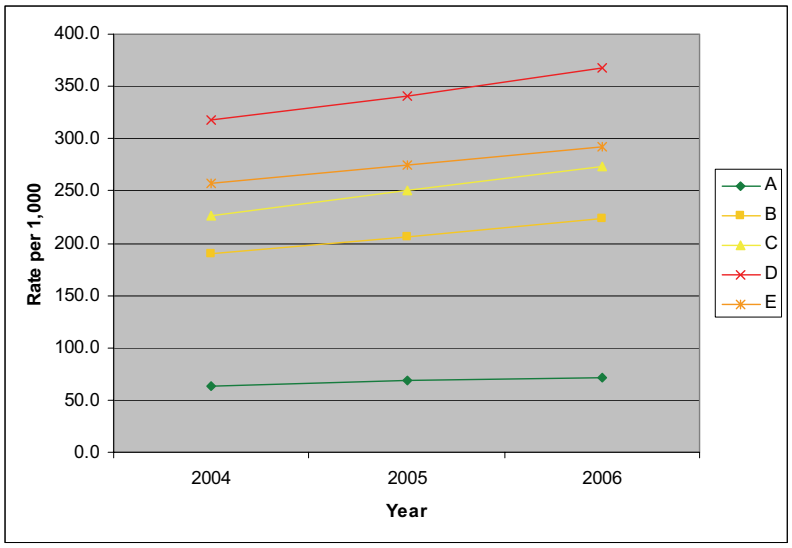
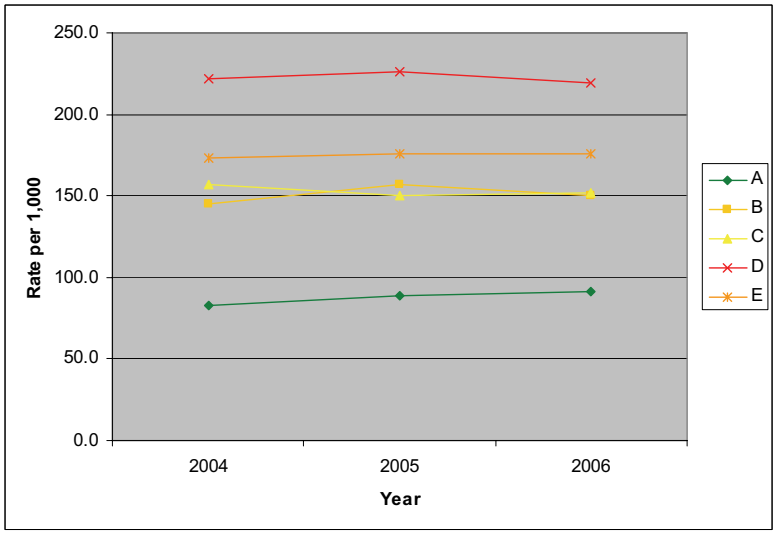


Figure 4O Trends in PCS Rates by PUMA in 65+ Age Group



The figures show:

- In 2006, PCS ED visit rates for children aged 0-17 were highest in PUMA B.
- Among children, there was an increase in PCS ED visits from 2004 to 2005 followed by a decrease from 2005 to 2006 in all PUMAs.
- Among adults aged 18 and over, PUMA D had the highest rates of PCS ED visits for all age ranges and for all years.
- PUMA A had the lowest PCS ED visit rates for both adults and children for all years.
- In PUMAs A and B the 2006 rates for PCS ED visits for adults were 14 percent above 2004 rates.
- Among adults aged 18-64, there has been a steady increase in PCS ED visit rates across almost all PUMAs. PUMA C has shown the most dramatic increase in PCS ED visit rates with an over 20 percent increase in rates in 2006 relative to 2004 rates.
- Between 2004 and 2006, PCS ED visit rates among adults over age 65 increased in PUMAs A and B. In other PUMAs, after a fluctuation in rates in 2005, rates were slightly lower in 2006 relative to 2004.

PCS Rates by Payer

Technical Appendix 6 provides figures depicting payer distribution for PCS ED visits among children and adults. Among children, approximately three-fourths of PCS visits are paid for by Medicaid (primarily), while just under a fifth of PCS ED visits were among privately insured children. Among adults, the primary payer for PCS ED visits is a private insurer in about one-third of cases, and another third are among adults with public insurance. The primary payer for most PCS ED visits among those 65 and over was Medicare. The distribution by primary payer has been relatively stable over time. As was the case for ACS admissions, because we do not know the numbers of people with different insurance types, we could not assess whether PCS rates were changing among people with different types of insurance.

PCS Admissions: Summary

The analyses of PCS ED visits show similar findings to the ACS analyses. PCS rates are highest in PUMA B for children and in PUMA D for adults, as they are with ACS rates. Among adults 40-64, both ACS and PCS rates have been rising over time; PCS rates rose 17 percent between 2004-2006 for this age group. While ACS rates for those 18-39 were relatively flat, PCS rates rose about 8 percent. The rise in PCS rates over time for adults aged 18-39 and 40-64 suggest worsening access to non-hospital based care among individuals in these age groups. Among children, PCS rates rose from 2004 to 2005 but fell back to 2004 levels in 2006. By comparison, ACS rates were falling in the pre-2004 period but have been rising since then among District youth; longer time trend data is not available for PCS rates.

4.6 Direct Assessment of Appointment Availability

A 2005 study done by George Washington University and RAND (Blanchard et al, 2005) used a simulated patient scenario to assess how difficult it would be for patients to get primary care appointments after an ED visit based on insurance status. Researchers called area providers presenting as a hypothetical patient who was evaluated in the ED the prior night and therefore required close outpatient follow-up. Only about half of all patients with private insurance, Medicare, DC Alliance or Medicaid HMO could get a primary care appointment within a week of calling about an urgent care condition. Less than a third of Medicaid fee-for-service and uninsured patients could get an appointment. These data suggest that access to primary care is problematic for people with all types of insurance, but worst for those with Medicaid fee-for-service and the uninsured.

5. Access to Health Care: Quality of Care

We describe the extent to which adults report that they receive recommended preventive care and cancer screening and to which parents report satisfaction with care for their children.

5.1 Rates of Preventive Care and Cancer Screening

Table 5.1 summarizes rates of preventive care (based on conservative guideline recommendations) and cancer screening rates (using nationally recommended practice guidelines) among appropriate age and gender subpopulations. [13, 14, 15]

Table 5.1 Preventive Care and Cancer Screening among Adult District Residents, 2004-2006

Measure	DC	Uninsured (8.7%)	Insured (91.3%)
Preventive Care [(a)]			
Cholesterol < 5 years ago (%)	79.3	52.3**	82.3**
Flu shot this year, among 50+ (%)	48.8	29.5**	50.0**
Pneumococcal vaccine, among age >65 (%)	52.0	23.4**	52.7**
HIV test among those under 65 (%)	64.1	61.2	64.4
Cancer Screening [(b)]			
Mammogram within 2 years among women 50+	84.4	65.0**	85.6**
Pap smear within 3 yrs among women 18-64 with no hysterectomy	90.5	74.5**	92.2**
Colonoscopy or flexible sigmoidoscopy in last 10 yrs among adults 50+	60.8	33.6**	62.7**
Any history of PSA or digital rectal exam among men 50+	90.9	72.7**	92.2**
Any history of PSA among men 50+	78.1	34.4**	81.2**

Source: Authors' analyses of 2006 BRFSS data
***statistically significant differences between insured and uninsured at the .05 level*
** at the .10 level*
(a) Analyses include 2005-2006. (b) Analyses include 2004 and 2006.

Twenty percent of persons reported not receiving cholesterol screening within five years. Among individuals over age 50, about 48 percent reported that they had not received a flu shot within the prior year. Over 50 percent of adults over age 65 reported never having received a pneumococcal

[13] Michigan Quality Improvement Consortium. Adult preventive services (age 18-49.)September, 2006; Michigan Quality Improvement Consortium: Adult preventive services (age 50-65+) September, 2006.
[14] Adult preventive health care: cancer screening. University of Michigan Health System. May, 2004.
[15] The evidence for prostate screening is less strong with digital rectal exam and prostate specific antigen screens (PSA) both having limitations. In general, it is recommended to screen men over age 50 with a PSA screen, preferably annually, and to consider screening African American men or men with a positive family history starting at 40. To be most conservative, and because there is less strong evidence supporting either modality of screening for prostate cancer, we evaluated the percentage of men aged 50 and over with *any* lifetime history of PSA screening. It may be harder for people to recall whether a digital rectal exam was used for prostate screening or other purposes, so PSA screening may be a more reliable measure of prostate screening based on recall of respondents.

vaccine (pneumonia vaccination). Over a third of all residents reported never having been tested for HIV. Reported rates of testing differ only slightly between the insured and uninsured.

Regarding cancer screening, among women over age 50, 84% reported having received a mammogram within the prior two years, while about 90% of women between the ages of 18-64 (without prior history of hysterectomy) received a pap smear within three years. About 61% of men and women over aged 50 reported receiving a colonoscopy or flexible sigmoidoscopy in ten years.[16] Among men age 50 and over, only 78% of men report ever having a lifetime history of PSA test for prostate cancer screening during their lifetime. Rates of all cancer screening tests were higher among the insured than uninsured.

We used regression analysis (not shown) to explore whether there were differences in cancer screening rates among individuals residing in different parts of the city, independent of other factors such as age, race, gender, income, education, insurance, and health status. We found that breast cancer screening rates were relatively high in PUMAs C and D compared to PUMAs A and E.

5.2 Health Care Quality for Children

The measures of health care quality available for children focus on satisfaction with care. Table 5.2 summarizes measures among children overall and separately for children with public and private insurance.

Table 5.2 Measures of Quality Care among District Children, 2003

% Children reporting:	**All (%)**	**Public Insurance (%)**	**Private Insurance (%)**
Not enough time with provider/physician (among children with a usual source of care)	26	31**	20**
Provider/physician does not communicate well (among children with a usual source of care)	7	9**	4**

*Source: Authors' analyses of NSCH data. **statistically significant difference between publicly and privately insured children.*

Twenty-six percent of parents reporting that their child had a usual source of care were dissatisfied with the time their provider spent with their child. Publicly insured children were both more likely to report not having enough time with their provider and not communicating well with their provider compared to privately insured children.

[16] We did not focus on fecal occult blood screening because of the potential for recall bias and the higher reliability associated with colonoscopy and flexible sigmoidoscopy.

6. Health Care Capacity and Infrastructure: Outpatient Care

In this section we focus on provider availability and the geographic accessibility of providers, two important dimensions of access to care. We describe the supply of outpatient care, including primary care providers, specialty providers, and ancillary facilities that provide services such as mammography and dialysis, and we summarize their geographic distribution across the city. We present results both in this section as well as in the Map Appendices, which provide maps of provider locations.

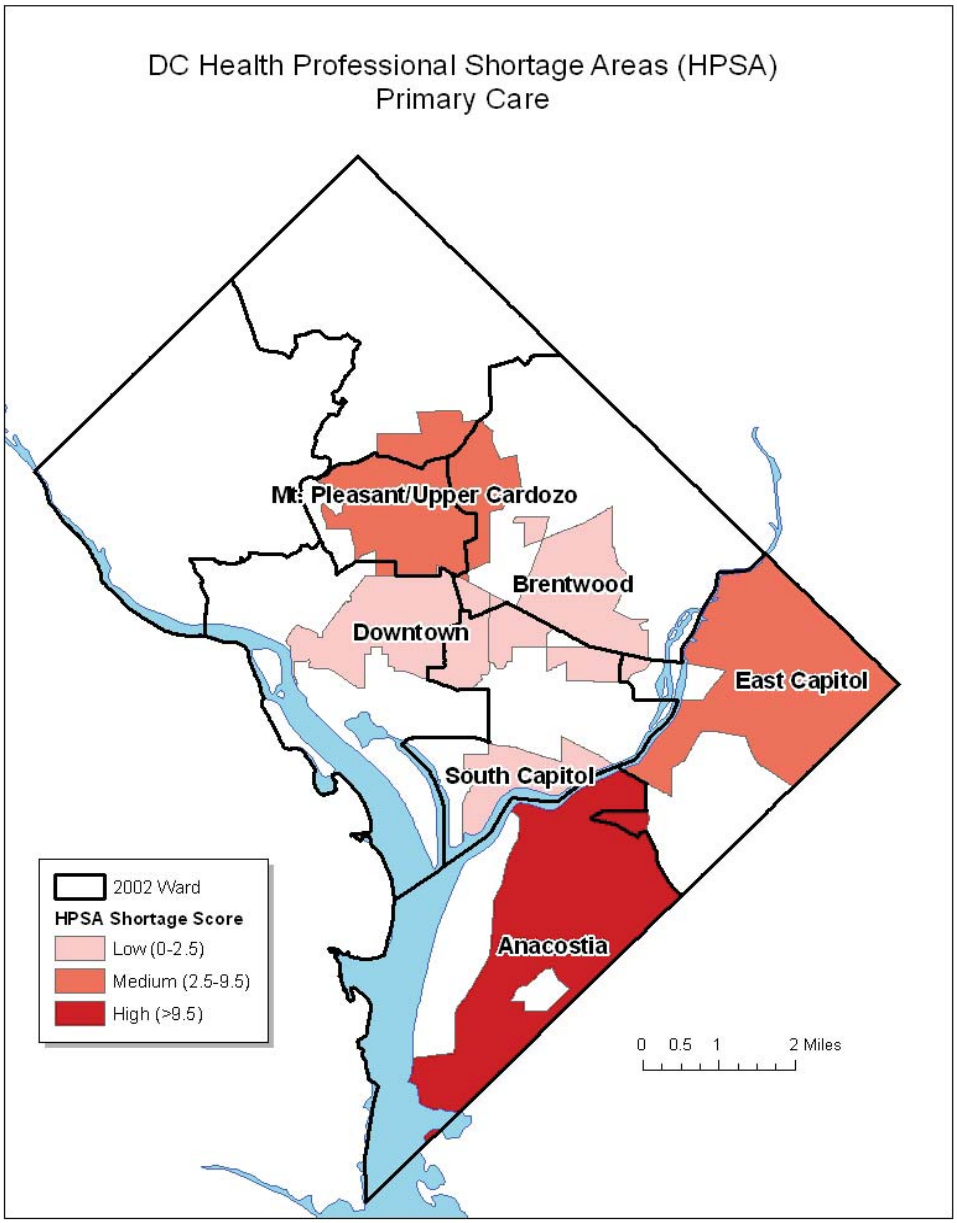
We first describe the location of federally designated health professional shortage areas (HPSAs) and then analyze provider supply rates for primary care physicians and physician specialists using data from the District's Health Professional Licensing Administration (HPLA) data.

6.1 Provider Availability: HPSA Designations

Health professional shortage areas (HPSAs) are designated by the federal Health Resource and Services Administration (HRSA) and as a medical, dental, or mental health HPSA depending on the availability of providers of these various types.[17] Figure 6A below shows the medical HPSAs in Washington DC as of 2006. In addition, the Map Appendices provide maps of mental health and dental HPSAs.

[17] Designation establishes eligibility for a number of initiatives designed to attract providers to work in the area, including the National Health Service Corps programs as well as for supplemental reimbursement from Medicare. Health Professional Service Administration. http://datawarehouse.hrsa.gov/ Site accessed October 9, 2007

Figure 6A


DC Health Professional Shortage Areas (HPSA)
Primary Care
Mt. Pleasant/Upper Cardozo
Brentwood
Downtown
East Capitol
South Capitol
Anacostia
2002 Ward
HPSA Shortage Score
Low (0-2.5)
Medium (2.5-9.5)
High (>9.5)
0 0.5 1 2 Miles

6.2 Primary Care and Specialist Supply

Table 6.1 provides estimates of primary care provider supply for the city as a whole and by ward.

Table 6.1 Supply of Primary Care Providers, 2007

	Adult Primary Care Providers (per 100k daytime population)*	**Pediatric Primary Care Providers** (per 100k daytime population)*
DC	54	42
Ward 1	59	92
Ward 2	61	24
Ward 3	54	25
Ward 4	30	22
Ward 5	155	179
Ward 6	19	11
Ward 7	6	37
Ward 8	35	40

*Source: Authors' analyses of DC HPLA data; *Daytime population includes non-resident commuter population.*

There are 54 adult and 42 pediatric primary care providers per 100,000 daytime population.

Based on the physicians' self-reported primary office location, Ward 7 has the smallest ratio of adult primary care providers to the daytime population, with only 6 providers per 100,000, compared to an overall rate in DC of 54 per 100,000. Wards 4, 6 and 8 also have adult primary care supply rates below the city average. The supply of pediatricians is lowest in Ward 6, and appreciably lower in Wards 2, 3, and 4 compared to the city average.[18]

Figures 6B and 6C show pediatric and adult primary care provider primary offices, by location. (Because these are offices, one dot could potentially represent more than one provider in large group settings.)

[18] Our analysis calculates basic ratios of providers to daytime population without considering provider FTEs or the burden of illness of the population. By comparison, HRSA's determination of shortage areas takes into consideration the age distribution and health needs of the population.

Figure 6B

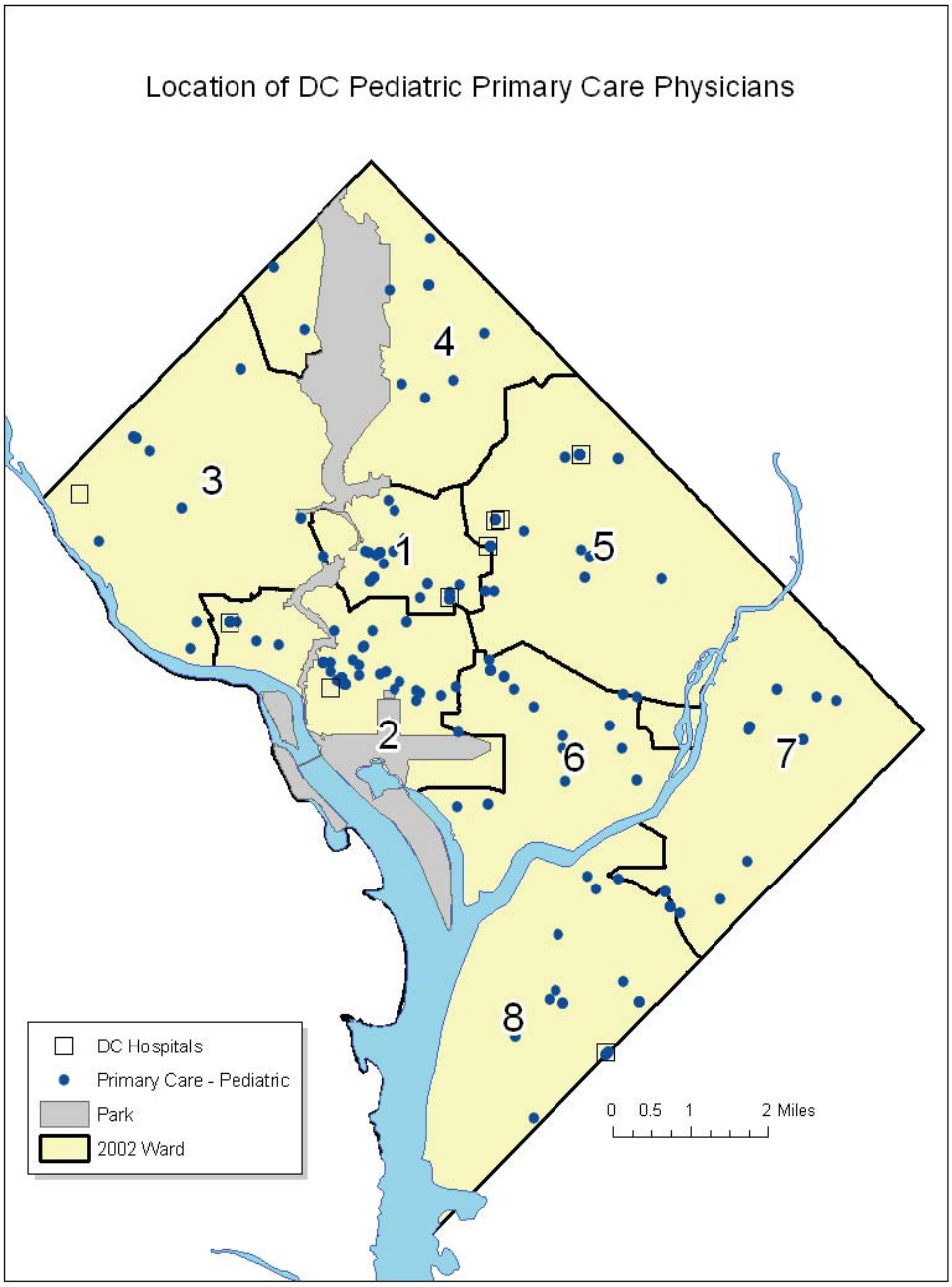

Location of DC Pediatric Primary Care Physicians
1
2
3
4
5
6
7
8
DC Hospitals
Primary Care - Pediatric
Park
2002 Ward
0 0.5 1 2 Miles

Figure 6C

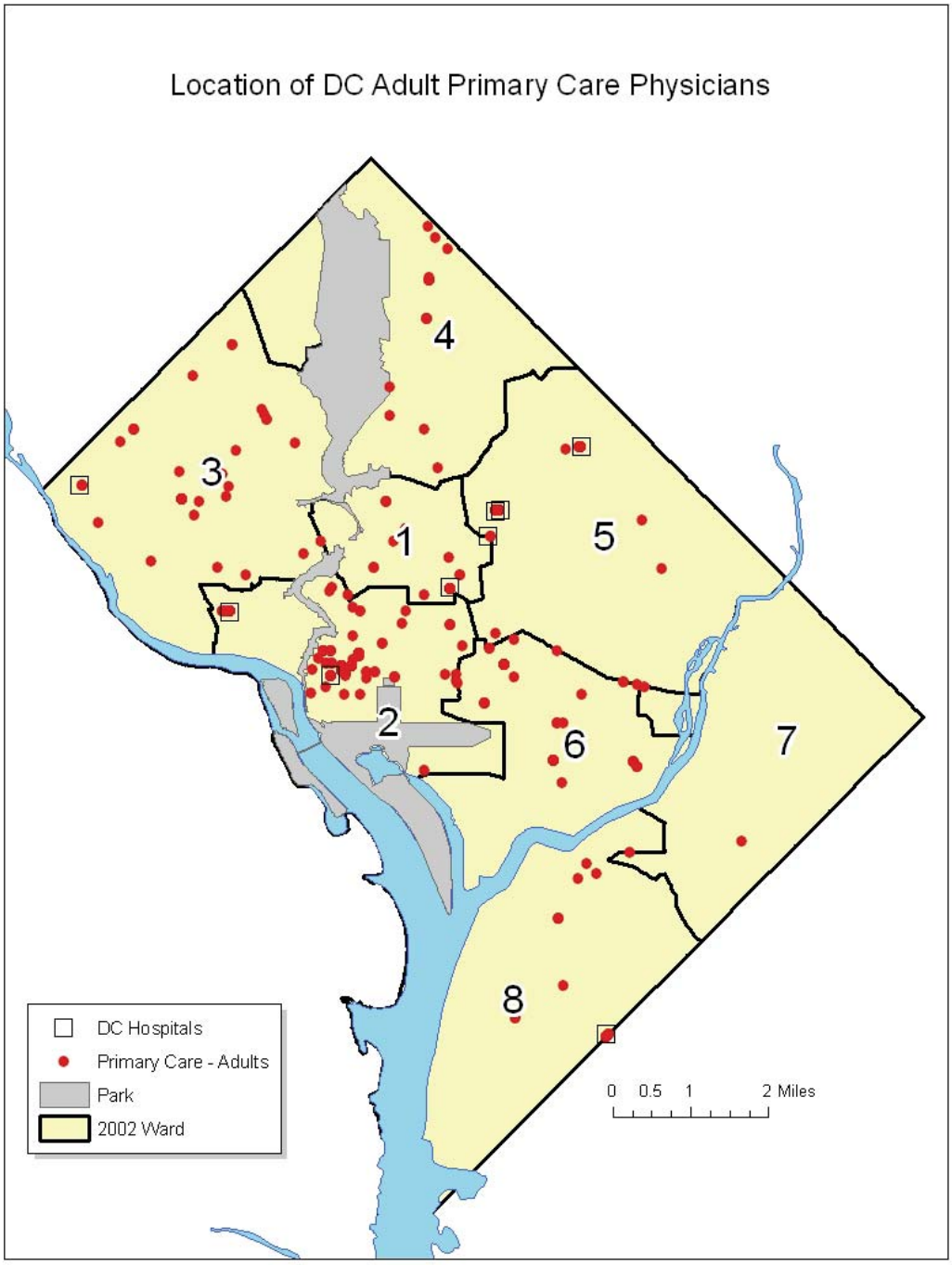

Location of DC Adult Primary Care Physicians
4
3
1
5
2
6
7
8
DC Hospitals
Primary Care - Adults
Park
2002 Ward
0 0.5 1 2 Miles

Table 6.2 provides physician supply rates for selected specialties.

Table 6.2 Provider Supply for Selected Specialties, 2007

	Providers per 100,000 daytime population
Cardiology	14
Gastroenterology	9
Hematology/Oncology	7
Infectious Disease	7
Nephrology	6
Ophthalmology	9
Psychiatry*	32
Urology	5

Source: Authors' analyses of DC HPLA data.
**Excludes psychiatrists whose specialty is limited to child/adolescent psychiatry in the DC HPLA Database; medical specialties are adult providers and exclude pediatric specialists*

The Map Appendix 3 provides distribution of specialty providers throughout the city. (These maps show only office locations; in many cases, particularly for many of the medical subspecialties, one practice location may actually have multiple providers.)

Benchmarking Rates of Provider Supply

There is no "gold standard" that can be used to determine if the supply of primary care providers and specialists in an area such as the District is sufficient, but two potentially useful benchmarks are the supply of providers in managed care provider networks and the supply in other U.S. metropolitan areas. Compared to the provider rates in other cities, the managed care benchmarks may be useful because some literature suggests that the number of current supply of specialists exceeds the required need for the population.[19] However, there are shortcomings to using either type of benchmark. In particular, neither benchmark takes into consideration the specific health needs of the local population. For example, the high rate of HIV in Washington DC may mean that more infectious disease specialists are needed relative to the rest of the population.

Table 6.3 presents supply by individual specialty category for three large group practices (in full time equivalents) and for Detroit, Michigan. We compare our rates to Detroit because the city is similar demographically (see Technical Appendices) and data are available.

[19] Weiner J. Forecasting the effects of health reform on US Physician workforce requirement. JAMA. 1994; 272: 222-230; Grumbach K, The Ramifications of Specialty-Dominated Medicine. Health Affairs. January/February 2002; 21: 155-157

Table 6.3 Physician Providers per 100,000 population for Washington DC, Three HMOs(2000-2002) and Detroit (2004)

	Washington DC[a]	Kaiser[b] (6 sites combined)	Group Health Cooperative of Puget Sound[b]	Health Partners of Minnesota[b]	Detroit[c] (2004)
Primary care					
Family Practice		12.7	47.2	26.4	34.9
General Internal Medicine*		27.6	11.7	34.8	44.1
General Pediatrics**		11.9	7.8	13.2	18.3
All Adult Primary Care***	53.7	40.3	58.9	61.2	79.0
All Pediatric Primary Care***	42.0	24.6	55.0	39.6	53.2
Medical Subspecialties					
Cardiology	13.8	2.9	3.0	3.8	7.1
Gastroenterology	8.5	2.1	2.0	2.1	3.2
Hematology/Oncology	6.9	2.0	1.9	2.2	2.2
Infectious Disease	6.5	0.9	0.5	0.9	1.9
Nephrology	6.2	1.3	1.1	1.8	2.6
Surgical Subspecialties					
Ophthalmology	9.0	3.6	3.3	3.5	7.1
Urology	4.5	2.5	2.6	N/A	3.3
Psychiatry—All		5.7	5.2	5.3	N/A
Psychiatry-Adult	32.1	N/A	N/A	N/A	12.0
Psychiatry-Children		N/A	N/A	N/A	2.3

Sources: (a) Authors analysis of the HPLA data; (b)Weiner JP. Prepaid group practice staffing and U.S. physician supply: lessons for workforce policy. Health Affairs web exclusive. February, 2004; (c) Detroit estimates include the city and some surrounding areas. Forte GJ and Armstrong DP. Physician Supply and Distribution in Michigan, 2004. Rensselaer, NY: Center for Health Workforce Studies, School of Public Health, SUNY Albany. March 2006. http://chws.albany.edu/index.php?id=11,0,0,1,0,0, Accessed on 10/31/07; Numbers for HMOs are in FTEs

** General Internal Medicine includes geriatrics for Detroit estimates.*

*** Pediatric primary care specialties exclude adolescent medicine for the Kaiser, Group Health and Health Partners benchmarks*

****We created this number by adding family practice+general internal medicine for adult primary care and family practice+general pediatrics for pediatric primary care.*

Before describing the comparability of provider supply rates for DC and the benchmarks, it is worth noting that the HMOs benchmark rates are for full time equivalents (FTEs), while the DC and Detroit rates are for the actual number of providers (not adjusted for time spent in practice).

Findings include:

- The supply of pediatric providers in the District is less than that for Detroit but higher than that of two of the benchmark HMOs.
- The supply of primary care providers for adults is below the rate of Detroit and two of the benchmark HMOs.
- The District's specialty provider rates are higher than those of both Detroit and the benchmark HMOs.

Non-Physician Specialists

Given the importance of podiatrists for diabetic care and dentists for diabetics and pediatric care, we also calculated the rate of supply of podiatry and dental care providers (no benchmarks available). DC has approximately 6 podiatrists per 100,000 daytime population and 67 dentists per 100,000 daytime population (see Table 6.4).

Table 6.4 Dentist Supply by Ward

	Dental Providers per 100,000 daytime population
DC	67
Ward 1	164
Ward 2	72
Ward 3	178
Ward 4	98
Ward 5	42
Ward 6	20
Ward 7	40
Ward 8	24

Source: Authors' analyses of DC licensing data.

Ancillary Facilities

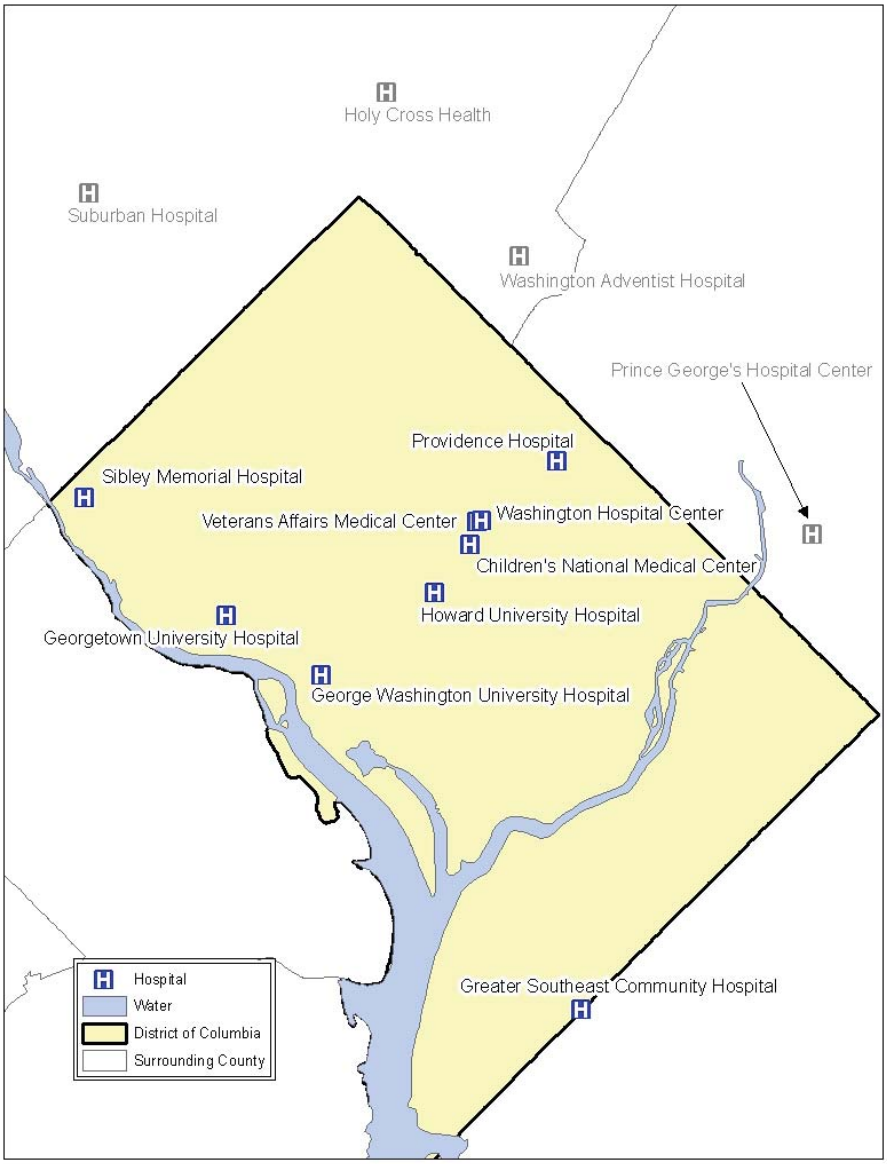
We examined two types of facilities: mammography centers and dialysis facilities.[20] We chose mammography centers because of the importance of breast cancer screening for early detection. We examined the location of dialysis facilities because of high rates among District residents of diabetes and hypertension among District residents, which are common causes of kidney disease if not controlled. (See Map Appendix 3.)

[20] Source of mammography center locations: FDA database and DC Department of Health. Source of Dialysis Center locations: DC DOH.

7. Health Care Capacity and Infrastructure: Inpatient Care

In this section, we describe the capacity and service offerings of non-federal acute care hospitals in the District using information from the DC Hospital Association. Figure 7A depicts the location of general medical and surgical and children's hospitals within DC and in the surrounding area.

Figure 7A General Medical and Surgical and Children's Hospitals In and Around the District



7.1 Operating Beds and Occupancy Rates

As shown in Table 7.1, in 2006, there were 2,780 staffed beds in the District. From 2000 to 2004 the number of staffed beds decreased (from 3,201 to 2,625), and since 2004 the number has slowly increased (from 2,625 to 2,780). Total hospital admissions declined from 2000-2005 and rose from 2005-2006 (see Table 8.1).

Table 7.1 Operating Beds Among DC Hospitals, 2000-2006

	Total Operating Beds						
Non-Federal Acute Care Hospitals	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Children's National Medical Center	188	188	188	188	188	188	230
Columbia Hospital for Women	110						
District of Columbia General Hospital	265						
George Washington University Hospital	277	231	326	332	332	332	339
Georgetown University Hospital	359	338	348	329	329	329	402
Greater Southeast Community Hospital	296	320	334	224	218	218	218
Hadley Memorial Hospital	71						
Howard University Hospital	309	291	291	291	291	291	291
Providence Hospital	316	305	281	264	273	275	264
Sibley Memorial Hospital	235	256	241	236	226	228	228
Washington Hospital Center	775	800	756	761	794	804	808
TOTAL	**3201**	**2729**	**2765**	**2625**	**2651**	**2665**	**2780**

Notes: Operating beds are as of the 4th quarter of each year. Source: District of Columbia Hospital Association, Utilization Indicators *Reports; 2000-2006. Accessed through DCHA Website http://www.dcha.org/Data-Pub.htm, November 2007.*

As shown in Table 7.2, the average occupancy rate was at or below 70 percent at four DC hospitals in 2006, and was between 73 and 85 percent for three other hospitals. Only one hospital, Children's National Medical Center, had occupancy rates at or near 100 percent.

Table 7.2 Annualized Occupancy Rates Among DC Hospitals, 2000-2006

	Annualized Occupancy Rate						
Acute Care Non-Federal Hospitals	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Children's National Medical Center	86.1	91.0	89.4	91.8	93.6	101.3	97.1
Columbia Hospital for Women	52.6	-	-	-	-	-	-
District of Columbia General Hospital	67.0	63.3	-	-	-	-	-
George Washington University Hospital	74.2	77.4	66.8	67.8	62.6	62.9	70.2
Georgetown University Hospital	71.0	70.2	72.8	74.5	82.8	83.9	72.7
Greater Southeast Community Hospital	76.2	65.6	61.3	55.1	61.3	61.1	56.0
Hadley Memorial Hospital	66.1	-	-	-	-	-	-
Howard University Hospital	60.5	76.6	74.3	70.7	72.9	72.9	68.6
Providence Hospital	73.0	73.7	76.6	78.8	76.8	79.6	78.3
Sibley Memorial Hospital	69.6	69.7	74.1	71.8	71.7	70.1	69.4
Washington Hospital Center	67.7	79.3	81.8	80.1	80.3	81.0	84.5
TOTAL	**69.8**	**75.2**	**75.1**	**74.1**	**75.8**	**76.9**	**77.7**

Notes: Operating beds are as of the 4th quarter of each year. Source: District of Columbia Hospital Association, Utilization Indicators *Reports; 2000-2006. Accessed through DCHA Website http://www.dcha.org/Data-Pub.htm, November2007.*

7.2 Classification of Inpatient Admissions

Table 7.3 classifies 2006 inpatient admissions into those that are ambulatory care sensitive or not. About one-fourth of inpatient admissions among children and among adults 40-64 are ambulatory care sensitive. The percentage is lower among adults 18-39 (12 percent of admissions are ACS) and higher among those 65 and over (30 percent).

Table 7.3 Classification of Inpatient Admissions Among DC Residents (2006)

Classification	**0-17**	**18-39**	**40-64**	**65+**
Non Ambulatory Care Sensitive	72.9%	88.4%	75.2%	70.2%
Ambulatory Care Sensitive	27.1%	11.6%	24.8%	29.8%

**Source: Authors analyses of DCHA data.*

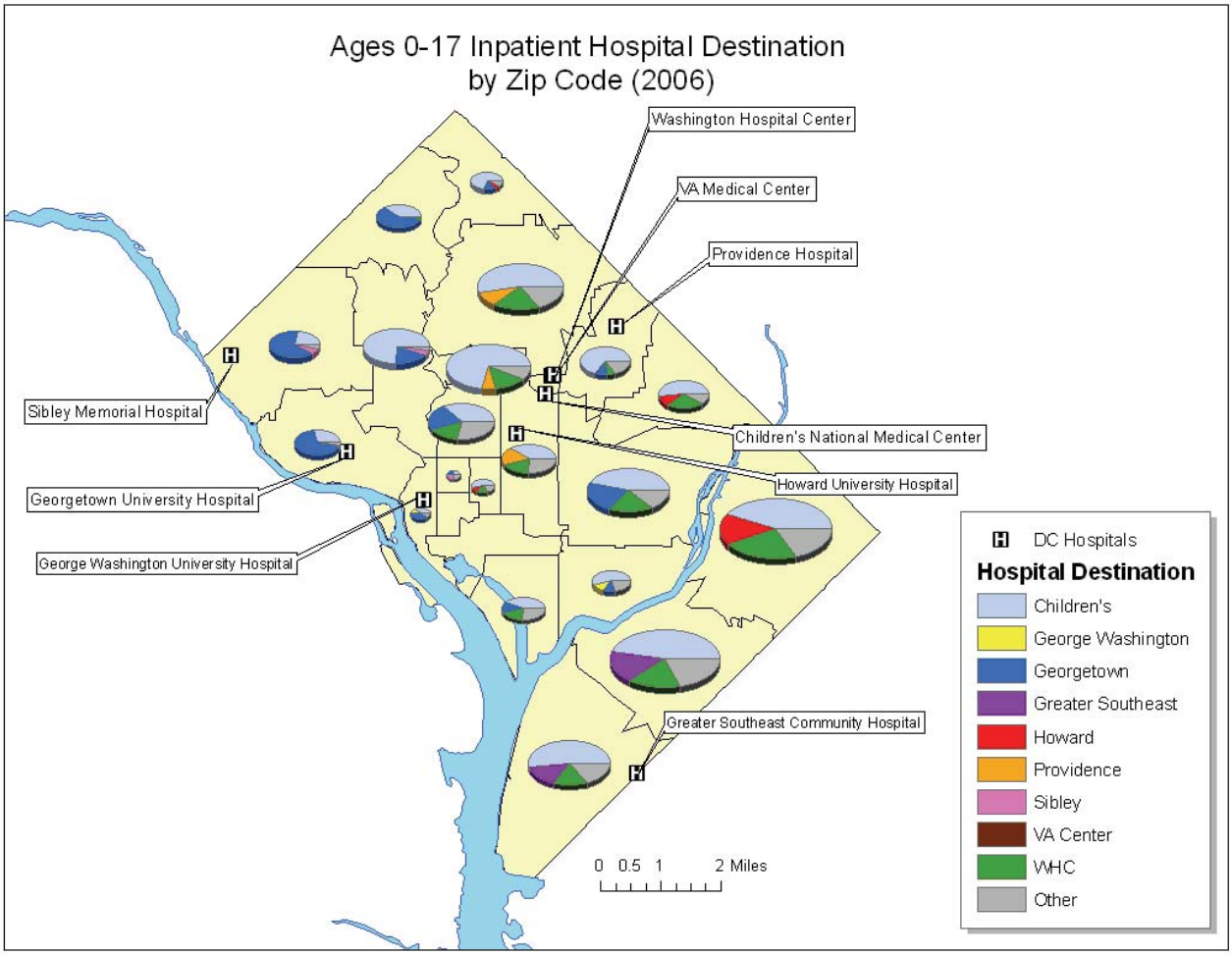
7.3 Inpatient Hospital Destination

We examined data on hospital destination by zip code for inpatient admissions. We include the VA in the maps of patient flows because the share of patients using the VA from several zip codes is substantial. Because there have been shifts in the distribution of destination hospital for many residents in Wards 7 and 8 over the past years, we report only on data from 2006. We present data by age, place of residence and insurance status. Our data for children exclude newborn admissions; however, they do include transfers due related to neonatal complications. In the text that follows, we discuss hospital destination from any given zip code. Data describing the zip code distribution of patients for each hospital are found in tables in the Technical Appendices. In addition, we provide patient flow data for ACS admissions (as well as PCS admissions) in the Technical Appendices.

Children Ages 0-17

Figure 7B shows the top three hospitals for all inpatient admissions for children by zip code. With the exception of children living in Northwest DC, the overwhelming majority of children are hospitalized at Children's National Medical Center. Georgetown and CNMC are the destinations for most children residing in upper Northwest and Georgetown. While for children living east of the River, half of all admissions are to CNMC, Howard and GSE each account for ten percent of all pediatric admissions from east of the river, and WHC accounts for 20 percent of all admissions in this area. Admissions to hospitals other than CNMC tend to be for older teenagers, and are almost always for childbirth.

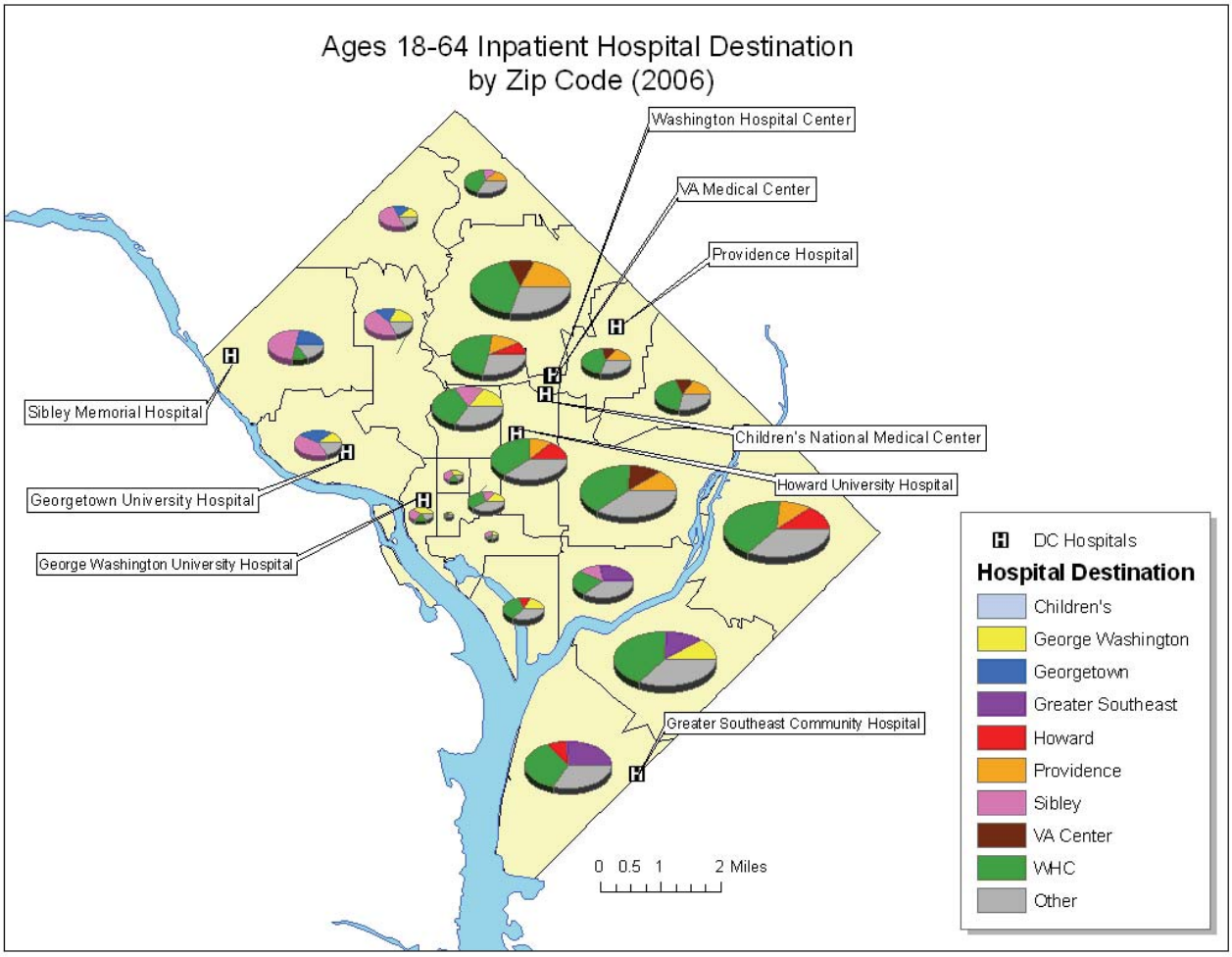
Figure 7B


Ages 0-17 Inpatient Hospital Destination
by Zip Code (2006)
Washington Hospital Center
VA Medical Center
Providence Hospital
Sibley Memorial Hospital
Children's National Medical Center
Howard University Hospital
Georgetown University Hospital
George Washington University Hospital
Greater Southeast Community Hospital
0 0.5 1 2 Miles
DC Hospitals
Hospital Destination
Children's
George Washington
Georgetown
Greater Southeast
Howard
Providence
Sibley
VA Center
WHC
Other

Adults Ages 18-64

Inpatient hospital destinations for adults are far more heterogeneous than for children. For simplicity we present the map for the 18-64 age group, but more detailed tables for adults aged 18-39 and 40-64 are available in the Technical Appendices. Other than for zip codes in Northwest, DC where the largest single proportion go to Sibley, and zip code 20037 where the majority go to George Washington, Washington Hospital Center has the largest share from the majority of zip codes in the city. While WHC is the hospital for close to 40 percent of all admissions for persons east of the River, about 15 percent go to Greater South East. Howard, Providence and George Washington each admit about 9 percent of persons from zip codes in this area.

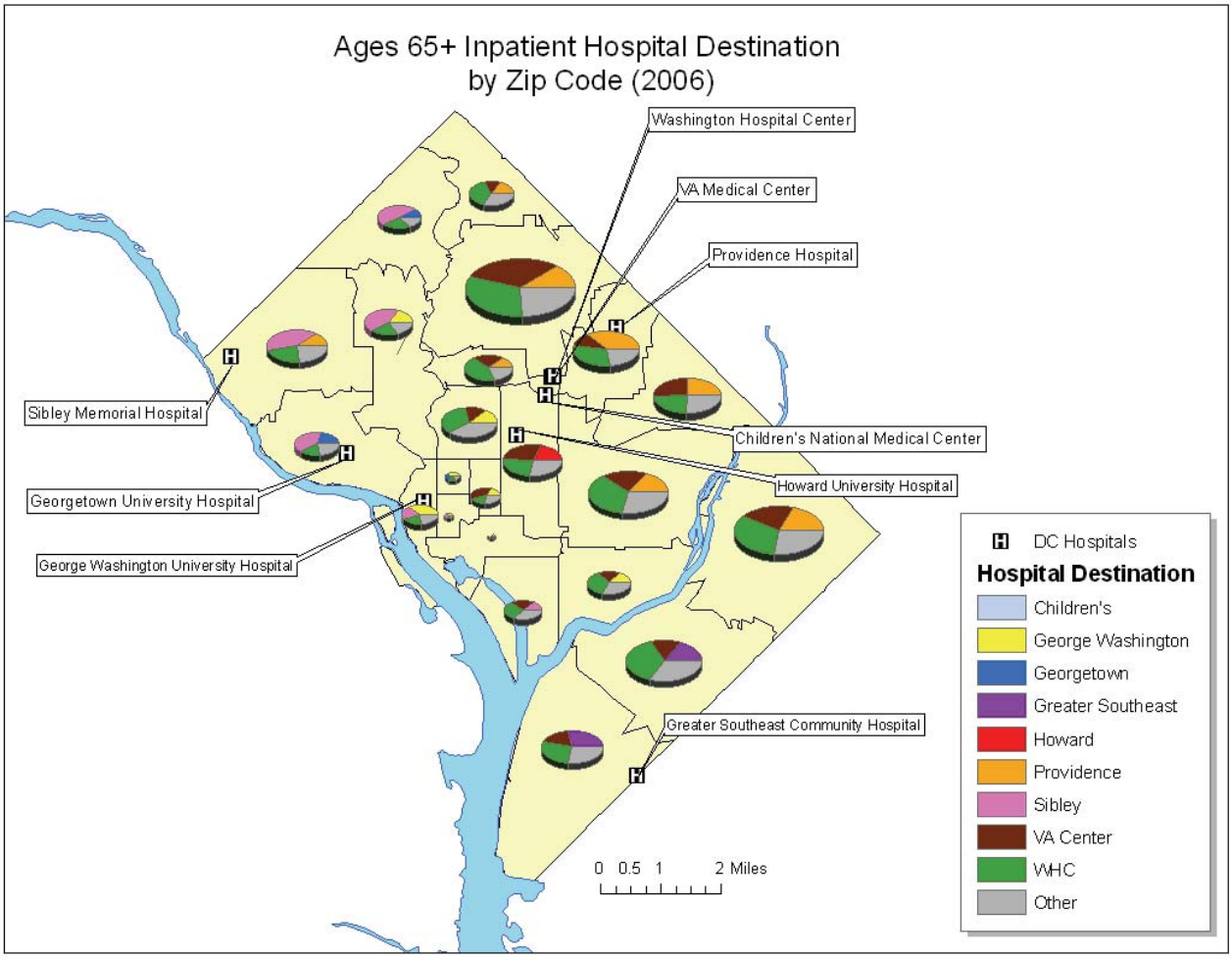
Figure 7C



Adults Age 65 and Older

Figure 7C presents analogous data for DC residents age 65 and over. Most noteworthy regarding inpatient admissions overall is the proportion of patients admitted to the VA Medical Center from virtually all parts of the city other than Northwest, DC. Otherwise, as is the case with prior patterns, admissions tend to be related to geographically proximate hospitals. WHC again receives substantial proportions from most areas of the city. East of the river, WHC accounts for almost a third of admissions, the VA accounts for 20 percent of all admissions and Providence and Greater Southeast each account for approximately 14 percent of all admissions for adults over age 65. ACS admission patterns are roughly similar to those for adults aged 18-65.

Figure 7D



7.4 Patient Origin and Payer for Inpatient Hospital Discharges

To answer questions about whether some hospitals receive a disproportionate share of uninsured patients, we examined inpatient discharges by payer status (Table 7.4)

Table 7.4 Patient Origin and Payer of Inpatient Discharges by Hospital (%), 2006

	Payer (%)					Patient Origin (%)		
	Private	Medicaid/ Alliance	Medicare/ VA	Uninsured	Other	DC	MD	VA
Children's Medical Center	57	40	<1	1	<1	15	63	18
George Washington Univ	40	5	19	1	35	38	41	19
Georgetown Univ Hosp	70	8	19	2	2	21	45	28
Greater Southeast Comm	34	32	21	11	2	82	17	<1
Howard University Hosp	43	35	20	3	<1	76	20	2
National Rehab Hosp	36	10	22	1	31	41	49	6
Providence Hospital	16	59	18	1	7	52	46	2
Sibley Memorial Hospital	81	<1	17	2	<1	33	45	21
VA Med Center	0	0	100	0	0	40	37	11
Washington Hospital Ctr	52	18	29	2	<1	39	52	5
All Hospitals	48	17	28	2	5	39	45	12

Greater Southeast has the highest proportion of uninsured inpatients (11 percent). About one-third of Greater Southeast and Howard University hospital patients are covered by Medicaid or the Alliance. Sibley has the greatest proportion of patients with private insurance (81 percent), followed by Georgetown (70 percent).

The majority of Greater Southeast and Howard University hospital patients are District residents. At other hospitals, patient origin is more mixed. At Georgetown and GWU, for example, 41-45 percent of patients are from Maryland.

Table 7.5 distinguishes patients by payer status and patient origin for patients from the District and Prince George's county.

Table 7.5 Inpatient Discharges by Patient Origin and Payer Type

Hospital	DC				
	Private	Medicaid/ Alliance	Medicare/VA	Uninsured	Other
Children's Medical Center	5	10	<1	<1	<1
George Washington Univ	13	4	7	<1	14
Georgetown Univ Hosp	13	4	3	<1	<1
Greater Southeast Comm	24	30	17	9	3
Howard University Hosp	29	30	15	2	<1
National Rehab Hosp	9	8	10	<1	14
Providence Hospital	8	28	13	<1	3
Sibley Memorial Hospital	26	<1	6	<1	<1
VA Med Center	0	0	40	0	0
Washington Hospital Ctr	16	15	8	<1	0
All Hospitals	14	11	11	<1	2

Table 7.5, Continued

Hospital	Prince George's Residents				
	Private	Medicaid Alliance	Medicare / VA	Uninsured	Other
Children's Medical Center	12	12	<1	<1	0
George Washington Univ	7	<1	3	<1	6
Georgetown Univ Hosp	9	1	3	<1	<1
Greater Southeast Comm	10	2	3	1	0
Howard University Hosp	9	3	2	<1	<1
National Rehab Hosp	11	<1	5	<1	7
Providence Hospital	6	25	3	<1	4
Sibley Memorial Hospital	5	0	<1	<1	0
VA Med Center	0	0	24	0	0
Washington Hospital Ctr	16	2	6	<1	0
All Hospitals	9.8	3.8	6	<1	1

At Greater Southeast, just over 9 percent of patients are uninsured District. At Howard, about 2 percent of patients are uninsured District residents. The fraction of uninsured patients from Prince George's county is small at each hospital and in aggregate. At Greater Southeast, 1.3 percent of inpatient hospital stays are for uninsured Prince George's County residents. The total percentage of hospital stays for uninsured Prince George's County residents is less than one half of one percent (0.3 percent).

7.5 Hospital Performance

In what follows, we depict the performance of District hospitals using selected measures of hospital quality from the Hospital Quality Alliance (HQA): Improving Care Through

Information.[21] Data were obtained at www.HospitalCompare.hhs.gov. The available hospital quality measures reflect recommended treatments for heart attack, heart failure, pneumonia and surgical care improvement/surgical infection prevention. Figures 7E, 7F, 7G display selected measures; additional hospital quality measures are provided in Technical Appendix 8 and hospital quality measures related to emergency department performance are provided in Section 8.

Hospital Abbreviation Key for Figures 7A-7C			
GSE	Greater Southeast Community Hospital	PH	Providence Hospital
GUH	Georgetown University Hospital	SMH	Sibley Memorial Hospital
GWU	The George Washington University Hospital	WHC	Washington Hospital Center
HUH	Howard University Hospital		

Figure 7E Percent of Heart Failure Patients given ACE Inhibitor or Angiotensin Receptor Blockers for Left Ventricular Systolic Dysfunction, April 2006-March 2007

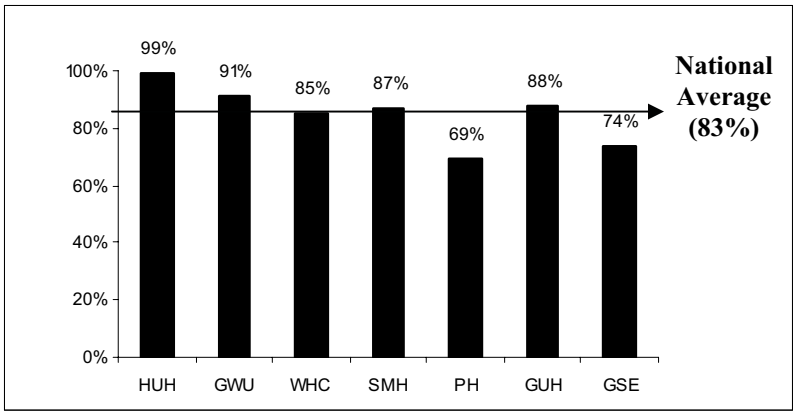
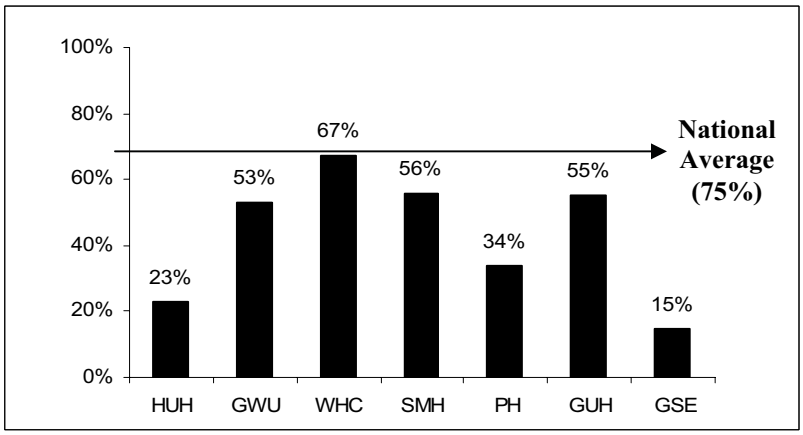
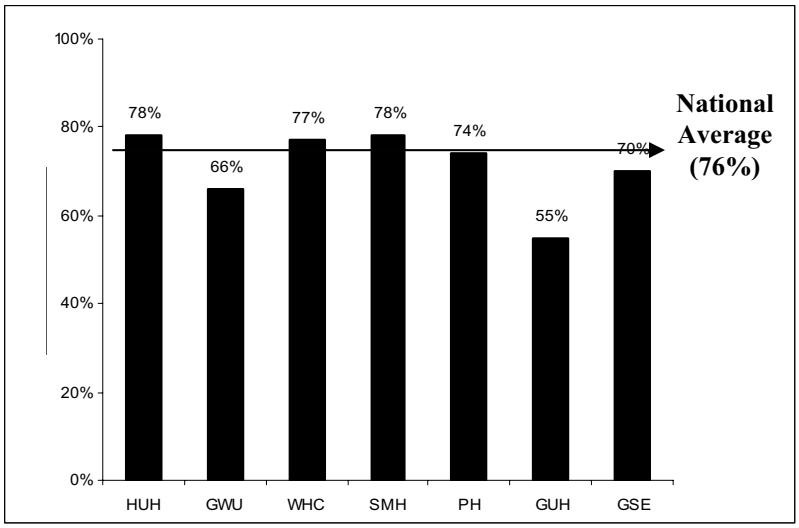


Figure 7F Percent of Pneumonia Patients Assessed and Given Influenza Vaccination, April 2006 - March 2007



[21] The HQA is a public-private collaboration established to promote reporting on hospital quality of care. The HQA consists of organizations that represent consumers, hospitals, doctors, employers, accrediting organizations, and Federal agencies.

Figure 7G Percent of Surgery Patients Whose Preventative Antibiotic(s) are Stopped Within 24 hours After Surgery, April 2006 - March 2007



8. Health Care Capacity and Infrastructure: Hospital Emergency Departments

Eight non-federal, acute care hospitals in the District of Columbia provide the bulk of hospital-based emergency services to DC residents. All of these hospitals provide general medical and surgical services to their patient populations. Several hospitals offer specialized services, such as trauma care, comprehensive cardiac care, mental health and pediatric specialty care. Currently, four hospitals (Children's National Medical Center, The George Washington University Hospital, Howard University Hospital and Washington Hospital Center) are accredited Level I Trauma Centers. One (Washington Hospital Center) offers comprehensive burn care.

Six hospitals indicate that they provide diagnostic and/or therapeutic cardiac catheterization services, which are critical to the state-of-the art management of heart attack patients.[22] Diagnostic procedures are those conducted to assess a patient's heart condition, including catheterization or angiography. In contrast, therapeutic procedures are performed to heal or improve the patient's heart condition, such as angioplasty or stent procedures to open blocked coronary arteries to limit the damage done by a heart attack. [23]

Washington Hospital Center runs one of the largest cardiac catheterization programs in the country and is by far the largest provider of cardiac catheterization in the District. The George Washington University Hospital, Howard University Hospital and Providence Hospital also offer diagnostic and therapeutic cardiac catheterizations. Sibley Memorial Hospital treats substantial numbers of patients with heart disease but transfers patients requiring cardiac catheterization. Georgetown provides only diagnostic or limited therapeutic cardiac services. Children's National Medical Center provides diagnostic and therapeutic cardiac care to children only. Greater Southeast Community Hospital, the only hospital east of the Anacostia River, does not have a staffed cardiac catheterization laboratory.

All of the hospitals provide mental health services, which often consists of a combination of limited inpatient, outpatient and ED care. The District operates the Comprehensive Psychiatric Emergency Program (CPEP) in a facility on the grounds of DC's former public hospital (DC General Hospital). CPEP serves as a short-stay treatment and holding station for individuals with mental illness and provides onsite emergency psychiatric evaluations for people 18 years of age and older who are in crisis. Psychiatric observation beds are also available.

8.1 Volume of ED Visits

Table 8.1 summarizes the total number of ED visits and inpatient hospital admissions over time, from 2000 to 2006.

[22] Data based on AHA FY 2005 Annual Survey Database and hospital interview information.

[23] Regenstein, M, Mead, H, Lara, A (2006). CV Report 1. The Heart of the Matter: The Relationship between Communities, Cardiovascular Services and Racial and Ethnic Gaps in Care. *Expecting Success: Excellence in Cardiac Care*; Cardiovascular Market Assessments, George Washington University.

Table 8.1 ED and Hospital Volumes in Washington, DC, 2000-2006

Year	Total ED Visits	Total Hospital Admissions
2000	364,823	135,000
2001	396,998	133,600
2002	362,577	128,223
2003	376,519	128,439
2004	374,178	129,052
2005	389,311	129,751
2006	398,568	131,875

Source: DCHA Annual Utilization Reports.

Between 2000 and 2001, emergency department visits to DC hospitals appear to have increased approximately 9 percent. However, DC General Hospital data are included in 2000 and 2001 despite the fact that the hospital closed in 2001 and did not report complete data for that year, and there is some question about the validity of data reported by DC General Hospital in the last years of its existence. Since 2001, ED utilization in the District has been relatively flat, with a slight decrease between 2001 and 2004 and then a slight increase from 2004 through 2006.

By comparison, the number of inpatient hospital admissions per year dropped from 135,000 in 2000 to 128,223 in 2002. Since that time there has been a slight but steady increase with 131,875 hospital admissions in 2006.

8.2 Emergency Department Visits: Patient Origin and Payer

Table 8.2 shows patient origin and payer for patients who visited a District ED between 2004 and 2006.

The majority of visits (68 percent) were from patients who reported Washington, DC as their zip code of residence. Twenty-three percent of visits were from Maryland residents (largely from Prince George's County) and 4 percent were from Virginia residents.

Over a third of all ED visits in this period were paid for by private insurance. DC Alliance and Medicaid accounted for another third of the visits. Twelve percent of visits were from uninsured patients.

Table 8.2 Patient Origin and Payer of ED Visits by Hospital, 2006

	Payer (%)					Patient Origin (%)		
	Private	**Medicaid/ Alliance**	**Medicare/ VA**	**Uninsured**	**Other**	**DC**	**MD**	**VA**
Children's	29	66	0	4	1	58	38	2
GWU	33	11	11	15	30	60	17	10
Georgetown	63	11	15	10	2	53	23	14
Greater Southeast	14	47	15	19	5	83	15	1
Howard	40	26	13	21	1	85	11	1
Providence	27	39	25	4	5	79	18	1
Sibley	60	2	29	9	0	51	37	8
WHC	44	17	22	16	0	72	23	2
All Hospitals	37	30	15	12	6	68	23	4

Source: Authors' analyses of DCHA data. Note: A percentage of patients come from the non-DC metropolitan area; thus patient origin percentages do not sum to 100.

Table 8.3 provides a more detailed description of ED visits by payer type and patient origin.

Table 8.3 ED Visits By Patient Origin and Payer, 2006

Hospital	DC				
	Private (%)	Medicaid/ Alliance (%)	Medicare / VA (%)	Uninsured (%)	Other (%)
Childrens Medical Center	10	46	0	2	0
George Washington Univ	16	10	8	8	19
Georgetown Univ Hosp	28	9	9	6	1
Greater Southeast Comm	8	44	13	13	4
Howard University Hosp	33	23	12	17	0
Providence Hospital	17	34	21	3	4
Sibley Memorial Hospital	30	2	15	5	0
Washington Hospital Ctr	28	16	17	11	0
All Hospitals	20	25	12	8	4

Table 8.3—Continued

Hospital	Prince George's Residents				
	Private (%)	Medicaid Alliance (%)	Other Public (%)	Uninsured (%)	Other (%)
Childrens Medical Center	12	15	0	1	0
George Washington Univ	4	0	1	2	4
Georgetown Univ Hosp	7	1	2	1	0
Greater Southeast Comm	5	2	2	5	0
Howard University Hosp	4	1	1	2	0
Providence Hospital	7	3	3	1	1
Sibley Memorial Hospital	3	0	1	1	0
Washington Hospital Ctr	10	1	3	3	0
All Hospitals	7	4	2	2	1

Source: Authors' analyses of DCHA data.

Howard had the largest proportion of ED visits from uninsured District residents (17 percent), but Greater Southeast and Washington Hospital Center also hadhigh proportions of ED visits from uninsured District residents (13 percent and 11 percent, respectively.

Approximately 16 percent of ED discharges from DC hospitals were for residents of Prince Georges County. Only 2 percent of ED discharges were from uninsured Prince Georges' residents.

We also analyzed Maryland hospital discharge data (results not shown) and found that six percent of ED visits to Prince George's Hospital Center came from District residents.[24]

[24] Analysis by Pamela W. Barclay, Director, Center for Hospital Services, Maryland Health Care Commission, July 26, 2007.

8.3 Classification of ED Visits

There are a variety of reasons people seek care from an emergency department and algorithms exist to classify various types of visits. Visits that are not for injuries or related to behavioral health issues (mental health or alcohol/drug use) can be classified according to their level of emergency (not emergent, emergent but primary care treatable, emergent) and preventability.

Table 8.4 below categorizes ED visits by District residents according to patient age and category of visit: non-emergent; emergent, but primary care treatable; emergent but preventable or avoidable; emergent and not preventable/avoidable; injury; mental health related; alcohol related; and drug related.[25] As described in Section 4.5, the first three categories (non-emergent, emergent but primary care treatable, and emergent but preventable or avoidable) together are considered primary care sensitive (PCS) ED visits.[26]

Table 8.4 Classification of ED Visits By District Residents, 2006

Classification	0-17	18-39	40-64	65+
Non-emergent **(a)**	23.9	25.1	23.5	21.3
Emergent, but primary care treatable **(b)**	24.1	22.6	21.7	21.3
Emergent, but preventable/avoidable **(c)**	9.7	6.9	9.1	9.0
Emergent, not preventable/avoidable	6.2	10.2	11.6	14.0
Injury	24.5	23.3	18.5	18.8
Mental Health Related	1.7	1.9	2.4	1.2
Alcohol Related	0.1	1.4	2.8	1.1
Drug Related (excluding alcohol)	0.1	0.2	0.3	0.0
Total	*90.3*	*91.6*	*89.9*	*86.7*
Unclassified	*9.7*	*8.3*	*10*	*13.3*
Primary care sensitive ED visits (sum of a-c)	***57.7***	***54.6***	***54.3***	***51.6***

**Source: Authors analyses of DCHA data.*
Excludes ED visits resulting in an inpatient admission

Across all age groups, 21-25 percent of all ED visits were considered non-emergent, i.e., they were for diagnoses that did not require immediate care. Another 21-24 percent of ED visits were for urgent diagnoses that could have been adequately addressed in the primary care setting (e.g., diagnoses that did not need any specialized resources only available in the ED setting). Another 7-10 percent of visits were for diagnoses for which ED care was needed, but the ED visit could have been averted if adequate primary care had existed prior to the visit. For example, complications from diabetes or asthma, which are amenable to outpatient treatment but can be poorly controlled without primary care, would fall into this category. Thus, in total more than half of ED visits are classified as primary care sensitive across all age groups, and the percentage of ED visits that are PCS is highest among children (at 58 percent).

[25] We were unable to classify a fraction of ED visits given the available diagnosis information.
[26] Table 8.4 below does not include ED visits that result in an inpatient admission; rather these visits are included in our analysis of the sensitivity of inpatient admissions to ambulatory care. In particular, 7 percent of ED visits among those 0-17, 10 percent of ED visits among those 18-39, 22 percent of ED visits among those 40-64 and 42 percent of ED visits among those 65 and over resulted in an inpatient admission in 2006.

Among children aged 0-17 only 6 percent of visits resulting in visit were emergent and not preventable with primary care. Among adults, the percentage of ED visits that were emergent and not preventable with primary care ranged from 10-14 percent. Among individuals up to age 39, approximately one-fourth of visits were for injury; the rate was about one in five among older adults.

8.4 DC Emergency Department Admissions for Critical Diagnoses

We selected four clusters of diagnoses for which timely intervention is medically indicated for best outcomes. Our diagnoses clusters include:

- Emergency Cardiac (acute myocardial infarction/unstable angina),
- Stroke (non-hemorrhagic);
- Non trauma related neurosurgical emergencies (hemorrhage); and
- Major trauma.

We focused on these four conditions because all four require timely intervention for optimal outcomes and also require specialized care that is not always available at all hospitals. For example, many cases of stroke can be optimally treated with thrombolytics ("clot dissolving" drugs) if these cases present to a facility that can provide such medications within a certain time window, generally three to six hours after initial presentation. [27] In the District, there are four major trauma centers. Several hospitals have stroke, neurosurgical services and therapeutic cardiac catheterization services. Both Sibley and Greater Southeast lack specialized services for stroke, trauma or cardiac catheterization. Sibley has limited neurosurgical services, while Greater Southeast lacks neurosurgical services.

We analyzed DCHA hospital discharge data from 2004 to 2006 for patients admitted to the hospital from the ED for non-traumatic neurosurgical conditions, non-hemorrhagic stroke, emergent cardiac conditions, and major trauma.[28] Table 8.5 shows the distribution of hospital diagnosis groupings by receiving hospital for this period. Washington Hospital Center had the largest number of neurosurgical admissions—50 percent of all District admissions for that grouping—between 2004 and 2006. WHC also had the highest percent of non-hemorrhagic stroke, emergent cardiac and trauma admissions.

Of note, Greater Southeast Community Hospital had 6 percent of all emergent cardiac admissions and 10 percent of non-hemorrhagic stroke admissions. This occurred despite the fact that Greater Southeast Community Hospital lacks a functioning cardiac catheterization laboratory, on-call cardiologists and on-call neurologists.

[27] In order to select more severe cases, we focused only on ED visits that resulted in admission (for example major categories of trauma that resulted in hospitalization).
[28] The DCHA did not start collecting ED discharge data until 2004.

Table 8.5 Distribution of ED Admissions to District Hospitals for Critical Diagnoses, 2004-2006

Hospital	Non-traumatic Neurosurgical (%)	Non-hemorrhagic stroke (%)	Emergent cardiac (%)	Major Trauma (%)
Children's National Medical Center	1.6	0.5	0.0	14.0
George Washington University Hospital	13.3	12.0	14.7	15.6
Georgetown University Hospital	11.9	4.9	1.8	4.0
Greater Southeast Community Hospital	2.4	10.4	6.4	1.9
Howard University Hospital	7.4	7.9	22.5	16.7
Providence Hospital	10.6	20.6	13.7	3.3
Sibley Memorial Hospital	2.6	7.2	9.4	7.3
Washington Hospital Center / MedStar	50.3	36.7	31.6	37.1
Total	100	100	100	100

Source: DCHA data, CY 2004-2006.

8.5 Emergency Department Performance

We used two data sources to develop an understanding of the quality of care rendered in the District's EDs: 1) Measures collected by HQA; and 2) a detailed survey administered to all acute care hospitals in the District. Here we report on the HQA measures.[29]

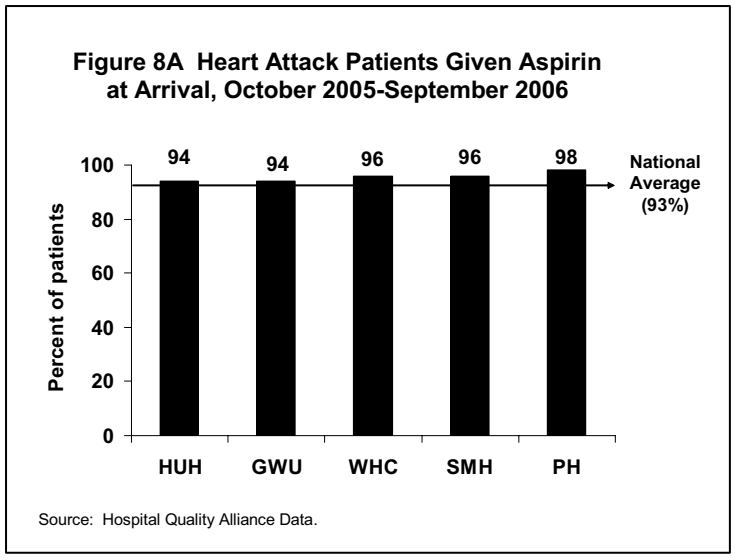
We reviewed five HQA measures that reflect care that is often rendered in an ED to patients with acute myocardial infarction or pneumonia[30]. The measures reviewed here include:[31]

- Percent of acute myocardial infarction (AMI) patients without aspirin contraindications who received aspirin within 24 hours before or after hospital arrival
- Percent of acute myocardial infarction (AMI) patients without beta blocker contraindications who received a beta blocker within 24 hours after hospital arrival
- Percent of pneumonia patients who received their first dose of antibiotic within four hours of arrival at the hospital
- Percent of pneumonia patients who had an assessment of arterial oxygenation by arterial blood gas measurement or pulse oximetry within 24 hours prior to or after arrival at the hospital
- Percent of immunocompetent patients with pneumonia who receive an initial antibiotic regimen that is consistent with current guidelines

[29] The survey is still underway and will be included in our final report.
[30] The HQA measures are reported quarterly to CMS by virtually all general hospitals in the United States, and are subject to periodic audits. These measures are designed to assess the proportion of patients who are receiving indicated care that someone with their condition should receive, based on the best known medical evidence
[31] Due to small sample sizes we were not able to include the measure that assesses timeliness of percutaneous coronary intervention.

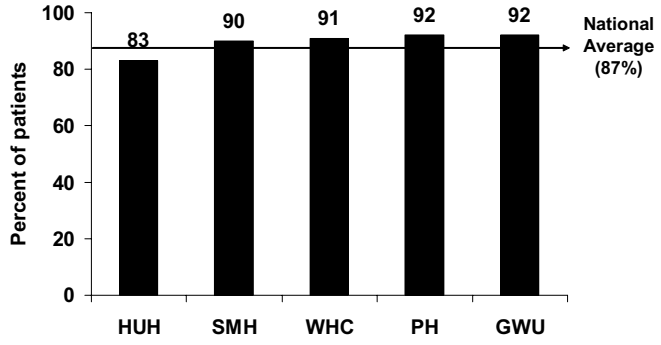
On four of the five measures we found statistically significant differences ($p<.05$) between the hospitals.[32] Greater Southeast Community Hospital ranked lowest on two of the measures and Howard University Hospital ranked lowest on two other measures. Figures 8A-8E display these comparisons.

Hospital Abbreviation Key for Figures 8A-8E			
GSE	Greater Southeast Community Hospital	PH	Providence Hospital
GUH	Georgetown University Hospital	SMH	Sibley Memorial Hospital
GWU	The George Washington University Hospital	WHC	Washington Hospital Center
HUH	Howard University Hospital		



[32] We reviewed and analyzed the most recent available HQA data for District hospitals (and Prince George's Hospital Center), for the period October 2005 to September 2006. Not all hospitals are included in every measure because they may have had an insufficient number of cases to be reported in the federal database.

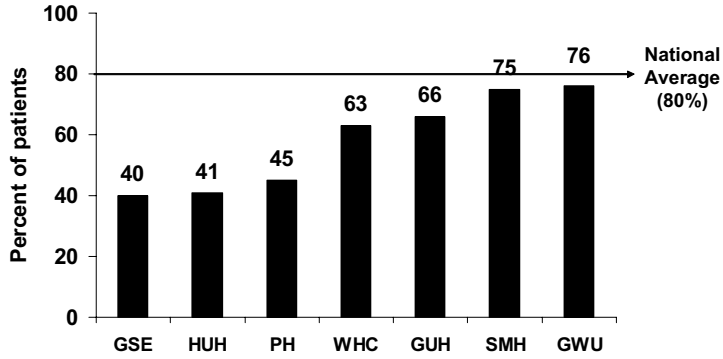
Figure 8B Heart Attack Patients Given Beta Blocker at Arrival, October 2005 – September 2006



Source: Hospital Quality Alliance Data.

Figure 8C Pneumonia Patients Given Initial Antibiotic(s) within 4 Hours After Arrival

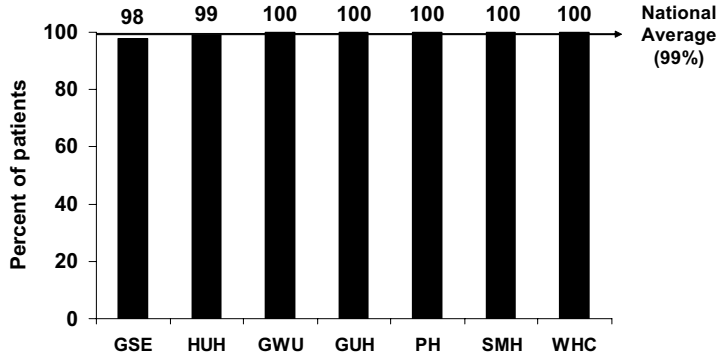
October 2005-September 2006



Source: Hospital Quality Alliance Data.

Figure 8D Pneumonia Patients Given Oxygenation Assessment

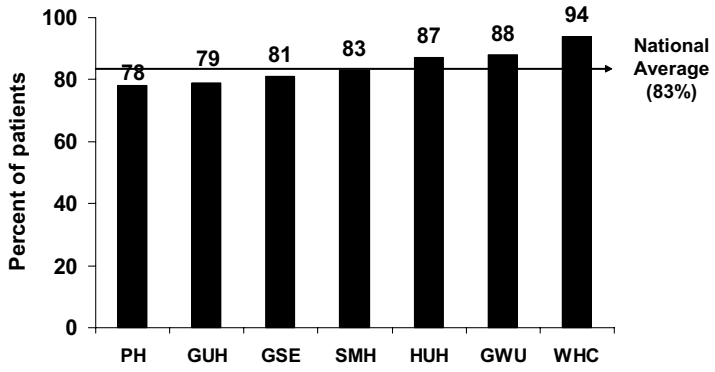
October 2005-September 2006



Source: Hospital Quality Alliance Data.

Figure 8E Pneumonia Patients Given the Most Appropriate Initial Antibiotic(s)

October 2005-September 2006



Source: Hospital Quality Alliance Data.

8.6 Mental Health and Hospitals

Mental health visits can have a disproportionate impact on an ED. Mental health patients can be disruptive, require intense nursing care, and have multiple medical complications. These patients often pose disposition challenges when the number of beds is limited at a particular facility, leading to prolonged boarding times and crowding in the ED for all patients. The Department of Mental Health's Comprehensive Psychiatric Emergency Program (CPEP) provides emergency psychiatric evaluations for adults on the site of the former DC General Hospital's campus. Because DC General no longer operates an acute care facility, CPEP has to send any cases requiring medical clearance to local acute care hospitals. There patients are evaluated and, if cleared medically, are returned to CPEP for evaluation for admission to one of three places: St. Elizabeths, Psychiatric Institute of Washington (PIW) or Greater Southeast Community Hospital. While mental health beds are available at all of the eight acute care hospitals, there are limited facilities available for involuntary admissions at these three institutions only. In 2006, there were 3,376 visits to CPEP, 33 percent of which resulted in an admission (see Table 8.6). [33]

[33] District of Columbia Department of Mental Health. CPEP Statistics January-December, 2006. Internal Document.

Table 8.6 DC ED Visits and Admissions with a Psychiatric Diagnosis, 2006

	Number	Percent of Total
ED Visits with Psychiatric Diagnosis		
All hospitals	3376	<1
Legal Status of Psychiatric ED Visits		
Involuntary	1843	55
Voluntary	1476	44
Other	36	1
Psychiatric Admissions		
St. Elizabeth's	474	42
Greater Southeast Community Hospital	453	40
PIW	201	18
Total	1128	N/A

Source: Comprehensive Psychiatric Emergency Program Data.

9. Emergency Care: Emergency Medical Transport

9.1 Overview of Pre-Hospital Emergency Services

The District of Columbia provides emergency medical services, including transports and pre-hospital care, through DC Fire and Emergency Services (FEMS). This model, in which fire and emergency services are organized together within a central management agency, is used by about one-third of the 200 largest cities in the United States.[34]

The volume of calls to DC FEMS has been increasing over the past several years: from 2000-2006 EMS call volume increased 8 percent. In 2005, DC FEMS responded to 118,846 calls and transported 79,928 patients to a health care facility – generally an ED at one of eight non-federal acute care hospitals in the District.

DC FEMS first responders include firefighters certified as basic emergency medical technicians (EMT-B) who respond to non-life threatening calls on a fire engine. EMT-Intermediate (EMT-I) or EMT-Paramedic (EMT-P) trained firefighters are on an engine designated for life threatening calls. The majority (86 percent) of EMS providers are "dual role," performing both EMS and firefighting functions.

Advanced life support (ALS) ambulance units handle life threatening transports. Non-life threatening transports are handled by basic life support (BLS) or ALS units, depending on unit availability. BLS units are staffed by EMT-Bs and ALS units are staffed by EMT-Is or EMT-Ps. According to the National Registry of Emergency Medical Technicians, EMT-Bs have 110 hours of training, EMT-Is have approximately 200-400 hours of training and EMT-Ps have approximately 1,000 or more hours of training.[35] Thus the difference in training hours is tenfold between EMT-Bs and EMT-Ps.

Emergency services have historically been operated under the leadership of a fire chief; with the emergency medical services operating under the direction of an in-house, full-time medical director. Emergency medical services providers constitute the largest division in DC FEMS. There are currently approximately 1,900 operational employees in DC FEMS including managers and supervisors. DC FEMS operates 37 staffed units on a 24-hour, seven days a week basis; 21 of these units are classified as BLS units and 16 are ALS units. Twelve of the DC FEMS staffed units (approximately one-third) are equipped with an electronic patient care reporting system (ePCR).

DC FEMS also operates 33 fire stations; 19 of these have an EMT-Intermediate or EMT-Paramedic who rides on an engine. This enables a higher level of trained EMS provider to be a first responder on-scene to emergency medical calls. The Health Emergency Preparedness and Response Administration (HEPRA) within the DOH provides regulatory oversight of DC FEMS and certifies all EMS providers.

[34] Williams, DM. (2007). JEMS 200-city survey. *JEMS*. (34:2), 38-54.

[35] National Registry of Emergency Medical Technicians , Retrieved October 10, 2007, from: http://www.nremt.org/about/ems_learn.asp

Emergency department visits have risen 8.6 percent from 2000-2006. In calendar year 2005, 118,846 calls for emergency services were received by FEMS. These calls resulted in 79,928 transports to the eight acute care hospitals in the District. In 2006, 20 percent of all ED visits originated from EMS transports.[36] This number has remained stable over the past seven years.

Just as important as how many patients are transported is the issue of transporting patients to appropriate hospitals. For instance, it is not optimal care for a patient with an acute myocardial infarction (AMI) to be transported to a hospital that has no ability to do therapeutic cardiac catheterization. To better understand whether patients in DC are being transported to the "right hospitals," we used the DC Fire and EMS system's computer aided dispatch (CAD) data to evaluate EMS calls and transports in 2005.

When emergency medical calls come into the Office of Unified Communications (OUC), dispatchers who receive the call categorize it according to the Medical Priority Dispatch System (MPDS) – a system that includes 33 different categories reflecting the caller's general complaint. For analytical purposes, we assigned these 33 categories to eight general classification groups, shown in Table 9.1. Further information about these classifications is included in Technial Appendix 9. The MPDS also assigns acuity based on a description of the complaint from the caller. Acuity is generally grouped into five call categories to help assign the appropriate unit for dispatch. Calls of lower acuity (classified by the letters A and B) can generally be transported by a BLS unit, staffed by EMT-Basics, whereas urgent calls (C) require an ALS assessment by paramedics and transport. An ALS unit transports the highest acuity calls (D and E).

Table 9.1 shows calls resulting in transport by category, acuity and receiving hospitals for the 2005 calendar year. The majority of all transported calls were medical related (53 percent) with trauma calls being the second most common category of transported calls (24 percent). Over half of all calls were of urgent or high acuity (C or D)[37]. Washington Hospital Center and Howard University Hospital received the greatest percentage of transports (approximately 19 and 18 percent respectively) followed by The George Washington University Hospital and Greater Southeast Community Hospital, which each received slightly over 15 percent of all of the transports.

[36] GWU analysis of DC Fire and EMS Computer Aided Dispatch Data.
[37] No E codes were used in the 2005 data.

Table 9.1 Characteristics of EMS Transports to DC Hospitals, 2005

Characteristic	Percent of Hospital Transports
Classification:	
Arrest/Death	1.0
Cardiac/Chest Pain	10.3
Man down (Unknown Complaint)	5.4
Medical	52.8
Other	2.9
Psych	1.8
Stroke	1.7
Trauma	24.1
Acuity:	
Low Acuity (A)	21.5
Semi-Urgent Acuity (B)	21.6
Urgent Acuity (C)	29.7
High Acuity (D)	27.2
Receiving Hospital:	
Children's National Medical Center	5.8
The George Washington University Hospital	15.5
Georgetown University Hospital	5.1
Greater Southeast Community Hospital	15.0
Howard University Hospital	17.9
Providence Hospital	14.0
Sibley Memorial Hospital	3.6
Washington Hospital Center/MedStar	18.9
Other	4.1

Source: DC FEMS CAD Data, CY 2005.

Unfortunately, no good data are available to predict whether high acuity designation of a call truly predicts the level of services required or whether the transport will result in an emergent final diagnosis or admission to the hospital. Therefore, we further analyzed three categories of calls (trauma, stroke and cardiac) that we can assume require timely care in the right hospital and ED. These patients typically require treatment at hospitals that have specialized services or providers. Many hospitals have developed rapid response teams to insure that such cases get optimal therapy, such as the specialized trauma, stroke and heart attack teams that can be activated to care for patients even before they arrive at the hospital on an EMS unit. In acute myocardial infarction, for instance, early cardiac catheterization has been recognized as a recommended intervention that improves overall outcomes.[38]

[38] Antman EM, Anbe DT, Armstrong PW et al. (2004). ACC/AHA guidelines for the management of patients with SAT elevation myocardial infarction. A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines.

We reviewed transports related to trauma, stroke and cardiac/chest pain complaints. We focused only on the highest levels of acuity assigned (D) for cardiac and trauma diagnoses, in order to try to further capture those transports that were potentially most critical. Stroke cases are generally classified as urgent (priority code C).

Results are shown in Table 9.2. Washington Hospital Center, which is a regional stroke center with a rapid stroke response team, received 26 percent of all transports categorized as stroke. Providence Hospital received 20 percent of stroke calls and The George Washington University Hospital, which also has a stroke response team, received 15 percent of stroke calls. Washington Hospital Center had the highest number of high acuity cardiac and chest pain transports (22 percent) followed by The George Washington University Hospital (17 percent), Providence Hospital (16 percent), Greater Southeast Community Hospital (16 percent) and Howard University Hospital (15 percent). Greater Southeast Community Hospital does not have cardiac catheterization services or on-call cardiologists.

The Level I Trauma Centers received the highest number of high acuity trauma transports (see Table 9.2) with Howard University Hospital receiving the highest number of trauma transports (24 percent). Washington Hospital/MedStar received 23 percent of trauma transports, followed by The George Washington University Hospital (17 percent). Children's National Medical Center is also a Level I Center, and received seven percent of transports. Notably, Greater Southeast Community Hospital (which is not a Level I Center) received 14 percent of all high acuity trauma transports, while other non-Level I Centers received less than 10 percent each of such transports.

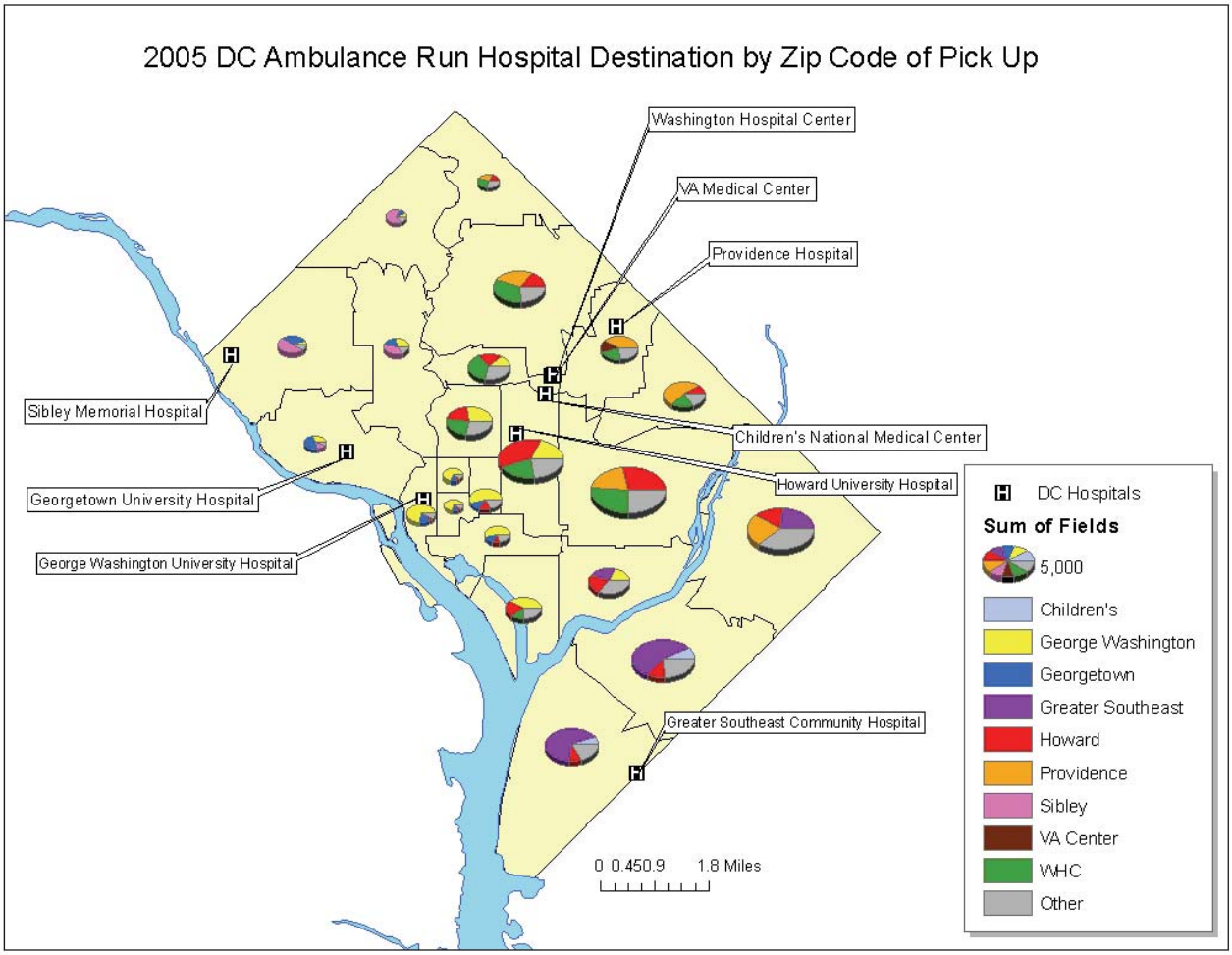
Table 9.2 Distribution of EMS Transports for Stroke, High Acuity Cardiac and High Acuity Trauma Calls, 2005

Hospital	Stroke (%)	High Acuity Cardiac / Chest Pain (%)	High Acuity Trauma (%)
Children's National Medical Center	0.5	1.3	6.9
George Washington University Hospital	15.4	16.8	17.4
Georgetown University Hospital	4.4	6.2	4.7
Greater Southeast Community Hospital	13.7	15.7	14.3
Howard University Hospital	10.0	15.0	23.7
Providence Hospital	20.2	16.4	7.7
Sibley Memorial Hospital	4.9	3.6	2.9
Washington Hospital Center /MedStar	25.5	21.5	23.0
Other		3.5	5.5

Source: DC FEMS CAD Data, CY 2005.

We also mapped the three most frequented hospitals by EMS transports in each zip code of patient origin in the District (Figure 9A). Patients in each zip code are often transported to a variety of hospitals.

Figure 9A



Source: DC FEMS CAD Data, CY 2005.

9.2 Emergency Medical Services Performance

Like many EMS agencies, DC FEMS measures its performance mainly based on response times. Data reported by DC FEMS shows a dramatic improvement in the timeliness of response over the past few years. The proportion of advanced life support responses to critical medical calls arriving within eight minutes rose from 51.5 percent in October 2003 to 92.0 percent in July 2007. Other indicators have also shown sustained improvement. The percent of critical medical dispatches receiving first transport unit arrival within 13 minutes had risen to 97.2 percent by July 2007, with the proportion of all medical dispatches achieving this time standard rising to 97.2 percent. Table 9.3 compares this performance to DC FEMS benchmark goals.

Table 9.3 DC FEMS Benchmark Goals vs. Actual Performance, July 2007

System Goal Description	System Benchmark	Actual July 2007
Critical Medical Dispatches with ALS arrival < 8 minutes	90%	92.0%
Critical Medical Dispatches with First Transport Unit Arrival <13 minutes	90%	97.2%
All Medical Dispatches with First Transport Unit Arrival <13 minutes	90%	97.2%

Source: DC FEMS Analysis of 2007 CAD data.

The District's timeliness of response compares favorably to that of other "benchmark" cities recently canvassed by the independent assessment of The Abaris Group, commissioned as part of the recent deliberations of the special Mayor's Task Force on EMS. While comparisons may not be entirely comparable given subtle differences in how goals are set and data collected in different jurisdictions, some may be instructive. San Diego achieves an 8-minute response for its highest priority calls 91 percent of the time. Closer to home, Montgomery County, Maryland achieves an 8-minute ALS response in 70 percent of its cases in areas deemed "urban." Other comparisons are more difficult given the paucity of data on actual performance. However, the District's goals seem in line with those of other benchmark cities for BLS and ALS response times. The District's 13-minute goal for first transport unit exceeds that of seven of eight benchmark communities.[39] The District's 8-minute ALS response goal is aligned with the National Fire Protection Association (NFPA 1710) standard of eight minutes.

The measurement of response times offers an important but incomplete picture of the quality of pre-hospital care in any community. National EMS leaders have urged quality improvement approaches that ensure that responders use and comply with care protocols consistent with the best medical evidence. They have also called for going beyond traditional retrospective review with punishment to systems that seek to build processes and train personnel who deliver high quality care for every patient.[40] One measure that has received increasing attention is the survival rate for cardiac arrest patients. This is a widely reported (but not consistently tracked) measure. It also reflects not only the performance of an EMS service, but overall community awareness and knowledge of how to respond to these incidents and begin resuscitation. A survey of some of the Mayor's Task Force benchmark communities shows that District residents have a relatively poor rate of cardiac survival (see Table 9.4). Additionally, the District cannot measure cardiac survival rate upon discharge from the hospital for EMS cases because hospital and EMS data are not currently linked.

[39] These data are drawn form The Abaris Group benchmark analysis presented to the Mayor's Task Force on Emergency Medical Services on May 24, 2007. The eight benchmark communities include Memphis, TN, Houston, TX, Richmond VA, Austin, TX, Phoenix, AZ, Pinellas County, FL, Seattle, WA and San Diego, CA.

[40] National Highway Traffic Safety Administration. (1997). A Leadership Guide to Quality Improvement for Emergency Medical Services Systems. Washington, DC: U.S. Department of Transportation. Retrieved April 30, 2007, from http://www.nhtsa.dot.gov/people/injury/ems/Leaderguide/index.html

Table 9.4 Cardiac Survival in Surveyed Benchmark Cities

	% SURVIVING	
Community	**To ED**	**To Home**
Austin (Travis County), TX	25	12
Pinellas County, FL	44.5	22
Richmond, VA	33-35	10
Seattle, WA	67	45
Washington DC	12	N/A

Source: Telephone and E-mail Survey by Abaris Group, May 2007.

9.3 Emergency Medical Services Quality Improvement Activities

Other than progress on response times, we found little historical evidence of proactive quality improvement efforts at DC FEMS. We note that this is probably the case in most EMS systems. DC FEMS leadership acknowledges that quality remains a "void" for the organization.

DC FEMS leadership plans to create a more robust peer review process, though this would still focus more on retrospective "look-backs" and retraining rather than on creating fail-safe processes. In recent months it appears that DC FEMS has moved aggressively toward a more vigorous stance on ensuring high quality care in its service. New staff has been recruited, including a Nurse Quality Coordinator. DC FEMS is in the process of rolling out the ePCR (electronic patient care reporting system), which, in addition to improving emergency services prior to and during transport, will allow for better and faster tracking of clinical information related to the quality of emergency services. This is a very promising development and puts DC "ahead of the pack" as most services do not have such systems. At the time of this report, only about one in three transports were able to benefit fully from this new technology.

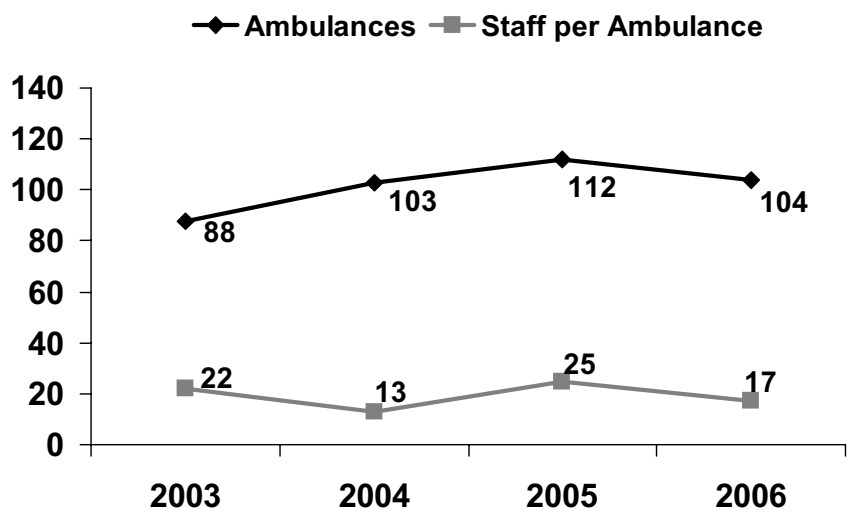
However, we should note that we did not find a single, comprehensive quality plan with timelines for DC FEMS that outlined the current state of quality of care (with established measures and benchmarks as are used for response times) and quality goals for the future. We did not find a detailed written work plan for improving quality, with clear deliverables and listings of accountable personnel. ePCR will not realize its full potential without a clearly articulated plan and goals for how DC FEMS will measure and ensure quality.

9.4 Emergency Medical Services Staffing

Despite the increase in number of transports, the EMS workforce has not changed dramatically in recent years. According to DOH's Health Emergency Preparedness Administration (HEPRA), which certifies both EMS units and providers, the number of certified EMS transport units has increased from 88 in 2003 to 104 in 2006. Yet there has not been a corresponding increase in staff. The number of staff per ambulance has decreased from 22 in 2003 to 17 in 2006 (see Figure 9B). In 2003, HEPRA certified 1,950 EMT-Basics (EMT-Bs). No data were available for intermediate or advanced providers for 2003. In

2006, HEPRA certified 1,383 EMT-Bs, 19 EMT-Is, and 395 EMT-Ps. According to data provided by HEPRA, the number of certified EMS providers has decreased from 1,950 in 2003 to 1,797 in 2006. These troubling decreases in staffing may reflect challenges in recruiting qualified personnel.

Figure 9B DC FEMS Certified EMS Providers per Ambulance, 2003-2006



Source: District of Columbia Department of Health Data

10: Emergency Care: Transitions from EMS to the Hospital

10.1 Hospital Diversion in the District

Over the past seven years, the District's hospitals have dramatically increased the amount of time they spend on "diversion" or "closure."[41] The total hours of closure and diversion for the District's eight acute care hospitals increased between 2000 and 2002, decreased in 2003, and then have increased every year since then. The total hours on diversion have increased from 5,330 in 2000 to 10,314 in 2006, an increase of 94 percent. Put in perspective, this represents an increase from approximately 7% of the hours in a year to approximately 14%. Table 10.1 summarizes the change in occupancy rates between 200 and 2006 for each hospital (See Table 7.2 for occupancy rates by year and hospital for 2000 through 2006). Table 10.2 summarizes patient days by hospital for 2000 through 2006 and summarizes the percentage change between 2000 and 2006. Table 10.3 does the same for hours on diversion.

Table 10.1 Occupancy Rate , 2000 - 2006

	Percent Change 2000-2006
Children's (%)	21
DC General (%)	N/A
GWU (%)	4
Georgetown (%)	14
Greater SE (%)	-16
Howard (%)	-14.4
Providence (%)	5
Sibley (%)	-4
WHC /MedStar (%)	13
Total (%)	**10**

Source: DCHA Utilization Data, 2000-2006.

[41] We did not find official definitions of diversion and closure that are shared by DC FEMS and the hospitals. According to DC FEMS, diversion is when a hospital can only accept the sickest "priority 1" patients. Closure means that an ED cannot accept any patients safely.

Table 10.2 Patient Days, 2000 – 2006

	2000	2001	2002	2003	2004	2005	2006	Percent Change 2000-2006
Children's	55,394	61,279	50,243	52,622	52,268	57,406	59,417	7%
DC General	56,046	17,108	N/A	N/A	N/A	N/A	N/A	N/A
GWU	57,295	60,915	69,781	79,315	72,381	73,472	82,240	44%
Georgetown	66,465	76,674	83,847	86,075	93,387	93,816	103,249	55%
Greater SE	65,373	74,109	71,561	51,865	46,664	46,344	41,754	-36%
Howard	84,535	80,373	74,838	72,918	76,679	75,397	66,098	-22%
Providence	87,184	83,334	80,286	75,918	72,998	78,063	75,230	-14%
Sibley	58,285	62,138	63,603	61,505	60,262	59,301	56,902	-2%
WHC /MedStar	225,953	236,158	221,453	217,884	224,820	234,866	234,016	4%
Total	**756,530**	**752,088**	**715,612**	**698,102**	**699,459**	**718,665**	**718,906**	**-5%**

Source: DCHA Utilization Data, 2000-2006.

Table 10.3 Hours on Diversion , 2000 - 2006

	2000	2001	2002	2003	2004	2005	2006	Percent Change 2000-2006
Children's	0	79	86	25	11	9	0	0%
DC General	1,604	1,139	N/A	N/A	N/A	N/A	N/A	N/A
GWU	124	363	604	573	987	1,747	1,492	1103%
Georgetown	178	339	646	625	855	764	887	398%
Greater SE	465	1,445	1,626	1,187	928	1,441	2,108	353%
Howard	323	1,052	1,667	1,288	1,186	1,451	1,933	499%
Providence	640	742	947	715	703	969	1,117	75%
Sibley	372	714	566	220	350	383	313	-16%
WHC /MedStar	1,624	1,969	2,229	1,882	2,340	3,109	2,464	52%
Total	**5,330**	**7,842**	**8,371**	**6,515**	**7,360**	**9,873**	**10,314**	**94%**

Source: DC FEMS data.

The picture of hospital diversion in the District is confusing. Most industry experts believe diversion is a symptom of a system that is "over capacity" and characteristic of a system in which the demand for ED and inpatient services has outstripped supply.[42] Essentially, hospitals do not have inpatient space available to admit sick patients from the ED. These patients instead wait for hours or even days in the ED, using resources such as nurse staffing, contributing to long ED waits and crowding. Diversion results from an inability to keep up with the patient flow and workload.

[42] Wilson, MJ, Siegel, B, Sickler, D. (In-press). Coping with crowding: Enhancing work flow to reduce crowding. *Journal of Quality and Patient Safety*.

In DC, however, the pattern of diversion in DC is not entirely consistent with this picture.

Emergency department visits to DC hospitals appear to have increased between 2000 and 2001 but then have been relatively steady between 2001 and 2006. (By comparison, ED visits increased 23 percent in Maryland between 2000 and 2006). As discussed in Section 7, only one hospital was near 100% occupancy rate, and it tries to adhere to a 'no diversion' policy. Further, the total number of patient days has decreased between 2000 and 2006 about five percent. In a community with classic signs of a crowding crisis, we would expect to see occupancy rates averaging over 90 percent and rapidly and steadily increasing indicators of demand such as patient days.

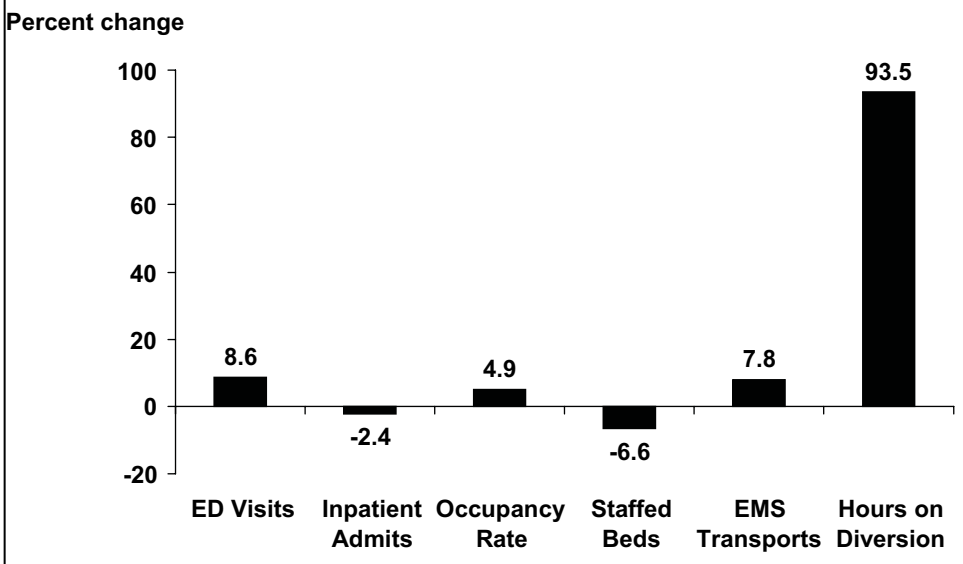
Diversion increased substantially at four hospitals (The George Washington University Hospital, Howard University Hospital, Georgetown University Hospital and Greater Southeast Community Hospital). Of these hospitals, two (Greater Southeast Community Hospital and Howard University Hospital) actually experienced significant declines in occupancy in this period and the number of ED visits declined or were essentially flat. The greatest increase in occupancy rate was at Children's, while Georgetown and GWU had the greatest increases in patient days. These two hospitals also saw significant increases in ED visits.

Table 10.4 Emergency Department Visits, 2000 – 2006

	2000	2001	2002	2003	2004	2005	2006	Percent Change 2000-2006
Children's	47,706	62,847	62,408	69,845	66,038	69,714	71,161	49%
DC General	51,491	34,541	N/A	N/A	N/A	N/A	N/A	N/A
GWU	44,854	46,338	46,755	53,173	54,351	57,129	60,378	35%
Georgetown	21,756	25,559	27,150	27,993	26,221	29,050	32,304	48%
Greater SE	37,429	44,972	43,554	40,377	39,103	37,891	36,006	-4%
Howard	43,784	48,435	45,783	44,773	47,738	47,059	44,095	1%
Providence	35,862	41,437	43,238	46,904	46,492	48,666	49,288	37%
Sibley	23,115	25,739	25,624	26,688	27,503	28,134	29,170	26%
WHC /MedStar	58,826	67,130	68,065	66,766	66,732	71,668	76,166	29%
Total	**364,823**	**396,998**	**362,577**	**376,519**	**374,178**	**389,311**	**398,568**	9%

Source: DC FEMS data.

Figure 10A Overall Percentage Change in Key Indicators Related to ED Crowding and Diversion, 2000-2006



Source: DCHA Annual Utilization Reports and DC FEMS data.

The change in District-wide indicators related to diversion is summarized in Figure 10A. While ED visits and EMS transports have shown only modest gains, hours on diversion have increased substantially. Increases in average length of stay at these hospitals could potentially explain some of the increase in diversion, since such an increase could signal an increase in the acuity of patients using inpatient care. However, data from AHA indicates that length of stay, which is in part determined by patient acuity, has actually decreased at five of the eight DC hospitals in the study (see Table 10.5).

Table 10.5 Length of Stay at DC Hospitals, 2000 & 2005

Hospital	LOS 2000	LOS 2005	% Change
Children's National Medical Center	5.84	5.66	-3.08%
Howard University Hospital	6.89	6.31	-8.42%
Washington Hospital Center	5.92	5.64	-4.73%
Georgetown University Hospital	6.00	6.56	9.33%
George Washington University Hospital	4.98	5.05	1.41%
Providence Hospital	13.30	11.88	-10.68%
Sibley Memorial Hospital	5.19	5.12	-1.35%
Greater Southeast Community Hospital	6.88	7.16	4.07%

Source: AHA Annual Survey of Hospitals, FY 2000 & 2005

Other metrics may also cast light on hospitals and diversion in DC. One useful ratio is the number of ED visits per staffed hospital bed. This is used as an indication of the hospital capacity "available" for admitting sick patients from the ED. Others include the proportion of ED visits from EMS and the proportion of ED visits resulting in an admission. These two measures may be used as a gauge of the severity of illness of ED patients. Arguably, if patients coming to the ED are sicker, they require more services and resources, and hospitals are more likely to need to go on diversion. These three measures are shown in Table 10.5. The ratio of ED visits per bed jumped in 2000-2001, but has since remained essentially flat. Available data for the other two measures also show flat trends.

Table 10.6 ED Visits by Hospital Capacity, EMS Transport, and Admitted Patients, 2000-2006

Year	ED visits per staffed hospital bed	Percent of ED visits from EMS	Percent of ED visits admitted
2000	123	20.8%	N/A
2001	145	18.3%	N/A
2002	141	18.8%	N/A
2003	146	20.4%	N/A
2004	141	19.1%	81.9%
2005	146	20.4%	82.2%
2006	143	20.2%	81.9%

Source: DCHA Annual Utilization Reports and DC FEMS data.

We gleaned additional information from our interviews with stakeholders. In our discussions with hospital leaders (see Section 11), most said the increase in hours on diversion was a function of the closure of DC General Hospital, less volume going to Greater Southeast Community Hospital, and generally greater crowding of hospitals caused by greater ED use and more crowded inpatient units. However, our review of data for this period does not appear to be consistent with this viewpoint. The closure of DC General Hospital certainly appears to have stressed the local health care system. Hours on diversion jumped by about 2,500 in 2000-2001, and the number of available hospital beds dropped. Nevertheless, diversion has continued to grow despite the fact that DC occupancy rates have remained quite modest, and other measures of demand have not risen significantly. Interestingly, the hospital with the highest occupancy rate in DC (Children's National Medical Center) has the lowest number of hours on diversion.

Many ED and hospital leaders also noted the lack of nursing home beds as creating logjams and bottlenecks, with patients who could be discharged to these settings instead waiting in hospital beds for placement. This ties up inpatient beds that could be used for sick ED patients. While the length of stay data does not necessarily reflect a rapidly worsening shortage of nursing home beds, this trend could be masked by falling LOS for some patients. The recently announced potential closure of two nursing home facilities in the District could worsen this problem. Available data were not sufficient for us to explore this issue further.

11. Emergency Care: Findings from Interviews with Key Informants

In this section, we discuss the results of interviews with key informants. Many issues were discussed in our interviews with key stakeholders.[43] These included:

- Coordination and communication across emergency services;
- Quality and availability of pre-hospital and hospital-based emergency care;
- Training requirements and opportunities for DC EMS personnel;
- EMS protocols;
- Structure, organization, management and oversight of emergency services;
- Management of ED services and hospital patient flow; and
- Opportunities for changing and improving the quality and integration of emergency services system-wide.

Overall, the majority of informants believe that their hospitals, their departments, and their EMS personnel are doing a good job providing services to the residents of the District. They also acknowledge the challenges in the system and recognize that there are weak spots in the delivery of care. Few, however, frame the problem in systemic terms. Simply stated, they do not see their work as part of the larger system of providing emergency care to the residents of the city. Perhaps as a result, they rarely identify solutions to problems in the system that would require closer communication, coordination, and a common set of objectives. There is a clear and uniform sense of accountability for a narrowly defined set of emergency tasks but no similar sense of accountability for the quality of the patient experience with the system of emergency care as a whole.

11.1 DC FEMS

Training and Protocols

Most of the discussion in the interviews addressed specific problems in one or more aspects of emergency care. One theme heard throughout the discussions was the training of EMS providers and ways that training opportunities and standards could be improved.

Inadequate training and continuing education for EMS providers frequently came up as an area of concern. Several issues were singled out as particularly problematic. First, there appear to be inconsistencies between the EMS training curriculum and actual EMS protocols. For example, providers are trained to use benzodiazepines that they are not authorized to administer in the field. Second, training for EMS providers includes very little hands-on practice of field protocols and techniques. Third, EMS providers receive minimal training beyond the training they receive when newly hired. According to interviewees, recertification for all EMS providers is required every other year, at which time EMT-Basics receive one week of BLS training and paramedics receive one week of ALS training along with pediatric and cardiac instruction. Few opportunities for continuing education currently appear to be available.

In addition to concerns about training, we heard about plans for improvements in many aspects of training for EMS providers, including expanding partnerships with local universities, focusing on

[43] See Technical Appendix 11 for copies of the interview guides used during the various interviews.

the quality of training and care, providing opportunities for continuing education, and changes in certification of providers to match more rigorous national standards set by the National Registry of Emergency Medical Technicians. Interviewees were quick to point out that these changes will not come about without additional resources for EMS training as well as a culture shift to elevate standards department-wide. With the new Task Force on Emergency Medical Services Report and Recommendations, all FEMS field operations providers will be trained as dual-role providers, meaning they will be trained to provide some level of emergency medical services and some level of firefighting services.

Improvements in training standards are likely to be a welcome change to ED, hospital and EMS personnel alike. Several interviewees raised concerns about the quality of the emergency services workforce, suggesting that they did not follow appropriate clinical protocols, appeared to be poorly trained, and at times were not providing safe and effective care to the residents of the District. While recognizing that many EMS providers were offering outstanding care, they attributed poor performance among some EMS providers to inadequate or outdated training. Some also had concerns about firefighters providing patient care, suggesting that this has a negative impact on overall quality of care. Several noted that emergency medical service providers in DC have a very limited scope of practice, which can have a negative effect on the condition of patients arriving by ambulance.

In addition to current training practices, out-of-date protocols were cited as affecting the quality of EMS care. Last updated in 2002, current EMS protocols require equipment that is no longer necessary or used. Another major concern regarding protocols is that the types of medications that providers are allowed to carry and dispense to patients are limited. Providers commented that carrying additional medications would allow them to better treat patients. Despite indications that changes to the protocols would be supported by both DC FEMS and HEPRA, there does not appear to be an established process in place for this purpose, making improvements less likely to occur. HEPRA has reported that they lack sufficient regulatory authority over EMS. Currently, it appears that all regulatory authority is derived from Regulation 72-29, passed in 1972, which gave the Commissioner of the District (now the Mayor) authority over ambulance licensing and certification of EMTs. The Mayor subsequently delegated his limited authority under that regulation to the Director of the Department of Health.[44] Additional legislation may be necessary to give HEPRA the authority to allow EMS providers to dispense a broader set of medications.

Quality Assurance

DC FEMS recently established a process for quality assurance that aims to improve quality by identifying errors and selectively retraining providers. Several interviewees described improvements in the EMS quality assurance process, signaling a move toward a culture of error identification, training and improvement. As part of this process, DC FEMS investigates outside complaints and reviews electronic records to ensure that protocols are followed. In cases where mistakes are confirmed, the process requires the responsible provider(s) to receive retraining in the indicated area. Reportedly, prior to the new system, providers might be punished for errors and without appropriate education and retraining. DC FEMS now hopes to create an atmosphere where providers are comfortable bringing attention to errors without fear of punitive action.

[44] Mayor's Order 2005-79, 52 DC Reg. 5508 (May 24, 2005).

The new quality assurance system has not been in place long enough to determine its effectiveness. According to many interviewees, despite the new quality assurance protocols, the current method of evaluation and promotion continues to include very little assessment of individual performance. Thus, it remains to be seen whether the promise of a new quality assurance focus will translate into changes in practice among the rank and file EMS workforce.

It is also an open question whether this process will have an impact on the quality of clinical care that is delivered through emergency services. The new quality assurance process does not include, nor does it appear to have plans to include, developing and tracking of clinical quality measures beyond cardiac arrest survival rates. For instance, there do not appear to be plans to measure indicators of the quality of airway or pain management.

Many interviewees both inside and outside of DC FEMS felt that the department is uniquely positioned to benefit from a full-time medical director who can lead the organization in measuring the quality of clinical performance. According to the JEMS 200 City Survey, 43.8 percent of medical directors spend less than ten hours per week on EMS. Thus, DC FEMS has an exceptional level of medical direction, which may translate into an enhanced ability to improve quality and service.

Staffing and Culture

During the interviews, many individuals described DC FEMS as a department primarily committed to fire suppression services – and one that places relatively less value on emergency medical services. This perceived culture of "fire first" creates difficulties when it comes to prioritizing and improving EMS services. Many felt that initiatives and priorities in EMS are evaluated against fire and safety, with EMS often coming out on the short end of resources, commitment, and talent.

Many individuals in different components of pre-hospital and hospital-based emergency care also discussed the tensions and discontent associated with a split workforce – with fire and safety personnel receiving better pay and benefits than EMS personnel. These disparities also create challenges in recruiting and retaining civilian (single-role) providers. According to interviewees, DC FEMS faces a doubly difficult challenge when trying to attract a high-quality workforce for emergency medical services because not only do fire-based employees receive a better compensation package than civilian providers, but surrounding communities also offer better compensation packages than DC FEMS for civilian providers.

Interviewees indicated that the current staffing structure does not provide adequate field supervision, which can result in EMS providers feeling hesitant to provide the required care without direct supervision. One reason cited for the lack of supervision is limited staff and funding for supervisory positions.

DC FEMS leadership appears to recognize these problems and is examining strategies for improving conditions within the organization and providing more equitable compensation to employees. One strategy currently underway includes adding and enhancing EMS leadership positions within the organization to achieve parity with fire-related leadership positions. Additionally, the department is moving toward a dual-role agency, requiring that all firefighters be trained EMS providers. This is an effort to fully integrate fire and EMS functions within DC FEMS. Many individuals expressed optimism about the new DC FEMS leadership and changes that have been implemented over the past several months.

Demand Reduction for EMS

Interviewees frequently discussed the problems associated with providing transportation for nursing home patients, which can be very time consuming for DC FEMS and use resources that many believe are more critically needed in other parts of the system. DC FEMS appears to play a critical role in nursing home transports. According to interviewees, most public EMS departments across the country do not provide transports for nursing home patients. DC, however, does not have the right of refusal when responding to calls, and therefore is obligated to provide transportation to any entity requesting the service.

DC FEMS also has aggressive plans for demand reduction as a way to increase available EMS capacity. These include plans to open clinics at the fire stations to treat patients who do not require emergency medical services, but who frequently utilize the system for basic care needs.

11.2 DC Hospitals

Emergency Department Crowding, Patient Flow and Diversion

ED crowding was a topic raised throughout the interviews and appears to be a problem familiar to all DC hospitals. Many ascribe this to poor patient flow, meaning there are frequent bottlenecks and long waits in the processes that are supposed to ensure that patients get the right care at the right time. Most interviewees cited growing demand for care, increasingly complex patients, limited inpatient beds for admitted patients as well as people who repeatedly use the ED as the principal reasons for crowding. Several interviewees cited measures undertaken by various hospitals to improve patient flow and reduce crowding. These included, for example:

- Installing computerized bed tracking systems to allow hospitals to rapidly monitor availability and turnover of scarce inpatient beds;
- Streamlining and speeding the admissions process;
- Discharging inpatients earlier in the day so that beds are available for ED patients being admitted to the hospital;
- Identifying a "discharge waiting room" allowing patients who are leaving the hospital to vacate their beds earlier, freeing those beds for ED patients needing a bed;
- Creating observation units for ED patients so they may not need an inpatient bed;
- Developing programs to increase hospital-wide awareness about the need for improved flow between the ED and inpatient units;
- Assigning responsibility for bed placement across the hospital to a dedicated staff person acting as a "traffic controller"; and
- Creating a fast track in the ED to quickly handle patients who are not severely ill.

According to hospital-based interviewees, these interventions have met with mixed results, and none has proven the ultimate solution to ED crowding.

Most DC hospitals do not have specific guidelines outlining when they should or should not go on diversion. Instead, the decision tends to be made by staff in charge of the ED at that particular time. Hospitals indicate that they try to keep diversion hours low, instructing staff to go on diversion only when absolutely necessary. Washington Hospital Center uses a computerized checklist to guide decisions related to diversion. Children's National Medical Center has a "no diversion" policy.

Several interviewees reported that they see a large number of patients for complaints that could be treated outside of the ED, such as in a primary care setting or in consultation with a medical specialist. These individuals frequently expressed concern that substantial numbers of patients do not have access to primary care or do not know how to access primary care in DC.

Many interviewees expressed serious concerns about how the potential closure of Greater Southeast Community Hospital and/or Prince George's Hospital Center would affect their hospitals. Several hospital-based interviewees stated that their hospitals experienced large increases in ED volume, as well as a change in the payer mix of their patients, following the closure of DC General Hospital. A common concern voiced by these interviewees was that a similar situation would result from further closures – especially of Greater Southeast Community Hospital and PG Hospital Center. Some interviewees were less concerned about the possibility of further hospital closures in the District or in surrounding Prince Georges County, in part because of the location of their hospital and its low likelihood of being the "hospital of choice" for former patients of the closed hospitals. Others also mentioned that Greater Southeast Community Hospital was seeing far fewer patients, indicating that many patients had already moved to other hospitals to receive care.

Another challenge to the safe and efficient flow of patients is the difficulty in placing inpatients into nursing homes. Often, these patients spend a long time in inpatient units and can be difficult to discharge back to their nursing home. This contributes to ED crowding and patient boarding, since patients cannot be moved from the ED to inpatient beds. In addition, two nursing homes in DC are scheduled to close in October 2007: Several of our interviewed hospitals were very concerned that they would have few options for discharging patients needing skilled nursing care if the District loses 500 nursing home beds.[45]

Arrestees in the ED are also an issue for several hospitals. Greater Southeast Community Hospital has a contract with DC to treat inmates who are already in the Department of Corrections (DOC) system and require hospitalizations. Other hospitals have reported an increase in the number of recent arrestees, who are not yet in the DOC system, coming to their ED. Hospitals report that arrestees waiting in the ED make other patients feel uncomfortable and that there have been instances in which they have attempted to escape custody. Also, in the case of admission to an inpatient unit, arrestees require private, secure rooms, which may not always be available. This means that correctional patients wait in the ED and take up additional space in inpatient units, contributing to problems with patient flow and overcrowding in the ED.

Specialty Coverage

Maintaining specialty coverage in the ED is critical to the timely and efficient handling of patients. Without key specialists in an ED, patients may need to wait too long for appropriate care, the ED becomes increasingly crowded and overall quality suffers. The lack of specialty coverage appears to be a common challenge for DC hospitals. Interviewees report that specialists often are unwilling to treat patients in the ED because they probably will not be reimbursed for care delivered to uninsured patients and believe they will be underpaid for patients enrolled in the DC Alliance. Inadequate reimbursement for services delivered to Medicaid, DC Alliance and other uninsured patients was mentioned often in the interviews, with many providers indicating that such

[45] Sinha, V. (2007, June 15). Second DC nursing home this year may shut down. *Washington Business Journal*, Retrieved September 17, 2007 , from http://www.bizjournals.com

reimbursement is low, often unreliable, or completely unavailable. Because of this, many hospitals must pay specialists to provide coverage in the ED. Hospitals report the greatest difficulty finding coverage for neurosurgery, urology, orthopedics and obstetrics/gynecology services.

Additional information regarding hospital operations and utilization will be included in our final report. Analysis of the hospital survey data will be reported at that time.

11.3 The DC Emergency Care System

Collaboration and Coordination across DC FEMS and DC Hospitals

Almost all interviewees expressed concerns about drop times at hospitals, i.e., the amount of time it takes for EMS providers and hospital staff to transfer a patient from pre-hospital to hospital care. Lengthy drop times consume resources that could be deployed elsewhere in the city. Ambulances that are parked at a hospital's doors are unable to respond to other calls for transports or emergency services.

Improving drop times will require coordination and cooperation between DC FEMS and area hospitals, although the prospects for immediate improvements are slim, given interviewees' sense of where blame for the problem rests. Interviewees associated with DC FEMS suggest that hospitals should take responsibility for shortening drop times. While DC FEMS interviewees acknowledge that they contribute to lengthy drop times primarily because of providers taking breaks at hospitals, they believe that hospital practices are the prime cause of these delays. According to these interviewees, hospitals often do not accept patients as quickly as possible, thereby contributing to long drop times.

Hospital leaders, however, do not share their DC FEMS colleagues' views about the principal cause of lengthy drop times, suggesting instead that they are primarily a function of EMS delays and lags in "clocking out" of the hospital. They also suggested that emergency medical services staff habits of visiting with hospital staff after transferring patients contribute to long delays. Hospital-based interviewees also reported difficulties with drop times as a result of multiple ambulances arriving at the ED at the same time.

To help decrease drop times at hospitals, DC FEMS has placed a paramedic, called "EMS 6" at the Office of Unified Communications to help direct the flow of ambulances throughout the District. EMS 6 evaluates all ALS calls and is designed to direct ambulances to the most appropriate hospital. This helps to ensure that multiple ambulances do not arrive at a single hospital all at once. EMS 6 can also place hospitals on diversion for short periods of time in the event they must cope with multiple arrivals.

Many hospital-based interviewees reported having good working relationships with DC FEMS providers, stating that DC FEMS generally routed patients to the most appropriate venue for hospital-based emergency care. However, nearly all interviewees reported little or no interaction between hospital leadership and DC FEMS leadership. While hospital and DC FEMS leadership and providers indicate that they recognize the need to work in a more coordinated fashion, few suggestions were offered by either group as to how this might best be accomplished or even initiated.

12. Comparison to Benchmark Cities

Because of its unique political status, the District is often compared to other states. However, states are much larger and more diverse, include both urban and rural areas and populations, and have administrative and policy infrastructures that the District does not have.

To assist in the interpretation of information presented in this report, we identified six cities that could serve as reference points to benchmark indicators of health outcomes and health care. These cities—Baltimore, Richmond, Philadelphia, Cleveland, Detroit, and Atlanta—were selected on the basis of their socio-demographic similarity to DC, as described in Technical Appendix 1.

Tables 12.1 through 12.3 compare health status and access to care among adults and children in the District to individuals living in the benchmark cities. In general, measured health outcomes among District residents are comparable to those among residents of other benchmark cities that are socio-demographically similar to D.C. However, rates of mortality from diabetes are higher in the District compared to other cities. Rates of health insurance coverage among adults are better in the District compared to other cities, probably largely as a result of the Alliance.

Table 12.1 Health Status Among Adults (18+) in the District and Benchmark Cities

	Measures	D.C.	Richmond	Baltimore	Atlanta	Cleveland	Detroit	Philadelphia
Self-rated health	% fair or poor	12.9%[1] (2005-2006)	18.0%[1] (2005)	14.5%[1] (2006)	N/A	N/A	24.5%[4] (2005)	19.0%[5] (2004-2006)
Heart Disease	Prevalence (%)	4.8%[1] (2005-2006)	3.8%[2] (2005)	N/A	2.2%[6, 7] (2004-2006)	N/A	5.0%4 (2005)	N/A
	Mortality (per 100k)	273.7[8] (2004)	247.9[9] (2002-2004)	287.2[8] (2004)	230.2[8] (2004)	362.8[8] (2004)	370.0[8] (2004)	265.9[8] (2004)
Cerebrovascular Disease	Prevalence (%)	2.8%[1] (2005-2006)	N/A	3.1%[3] (2006)	1.8%[6, 7] (2004-2006)	N/A	5.2%[4] (2005)	N/A
	Mortality (per 100k)	35.4[9] (2002-2004)	86.3[9] (2002-2004)	60.8[9] (2002-2004)	N/A	N/A	48.9[9] (2002-2004)	59.5[9] (2002-2004)
Diabetes	Prevalence (%)	8.1%[1] (2005-2006)	4.9%[2] (2005)	10.2%[3] (2006)	5.2%[6, 7] (2004-2006)	N/A	12.0%[4] (2005)	8.0%[5] (2004-2006)
	Mortality (per 100k)	39.8[8] (2004)	35.9[9] (2002-2004)	38.5[7] (2004)	20.4[8] (2004)	31.4[8] (2004)	32.4[8] (2004)	26.6[8] (2004)
Cancer	Mortality (per 100k)	205.6[8] (2004)	203.7[9] (2002-2004)	231.0[8] (2004)	211.3[8] (2004)	258.1[8] (2004)	230.4[8] (2004)	232.2[8] (2004)
Breast Cancer	Incidence (per 100k)	125.8[10] (2006)	129.7[11] (2007)	N/A	N/A	N/A	N/A	125.5[5] (2004-2006)
	Mortality (per 100k)	27.1[8] (2004)	32.2[11] (2007)	33.2[8] (2004)	29.4[8] (2004)	38.3[8] (2004)	30.7[8] (2004)	31.7[8] (2004)
Asthma	Prevalence (%)	10.0%[1] (2005-2006)	10.8%[2] (2005)	9.9%[3] (2006)	6.3%[6, 7] (2004-2006)	N/A	13.7%[4] (2005)	13.0%[5] (2004-2006)
Obesity	Prevalence (%)	22.5%[1] (2005-2006)	36.0%[2] (2005)	33.6%[3] (2006)	23.6%[6, 7] (2004-2006)	N/A	38.0%[4] (2005)	27.0%[5] (2004-2006)

*Year and subpopulation denoted in parentheses. Table notes follow Table 12.3.

Table 12.2 Measures of Access to Care among Adults in the District and Benchmark Cities

	D.C.	Richmond	Baltimore	Atlanta	Cleveland	Detroit	Philadelphia
No Regular Source of Care (%)	19.9[12]	N/A	N/A	N/A	N/A	22.6[4]	12.0[13]
(Year)	(2006)					(2005)	(2002)
No dental visit in 5 or more years (%)	8.2[12]	N/A	10.4[3]	N/A	N/A	N/A	28.0[13, 14]
(Year)	(2006)		(2006)				(2002)
Never had HIV test (<65yrs) (%)	36.3[12]	N/A	38.2[3]	41.2[6]	N/A	36.8[4]	48.0[5]
(Year)	(2006)		(2006)	(2004-2006)		(2005)	(2004-2006)
Mammogram within 2 years (%)	84.4[15]	72.9[2]	82.5[3]	80.2[6]	N/A	47.2[16]	69.9[13]
(Year)	(2004-2006)	(2005)	(2006)	(2004-2006)		(2002-2006)	(2002)
(Age)	(50+)	(40+)	(40+)	(40+)		(40+)	(50+)
Pap smear within 3 years[17] (%)	90.3[15]	88.4[2]	84.1[3]	90.2[6]	N/A	83.0[16]	87.0[13]
(Year)	(2004-2006)	(2005)	(2006)	(2004-2006)		(2002-2006)	(2002)
Uninsured (%)	9.8[1]	14.0[2]	14.2[3]	15.9[6]	N/A	22.2[4]	19.0[5]
(Year)	(2005-2006)	(2005)	(2006)	(2004-2006)		(2005)	(2004-2006)

*Year and subpopulation denoted in parentheses. Table notes follow Table 12.3.

Table 12.3 Health Status Among Children in the District and Benchmark Cities

	D.C.	Richmond	Baltimore	Atlanta	Cleveland	Detroit	Philadelphia
Self-rated health (% Fair or Poor)	4.1[18] (2003) (<18yrs)	N/A	7.3[19] (2005) (High School)	8.1[19, 20] (2005) (High School)	N/A	N/A	N/A
Asthma (%)	11.8[18] (2003) (<18yrs)	N/A	19.0[19] (2003) (High School)	18.4[19, 20] (2003) (High School)	N/A	17.1[19] (2003) (High School)	N/A
Overweight & Obese (%)	23.0[10] (2006)	N/A	23.5[3] (2006)	N/A	N/A	N/A	N/A
Infant Mortality (Rate per 1,000)	10.5[8] (2003)	11.0[9] (2002-2004)	12.8[8] (2003)	N/A	10.0[8] (2003)	16.4[8] (2003)	10.6[8] (2003)
Low birth weight prevalence (%)	10.9[8] (2003)	7.03[21] (2003)	13.2[8] (2003)	10.4[8] (2003)	11.4%[8] (2003)	13.5[8] (2003)	11.7[8] (2003)

*Year and subpopulation denoted in parentheses.

[1] District of Columbia BRFSS, 2005-2006; [2] Virginia BRFSS, 2005; [3] Maryland BRFSS, 2006 ; [4] Michigan BRFSS, 2005; [5] Philadelphia County Health Profile, 2004-2006; [6] Atlanta BRFSS, 2004-2006; [7] City of Atlanta is defined as average of Fulton and DeKalb County; [8] Big Cities Health Inventory, 2007 *Data is from 2004, with the exception of maternal health indicators which are from 2003; [9] State Center for Health Statistics: Major Causes of Death for the District of Columbia, U.S., and Selected Cities, 2002-2004 ; [10] Kaiser State Health Facts, 2006 ; [11] Virginia Department of Health, Cancer Prevention Control Website: http://www.vahealth.org/cdpc/cancerprev/data.asp ; [12] District of Columbia BRFSS, 2006; [13] Pennsylvania BRFSS, 2002 ; [14] No Dental visit for 1 year or more instead of 5 y ears as indicated in table; [15] District of Columbia BRFSS, 2004-2006; [16] Michigan BRFSS, 2002-2006; [17] Surveyed women 18 and over; [18] National Survey of Children's Health, 2003; [19] Morbidity and Mortality Weekly Report: Youth Risk Behavior Surveillance 2005, June 9, 2006, Vol. 55 No. S-5. Department of HHS and CDC; [20] DeKalb County, not actually the city of Atlanta; [21] Virginia Health Information Website, Prevention Quality Indicators for 2003, http://www.vhi.org/pqidata.asp.

We also compared the supply of inpatient hospital beds in the District to the benchmark cities. We included children's hospitals and general/medical/surgical hospitals. As shown in Table 12.4, we find that D.C. has more hospital beds per population than Philadelphia or Detroit, but fewer than Baltimore, Atlanta, Cleveland or Richmond. The geographic concentration of hospital beds in the District is greater in the District compared to Detroit, Richmond and Atlanta and is comparable to Cleveland. Maps provided in the Map Appendices depict the location of hospitals in the District and benchmark cities.

Table 12.4 Comparison of Hospital Beds and Number of Hospitals: Washington D.C. vs Benchmark Cities

	Atlanta	Baltimore	Cleveland	Detroit	Philadelphia	Richmond	Washington
Population (in 100,000s)	4.2	6.5	4.8	9.5	15.2	2.0	5.7
Size (in 100s of square miles)	13	8	8	14	14	6	7
Total hospital beds	2277	4221	3347	2917	6657	1679	2808
Number of hospitals	4	12	6	8	20	4	7
Number of children's hospitals	0	1	0	1	2	0	1
Hospital beds per 100k population	547	648	700	307	439	849	491
Hospital beds per 100 square miles	172	518	430	209	466	268	411

Source: AHA Annual Survey, 2005.

We also compared the supply of hospital beds between the District and surrounding areas (the Washington "health service area") and benchmark cities and their surrounding areas.

Table 12.5 Comparison of Hospital Beds and Number of Hospitals—Washington D.C. Health Services Area vs. Benchmark Health Service Areas

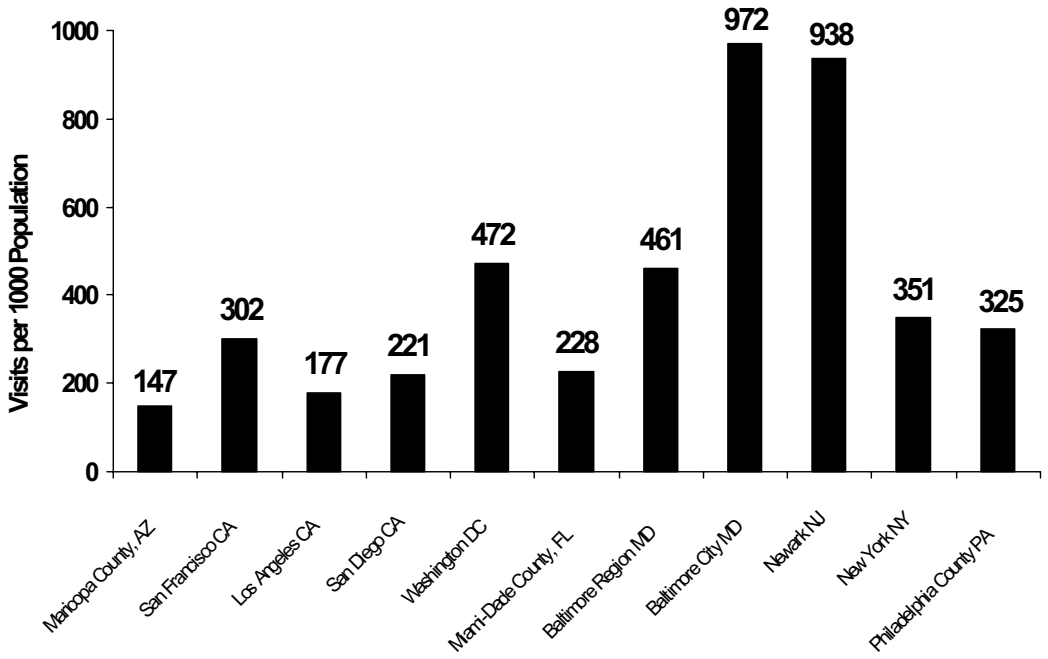
	Atlanta	Baltimore	Cleveland	Detroit	Philadelphia	Richmond	Washington
Population (in 100,000s)	30.4	24.3	17.8	25.1	38.8	6.1	25.6
Size (in 10s of square miles)	249	203	181	300	220	154	201
Total hospital beds	6899	6584	6613	11614	12204	3056	5596
Number of hospitals	22	21	22	41	44	10	20
Number of children's hospitals	1	1	0	1	2	0	1
Hospital beds per 100k population	227	270	371	462	314	501	219
Hospital beds per 10 sq miles	28	32	37	39	55	20	28

Source: AHA Annual Survey, 2005.

As shown in Table 12.5, the District has fewer hospital beds per population than the other benchmark areas (the supply is comparable to Atlanta), but the geographic concentration in the District is greater than in Richmond and is comparable to Atlanta. Maps provided in the Map Appendices depict the location of hospitals in the health service areas of Washington and the benchmark cities.

Finally, we were unable to identify rates of ED use for each of the benchmark cities. Figure 12A compares rates of ED use across the District and other areas for which data were available. The rate for DC was in the mid-range compared to the other areas.

Figure 12A ED Visits Per 1000 Population



Note on data sources: Due to variation in available data, the number of ED visits and population count are not necessarily from the same year, although all data are from 2003 or later. Visits per population may be calculated using number of visits from a fiscal year (i.e., 07/04-07/05) and population count from a calendar year.

13. Conclusion

In what follows, we highlight key findings, identify a number of important gaps in knowledge, and provide preliminary implications from our findings.

13.1 Key Findings

Findings from our study of health, health care, and the emergency care system in the District of Columbia include the following:

(1) Among adult District residents, more than one in four adults reported having hypertension, making it the most common among the chronic diseases reported.

- Following hypertension, in order of prevalence, are asthma (10 percent), diabetes (8 percent), heart disease (5 percent), and cerebrovascular disease (3 percent).
- Over half of adult District residents qualify as overweight or obese, and nearly one-quarter qualify as obese.

(2) District-wide, mortality rates from heart disease and cancer were higher than those from other causes, although cancer and HIV/AIDS contribute the most to rates of premature mortality.

(3) Measured health outcomes among District residents are comparable to those among residents of other "benchmark" cities that are socio-demographically similar to D.C (such as Baltimore, Maryland and Atlanta, Georgia); although rates of mortality from diabetes are higher in the District compared to those in other cities.

(4) Among District children, 36 percent between ages 6 and 12 were overweight, based on reported height and weight, while 17 percent between ages 13 and 17 were overweight. Twelve percent were reported to have asthma.

- 9 percent of DC children were reported to have a dental health problem.
- 11 percent of parents reported that their children require services for a behavioral health issue.
- 8 percent of children in DC were estimated to have a serious emotional disturbance (in 2000).

(5) Among adults, residents of Wards 7 and 8 had generally higher rates of chronic disease, poor health status, and premature mortality.

- However, other areas of the city also have poor health outcomes. Among adults, **Ward 5** had rates of hypertension and overweight/obesity that exceeded the city-wide average.
- Breast and prostate cancer incidence rates among adults were highest in **Wards 4 and 8.** The cervical cancer incidence rate was highest in **Ward 7** and for colon cancer, **Ward 6.**

(6) Among children, health outcomes were better among those in Ward 3 than in other wards.

- Asthma prevalence among children was highest in **Ward 7,** with 18 percent of children reported to have asthma of any severity.

(7) Rates of health insurance coverage among adults were higher in the District than in comparable cities, probably largely as a result of the Alliance.

(8) Despite a relatively high rate of insurance coverage, about 20 percent of District residents—children and adults—reported no usual source of care.

- Lack of a usual source of care was greater among uninsured compared to insured adults.
- Among adults, PUMA C (which includes Wards 5 and 6) was associated with having a relatively low probability of having a usual source of care among adults.
- Among children, those with public insurance were less likely to report having a usual source of care compared to those with private insurance.
- Among children, PUMAs D (which includes Wards 7 and 8) and B (which includes most of Ward 4 and some of Wards 1 and 5) were associated with relatively low rates of having a usual source of care, compared to other PUMAs.

(9) Rising rates of admissions for ambulatory care sensitive conditions[46] over time among youth and adults aged 40-64 suggest worsening access to non-hospital-based care in recent years. Similarly, rates of emergency department visits for conditions that are primary care sensitive have risen for adults 18-64.

(10) Admissions for ambulatory care sensitive conditions were highest in 2006 among adults in PUMA D (which includes Wards 7 and 8) and among children in PUMA B (which includes most of Ward 4 and some of Wards 1 and 5).

- Among children, PUMA D (which includes Wards 7 and 8) was associated with a low probability of having a well child visit or dental care. PUMA C (which includes Wards 5 and 6) was associated with having a low probability of any well child visit, any acute care visit, or any dental care.
- Among adults, the probability of having a check-up in the last two years was relatively low among residents of PUMA B (which includes most of Ward 4 and some of Wards 1 and 5) compared to those in other locations.

(11) Rates of primary care use among individuals enrolled in public insurance programs are low, as are rates of specialty use among those with chronic conditions. Rates of inpatient hospital stays and ED visits are relatively high.

- Among children enrolled in Medicaid managed care, rates of primary care use ranged from about one third among older children to just over half among children 0-5 years old. Between 2 and 4 percent had an inpatient stay during the course of a year. Among children 0-5 years who are covered by Medicaid, 42 percent had an ED visit during the year. Approximately one-quarter of children 6-17 years old who are enrolled in Medicaid had an ED visit during the year .
- Among adults covered by Medicaid, 40 percent had an ED visit during a year period. Approximately 14 percent of adult Medicaid enrollees had an inpatient stay during a one-year period.

[46] These are conditions, such as asthma or heart failure, which can usually be treated by timely access to high quality outpatient care, thereby preventing the need for hospitalization

- While the majority of individuals with chronic conditions who are enrolled by Medicaid or the Alliance have at least one visit to a primary care provider, few see a specialist with expertise in treating their condition. Between about half and three-fourths of these individuals use the ED at least once. Rates of inpatient hospital use among with those with selected chronic conditions (such as heart disease, HIV/AIDS, asthma or diabetes) ranged from 23 to 34 percent.

(12) From 2000-2006, rates of inpatient hospital use by DC residents remained fairly steady, while rates of ED use by District residents increased 7 percent between 2004 and 2006, with most of the increase driven by greater use among District residents ages 40-64.

(13) Overall primary and specialty care supply measures are not appreciably different from benchmark rates, but the distribution of providers does not appear commensurate with population need, and the availability of providers for vulnerable populations was difficult to measure.

(14) The average occupancy rate was at or below 70 percent at four hospitals in 2006, and was between 73 and 85 percent for three other hospitals. Only one hospital, Children's National Medical Center, had occupancy rates at or near 100 percent.

- In all areas of the city, residents appear to have a choice in which hospital they go to, as residents from every zip code (or ward) used a variety of hospitals.
- The supply of hospitals and hospital beds in the District was in the range of other benchmark cities.

(15) About one-fourth of inpatient admissions among children and among adults 40-64 are ambulatory care sensitive. More than half of ED visits (that did not result in an inpatient admission) are classified as primary care sensitive across all age groups, and the percentage of ED visits that are PCS is highest among children.

(16) The overall demand for District emergency services has increased only modestly in recent years.

- The volume of EMS runs was approximately eight percent greater in 2006 than 2000.
- The number of ED visits appears to have increased between 2000 and 2001, although data from DC General, which are included in ED visit estimates, may be incomplete for these years. Since 2004, ED utilization at District hospitals increased 6.5 percent.
- We were unable to fully explain the increase in diversion, which nearly doubled between 2000 and 2006.[47]

(17) Patients with serious, acute conditions, such as heart conditions, strokes, and major trauma, are sometimes transported to hospitals that are not best suited to meet their needs.

- This is a particular problem for residents in Wards 7 and 8 transported to Greater Southeast.

[47] Diversion is when a hospital can only accept the sickest "priority 1" patients.

(18) There is little evidence of a single, unified vision of high quality pre-hospital and hospital emergency services and there are few available measures of the quality of emergency care in the District.

- Hospital and DC Fire and Emergency Medical Services leaders appear to know little of each other's challenges.

13.2 Gaps in Knowledge

In what follows, we highlight a number of gaps in knowledge. These knowledge gaps are largely due to gaps in data.

♦ **Little is known about children's health status and access to care**. The only available data are from the 2003 National Survey of Children's Health (NSCH), for which we needed to conduct analysis at the secure Research Data Center in Hyattsville, Maryland. While the 2007 wave of the NSCH is nearly complete, the District should consider a more regularly collected and accessible mechanism to gather information on access to care and health status for children.

♦ **Available information about insurance status among adults in the District is inadequate**. The Behavioral Risk Factor Surveillance System (BRFSS) only asks about whether an individual has insurance but about not type of insurance. Further, the failure to ask about specific insurance sources by program name likely results in some misreporting by Alliance enrollees.

♦ **Little is known about the quality of emergency medical services in DC.** Response times have been an important metric historically. But quality in health care has moved beyond just a question of timeliness. Quality is now thought to include six domains: safety, timeliness, efficiency, effectiveness, equity and patient-centeredness. Currently, some data exist on EMS timeliness and a little is known about hospital emergency care effectiveness. Not much in the way of quality of emergency services is measured in the District, and we have seen no imminent plans to do so, despite the District government's major role in financing these services

♦ **Available data on mental health prevalence and mental health and substance abuse service use are extremely limited**. Data from the National Survey of Drug Use and Health provide sub-city estimates of the prevalence of substance abuse disorders, but no comparable data exist for mental health. As a result, we had to rely on indirect estimates of mental health prevalence from outdated sources. Given the importance of these problems for the District's population and their implications for health care and for quality of life, productivity, employability and safety, the District would benefit from developing mechanisms to regularly monitor mental health needs and access to mental health and substance abuse services.

♦ **Provider supply could be measured with more precision if reliable data on practice time in the District and population served by type of insurance were available.**

♦ **Differences in data formats and availability of Medicaid and Alliance data from managed care organizations make it less useful than it could be.** The District should, as part of its managed care organization (MCO) contracting process, work with MCOs to ensure that progress is made towards standardization of data in the future.

♦ **The lack of timely analysis of data with which to monitor the health of the District should be addressed**. Such data clearly exist (e.g., vital statistics, cancer statistics and BRFSS), but analysis of them are often several years out of date.

13.3 Preliminary Implications

Our forthcoming final report will address policy approaches to the problems identified. However, we offer some preliminary insights from our findings.

1. **The relatively high rates of use of ED and inpatient hospital services among Medicaid/Alliance enrollees and rates of ambulatory care sensitive admissions and primary care sensitive emergency department visits may reflect inadequacies in the supply or effectiveness of primary and specialty care, inappropriate care-seeking patterns, or supply-sensitive demand.** Reducing hospital use by addressing these issues may provide additional hospital and emergency department capacity. Planning for any new hospital capacity must consider whether efforts to reduce use could be successful and the extent to which supply-sensitive demand could generate more hospital use.[48]

2. **The District's hospital system does not appear to be operating on the brink of saturation**. Over the last six years, inpatient admission rates to District hospitals have been relatively flat; rates of ED visits to District hospitals have increased only moderately since 2004; hospital occupancy rates have averaged about 75% with only one hospital operating at near 100 percent capacity (Children's); patients from each zip code within the District appear to have a choice in hospital destination, as shown by the diversity of hospitals which they use; and the supply of hospital beds and hospitals per population and per square mile are within the range of benchmark cities. However:
    a. Disruption at Prince George's Hospital Center could have a dramatic regional impact; and
    b. Steps need to be taken to ensure that District residents in emergency situations are taken to hospitals with the appropriate facilities to care for them, and/or that hospitals they are taken to develop broader capacities for treating conditions requiring emergency care.

3. **There appears to be considerable room for improvement in quality of care and its measurement across the various types of care—emergency, inpatient, or outpatient—and for particular providers**.

4. **Addressing problems in the availability of outpatient care—both primary care and specialty services—will need to consider not only the appropriate location for those providers, but what incentives might help patients use care appropriately and what will increase provider willingness to serve populations in greatest need**.

5. **Coordination of efforts between hospitals and Fire and Emergency Medical Services (FEMS) has the potential to better serve District residents**. Further, while DC FEMS has

[48] Supply-sensitive care is care whose frequency of use is not determined by well-articulated medical theory or scientific evidence. (Center for the Evaluative Clinical Sciences, Dartmouth Atlas Project, www.dartmouthatlas.org) .

aggressive plans for reducing demand for EMS, other initiatives to address core aspects of quality, such as pain management, trauma management, advanced airway management and cardiac arrest survival are also needed.

6. **The dynamics of change since 2004 need to be better understood**. For many of the measures we studied, 2004 was a turning point. Additional study is required to understand what forces led to the changes in 2004 and beyond.

Future analysis will be aimed at identifying a set of recommendations to improve access to appropriate care that meets population needs and to promote care-seeking at the kinds of locations that are most appropriate. Our subsequent report will also make recommendations about the use of tobacco settlement funds to strengthen the health care system in the District.

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TECHNICAL APPENDICES

APPENDIX 1: Choice of Benchmark Cities

We chose six demographically similar cities against which to compare the District. Benchmark cities are Baltimore, Maryland; Richmond, Virginia; Philadelphia, Pennsylvania; Cleveland, Ohio; Detroit, Michigan; and Atlanta, Georgia (Table A1.1). All six cities chosen have a large proportion of African American residents, and most have a similar proportion of Hispanics compared to DC (7.9%). With the exception of Detroit, the proportion of Caucasian residents is also relatively similar to that of DC (30.8%) across our benchmark cities. The largest difference seen between cities is in the percent of residents who have had any college education (Table A1.1).

Table A1.1 Comparison of DC to Benchmark Cities

Demographic Characteristic	DC	Richmond	Atlanta	Baltimore	Detroit	Cleveland	Philadelphia
Population Size (%)	572k	195k	416k	651k	951k	478k	152k
People per Square Mile (ppl/mi^2)	8, 376	3, 165	3, 146	7, 070	6, 652	5, 805	8, 376
Caucasian (%)	30.8	38.3	33.2	31.6	12.3	41.5	45.0
Black (%)	60.0	57.2	61.4	64.3	81.6	51.0	43.2
Hispanic (%)	7.9	2.6	4.5	1.7	5.0	7.3	8.5
Population 16-19 who are HS dropouts (%)*	10.0	10.6	13.9	15.3	15.4	17.7	10.0
Less than HS (%)	22.2	24.9	23.1	31.6	30.3	31.0	28.8
HS/GED (%)	20.6	23.6	22.3	28.2	30.0	33.2	33.3
College (%)	57.2	51.5	54.7	40.2	39.6	35.7	37.8
Unemployed (%)	6.8	5.0	9.0	6.0	7.8	6.4	6.1
Median family income ($)	$46.3k	$38.3k	$37.2k	$35.4k	$33.8k	$30.2k	$37.0k
Income gap ratio†	30.5	N/A	29.5	21.1	20.4	18.8	20.8
Families in poverty (%)	19.0	21.4	24.4	22.9	26.1	26.3	22.9
Children living in high-poverty neighborhoods (%)*	54.0	61.2	69.3	55.0	72.1	68.6	59.2
Population <18 yrs below poverty (%)*	31.7	33.4	39.3	31.0	34.8	38.0	31.6

Notes: † Ratio of top quintile to bottom quintile based on U.S. Census 2000, source: DC Fiscal Policy Institute.
**Source: Kids Count*
All other data are from the 2000 Census except those variables marked with an asterisk

APPENDIX 2: Design and Analysis of BRFSS

The Behavioral Risk Factor Surveillance System (BRFSS) is a collaborative project of the Centers for Disease Control and Prevention (CDC) and U.S. states and territories. The BRFSS is an ongoing data collection program designed to measure behavioral risk factors in the adult population (18 years of age or older) living in households. BRFSS field operations are managed by state health departments, who follow guidelines provided by the CDC and participate in developing the survey instrument. The data are transmitted to the CDC's National Center for Chronic Disease Prevention and Health Promotion's Behavioral Surveillance Branch for editing, processing, weighting, and analysis.

The health characteristics estimated from the BRFSS pertain to the adult population, aged 18 years and older, who live in households. Respondents are identified through telephone-based methods. No direct method of compensating for non-telephone coverage is employed by the BRFSS; however, post-stratification weights are used, which may partially correct for any bias caused by non-telephone coverage. These weights adjust for differences in probability of selection and non-response, as well as non-coverage, and must be used for deriving representative population-based estimates of risk behavior prevalence.

The publicly available BRFSS files do not contain sub-city identifiers for the District. The DC Department of Health (DOH) provided us with respondents' zip code and ward information so that we could construct local estimates. We noted a significant amount of discordance between individuals' reported zip code and ward; we used individuals' reported zip code and created ward level estimates using the method described in Technical Appendix 5. Briefly, we calculated the distribution across wards of the population in each zip code that crossed ward boundaries and aggregated zip code level estimates to ward level estimates using the population-weighted crosswalk.

Note on BRFSS Post-stratification

When survey data are used without weights, each record counts the same as any other record. Implicit in such use are the assumptions that each record has an equal probability of being selected and that non-coverage and non-response are equal among all segments of the population. When deviations from these assumptions are large enough to affect the results obtained from a data set, then weighting each record appropriately can help to adjust for assumption violations. An additional, but conceptually unrelated, reason for weighting is to make the total number of cases equal to some desired number which, for Washington DC BRFSS data, is the number of people in the District state who are age 18 and older. We also usually need to adjust for differences stemming from non-coverage (such as wireless households in a telephone survey) and systematic non-response (such as rich households more likely to not complete the survey than poor households). The weighting is usually done in two steps.

In the first step, sampling weights are calculated directly as the inverse of the probability of selection associated with each record. In the second step, we conduct a blanket adjustment for non-coverage and non-response and any other issues outside of our control using post-stratification. In order to do so, we align sum of weights for specific sub-groups against the

population totals and do this iteratively to match key marginal distributions of interest. In BRFSS, the sum of weights for BRFSS records were made to correspond to the population numbers for age-by-sex and age-by-race-ethnicity by sex, but did not adjust for potential differences in the sample and population for socio-economic measures. When we computed weight distributions of BRFSS, we found that while BRFSS distributions for Age and Race-ethnicity lined up well against the Census, the distributions of education and income did not line up with the Census distributions. We are exploring potential adjustments to BRFSS weights to account for these discrepancies.

Regression Analyses

We used regression analysis to explore the effects among adults of individual location of residence on three measures of access to care: usual source of care, any dental care in the last 5 years, and any checkup in the last two years. We also analyzed three cancer screening variables: screening for breast, prostate, and cervical cancer. We pooled data from 2004-2006 where possible. We controlled for individual's age, income, health status, insurance status, race, gender, education, and household composition. We analyzed breast cancer screening among women over 50, prostate screening for men over 50, and cervical cancer screening for all women.

We did not find statistically significant effects of location on cervical or prostate screening (holding other factors constant). Location of residence was associated with the other measures and results are provided in Table A2.1.

Table A2.1 Effects of Location of Residence on Access to Care Among Adults (2004-2006)

Dependent Variable	PUMA (vs PUMA A)	Coeff.	Std Err	Significance	Notes
Usual source of care	PUMA B	0.85	(0.14)		Difference between PUMA D and E is statistically different
	PUMA C	0.78	(0.12)	*	
	PUMA D	0.92	(0.17)		
	PUMA E	0.89	(0.12)		
Check-up in last 2 years	PUMA B	0.69	(0.13)	**	No cross-PUMA statistically significant differences
	PUMA C	0.78	(0.14)		
	PUMA D	0.87	(0.21)		
	PUMA E	0.79	(0.11)		
Any dental care in last 5 years	PUMA B	0.41	(0.13)	***	No cross-PUMA statistically significant differences
	PUMA C	0.34	(0.11)	***	
	PUMA D	0.47	(0.17)	**	
	PUMA E	0.37	(0.12)	***	
Breast cancer screening (women>50)	PUMA B	1.75	(0.63)		Difference between PUMA D and E is statistically different
	PUMA C	1.75	(0.58)	*	
	PUMA D	2.17	(0.84)	**	
	PUMA E	1.08	(0.34)		

Location effects varied with the particular measure of study. For example, PUMA C was associated with having a relatively low probability of having a usual source of care (holding other factors constant). The probability of having a check-up in the last two years was relatively low among residents of PUMA B compared to other locations. The probability of receiving dental care was highest in PUMA A compared to all other PUMAs. Breast cancer screening rates were relatively high in PUMAs C and D compared to PUMAs A and E.

APPENDIX 3: Design and Analysis of the National Survey of Children's Health

Design

The National Survey of Children's Health (NSCH) is conducted by the CDC's National Center for Health Statistics and is part of the State and Local Area Integrated Telephone Survey (SLAITS) program. SLAITS uses the sampling frame of the National Immunization Survey (NIS), which is conducted jointly by NCHS and CDC's National Immunization Program. NIS is a large-scale random-digit-dialed (RDD) telephone survey that screens for the presence of young children in selected households and collects immunization history information for eligible children. The size of the NIS sampling frame provides an economical opportunity for SLAITS projects to survey other populations in addition to the rare population that eventually screens into the NIS itself. The National Survey of Children's Health is the third SLAITS survey to produce national estimates concerning the health of children under 18 years of age. It is the second SLAITS survey to take full advantage of the NIS sampling to produce children's health estimates at the state level.

The goal of the NSCH is to select representative samples of children under 18 years of age in each State. The target number of interviews was set at 2,000 per State to permit reasonably precise estimates of the characteristics of children in each State. To obtain population-based estimates, each sampled child for whom an NSCH interview is completed is assigned a sampling weight. The sampling weight is composed of a base sampling weight, an adjustment for multiple telephone lines within a household, multiple children in the household and various adjustments for non-response.

Analysis

The NSCH data were used to conduct descriptive analysis and significance tests. We calculated weighted percentages and standard errors for each variable. Some estimates were generated at the Ward level, which is the smallest area at which estimates with a reasonable margin of error can be generated for these surveys. If the ward of residence for every individual in the sample were known, these calculations would be straightforward. However, the restricted NSCH data provides only the zip code of residence for each person. The Census data can be used to estimate the breakdown of zip code populations across the different wards. Using these two pieces of information, we generated our point estimates in two steps. First, we calculated all of the statistics mentioned above at the zip code level. We then combined zip code-level estimates to obtain ward-level estimates. For example, if ward Y is made up of zip codes 1, 2 and 3 with 50 percent of its population in zip code 1, 30 percent in zip code 2 and 20 percent in zip code 3, and the percentage of children with asthma are p1, p2 and p3 for zip codes 1, 2 and 3, respectively, then the percentage estimate for ward Y is:

Percentage of children with asthma in ward Y = $p_Y = 0.50 \times p_1 + .30 \times p_2 + .20 \times p_3$; Variance $(p_Y) = 0.50^2 \times Var(p_1) + 0.30^2 \times Var(p_2) + 0.20^2 \times Var(p_3)$.

The sample size calculation is similar but uses a different set of weights. If 25 percent of the population of zip code 1, 40 percent of the population of zip code 2 and 75 percent of the population of zip code 3 live in ward Y, then the counts for ward Y can be calculated as: Number of children with asthma in ward Y = $N_Y = 0.25 \times N_1 + .40 \times N_2 + .75 \times N_3$, where N_1, N_2, and N_3 are the number of children with asthma in zip codes 1, 2 and 3, respectively. With these estimated ward-level counts, we created a cross-classified table of counts with 8 wards and 2 levels of asthma.

Regression Analysis

We analyzed differences across locations in use of care controlling for individual characteristics such as health status, income, household composition, education, race, age and insurance. We found significant differences in use of care across locations within DC after controlling for all of these individual level factors. The set of PUMA indicators together jointly explained a significant amount of the variability in each of the measures of access to care. The table compares each PUMA to PUMA A and the statistical significance of the comparison. We also compared each PUMA to every other PUMA—most differences were statistically significant—exceptions are noted in the final column of the Table.

Table A3.1 Effects of Location of Residence on Access to Care Among Children (2003)

Dependent Variable	PUMA	Odds Ratio (vs PUMA A)		95% c.i.	Cross-PUMA Comparsions
Usual Source of Care	PUMA B	0.63	***	(0.56 - 0.71)	*All cross PUMA comparisons statistically significant.*
	PUMA C	0.90	*	(0.80 - 1.01)	
	PUMA D	0.67	***	(0.60 - 0.76)	
	PUMA E	1.42	***	(1.25 - 1.62)	
Any Well-Child Visit	PUMA B	1.28	***	(1.11 - 1.48)	*Difference between PUMAs C and D not significant.*
	PUMA C	0.73	***	(0.64 - 0.84)	
	PUMA D	0.76	***	(0.66 - 0.87)	
	PUMA E	0.88	*	(0.76 - 1.01)	
Any Acute Care Visit	PUMA B	0.71	***	(0.65 - 0.76)	*Difference between PUMAs C and E not significant.*
	PUMA C	0.58	***	(0.54 - 0.63)	
	PUMA D	0.62	***	(0.57 - 0.67)	
	PUMA E	0.57	***	(0.53 - 0.62)	
Any Dental Care	PUMA B	0.58	***	(0.52 - 0.65)	*Difference between PUMAs C and D not significant.*
	PUMA C	0.48	***	(0.43 - 0.53)	
	PUMA D	0.49	***	(0.44 - 0.55)	
	PUMA E	0.71	***	(0.63 - 0.80)	

The PUMA effects varied depending on the measure. For example, PUMAs D and B were associated with relatively low rates of having a usual source of care, compared to other PUMAs. PUMA D was also associated with a low probability of having a well child visit or dental care. PUMA C was associated with having a low probability of any well child visit, any acute care visit and any dental care.

APPENDIX 4: ANALYSES OF CLAIMS DATA

In what follows, we describe our analyses of claims data from the three managed care organizations which cover individuals enrolled in Medicaid and/or Alliance.

Each of the three health plans in the District that serve Medicaid and Alliance managed care enrollees agreed to provide us a de-identified, limited data set (LDS), with information about particular demographic characteristics of their enrollees and use of care. RAND's Institutional Review Board (IRB) reviewed and approved our request for the data and our plans for analyses.

We received data from Chartered Health Plan (for their Medicaid and Alliance enrollees), HealthRight (also for their Medicaid and Alliance enrollees), and Amerigroup (only for their Medicaid enrollees, because they do not participate in Alliance). The claims files included a full year of claims data for enrollees who were enrolled in the managed care plan for at least six months of the year period. The data covered January 1 through December 31, 2006 for Medicaid enrollees, and June 1, 2006 through May 31, 2007 for Alliance enrollees.

We also received information on the demographic characteristics of enrollees, including patient age, gender, race/ethnicity, primary language, and zip code of residence—to the extent such data were available; as well as on characteristics of their enrollment, including number of months enrolled during the year period and whether enrollment was continuous or interrupted.

We requested demographic information for enrollees who used services (and are represented in the claims files) as well as those who did not use services (and thus are not observed in the claims data).

Our claims analyses focused on three types of health care: office based visits, emergency department (ED) visits, and inpatient stays. We constructed a file at the encounter level; that is, where one row of data represents a single office visit, single ED visit, or single inpatient stay. We did not examine other types of care such as prescription drug use, use of durable medical equipment, or use of ambulance services.

The claims files included information about the location of care, provider type and specialty, date of service, primary and secondary diagnosis codes, procedure codes, and for inpatient admissions, length of stay.

We defined three major analytic goals:

1. Analyze use of care among Medicaid and Alliance enrollees;
2. Analyze use of care among Medicaid and Alliance enrollees who have certain chronic conditions; and
3. Analyze use of office based care before an ambulatory care sensitive (ACS) inpatient hospital admission or ED admission for certain conditions.

Goal 1 included analysis of whether or not an individual had any use of a particular type (such as an office based visit or ED visit). We analyzed enrollees' use of (any type of) office based care, office-based primary care, ED care, and inpatient hospital care. We coded office-based care using procedure (CPT) codes and we considered an office visit a primary care visit using information on provider type and specialty.[1] Analyses were performed separately for Alliance and Medicaid enrollees, but aggregated across the plans serving those enrollees.

We separated Medicaid enrollees by age (0-5, 6-12, 13-17, and 18-64). For Alliance, we only analyzed adults (18-64). We also separated individuals by number of months enrolled (12 months or 6-12 months). The analysis of those with a full 12 months observed included most Medicaid enrollees (81 percent), but only about one-third of Alliance enrollees. Utilization is not typically linear over the number of months observed, so we did not attempt to linearly inflate utilization observed over a six or nine month period to a 12 month period; rather we report utilization figures separately for those observed less than a year.

For Goal 2, we identified key conditions of interest—cancer (excluding skin, prostate, bladder, cervical, uterine, and ovarian cancers which may be primarily treated by non-oncologists), cerebrovascular disease (CVD), HIV/AIDS, chronic heart failure (CHF), diabetes, chronic obstructive pulmonary disease (COPD), asthma, and diabetes. We classified individuals who had these conditions using the AHRQ clinical classification software and the diagnosis information from the claims data. One limitation of our analysis of use of care among individuals with these conditions is our reliance on the claims data to identify individuals with the particular conditions; those who have the condition but who did not use care during the year period are unobserved. As a result, we must interpret our results in the following away: Among individuals with a particular condition who use at least some care during the year, what fraction have a visit to a particular type of specialist?

We analyzed whether or not individuals with these conditions (with at least some use of any kind) use primary care, had an ED visit, had an inpatient stay, or saw a specialist. Table A4.1 below shows the type of specialty care we analyzed for each of the conditions.

[1] Specifically, we defined office based care as having a claim with any of these CPT codes: 992.01, 992.02, 992.03, 992.04, 992.05, 992.11, 992.12, 992.13, 992.14, 992.15. Primary care visits included those to providers classified as general practice, family practice, internal medicine, pediatricians, and geriatricians, and included visits to both medical doctors as well as nurse practitioners and physicians' assistants associated with primary care providers.

Table A4.1 Conditions and Associated Specialists for Analyses of Claims Data

Condition	Type of Specialist Care
CVD	Cardiologist
HIV/AIDS	Infectious disease
CHF	Cardiologist
Diabetes	Podiatrist
COPD	Pulmonologist
Asthma	Pulmonologist
Cancer	Oncologist

As part of Goal 3, we identified ACS hospitalizations for hypertension, CHF, COPD, diabetes, asthma, pneumonia, kidney infection, cellulites, and dehydration by comparing the diagnosis codes associated with inpatient hospitalizations from the claims data to the select set of diagnosis codes used to identify ACS admissions from the Billings algorithm (as described in Section 4). We created "flags" (0/1 variables) to indicate whether or not the ACS admission was preceded (in the previous 30 days) by an office based visit (to any type of provider). For some ACS admissions, we do not observe the full 30 day window before inpatient stay; thus, we summarized the percentage of admissions with office based care before the hospitalization among those for which we observe the full window.

APPENDIX 5: DCHA Data

This appendix provides a more in-depth look at the composition of the DCHA inpatient and outpatient discharge data and the processes used in analyses.

Geography

For most of the analysis, we consider three primary geographies: zip code, ward, and PUMA (see Figure A5.A for zip code and wards, Figure A5.B for zip codes and PUMAs). It should be noted that we consistently use the 2002 ward boundaries.

Figure A5.A DC Zip Codes and 2002 Wards

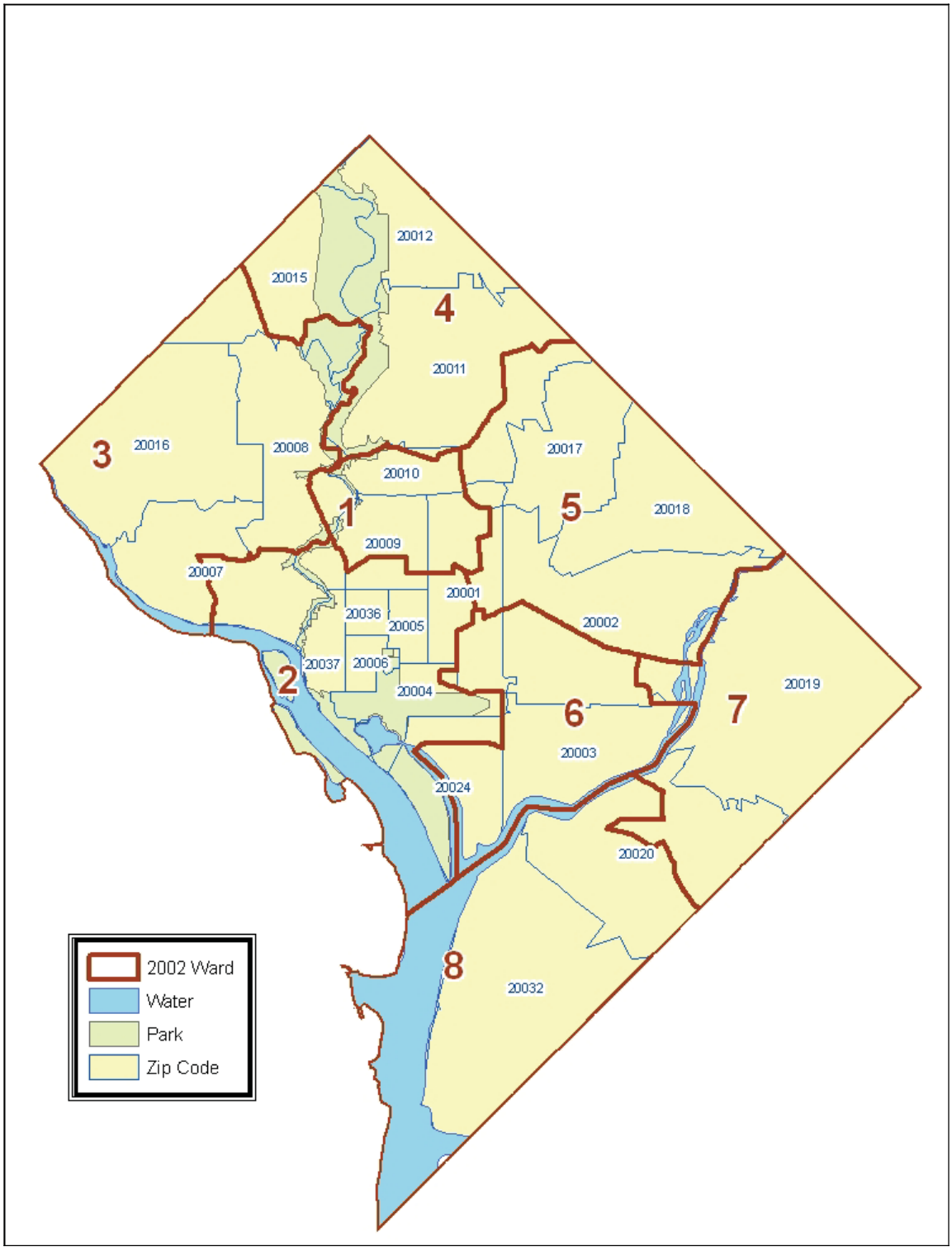
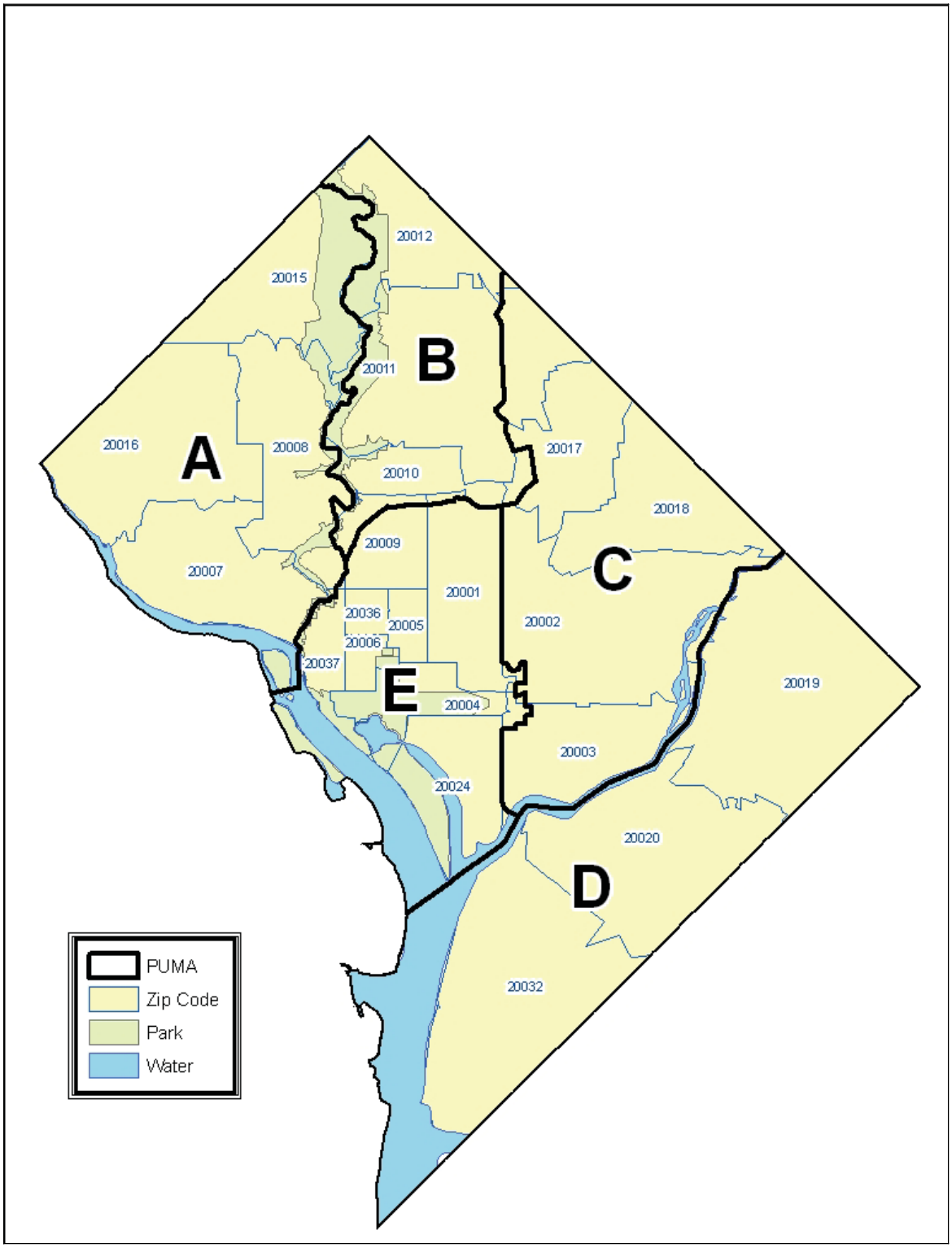


Figure A5.B DC Zip Codes and PUMAs



To decide which zip codes were part of the District of Columbia, in part we relied on the composition of the U.S. Census Bureau 3-Digit Zip Code Tabulation Area [ZCTA] 200. Notable exclusions from this definition are patients with a zip code outside of DC; those who provided a zip code that is uniquely assigned to a business, university, organization, P.O. Box, or military institution; and values not in zip code format.

The geographical categorization decisions were made using the following rules:

- **Alexandria / Arlington**: the zip codes 22201, 22202, 22203, 22204, 22205, 22206, 22207, 22209, 22213, 22214, 22301, 22302, 22304, 22305, 22311, and 22314.
- **Fairfax / Fall's Church**: the zip codes 20120, 20121, 20124, 20151, 20170, 20171, 20190, 20191, 20194, 22003, 22015, 22027, 22030, 22031, 22032, 22033, 22039, 22041, 22042, 22043, 22044, 22046, 22066, 22079, 22101, 22102, 22124, 22150, 22151, 22152, 22153, 22180, 22181, 22182, 22303, 22306, 22307, 22308, 22309, 22310, 22312, and 22315.
- **Other Virginia**: any other zip code with the three digit prefix 201 or 220-246.
- **Montgomery**: the zip codes 20812, 20814, 20815, 20816, 20817, 20818, 20832, 20833, 20837, 20838, 20839, 20841, 20842, 20850, 20851, 20852, 20853, 20854, 20855, 20860, 20861, 20862, 20866, 20868, 20871, 20872, 20874, 20876, 20877, 20878, 20879, 20880, 20882, 20886, 20895, 20896, 20901, 20902, 20903, 20904, 20905, 20906, 20910, and 20912.
- **Prince George's**: the zip codes 20607, 20608, 20613, 20623, 20705, 20706, 20707, 20708, 20710, 20712, 20715, 20716, 20720, 20721, 20722, 20735, 20737, 20740, 20743, 20744, 20745, 20746, 20747, 20748, 20769, 20770, 20772, 20774, 20781, 20782, 20783, 20784, and 20785.
- **Other Maryland**: any other zip code with the three digit prefix 206-219.
- **Other States**: any other zip code not categorized by these listed rules.
- **Unique / PO Box / Military**: this contains a list of several specific zip codes within DC and the surrounding counties for zip codes that are uniquely associated with an identified business, university,[2] military installation,[3] government building or organization. Additionally, this will include any other zip codes with the three digit prefix 200 or 202-205.
- **Miscode**: the zip codes 00000, 99999, ZZZZZ, YYYYY, or any zip code that is not 5 digits.

The second issue involved the miscoded zip codes. Beginning in 2003, one hospital began reporting a large number of 'YYYYY' zip codes - over 40% of their records in 2004 and 2005. To deal with this, we randomly redistributed these observations to the different geographical regions based on the average distribution of discharges from 2004-2006 (which was quite stable over time).

[2] This includes 20052 (George Washington University), 20057 (Georgetown University), 20059 (Howard University), 20064 (Catholic University), and 20742 (University of Maryland).
[3] This includes the entire 203 prefix, 20762 (Andrew's Air Force Base), 22060 (Fort Belvoir), and 22211 (Fort Myer).

The final issue involved the mapping of the DC zip codes into the ward geography. This was necessary because the DCHA files only include a zip code identifier. To generate ward level estimates, we distributed observations in a zip code to a ward using weights based on population from the 2000 Census long form (SF1). More specifically, we assigned a ward and zip code identifier to the every Census block in DC, and aggregated up. It was necessary to go to such a fine level of geography because the wards also split census tracts. It appears that zip codes and wards may not always fit into the block geography, but the population in question is negligible. The final numbers used are listed below:

Table A5.1 Zip by Ward Population Distribution

ZCTA5	WARD1	WARD2	WARD3	WARD4	WARD5	WARD6	WARD7	WARD8
20001	13.6%	13.5%			10.6%	9.8%		
20002					30.8%	37.5%	2.6%	
20003						34.0%		
20004						1.3%		
20005		15.4%						
20006		2.7%						
20007		21.8%	18.7%					
20008	2.2%	4.7%	29.0%					
20009	46.6%	18.0%						
20010	37.6%			1.3%	0.3%			
20011				69.1%	7.7%			
20012				18.1%				
20015			9.7%	11.5%				
20016			42.6%					
20017					26.8%			
20018					23.8%			
20019							74.8%	
20020							22.6%	51.8%
20024						17.3%		
20032								48.2%
20036		5.5%						
20037		18.4%						

Payer Type

The payer groups were created by combining smaller groups already defined in the data. The following table lists the code used in the data, the description of the data, and the grouping that is used in the current analysis.

Table A5.2 Categorization of Payer Types

Code	Description	Current
B	Blue Cross / Blue Shield	Private
I	Commercial Insurance	Private
W	Worker's / State Compensation	Private
C	Federal, Champus	Private
4	Medicaid Pending	Medicaid
D	Medicaid (out of region)	Medicaid
F	D.C. Medicaid	Medicaid
G	Maryland Medicaid	Medicaid
J	Virginia Medicaid	Medicaid
5	D.C. Alliance	Alliance
M	Medicare	Medicare/VA
Q	Medicare Psychiatric	Medicare/VA
R	Medicare Rehabilitation	Medicare/VA
2	VA Medical- Mandatory	Medicare/VA
3	VA Medical- Discretionary	Medicare/VA
P	Self Pay	Uninsured
S	Self Insured	Uninsured
Z	Medically Indigent / Free	Uninsured
6	<undefined>	Other
O	Other , Unknown	Other

APPENDIX 6: ACS and PCS Rate Analyses

In this section, we describe our analyses of ambulatory care sensitive inpatient hospital admissions and primary care sensitive ED visits. We first describe what we mean by ACS and PCS and describe how these provide information about outpatient care.

Inpatient Hospital Admissions for Ambulatory Sensitive Conditions

Inpatient hospital data provide an indirect, but useful way to assess access to and quality of outpatient care. It is widely recognized that a substantial proportion of hospital admissions may be preventable with timely access to high quality primary care. For example, good management of asthma or congestive heart failure at the first sign of an exacerbation can usually alleviate symptoms or keep them from progressing, stopping the progression of symptoms to the point that hospitalization is required.

Hospitalizations of this type are referred to as Ambulatory Care Sensitive (ACS). A large body of evidence suggests that ACS admissions are a reflection of access to, and quality of, care. Standard, well-validated methods exist for classifying discharge diagnoses as ACS. These methods, which were first established by Billings et al., (2000) are used by the US Agency for Healthcare Research and Quality and by several states in monitoring the progress of their health care system. They have also been used in the District of Columbia since 2001. Examples of ACS admissions include diagnoses of asthma, dehydration, chronic obstructive pulmonary disease, congestive heart failure, hypertension, angina, diabetes, and hypoglycemia, among others.

Non-ACS hospitalizations consist of a mixture of those that are for urgent or emergent conditions, such as heart attacks or major trauma, obstetrical care, medical treatments and surgeries. Without additional information, there is no good way to assess the proportion of hospitalizations that that are necessary and appropriate. Hence, we limit our analysis to ACS admissions.

Primary Care Sensitive Emergency Department Visits

Just as some hospital admissions are potentially avoidable with timely and high-quality primary care, some patients visiting EDs would either be treated in a non-emergency room setting, or could have avoided an emergency room visit with timely and high quality primary care. Thus, we also consider the types of ED visits that may have been potentially avoidable.

As is the case with ACS admissions, algorithms exist to classify ED visits into those that are: (1) non-emergent (i.e., did not require immediate medical care); (2) emergent/primary care treatable (needed medical care urgently but such care could have been provided in a primary care setting); (3) emergent but preventable (the need for such visits could have been prevented if effective primary care had been available); and (4) emergent not preventable (such care needed urgently and could not be provided in a

primary care setting.)[4] The first three categories of visits are considered primary care sensitive (PCS) and are often used as markers for the effectiveness of the primary care system. For example, those conditions which are emergent but preventable, if treated early and effectively in the primary care setting, should rarely become serious enough to require hospitalization. Examples of such visits are those related to many of the chronic diseases, such as asthma, chronic obstructive pulmonary disease, congestive heart failure, and diabetes, among others.

Two points are noteworthy. First, in contrast to the ACS algorithm, the PCS algorithm takes each diagnosis code and assigns it a probability that the visit was in one of the categories. Second, in the analyses presented in this chapter, we only consider those ED visits that did not result in a hospital admission. We do not consider whether the ED visits associated with the inpatient admissions were potentially avoidable. Thus, the calculated PCS rates are likely higher than they would be if all ED visits were included.

In the ACS and PCS analyses, we include only patients who are DC residents because we are interested in understanding access to outpatient care among District residents in particular. We exclude from analysis individuals who reside in Maryland and Virginia.

Hospital Use Data

Data on inpatient and ED use come largely through data reported to the District of Columbia Hospital Association (DCHA). Data on emergency visits are not available prior to 2004. In 2005 and 2006, we obtained data on ED use directly from Children's National Medical Center (CNMC) and Greater Southeast Community Hospital (GSECH) as they did not submit those data to DCHA.

Population Data

In constructing ACS rates, we divide the number of ACS admissions (derived from DCHA data) by the number of individuals in the appropriate population. For example, the ACS rate for children would be the number of ACS admissions among children divided by the number of children in the District. For ACS rates at the city level, we derive the population denominators from 2000 Census data. There are no reliable data on the population level in the District between 2000 and 2006 that we can use to adjust later years for population growth or decline. Consequently, we use 2000 population data for all years.

We would ideally like to analyze trends in ACS admissions and PCS ED visits for different neighborhoods, or proxies for neighborhoods, such as those defined by ward or zip codes. But, one challenge in doing so is that the District, like other American cities,

[4] Billngs J, Parikh N, Mijanovich. Emergency Department Use in New York City: A Substitute for Primary Care. The Commonwealth Fund Issue Brief. November, 2000.

is undergoing demographic transitions. For these reasons, when calculating rates of ACS admissions, it is important to use data that most accurately reflect the changes in the population in different areas of the city. The last U.S. Census was in 2000, which means that, if we base our population estimates on the 2000 Census, the potential for mis-estimation of ACS rates grows with every year. However, as discussed above, we used the American Community Survey (which we abbreviate to the ACSY, to distinguish it from ambulatory care sensitive) to better estimate changes in ACS rates for areas of the city. The ACSY collects data on samples of people each year between the decennial census.

Thus, for ACS rates at the sub-city level, we derive population denominators using the 2006 ACSY. We do not use the 2006 ACS numbers in the calculation of city-wide ACS rates for years after 2000 because there is concern about the reliability of the population *levels* reported in the ACS and whether they accurately reflect true population growth or decline.[5] However, given the significant changes in age distributions within PUMAs, we adjust the 2000 population using the 2006 age distribution information from the ACS. For 2006, we create population figures that match the age distribution in the ACSY for that year; for earlier years we use linearly interpolated values derived from our 2000 and 2006 data.

[5] For sensitivity, we compared trends in ACS rates using Census 2000 population estimates as the denominator to those that use interpolated values based on 2000 Census and 2000 ACS estimates of city-wide population. The trends over time for every age group were identical and the level differences were minimal.

ACS Tables

Table A6.1 Time Trends in ACS Inpatient Admissions, by Age

Age	Year	ACS Rate	Marker Rate	ACS/Marker
0-17	2000	14.04	0.89	15.7
	2001	13.02	0.89	14.6
	2002	10.45	0.88	11.8
	2003	9.48	0.66	14.3
	2004	8.92	0.77	11.6
	2005	10.81	1.02	10.6
	2006	12.09	0.99	12.2
18-39	2000	11.26	1.63	6.9
	2001	10.30	1.64	6.3
	2002	9.65	1.69	5.7
	2003	9.31	1.84	5.1
	2004	9.39	1.71	5.5
	2005	9.94	1.76	5.7
	2006	9.18	1.75	5.2
40-64	2000	39.09	5.65	6.9
	2001	37.95	5.91	6.4
	2002	36.04	5.85	6.2
	2003	37.85	5.60	6.8
	2004	39.16	5.66	6.9
	2005	40.99	5.67	7.2
	2006	43.42	6.03	7.2
65+	2000	120.54	23.74	5.1
	2001	108.19	25.22	4.3
	2002	104.27	23.70	4.4
	2003	98.45	21.51	4.6
	2004	97.84	20.08	4.9
	2005	102.25	21.08	4.9
	2006	92.96	20.71	4.5

Table A6.2 ACS Admissions Over Time and by Age for Selected Diagnoses

	2000	2001	2002	2003	2004	2005	2006	2004-2006 Percent Change
0-17								
Bacterial pneumonia	282	231	202	108	98	168	163	66
Asthma	454	502	340	326	254	281	387	52
Cellulitis	82	78	55	60	68	112	116	71
Dehydration	262	264	195	177	202	260	282	40
Kidney Infection	69	50	46	45	43	51	60	40
Gastroenteritis	54	25	20	17	16	15	30	88
18-39								
CHF	169	162	158	116	104	118	138	33
Cellulitis	181	176	166	174	204	266	197	-3
Diabetes A^	128	135	153	147	152	162	166	9
Kidney Infection	167	155	141	156	163	165	154	-6
40-64								
Angina	207	148	123	154	150	130	110	-27
Asthma	500	489	548	640	512	542	598	17
Bacterial Pneumonia	853	801	801	882	855	917	865	1
CHF	1340	1320	1205	1223	1356	1430	1534	13
COPD	323	338	330	292	255	324	318	25
Cellulitis	369	367	362	443	472	560	523	11
Convulsions	351	361	286	294	344	372	394	15
Dehydration	1036	1003	963	943	962	985	1126	17
Diabetes A^	237	273	288	282	280	259	293	5
Diabetes B^	191	177	161	149	217	197	248	14
Diabetes C^	268	244	197	201	193	230	248	29
Gastroenteritis	89	79	70	60	85	86	135	59
65+								
Angina	193	164	105	86	80	74	50	-38
Asthma	215	212	222	279	249	251	228	-8
Bacterial Pneumonia	1153	1006	918	982	888	1012	776	-13
CHF	2050	1881	1783	1714	1685	1681	1559	-8
COPD	572	516	479	458	444	511	465	5
Cellulitis	183	181	157	185	170	192	208	22
Dehydration	2363	2108	2067	1691	1917	1868	1681	-12
Diabetes B^	212	180	192	187	207	226	244	18
Gastroenteritis	63	49	54	49	51	63	81	59
Hypoglycemia	25	23	37	23	28	26	47	68
Kidney Infection	611	517	560	566	534	610	574	8

Source: Authors' analyses of DCHA inpatient discharge data. ^ Diabetes A includes complications related to very high blood sugar, like ketoacidosis or hyperosmolar coma; Diabetes B includes complications related to low blood sugar; Diabetes C includes other non-specified complications.

Table A6.3 Primary Payer for ACS Admissions, by Age Group and Year

Age	Year	Percentage of ACS Admissions With a Primary Payer of: Private Insurance	Medicaid/ Alliance	Medicare/ VA	Self-Pay or Medically Indigent (Uninsured)	Other
0-17	2000	28	50	0	3	19
	2001	30	65	0	4	1
	2002	38	58	1	3	2
	2003	30	67	0	2	1
	2004	32	65	0	2	0
	2005	32	66	0	2	0
	2006	32	66	0	2	0
18-39	2000	31	28	9	14	19
	2001	33	33	10	14	10
	2002	38	26	11	17	8
	2003	33	42	9	9	7
	2004	36	40	8	13	4
	2005	34	44	7	11	5
	2006	33	39	8	11	9
40-64	2000	32	22	20	9	18
	2001	35	28	22	10	6
	2002	37	24	23	11	6
	2003	33	36	22	6	3
	2004	34	36	23	6	2
	2005	32	37	22	6	3
	2006	32	36	21	6	5
65+	2000	6	2	85	1	6
	2001	6	2	90	1	1
	2002	6	2	90	1	1
	2003	6	3	90	1	1
	2004	6	3	90	0	1
	2005	6	3	90	1	1
	2006	6	3	90	1	1

Source: Authors' analyses of DCHA inpatient discharge data.

Table A6.5 ACS Rates Over Time and by Age, by PUMA

		2000	2001	2002	2003	2004	2005	2006
0-17								
	PUMA A	4.9	6.5	5.1	6.6	6.7	9.4	7.6
	PUMA B	10.8	12.5	11.1	11.9	10.5	16.1	17.6
	PUMA C	14.7	10.9	10.3	9.6	9.2	11.2	15.2
	PUMA D	15.9	14.3	10.6	7.9	7.5	7.9	9.5
	PUMA E	17.7	16.9	12.9	13.5	13.1	14.9	15.2
18-39								
	PUMA A	2.2	2.2	1.8	2.2	2.5	2.1	2.3
	PUMA B	10.4	10.2	9.5	8.4	8.8	8.8	7.3
	PUMA C	12.8	12.7	12.5	11.6	12.0	12.9	11.8
	PUMA D	21.8	17.9	16.9	16.6	16.3	18.8	18.0
	PUMA E	9.1	8.6	7.8	7.8	7.6	7.5	6.8
40-64								
	PUMA A	7.1	5.9	6.4	7.0	6.0	6.2	6.9
	PUMA B	34.0	34.3	31.9	31.1	32.5	29.9	31.4
	PUMA C	43.0	41.5	40.1	40.6	41.7	45.5	46.7
	PUMA D	60.4	57.2	52.8	56.9	57.3	62.9	66.7
	PUMA E	45.8	43.6	40.1	41.9	44.3	42.5	44.1
65+								
	PUMA A	64.6	61.6	55.1	57.6	59.0	57.0	54.6
	PUMA B	119.1	109.6	100.6	90.3	92.6	96.2	86.1
	PUMA C	122.8	107.4	110.9	99.7	98.7	104.0	89.1
	PUMA D	162.3	140.3	135.1	130.6	133.1	141.1	130.5
	PUMA E	138.4	125.7	119.9	114.0	101.9	108.0	100.2

Source: Authors' analyses of DCHA inpatient discharge data.

PCS Tables

Table A6.6 PCS ED Visit Rates per 1000, by Age 2004-2006

	2004	2005	2006	%Change 2004-2006
0-17	238.4	256.3	240.5	0.8%
18-39	173.2	184.6	187.0	8.0%
40-64	215.4	233.3	251.3	16.7%
65+	155.1	158.2	156.6	1.0%

Source: Authors' analyses of DCHA ED discharge data.

Table A6.7 Primary Payer of PCS ED Visits, by Age Group and Year

		Percentage of PCS ED Discharges With a Primary Payer of:				
Age Group	Year	Private Insurance	Medicaid/ Alliance	Medicare/ VA	Self-Pay, Medically Indigent (Uninsured)	Other
0-17	2004	20	73.8	0	4.9	1.3
	2005	19.2	75.4	0	4.4	0.9
	2006	18.8	74.7	0	4.8	1.7
18-39	2004	36.7	35.3	2.1	19.7	6.2
	2005	37.7	35.9	2.1	18.3	6
	2006	34.5	33.9	2	16.1	13.6
40-64	2004	36.4	34.6	10.1	14.5	4.4
	2005	36.6	35.4	9.8	13.2	4.9
	2006	34.2	33.9	10.2	11.4	10.3
65+	2004	10.6	4.1	83	1.6	0.7
	2005	11.1	4.3	80.9	2.2	1.5
	2006	10.9	4.4	80.2	2.3	2.2

Source: Authors' analyses of DCHA ED discharge data.

Table A6.8 PCS Rates (per 1000), by Age and PUMA

	2004	2005	2006	% Change (2004-2006)
0-17				
PUMA A	73.0	88.1	83.4	14.2%
PUMA B	276.7	331.2	314.7	13.7%
PUMA C	243.4	247.6	231.4	-4.9%
PUMA D	239.5	250.6	237.6	-0.1%
PUMA E	273.5	279.5	249.6	-8.7%
18-39				
PUMA A	62.0	66.6	68.2	10.0%
PUMA B	159.2	173.0	178.1	11.9%
PUMA C	194.5	209.3	207.7	6.8%
PUMA D	305.2	327.8	332.5	8.9%
PUMA E	144.3	147.8	150.0	4.0%
40-64				
PUMA A	62.9	68.3	71.0	12.9%
PUMA B	190.2	206.6	223.0	17.2%
PUMA C	225.6	250.0	273.9	21.4%
PUMA D	317.7	341.1	367.7	15.7%
PUMA E	257.4	274.9	292.2	13.5%
65+				
PUMA A	83.2	88.7	91.5	10.0%
PUMA B	145.4	157.4	150.5	3.5%
PUMA C	156.8	150.5	152.2	-2.9%
PUMA D	221.5	225.9	219.2	-1.0%
PUMA E	173.0	175.4	175.9	1.7%

Source: Authors' analyses of DCHA ED discharge data.

Table A6.9 Time Trends in PCS ED Visits by Age and Classification

Age	Classification	2004	2005	2006
0-17	Non-Emergent	23.4%	24.4%	23.9%
	Emergent, Primary Care Treatable	22.8%	24.2%	24.1%
	Emergent, ED Care Needed, Preventable/Avoidable	10.8%	10.8%	9.7%
	Emergent, ED Care Needed, Not Preventable/Avoidable	5.8%	5.8%	6.2%
	Injury	26.5%	24.9%	24.5%
	Mental Health Related	1.7%	1.6%	1.7%
	Alcohol Related	0.4%	0.4%	0.1%
	Drug Related (excluding alcohol)	0.1%	0.1%	0.1%
	Unclassified	8.6%	7.8%	9.7%
18-39	Non-Emergent	24.8%	25.0%	25.1%
	Emergent, Primary Care Treatable	21.9%	22.6%	22.6%
	Emergent, ED Care Needed, Preventable/Avoidable	7.1%	7.4%	6.9%
	Emergent, ED Care Needed, Not Preventable/Avoidable	10.2%	10.3%	10.2%
	Injury	24.3%	23.6%	23.3%
	Mental Health Related	2.1%	1.9%	1.9%
	Alcohol Related	1.5%	1.4%	1.4%
	Drug Related (excluding alcohol)	0.2%	0.2%	0.2%
	Unclassified	7.9%	7.7%	8.3%
40-64	Non-Emergent	23.1%	22.8%	23.5%
	Emergent, Primary Care Treatable	21.0%	21.7%	21.7%
	Emergent, ED Care Needed, Preventable/Avoidable	9.2%	9.2%	9.1%
	Emergent, ED Care Needed, Not Preventable/Avoidable	11.7%	11.6%	11.6%
	Injury	20.1%	19.2%	18.5%
	Mental Health Related	2.6%	2.6%	2.4%
	Alcohol Related	3.0%	3.0%	2.8%
	Drug Related (excluding alcohol)	0.3%	0.3%	0.3%
	Unclassified	9.1%	9.5%	10.0%
65+	Non-Emergent	20.7%	20.5%	21.3%
	Emergent, Primary Care Treatable	20.5%	21.0%	21.3%
	Emergent, ED Care Needed, Preventable/Avoidable	9.9%	9.6%	9.0%
	Emergent, ED Care Needed, Not Preventable/Avoidable	14.3%	14.8%	14.0%
	Injury	18.7%	18.5%	18.8%
	Mental Health Related	1.4%	1.2%	1.2%
	Alcohol Related	1.3%	1.2%	1.1%
	Drug Related (excluding alcohol)	0.0%	0.0%	0.0%
	Unclassified	13.2%	13.4%	13.3%

APPENDIX 7: Analyses of Health Care Provider Supply

HPSA

An area is considered a medical HPSA, or health professional shortage area, if the ratio of primary care physicians to the population ratio is less than 1:3500. The cutoff is lower (1:3000) if an area is determined to have "high medical needs" or if the professionals in the area are overutilized or difficult to access because of distance.[6] The HPSA designation focuses on primary care providers because they are the most common caregivers for preventive care as well as for the treatment of chronic medical conditions, such as diabetes, asthma and hypertension. While each of these conditions also require specialty care, an adequate primary care system can reduce rates of potentially avoidable complications that can result in high cost ED visits and hospitalizations The primary care system consists of a network of internal medicine, family practice and pediatric providers.

An area is considered a mental health HPSA if one of several conditions holds: (1) the ratio of core mental health professionals to patients is 1:9000 or lower; (2) the ratio of psychiatrists to the population is 1:30,000 or lower; or (3) the ratio of core mental health professionals to the population is 1:6,000 or lower and the ratio of psychiatrists to the population is 1:20,000 or lower. The thresholds are adjusted for areas with particularly high mental health service needs. Dental health service areas use similar calculations, with a ratio of less than one dentist to 5000 patients considered as a dental shortage area.[7]

Primary and Specialty Care Supply

To develop estimates and map the supply of primary and specialty care providers in the District, we used data from the District of Columbia Health Practitioner Licensing Administration (HPLA) database of allopathic (MDs) and osteopathic (DOs) physicians with active licenses in the District. We checked and modified the data in several ways.

- We included only those providers who reported a practice or business address within the District of Columbia.
- We checked the HPLA file against the Washington Providers Directory (WPD) to clarify subspecialties for internal medicine and to supplement specialties when this field was missing in the provider file. Persons with no address or specialty information through the provider file or through the WPD

[6] HRSA considers a rational distance to travel as less than 30 minutes travel time by car or public transportation; although an area can still be considered a HPSA if it consists of a population of 20,000 or more individuals with a strong community identity, making travel less practical. HRSA considers 40 minutes as a rational amount of time to travel to mental health and dental services

[7] A Medically Underserved Area/Medically Underserved Population designation is similar to a HPSA in that it is based on the provider: population ratio, however it also takes into consideration other population indicators, such as the infant mortality rate, percentage of the population living below poverty, and the percentage of the population that is over age 65. A Medically Underserved Population refers to a specific population (instead of a defined area as in an MUA) such as those living in poverty, those with language barriers or Medicaid enrollees. HRSA uses the MUA/MUP designation to determine recipients of community health center funding.

were not mapped or included in our rates by provider type since inadequate information was available to do so.

- We grouped subspecialties by their designated practice area (such as cardiology), although conceivably many also practice primary care.
- We calculated adult primary care supply by summing up several provider categories. For adults primary care supply, we summed counts of general internal medicine physicians, geriatricians, general practice, and family practice providers. For pediatric primary care supply, we summed counts of general pediatrics, adolescent medicine, general practice, and family practice. Family practice is counted twice because these providers count for both adults and children, and we do not have information available on the number of full time equivalent (FTE) hours devoted to each, and providers.
- In cases when more than one practice location was identified, we mapped the address listed as their primary practice location.

We focus on specialists who screen and treat some of the most prevalent medical conditions in the city. For example, the American Diabetes Association recommends that diabetics receive annual retinal screening exams from ophthalmologists to monitor and provide early intervention for diabetic retinopathy and biannual screening from podiatrists for foot exams. Given the city's high breast, colon, and prostate cancer rates, we also focused on oncologists, gastroenterologists and urologists who provide screening and/or care for these types of cancers. Nephrologists care for persons with kidney disease, a common complication of hypertension and diabetes, both with particularly high rates in the city. Finally, infectious disease doctors are critical for providing the most up to date medical care for persons with HIV.

When calculating provider supply rates, we adjusted the DC population estimates for the large influx of commuters who often avail themselves of medical services in DC. The District's daytime population increases 1.7 times its normal size as workers commute to the large number of the city's government jobs although this increase is not distributed evenly across wards. We used 2000 Census numbers to create "daily" population estimates for DC and by ward; these were our denominators. We calculated provider supply per 100,000 daytime population for comparison to other provider supply rates. We also stratified our supply ratios for adults and children using population estimates of each in order to calculate provider supply for a given population served.

It is also difficult to estimate the specific subpopulation that should be included in the denominator calculation to evaluate the need for specialty care. Most specialists do not limit their care to one small category of disease. Nephrologists may treat the complications of kidney disease that occur from diabetes, hypertension, and other conditions. There is also no clear distinction of what should be treated by a primary care physician and what requires more specialty oriented care. Because of this difficulty, we mapped providers over the city as a whole and did not try to evaluate supply based on specific need or disease burden of the population.

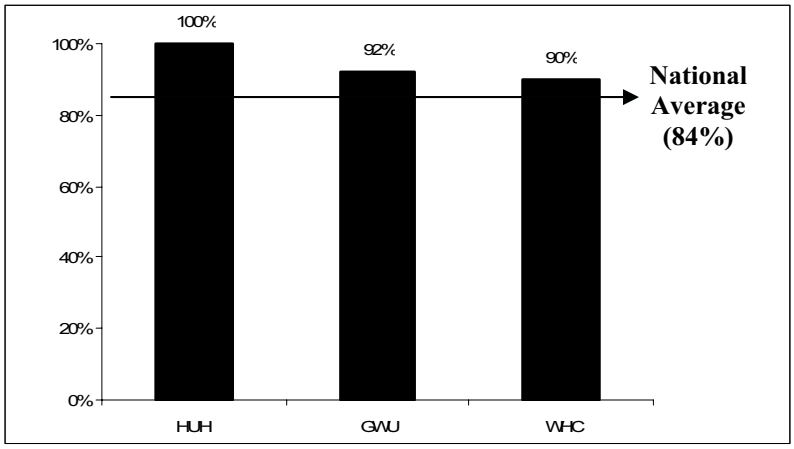
Another challenge in estimating appropriate provider supply is deciding what the appropriate boundaries should be within which to evaluate provider catchment. Because Washington, DC is a small city with a good transportation system, it could be argued that most places can be reached within the HRSA recommended travel times of 30 minutes and therefore supply calculations should only be determined for the city as a whole. Others could argue that transportation is a major barrier that can prohibit care for persons with chronic disease, who often may find such travel burdensome. We calculate specialist supply rates for the city as a whole, but provide maps that show the distribution of providers throughout the city.

There are some significant limitations to the HPLA data. Most importantly, we did not have a measure of the actual time each physician spent providing care in the District (the data were collected for some but not all physicians), so our ratio of specialty providers to the population is an upper bound on the actual availability of care, because providers may work part time or work in surrounding areas in Maryland or Virginia.

APPENDIX 8: Hospital Quality and Patient Flow

Figures A8.A-A8.0 compare District hospitals using a variety of measures of hospital quality. Tables A8.1 through A8.12 summarize patient flow data for District hospitals.

Figure A8.A Percent of Heart Attack Patients given ACE Inhibitor or Angiotensin Receptor Blockers for Left Ventricular Systolic Dysfunction



A8.B. Percent of Heart Attack Patients given Beta Blocker at Discharge

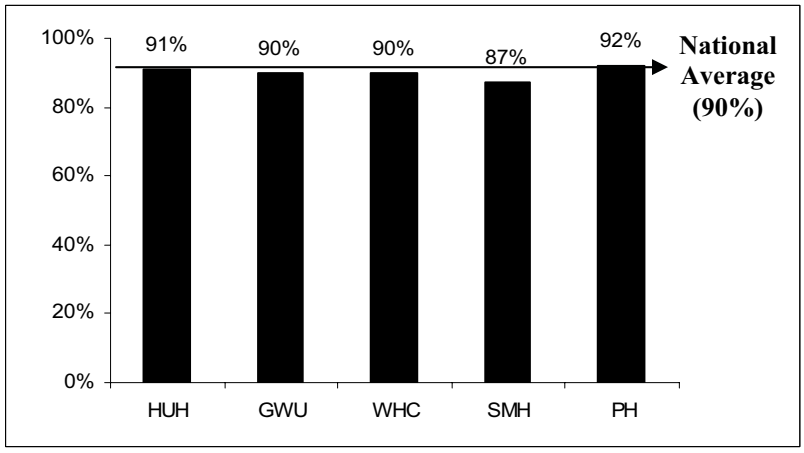


Figure A8.C Percent of Heart Attack Patients given Aspirin at Discharge

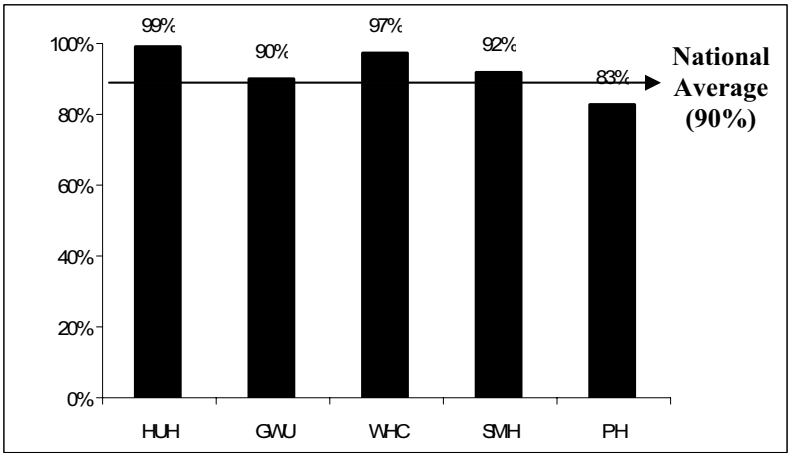


Figure A8.D Percent of Heart Attack Patients given Percutaneous Coronary Innervations within 90 Minutes of Arrival

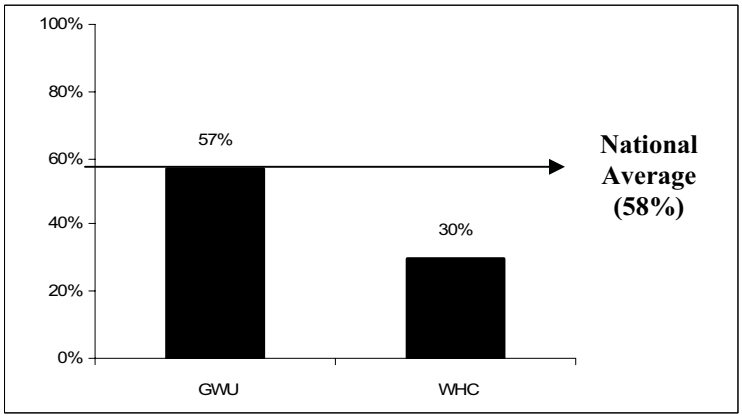


Figure A8.E. Percent of Heart Attack Patients given Smoking Cessation Advice

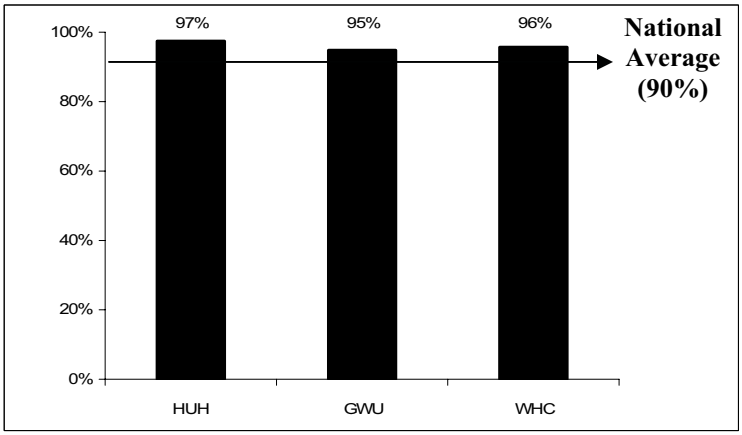


Figure A8.F Percent of Heart Failure Patients given an Evaluation of Left Ventricular Systolic Function

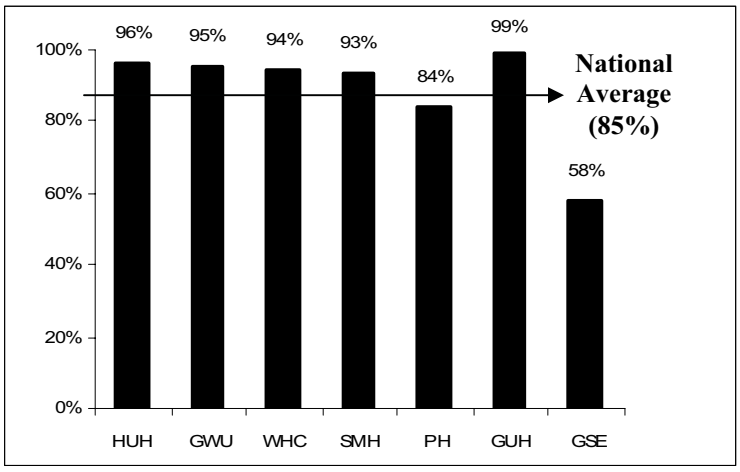


Figure A8.G Percent of Heart Failure Patients given Discharge Instructions

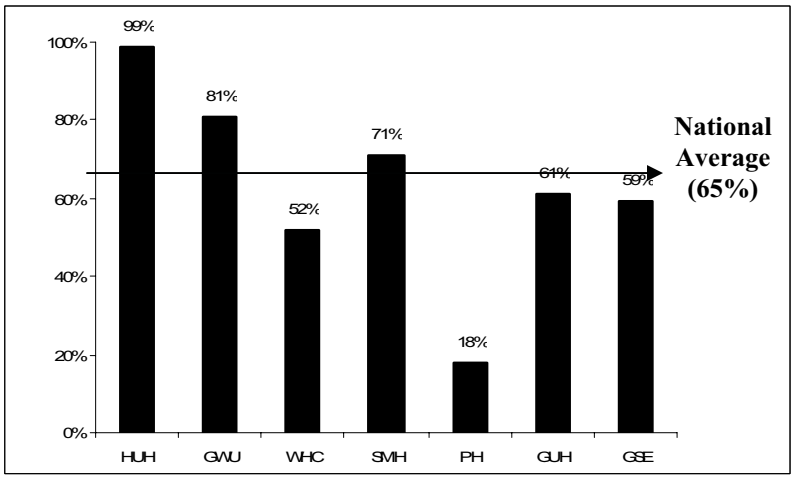


Figure A8.H Percent of Heart Failure Patients given Smoking Cessation Advice

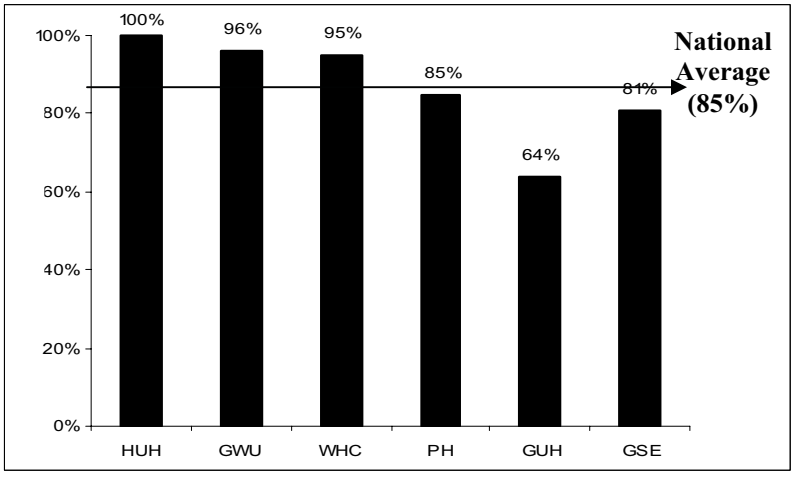


Figure A8.I Percent of Pneumonia Patients Assessed and Given Pneumococcal Vaccination

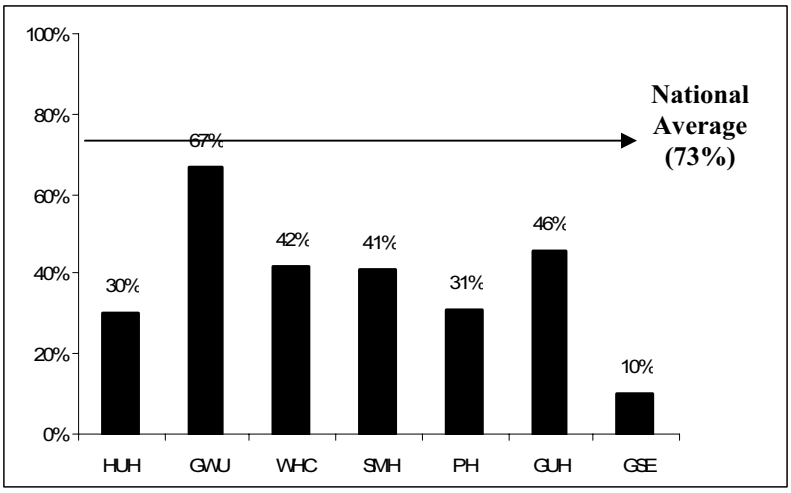


Figure A8.J Percent of Pneumonia Patients Given Smoking Cessation Advice

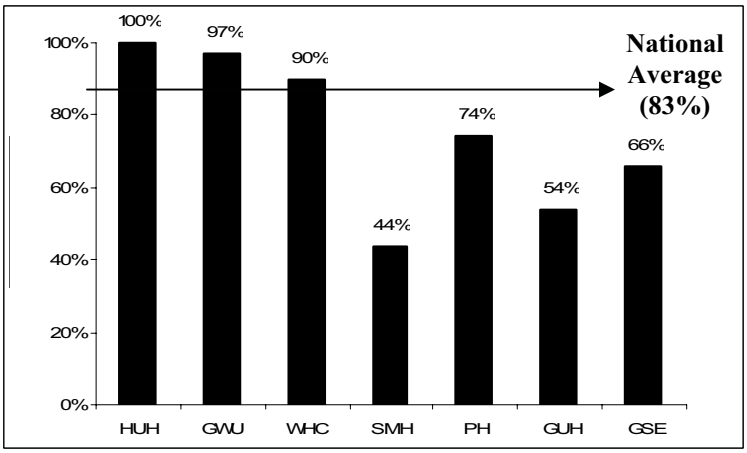


Figure A8.K Percent of Pneumonia Patients Whose Initial Emergency Room Blood Culture Was Performed Prior To the Administration Of The First Hospital Dose Of Antibiotics

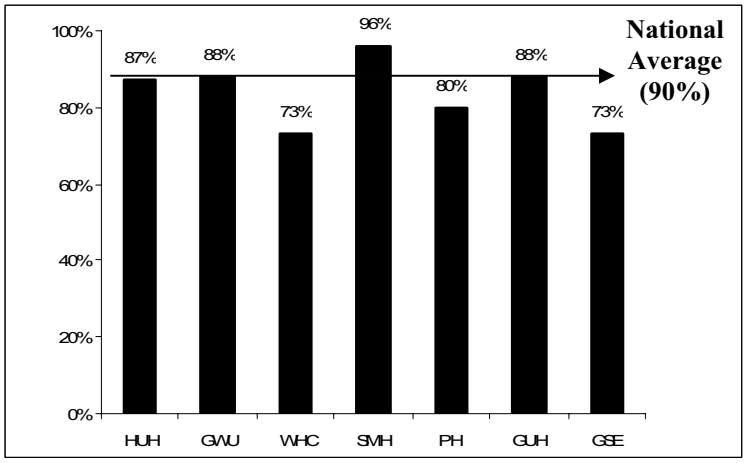


Figure A8.L Percent of Surgery Patients Who Received Preventative Antibiotic(s) One Hour before Incision

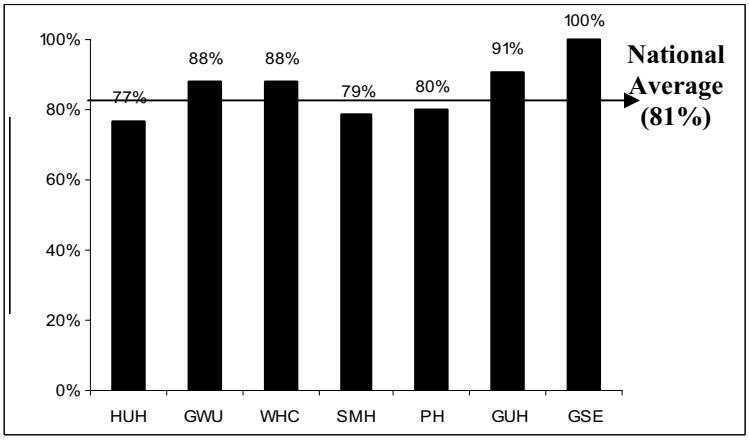


Figure A.8.M Percent of Surgery Patients Who Received the Appropriate Preventative Antibiotic(s) for Their Surgery

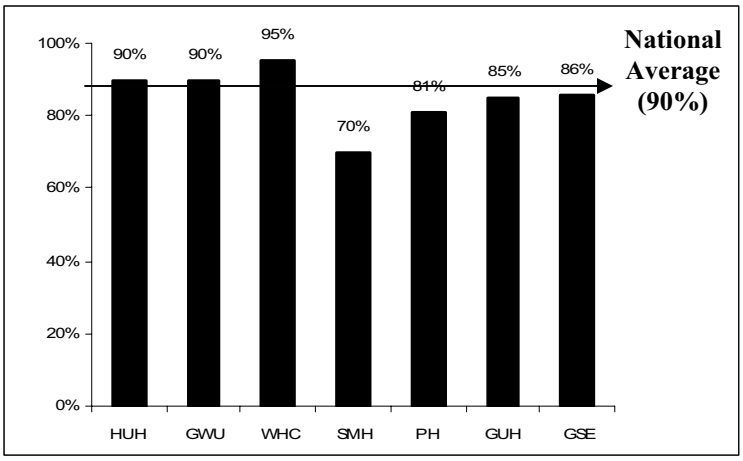


Figure A.8.N Percent of Surgery Patients Who Received Treatment To Prevent Blood Clots Within 24 Hours Before or After Selected Surgeries to Prevent Blood Clots

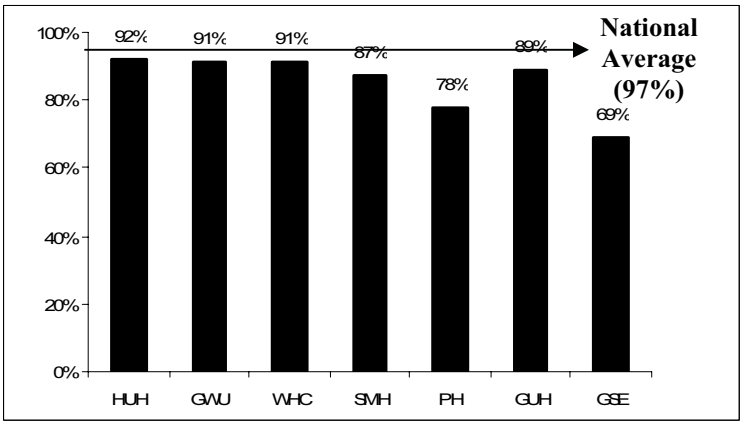


Figure A.8.O Percent of Surgery Patients whose Doctors Ordered Treatments to Prevent Blood Clots (Venous Thrombolism) For Certain Types of Surgeries

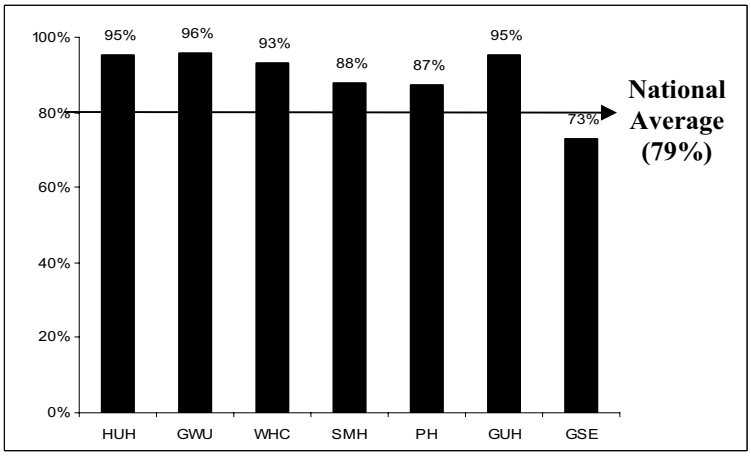


Table A8.1 Hospital Destination and Market Share by zip code for 0-17 Age Group

Zip Code	Hospital *(All figures are percent)*									
	CNMC	GWU	Georgetown	GSCH	Howard	Rehab	Providence	Sibley	VA	WHC
20001	40	2	14	0	7	0	16	3	0	19
20002	46	0	19	1	5	1	5	1	0	22
20003	55	10	14	3	7	0	0	3	0	7
20004										
20005	55	0	0	0	9	0	9	9	0	18
20006										
20007	29	0	67	0	0	0	0	2	0	2
20008	75	0	19	0	0	1	0	4	0	1
20009	37	3	19	0	2	3	15	3	0	16
20010	71	1	1	0	4	1	7	0	0	14
20011	53	1	7	1	4	1	9	1	0	23
20012	71	0	14	0	5	0	5	0	0	5
20015	39	0	58	0	0	0	0	0	0	3
20016	22	2	67	0	0	0	0	6	0	2
20017	65	2	10	0	4	4	6	0	0	8
20018	52	0	8	0	10	0	2	0	0	28
20019	44	3	6	3	13	2	3	0	0	26
20020	47	1	5	14	9	1	2	1	0	20
20024	43	3	11	6	11	0	6	0	0	20
20032	52	3	3	14	5	2	2	0	0	18
20036	25	0	25	0	0	0	0	25	0	25
20037	38	13	38	0	0	0	0	13	0	0
Total	50	2	14	4	6	1	5	1	0	17

Table A8.2 Hospital Destination and Market Share for ACS Admissions by zip code for 0-17 Age Group

Zip code	Hospitals *(All figures are percent)*									
	CNMC	GWU	Georgetown	GSCH	Howard	Rehab	Providence	Sibley	VA	WHC
20001	79	0	9	0	9	0	0	3	0	0
20002	75	0	12	0	12	0	1	0	0	0
20003	57	0	26	0	13	0	0	4	0	0
20004	100	0	0	0	0	0	0	0	0	0
20005	75	0	25	0	0	0	0	0	0	0
20006	100	0	0	0	0	0	0	0	0	0
20007	10	0	90	0	0	0	0	0	0	0
20008	30	0	67	0	0	0	0	4	0	0
20009	67	0	19	0	13	0	0	0	0	0
20010	87	0	7	0	4	0	0	1	0	1
20011	85	0	9	0	5	0	0	0	0	1
20012	76	0	12	0	12	0	0	0	0	0
20015	35	0	65	0	0	0	0	0	0	0
20016	14	0	81	0	0	0	0	6	0	0
20017	82	0	9	0	5	0	2	0	0	2
20018	87	0	7	0	7	0	0	0	0	0
20019	81	0	6	0	12	0	0	0	0	0
20020	79	1	8	0	13	0	0	1	0	0
20024	80	0	10	0	10	0	0	0	0	0
20032	91	0	5	0	3	0	0	0	0	2
20036	0	0	50	0	0	0	0	50	0	0
20037	67	0	33	0	0	0	0	0	0	0
Total	75	0	15	0	8	0	0	1	0	0

Table A8.3 Hospital Destination and Market Share for PCS Admissions by zip code for 0-17 Age Group

Zip code	Hospitals *(All figures are percent)*							
	CNMC	GWU	Georgetown	GSCH	Howard	Providence	Sibley	WHC
20001	80	2	2	1	12	2	0	1
20002	83	1	3	1	6	4	0	2
20003	77	4	6	4	4	2	1	1
20004	88	0	9	0	3	0	0	0
20005	68	8	14	1	6	1	2	0
20006	70	12	15	3	0	0	0	0
20007	12	1	71	0	0	0	16	0
20008	33	3	37	0	0	1	26	0
20009	81	3	6	0	7	2	1	1
20010	93	0	2	0	2	1	0	2
20011	85	1	3	0	4	5	1	1
20012	81	1	5	0	7	2	4	1
20015	26	2	32	0	0	0	39	0
20016	12	1	45	0	0	0	42	0
20017	80	1	3	0	2	12	1	2
20018	85	1	2	0	2	7	0	2
20019	80	2	3	5	6	3	0	1
20020	66	2	2	22	4	2	0	1
20024	78	5	5	3	8	1	0	0
20032	60	1	1	32	3	1	0	1
20036	45	8	39	0	0	0	8	0
20037	34	38	23	0	0	0	5	0
Total	75	2	5	7	5	3	2	1

Table A8.4 Hospital Destination and Market Share for Inpatient Admissions by zip code for 18-39 Age Group

Zip code	Hospitals *(All figures are percent)*									
	CNMC	GWU	Georgetown	GSCH	Howard	Rehab	Providence	Sibley	VA	WHC
20001	1	9	6	3	9	1	15	9	1	45
20002	0	11	7	3	11	1	13	11	1	42
20003	1	12	10	22	6	1	4	23	3	19
20004	0	36	7	0	7	0	0	43	0	7
20005	0	15	6	3	10	0	13	13	1	39
20006	0	30	10	0	0	0	10	20	10	20
20007	0	11	30	0	1	1	3	47	0	8
20008	3	11	21	0	0	0	2	54	0	7
20009	0	15	6	0	4	0	14	23	1	35
20010	0	6	5	1	7	1	20	7	0	53
20011	1	8	5	1	8	0	26	5	1	46
20012	1	9	7	1	5	2	21	14	1	41
20015	0	10	18	1	1	1	1	62	0	6
20016	0	9	23	0	0	0	3	57	0	7
20017	2	8	3	2	8	0	21	7	0	49
20018	1	7	6	2	8	0	20	3	0	53
20019	1	9	4	8	13	1	12	1	1	51
20020	0	11	3	18	10	1	7	2	0	46
20024	0	21	8	3	14	1	6	9	1	38
20032	0	9	3	27	10	1	10	1	0	39
20036	0	34	11	0	0	0	0	42	0	13
20037	0	49	9	0	0	0	2	33	0	7
Total	1	10	7	7	8	1	13	13	1	40

Table A8.5 Hospital Destination and Market Share for ACS Admissions by zip code for 18-39 Age Group

Zip Code	Hospitals *(All figures are percent)*									
	CNMC	GWU	Georgetown	GSCH	Howard	Rehab	Providence	Sibley	VA	WHC
20001	0	9	1	3	53	0	10	2	0	23
20002	0	9	2	6	22	0	19	2	1	38
20003	0	21	2	47	13	0	6	0	0	11
20004	0	25	0	0	50	0	0	0	0	25
20005	0	48	9	0	13	0	9	4	0	17
20006	0	80	0	0	0	0	0	0	0	20
20007	0	14	68	0	0	0	0	14	0	5
20008	0	35	13	0	9	0	0	39	0	4
20009	0	34	4	1	17	0	6	9	1	28
20010	5	5	7	1	28	0	6	5	0	43
20011	1	7	3	1	25	0	27	3	0	34
20012	0	25	4	0	25	0	17	4	0	25
20015	0	8	15	0	8	8	0	54	0	8
20016	0	3	22	0	3	0	0	67	0	6
20017	9	3	0	0	27	0	33	0	0	27
20018	1	13	0	7	12	0	42	1	0	22
20019	1	6	4	19	27	0	13	1	0	29
20020	1	15	4	35	16	0	6	0	0	22
20024	0	33	2	7	26	0	9	0	2	21
20032	3	7	2	55	16	0	4	1	0	15
20036	0	88	0	0	0	0	0	0	0	13
20037	0	94	0	0	0	0	0	6	0	0
Total	1	13	4	17	22	0	12	4	0	25

Table A8.6 Hospital Destination and Market Share for PCS Admissions by zip code for 18-39 Age Group

Zip Code	Hospitals *(All figures are percent)*							
	CNMC	GWU	Georgetown	GSCH	Howard	Providence	Sibley	WHC
20001	1	20	5	2	29	10	2	31
20002	2	15	5	5	15	19	2	38
20003	1	28	7	24	10	7	3	19
20004	0	68	6	0	6	2	4	13
20005	0	53	13	1	8	8	5	12
20006	0	73	6	3	3	0	7	7
20007	0	15	65	0	0	1	17	2
20008	0	40	23	0	2	1	30	5
20009	1	37	12	1	12	6	5	26
20010	5	13	6	1	13	9	4	48
20011	2	9	5	1	14	27	3	38
20012	2	10	7	1	14	25	8	32
20015	0	13	16	0	3	1	61	5
20016	0	8	18	0	1	1	71	2
20017	2	5	3	2	6	46	2	33
20018	2	6	3	4	9	41	1	34
20019	2	13	3	17	14	18	1	32
20020	1	15	5	39	10	8	1	21
20024	1	35	7	7	16	7	2	25
20032	1	10	3	54	7	7	1	17
20036	0	74	9	1	1	1	6	6
20037	0	90	4	0	0	0	5	1
Total	2	18	8	14	12	14	5	27

Table A8.7 Hospital Destination and Market Share for Inpatient Admissions by zip code for 40-64 Age Group

Zip Code	Hospitals *(All figures are percent)*									
	CNMC	GWU	Georgetown	GSCH	Howard	Rehab	Providence	Sibley	VA	WHC
20001	0	8	7	4	16	4	10	2	25	25
20002	0	7	4	7	10	4	8	2	26	32
20003	0	12	5	33	6	2	4	5	13	20
20004	0	11	5	0	16	5	0	37	0	26
20005	1	13	5	1	4	3	7	15	28	24
20006	0	13	0	25	0	0	13	0	38	13
20007	0	15	29	1	1	2	0	33	0	19
20008	0	28	14	1	2	4	1	34	4	14
20009	0	17	9	3	9	2	6	7	13	34
20010	0	8	6	3	11	4	5	4	19	41
20011	0	6	4	3	10	4	10	4	26	32
20012	0	9	8	0	7	5	6	10	14	41
20015	0	17	17	0	0	3	2	40	7	15
20016	0	11	21	0	2	3	3	41	1	18
20017	0	5	5	3	6	6	12	3	23	37
20018	0	7	7	4	4	3	15	1	23	33
20019	0	8	5	8	9	5	12	2	21	29
20020	0	9	6	11	9	4	7	1	21	32
20024	0	15	7	3	13	4	7	4	16	31
20032	0	8	5	24	9	5	6	0	18	25
20036	0	23	9	0	0	3	0	29	3	34
20037	0	35	3	0	0	0	5	18	11	27
Total	0	10	7	8	9	4	8	6	19	29

Table A8.8 Hospital Destination and Market Share for ACS Admissions by zip code for 40-64 Age Group

Zip Code	Hospitals *(All figures are percent)*									
	CNMC	GWU	Georgetown	GSCH	Howard	Rehab	Providence	Sibley	VA	WHC
20001	0	14	4	4	44	0	7	1	3	23
20002	0	8	2	5	32	0	16	1	5	31
20003	0	12	4	34	19	0	6	1	3	21
20004	0	30	10	0	20	0	0	20	0	20
20005	0	36	8	3	17	0	1	6	10	18
20006	0	18	0	6	47	0	6	12	12	0
20007	0	24	45	2	4	0	0	22	0	4
20008	0	22	17	0	5	0	3	31	2	20
20009	0	20	9	2	24	0	5	3	3	33
20010	0	9	3	1	28	1	6	2	6	45
20011	0	8	4	2	22	0	22	2	7	33
20012	0	8	4	2	19	0	13	8	3	43
20015	0	16	16	0	0	0	0	61	0	6
20016	0	5	22	0	3	0	11	55	0	4
20017	0	3	4	1	11	0	45	1	8	27
20018	0	5	3	3	17	0	40	1	5	27
20019	0	9	4	18	17	0	20	0	4	28
20020	0	8	4	39	16	0	8	0	4	21
20024	0	33	4	7	24	0	4	2	3	24
20032	0	7	3	53	12	0	5	0	2	17
20036	0	58	0	0	11	0	11	21	0	0
20037	0	88	4	1	1	0	0	0	3	3
Total	0	11	4	16	22	0	13	2	4	26

Table A8.9 Hospital Destination and Market Share for PCS Admissions by zip code for 40-64 Age Group

Zip Code	Hospitals *(All figures are percent)*							
	CNMC	GWU	Georgetown	GSCH	Howard	Providence	Sibley	WHC
20001	0	14	4	4	36	12	2	28
20002	0	11	4	6	22	22	2	34
20003	0	21	4	28	15	11	3	18
20004	0	49	4	6	6	9	10	17
20005	0	41	8	2	16	10	4	19
20006	0	27	23	5	24	10	4	8
20007	0	13	56	0	1	1	27	2
20008	0	21	23	0	2	4	42	8
20009	0	26	9	2	22	6	5	29
20010	0	10	5	2	22	10	3	49
20011	0	9	4	2	17	29	4	35
20012	0	9	5	1	16	28	9	33
20015	0	9	12	0	1	3	68	6
20016	0	7	16	0	1	2	71	3
20017	0	5	3	1	6	55	2	28
20018	0	5	4	2	10	50	1	28
20019	0	12	4	19	16	23	1	26
20020	0	13	5	41	11	9	1	20
20024	0	37	7	9	17	8	2	20
20032	0	9	3	58	10	6	1	14
20036	0	71	14	2	2	0	8	3
20037	0	89	3	0	1	2	2	2
Total	0	14	6	15	16	17	5	26

Table A8.10 Hospital Destination and Market Share for Inpatient Admissions by zip code for 65+ Age Group

Zip Code	Hospitals *(All figures are percent)*									
	CNMC	GWU	Georgetown	GSCH	Howard	Rehab	Providence	Sibley	VA	WHC
20001	0	5	4	1	18	7	9	2	31	23
20002	0	6	2	1	9	8	15	3	23	33
20003	0	15	2	3	2	13	5	6	22	32
20004	0	17	0	0	0	0	0	50	17	17
20005	0	16	4	0	5	4	6	7	38	20
20006	0	38	0	0	0	13	0	25	0	25
20007	0	14	21	1	1	5	0	38	3	18
20008	0	16	8	0	0	5	0	43	3	25
20009	0	12	3	0	10	10	5	12	15	32
20010	0	5	1	0	6	6	13	1	26	42
20011	0	4	1	0	6	9	10	4	35	31
20012	0	2	3	1	6	10	16	10	15	37
20015	0	6	10	0	2	3	1	49	2	27
20016	0	7	10	0	0	4	12	41	2	24
20017	0	2	2	0	5	9	37	2	11	30
20018	0	4	1	1	11	7	25	2	25	24
20019	0	4	1	4	8	8	18	2	24	31
20020	0	6	3	16	6	6	11	1	17	35
20024	0	12	7	1	5	7	4	13	26	25
20032	0	6	3	28	5	5	10	0	18	26
20036	0	46	17	0	0	4	0	8	4	21
20037	0	38	12	0	0	3	0	17	8	22
Total	0	7	4	4	6	7	13	9	21	29

Table A8.11 Hospital Destination and Market Share for ACS Admissions by zip code for 65+ Age Group

Zip Code	Hospitals *(All figures are percent)*									
	CNMC	GWU	Georgetown	GSCH	Howard	Rehab	Providence	Sibley	VA	WHC
20001	0	10	3	1	32	0	16	1	6	31
20002	0	6	2	2	16	0	26	1	7	40
20003	0	14	5	7	18	1	19	2	4	31
20004	0	17	0	0	0	0	17	33	0	33
20005	0	37	8	0	20	0	4	9	9	12
20006	0	40	0	0	10	0	20	20	0	10
20007	0	12	43	0	2	0	2	37	1	3
20008	0	9	12	0	2	1	1	71	2	4
20009	0	19	12	0	19	1	6	6	4	34
20010	0	9	5	1	15	0	13	7	6	43
20011	0	3	4	0	10	0	27	5	13	38
20012	0	7	4	1	7	0	26	7	5	43
20015	0	3	6	0	4	0	1	75	1	11
20016	0	3	14	0	0	0	6	70	0	7
20017	0	0	2	0	4	0	60	3	5	24
20018	0	2	2	1	10	0	51	2	9	24
20019	0	6	2	13	11	0	31	1	7	29
20020	0	8	3	42	8	0	13	1	3	21
20024	0	35	8	5	12	0	5	6	7	22
20032	0	6	2	60	8	0	8	1	2	13
20036	0	73	13	0	7	0	0	7	0	0
20037	0	66	15	0	2	1	0	13	2	1
Total	0	9	5	10	11	0	21	11	6	26

Table A8.12 Hospital Destination and Market Share for PCS Admissions by zip code for 65+ Age Group

Zip Code	Hospitals *(All figures are percent)*							
	CNMC	GWU	Georgetown	GSCH	Howard	Providence	Sibley	WHC
20001	0	10	5	1	27	18	1	38
20002	0	7	5	2	11	32	1	42
20003	0	16	7	11	9	21	4	33
20004	0	41	8	8	0	11	32	0
20005	0	35	10	1	17	11	4	22
20006	0	39	17	0	5	8	21	9
20007	0	10	52	0	1	0	35	1
20008	0	11	15	0	0	1	67	6
20009	0	20	8	0	15	11	4	42
20010	0	8	6	0	15	11	3	56
20011	0	4	4	0	7	37	6	42
20012	0	6	6	0	5	30	8	44
20015	0	4	6	0	2	4	76	8
20016	0	4	13	0	0	2	76	4
20017	0	2	2	0	4	64	2	26
20018	0	3	3	1	6	54	2	32
20019	0	8	3	17	9	33	1	29
20020	0	9	3	48	6	12	2	20
20024	0	33	12	5	10	11	6	23
20032	0	6	3	65	5	7	1	14
20036	0	63	12	0	0	4	17	5
20037	0	84	10	0	0	1	5	1
Total	0	10	7	12	8	23	11	29

APPENDIX 9: Emergency Services: Methodology and Data Sources

We used a combination of methods to conduct this analysis. We collected both qualitative and quantitative data from several sources to construct an overview and analysis of emergency care in the District of Columbia.

We conducted interviews with approximately 60 key stakeholders in pre-hospital emergency services and hospital-based emergency care, as well as key stakeholders in government agencies that have oversight in emergency services. In-person, individual interviews were held with leadership from DC FEMS, DC Department of Health (DOH) leadership, the DC Hospital Association (DCHA), the Office of the City Administrator (OCA) and the Office of Unified Communications (OUC). In-person, individual interviews were also conducted with at least four individuals at each of the eight non-federal acute care hospitals in DC, including the chief executive officer, the chief medical officer, the chief nursing officer, and either the director of the ED or the chair of emergency medicine.

We also convened one focus group of active emergency medical services (EMS) providers to gain insights into the day-to-day challenges of working in pre-hospital emergency services. Eight EMS providers participated in the focus group. While we acknowledge by name and title the people who participated in individual stakeholder interviews, we do not do so with the focus group participants in order to maintain anonymity (see Appendix 10 for a complete list of interviewees).

Data from the DC FEMS were used to examine EMS performance (specifically timeliness and cardiac survival rates) and the frequency and duration of diversion and closure of hospital EDs. Much of this information is derived from DC FEMS's Computer Aided Dispatch (CAD) data. For utilization and capacity of hospital-based emergency services, we used two sources of data: DCHA data and the American Hospital Association's (AHA) Annual Survey Database (FY 2000 and FY 2005). The Spring 2008 final report will present additional data on hospital ED utilization, capacity and quality from a survey of hospitals conducted specifically for this study. The report also draws upon the federal Centers for Medicaid and Medicare Services Hospital Quality Alliance dataset, which includes audited performance data on clinical quality in hospitals. We provide additional detail on several of the data sources below.

District of Columbia Fire and Emergency Medical Services (DC FEMS) Computer Aided Dispatch Data and Diversion Statistics

The DC FEMS Computer Aided Dispatch (CAD) data consists of medical calls fielded through the 911 system and includes location of call, priority of call, type of unit dispatched and receiving hospital as well as time to scene, time at scene and drop time. The priority and category of the calls are based on codes entered by trained dispatchers at the Unified Communications Center at the time of call. These codes are based on the Medical Priority Dispatch System (MPDS). This is a nationally used designation system

that groups calls based on both severity of call (priority) as well as based on classification by complaint. Calls are entered using a standard protocol, which assesses the priority of call and dispatches the appropriate unit to the scene. We used data from the 2005 calendar year (January 1-December 31, 2005). We note that these dispatch codes are entered by the dispatcher at the Unified Communications Center at the time of call and may not reflect the actual complaint assessed on arrival at the scene of the call.

We also used DC FEMS aggregate data to report number of EMS calls and hours on diversion from 2000-2006.

District of Columbia Health Emergency Preparedness and Response Administration (HEPRA) Data

HEPRA is the Department of Health (DOH) agency responsible for certification and recertification of EMS providers and EMS ambulance units. HEPRA also grants hospitals trauma certification. We used HEPRA certification data to report trends in the number of EMS providers and ambulance units from 2000-2006.

APPENDIX 10: EMS/List of Interviewees

We would like to thank the following individuals for taking the time to speak with the project team.

Children's National Medical Center

- James Chamberlain, MD, Chief, Division of Emergency Medicine
- Janet Eckhart, RN, MSN, Service Director, Emergency Medical Trauma Center (Chief Nursing Officer designate)
- Peter Holbrook, MD, Chief Medical Officer
- Joseph Wright, MD, MPH, Executive Director, Child Health Advocacy Institute

District of Columbia Department of Health

- Gregg A. Pane, MD, Director and State Health Officer
- Beverly A. Pritchett, Senior Deputy Director, Emergency Health and Medical Services Administration
- Feseha Woldu, MD, Administrator, Health Professional Licensing Administration

District of Columbia Fire and Emergency Medical Services

- Gregory Blalock, Deputy Chief of EMS Operations
- John Dudte, MD, Assistant Medical Director for Training and Education
- Claude Ford, EMS Training Program Manager
- Thomas Herlihy, Assistant Fire Chief of Services
- Dennis Rubin, Fire and EMS Chief
- Rafael Sa'adah, Battalion Fire Chief
- Lawrence Shultz, Assistant Fire Chief of Operations
- Patricia White, RN, Nurse Quality Coordinator
- Michael Williams, MD, Medical Director

District of Columbia Hospital Association

- Robert A. Malson, Esq., President and Chief Executive Officer

District of Columbia Office of the City Administrator

- Phil Heinrich, CapStat Program Manager
- Julie Hudman, Health and Human Services Program Manager
- Amy Mauro, Program Analyst for Public Safety

District of Columbia Office of Unified Communications

- Kenneth Mallory, Operations Manager
- Janice Quintana, Director

The George Washington University Hospital

- Richard Becker, MD, Chief Executive Officer
- Robert Shesser, MD, MPH, Chair of Emergency Medicine

- Carlos Silva, MD, Medical Director
- Patricia Winston, MS, RN,CNAA-BC, FACHE, Chief Nurse Officer

Georgetown University Hospital
- Joy Drass, MD, President
- Brendan Furlong, MD, Clinical Chief of Emergency Medicine
- Richard Goldberg, MD, Vice President of Medical Affairs
- Joyce Johnson, RN, DNSc, Vice President of Operations

Greater Southeast Community Hospital
- Cyril Allen, MD, MSPH, Chief Executive Officer
- Gilbert Daniel, MD, Associate Medical Officer
- Dell Harvell, RN, Vice President of Nursing
- Leslie Rodney, RN, Shift Supervisor, Emergency Department
- Jean Williams, MD, Chair of Emergency Medicine

Howard University Hospital
- Mayble Craig, RN, Interim Chief Nursing Officer
- Thomas Gaiter, MD, Chief Medical Officer
- Joseph M. Huber, Interim Chief Financial Officer
- Geoffrey Mountvarner, MD, MPH, Interim Chair, Department of Emergency Medicine
- Larry Warren, MA, Chief Executive Officer

Prince George's Hospital Center
- Ruby Anderson, RN, MSN, CNA-BC, Vice President, Nursing & Patient Care Services
- David Goldman, MD, Vice President for Medical Affairs
- Gary Little, MD, Chair of Emergency Medicine
- John O'Brien, President

Providence Hospital
- Suzanne Felder, RN, MSN, Assistant Vice President, Nursing
- Deborah Morrison, RN, MGA, Vice President, Quality Improvement/Risk Management
- Robert L. Simmons, MD, Senior Vice President, Medical Affairs
- Julius D. Spears, Jr., President and Chief Executive Officer
- William J. Strudwick, MD Director, Emergency Department

Sibley Memorial Hospital
- Robert Ludewig, MD, Vice President, Medical Affairs
- Susan Ohnmacht, MSN, MS, RN, CNAA, BC, Director, Critical Care, VIP and Special Care Services / Emergency Management Coordinator
- Robert L. Sloan, President and Chief Executive Officer
- J. Andrew Sumner, MD, Director, Emergency Medicine

- Joan Vincent, RN, Vice President, Patient Care / Chief Nursing Officer

Washington Hospital Center

- James Caldas, Chief Executive Officer
- Ann Marie Madden, RN, Nursing Director for Critical Care and Emergency Services
- Kathleen Pearrell, RN, Director, ED Operations/MedSTAR
- Mark Smith, MD, Chairman, Department of Emergency Medicine
- Janis Orlowski, MD, Chief Medical Officer

APPENDIX 11: Interview and Focus Group Guides

EMS STAKEHOLDER INTERVIEW GUIDE

Introduction

1. Welcome participant:

   Hi, I am _____. I work at the health policy department at The George Washington University in Washington, DC. We are conducting an assessment of emergency medical services and how to better emergency care for residents of the District. We are interested in hearing about the emergency care your agency provides. We appreciate your participation and look forward to hearing what you have to tell us about emergency health care in your community. Thank you for coming.

2. Explain the project:

   The purpose of this project is to conduct a comprehensive assessment of the District's health care delivery system for individuals with urgent or emergent medical needs and recommend improvements and expansions of that system. This project will look at health care provided in emergency departments and by FEMS in DC.

3. Oral Consent:

   - Participation in this interview is voluntary.
   - You may answer or decline to answer any questions you wish, and may end the interview at any time.
   - We may report your identity as an interviewee in public reports, but will not link your comments and observations to you by name. If you are not comfortable with this, please let us know.

4. Ground rules:
   - There are no right or wrong answers. Feel free to speak openly and give your own opinions.
   - I may sometimes need to stop you so that we can get back on focus and get through our topics.
   - We expect this meeting to last approximately one hour.
   - Please relax and be as open as possible.

1. What is your current position/title and what are your current responsibilities? How long have you held this position?
2. What do you think DC FEMS does really well in the community?
3. What accomplishments are you most proud of?
4. Where do you think DC FEMS need more support?
5. If you ran DC FEMS, what would you change?
6. What are the five elements of an effective EMS system?
7. In your judgment, what is the availability of emergency health care services in this community?
8. What would be helpful from the DC government that would enable DC FEMS to provide quality and timely prehospital care?
9. What would be helpful from DC hospitals that would enable DC FEMS to provide quality and timely prehospital care?
10. Has the DC government or DC hospitals recently implemented any policies, standing orders, etc. that you think work really well?
    a. Any that don't work?
11. Do you feel that Fire and EMS should be separate entities?
    a. If so, why?
    b. If not, why?
12. What are your overall impressions of patients' experiences obtaining prehospital care in this community?
13. What are your overall impressions of how the community views prehospital care in DC?
14. What do you think that other cities are doing more effectively in emergency response and how are they doing it?
15. What has happened in the wake of the Rosenbaum incident? Any changes in policies? Practice/ atmosphere?
16. Who heads quality assurance for DC FEMS?
17. Is there a DC FEMS quality improvement plan?
18. A lot of the literature states that drop-off times are a huge problem for EMS crews. What incentives from hospitals would decrease this time? Probe: Supplies
19. What could DC FEMS do better to cut drop-off times?
20. Do you have a hospital coordinator? If so, can you tell me a little bit about their role?
21. Does DC FEMS track clinical measures (e.g., return of spontaneous circulation, intubation success, GCS both at arrival on-scene and arrival at the hospital)?
22. Does DC FEMS measure customer satisfaction?
23. Does DC FEMS measure employee satisfaction and attitudes?
24. How is morale in the department in general?
25. How do DC FEMS crews use the new GPS systems?
26. Can you tell me about your ePCR system? What are the goals of implementation for this new system?
27. Can you tell me about your PSAP-based paramedic supervisor? What is their main role?
28. Do you have a policy regarding regional destinations? Specifically, do you have a central system in place to track which hospitals have received the majority of ambulances most recently and the acuity of patients these hospitals have received?

29. Have DC FEMS staff received formal QI training? How? What course? When?
30. In what areas do you think DC FEMS staff need more training?
31. Do you have a timeline to implement task force strategies?
    a. Do you have benchmarks for these tasks?
    b. Can you share it?
32. How will you know you have made a difference?
    Probe: What would you consider a symptom of success in DC FEMS?
33. Is there anything else you would like to tell me about DC FEMS that we haven't discussed?

EMS PROVIDER FOCUS GROUP GUIDE

Introduction

1. Welcome participant:

   Hi, I am _____. I work at the health policy department at The George Washington University in Washington, DC. We are conducting an assessment of emergency medical services and how to better emergency care for residents of the District. We are interested in your experiences with delivering emergency care and working for DC Fire Department. We appreciate your participation and look forward to hearing what you have to tell us about emergency health care in your community. Thank you for coming.

2. Explain the project:

   The purpose of this project is to conduct a comprehensive assessment of the District's health care delivery system for individuals with urgent or emergent medical needs and recommend improvements and expansions of that system. This project will look at health care provided in emergency departments and by EMS in DC.

3. Oral Consent:

   - Participation in this interview is voluntary.
   - You may answer or decline to answer any questions you wish, and may end the interview at any time.
   - We are not interested in learning your identity. If we do learn your identity, we will not disclose it to anyone outside of the project team.

4. Ground rules:
   - There are no right or wrong answers. Feel free to speak openly and give your own opinions.
   - I may sometimes need to stop you so that we can get back on focus and get through our topics.
   - We ask that you respect these rules as well and not discuss this interview with anyone outside of the study team. Please do not tell people outside of this room who participated in this discussion.
   - We expect this meeting to last approximately one hour.
   - Please relax and be as open as possible. You are under no obligation to stay and can leave at any time.

1. We are here to discuss what it is like to provide emergency care in the District. First, I would like to ask you to tell us your first name and a little bit about yourself (e.g., how long you have worked with DC FEMS, your role (paramedic on ALS unit, EMT on BLS unit, paramedic on truck) if you have been an EMS provider in other cities).
2. Do you like working at DC FEMS? On a 1-10 scale, how satisfied are you with your job?
3. What training did you receive for your current position?
4. Do you have continuing education at your work? If so, how often? Tell me what you usually learn about…clinical knowledge, skills training, DC FEMS protocols, etc.
5. Do you feel that you have enough training and guidance to follow DC FEMS protocols?
6. Do you feel that you get the training and education you need to perform your job effectively?
7. Do you feel that you have a clear career path at DC FEMS?
8. Do you feel that your superiors make good decisions when it comes to managing FEMS? Do you think they make decisions in your best interest?
9. Are there a lot of vacancies at DC FEMS?
    a. What positions are most often vacant? Why do you think that position is difficult to fill?
10. Do you think people in DC generally have good access to EMS care?
    a. Do they get it in a timely manner?
11. I know there has been a lot of press around DC FEMS recently. Has anything changed in your job recently?
12. I have heard that drop-off times at hospitals are a problem for DC FEMS. Can you tell me a bit about that?
    a. Is it a problem at all hospitals? Where is it the worst? Is it worse for certain types of patients?
    b. What is your average drop-off time?
13. Do you feel you are adequately stocked with appropriate medications? What medications do you feel you need most that you do not currently have?
14. What aspect of DC FEMS do you think is most effective in enabling you to provide quality and timely prehospital care?
15. What aspect of DC FEMS do you think is least effective in enabling you to provide quality and timely prehospital care?
16. What are your impressions about the DC government and how it oversees DC FEMS?
17. What are your overall impressions of patients' experiences obtaining prehospital care in this community?
18. What are your overall impressions of how the community views prehospital care in DC?
19. How could DC hospitals help you provide care more efficiently? Specifically, can you talk about your experience with offload times at different EDs in the District?

20. What do you think that other cities are doing more effectively in emergency response and how are they doing it?
21. If there was one message you would want us to go back to the DC government with, what would it be?
22. Is there anything I didn't ask that you would like to tell me about?

HOSPITAL STAKEHOLDER INTERVIEW GUIDE

Introduction

1. Welcome participant:

   Hi, I am _____. I work at the health policy department at The George Washington University in Washington, DC. We are conducting an assessment of emergency medical services and how to better emergency care for residents of the District. We are interested in hearing about the emergency care your hospital provides. We appreciate your participation and look forward to hearing what you have to tell us about emergency health care in your community. Thank you for coming.

2. Explain the project:

   The purpose of this project is to conduct a comprehensive assessment of the District's health care delivery system for individuals with urgent or emergent medical needs and recommend improvements and expansions of that system. This project will look at health care provided in emergency departments and by EMS in DC.

3. Oral Consent:

   - Participation in this interview is voluntary.
   - You may answer or decline to answer any questions you wish, and may end the interview at any time.
   - We may report your identity as an interviewee in public reports, but will not link your comments and observations to you by name. If you are not comfortable with this, please let us know.
   - No one person will be asked all of the questions that appear in this interview guide.

4. Ground rules:
   - There are no right or wrong answers. Feel free to speak openly and give your own opinions.
   - I may sometimes need to stop you so that we can get back on focus and get through our topics.
   - We expect this meeting to last approximately one hour.
   - Please relax and be as open as possible.

FOR DISCUSSIONS WITH THE HOSPITAL'S CEO, CFO, COO, CMO, CNO, DIRECTOR OF ED, OR OTHER SENIOR EXECUTIVES AND MANAGERS

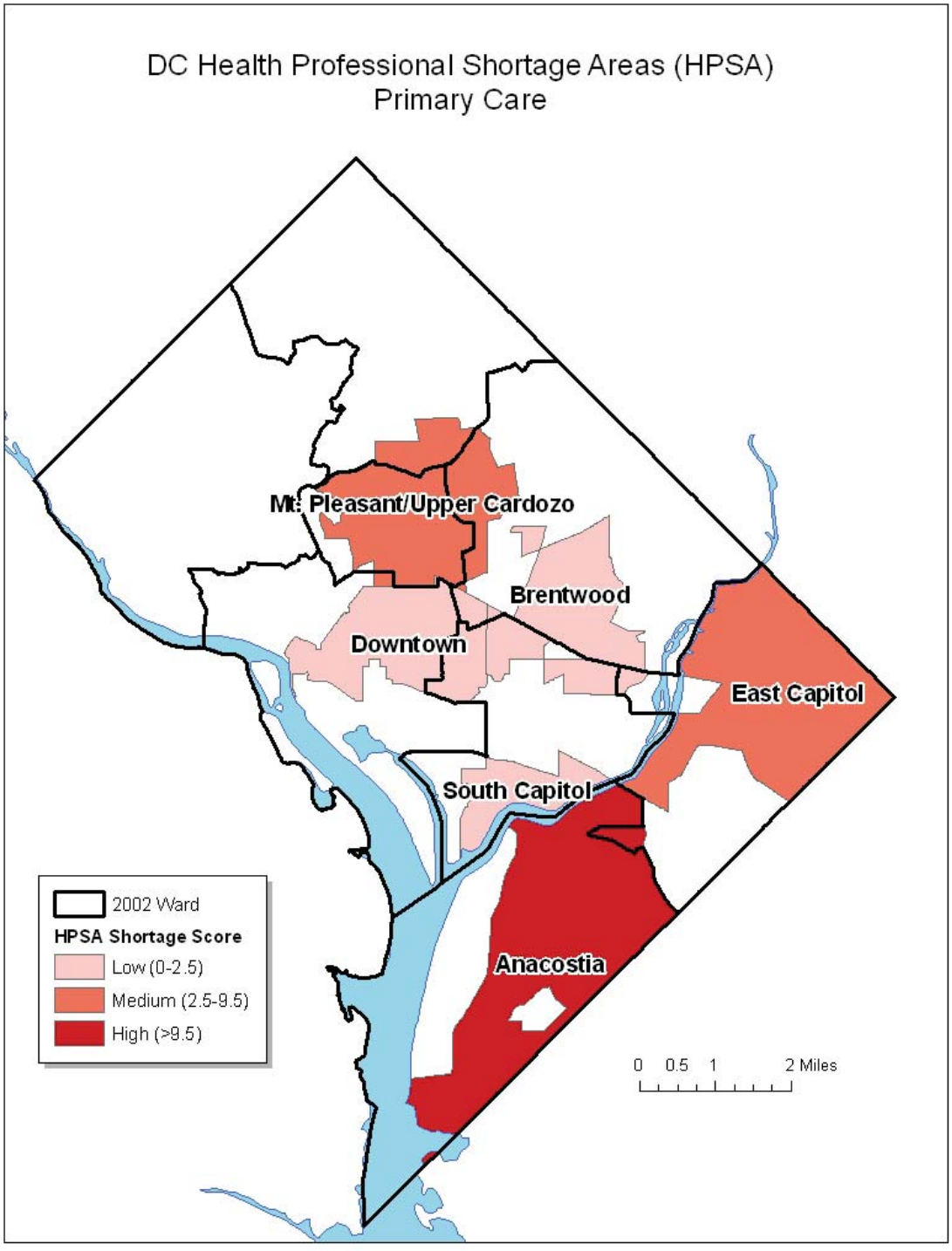
1. What is your current position/title and what are your current responsibilities? How long have you held this position?
2. Can you give an overview of your patient mix, in terms of both ED visits and admissions? Probe: Payer mix, prevalent conditions, race/ethnicity, immigrants.
3. Is your emergency department crowded often?
4. How often has the ED been overcrowded in the past 3 months?
5. How often has your ED diverted ambulances in the past 3 months?
6. How do patient volumes and waiting times vary at different times of the day and different times of the year?
7. What do you see as the greatest challenges to meeting the ongoing demand for ED care? Probe: capacity, staffing, equipment
8. What are the major barriers to efficient patient flow through the ED?
   Probe: available beds, staffing, on-call specialists, coordination across hospital units, discharge to sub-acute care
9. If a nearby hospital closed, how difficult would it be to serve patients from the closed facility, particularly in the ED?
10. What impact, if any, did the closure of DC General have on your emergency department? If there were impacts, were any of these measured?
11. How do you think the potential closure of Prince George's Hospital Center would affect your patient volume and the way you deliver services? i.e. would you have to bring on additional staff, expand your facilities, etc?
12. How do you think the potential closure of Greater Southeast Community Hospital would affect your patient volume and the way you deliver services? i.e. would you have to bring on additional staff, expand your facilities, etc?
13. Are there any approaches to alleviate ED overcrowding that you have tried and found particularly successful or unsuccessful? Probe: redesigning elective surgery schedule, patient flow procedures in other units, hospitalists or bed czars.
14. How do you handle patients that are prisoners in the ED? What special challenges do they create?
15. Do you have a large number of repeat ED users?
    a. Do they create special challenges?
    b. Do you have specific procedures to identify and direct the care of these patients?
16. Are there any other patients with certain types of diagnoses that you find potentially challenging to move through the ED?
    Probe: Mental health, prisoners, etc.
    a. Why?
17. Do you have arrangements with local FQHCs or other primary care sites to provide follow-up care after an ED episode?
    a. Are any targeted to specific populations or disease categories?
    b. Do you coordinate patient care between the hospital and FQHC?
18. What is the greatest barrier to staffing beds that are now out of service?
19. Have any of these beds been permanently taken out of service?
20. What sorts of public policy initiatives would you consider most important to support or improve hospital emergency care?

21. What do you think about your relationship with DC FEMS?
22. What would you like to change about your working relationship with DC FEMS?
23. Do you have strategies in place to try to decrease offload time for ambulances?
    Probe: Is there a conflict between ED staff and EMS surrounding the hand-over of patients?
24. Do you have an EMS liaison?
25. When an ambulance comes to the ED, what would you like to happen that doesn't happen now?
26. What do you think hospitals in the District can do to attract more specialty coverage/physicians?
27. Do you think a healthplex or other health care facility would ease the strain on area hospitals?
28. What are special considerations about your hospital that we should be aware of?
29. Do you have anything else you would like to tell me about your hospital?

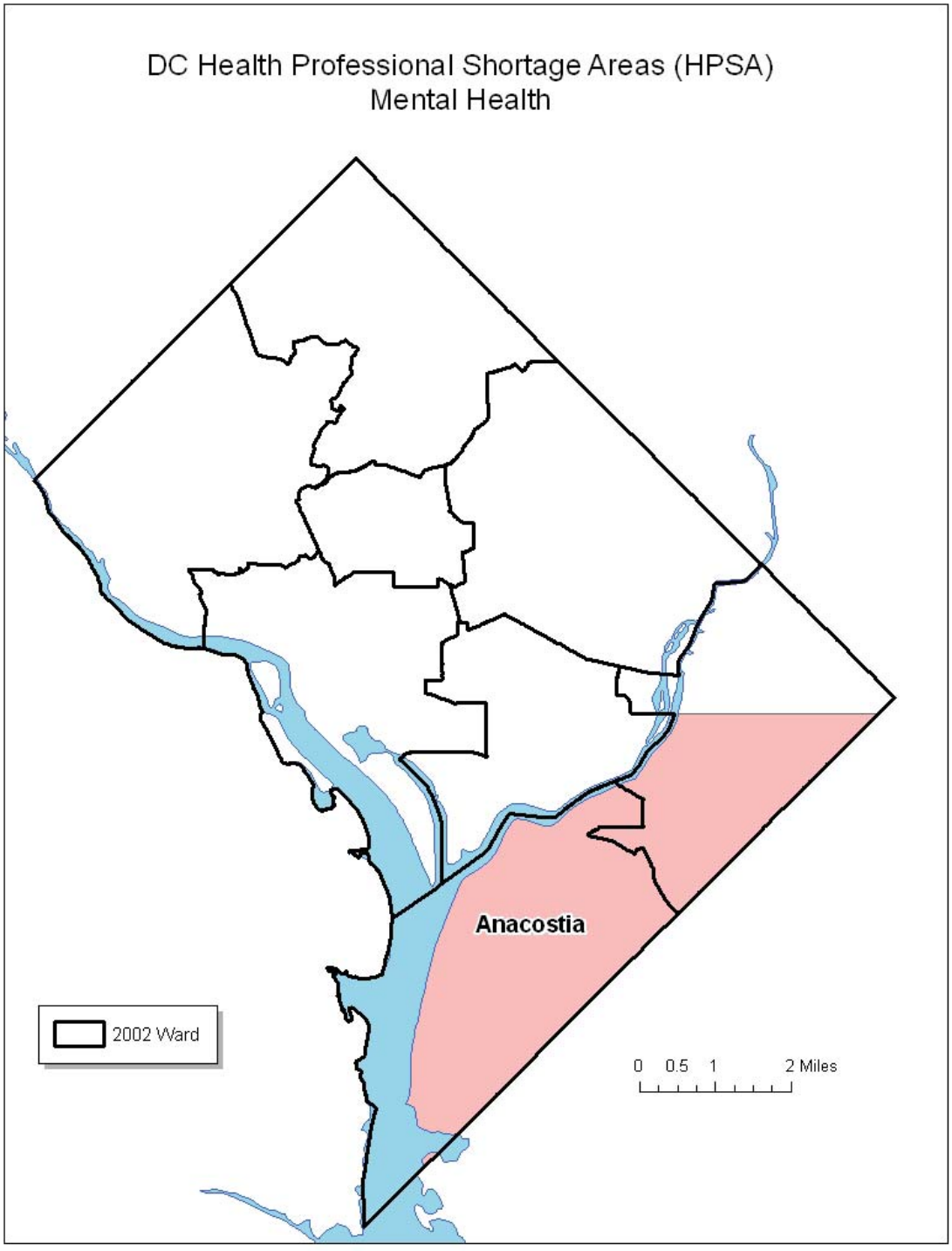
MAP APPENDICES

MAP APPENDIX 1: HPSA Maps

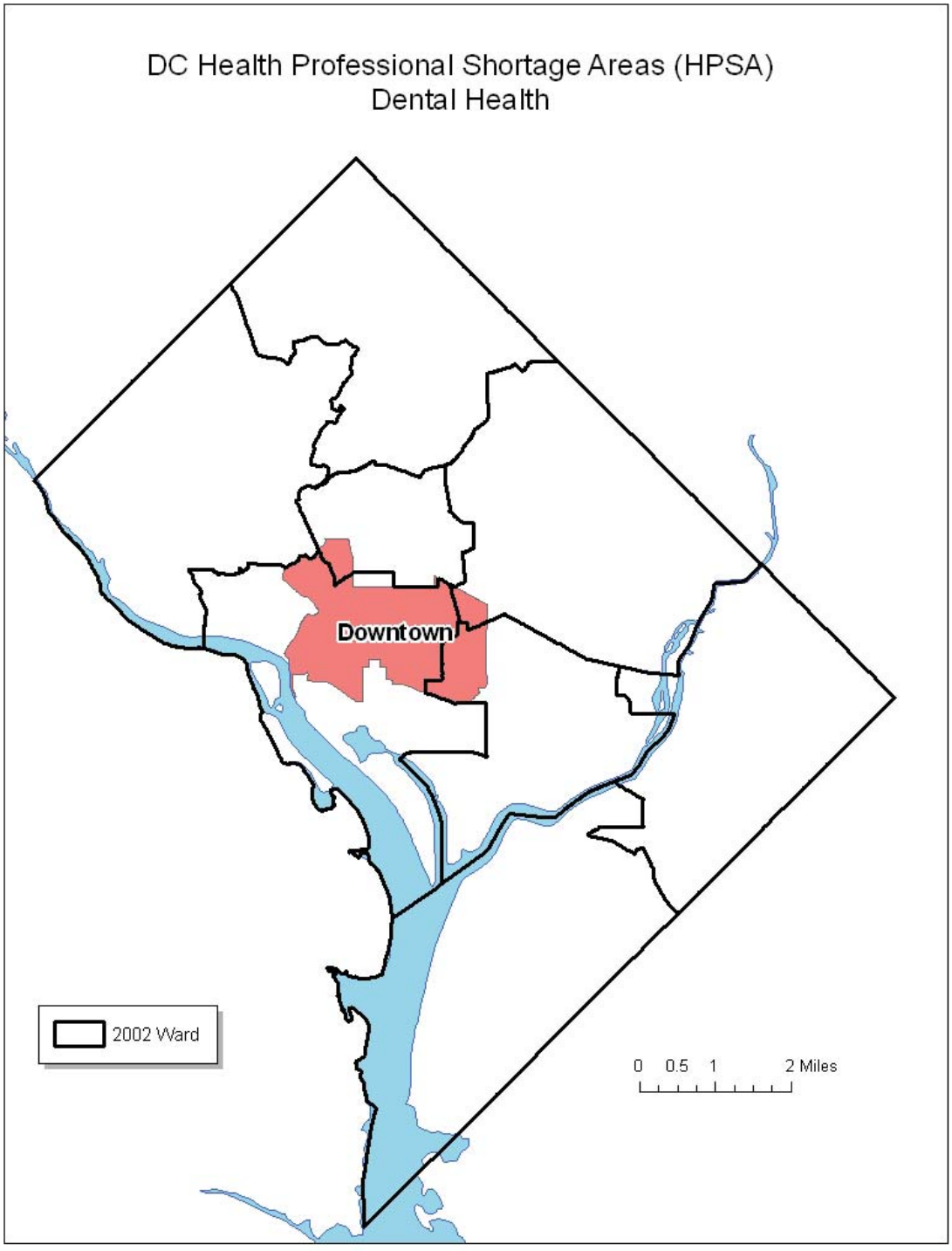
Map MA1.1:



Map MA1.2:

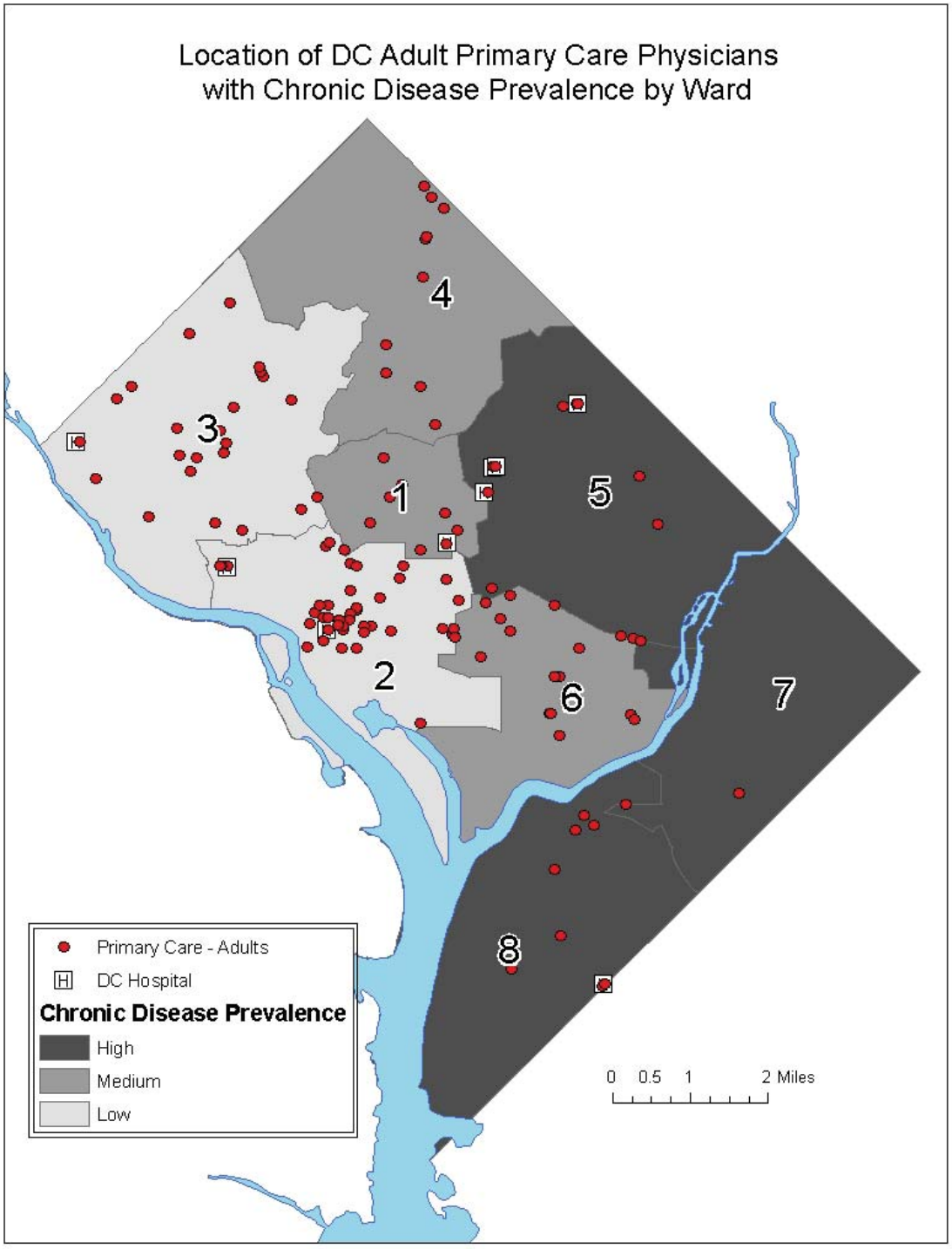

DC Health Professional Shortage Areas (HPSA)
Mental Health
Anacostia
2002 Ward
0 0.5 1 2 Miles

Map MA1.3:

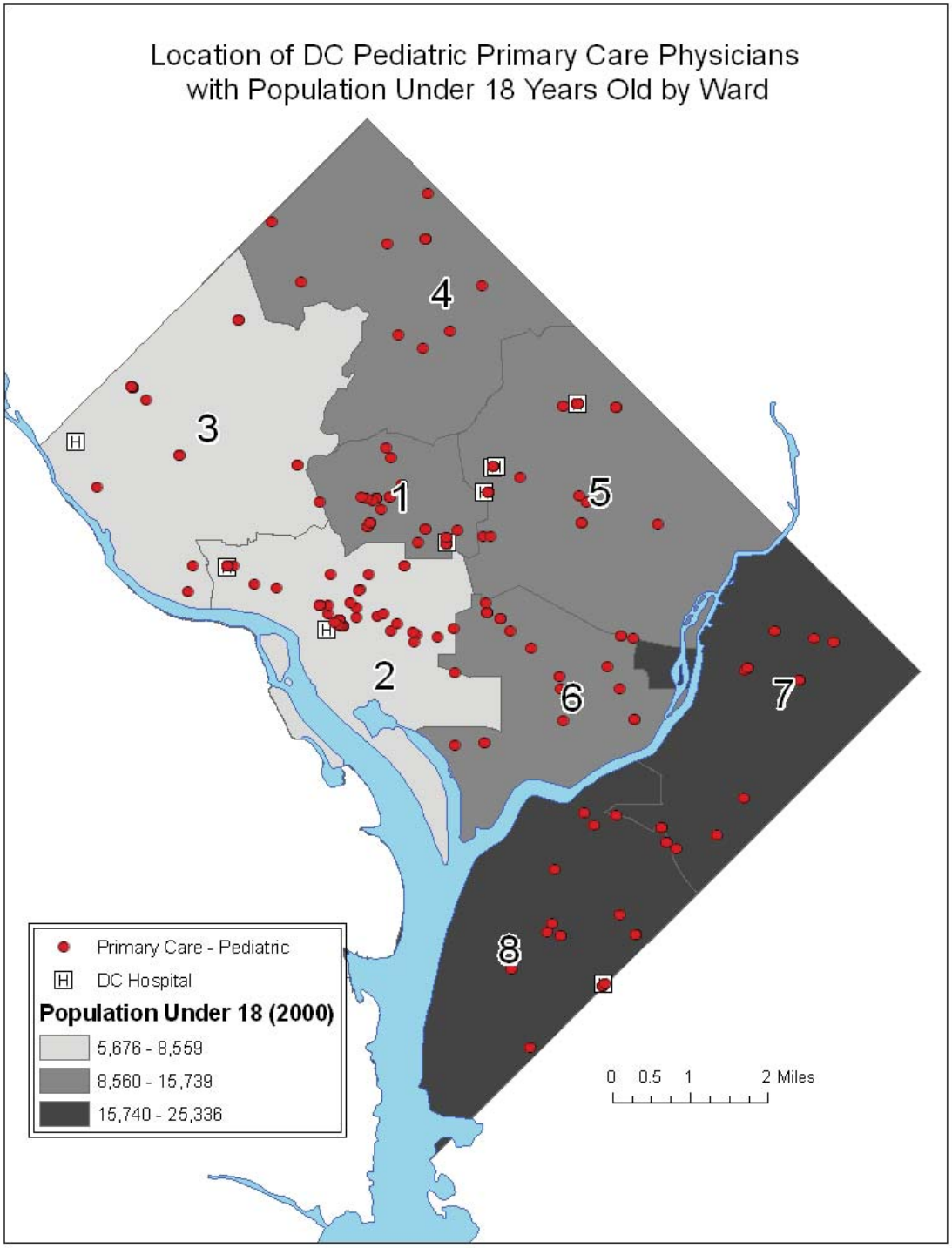

DC Health Professional Shortage Areas (HPSA)
Dental Health
Downtown
2002 Ward
0 0.5 1 2 Miles

MAP APPENDIX 2: Primary Care Provider Maps

Map MA2.1:

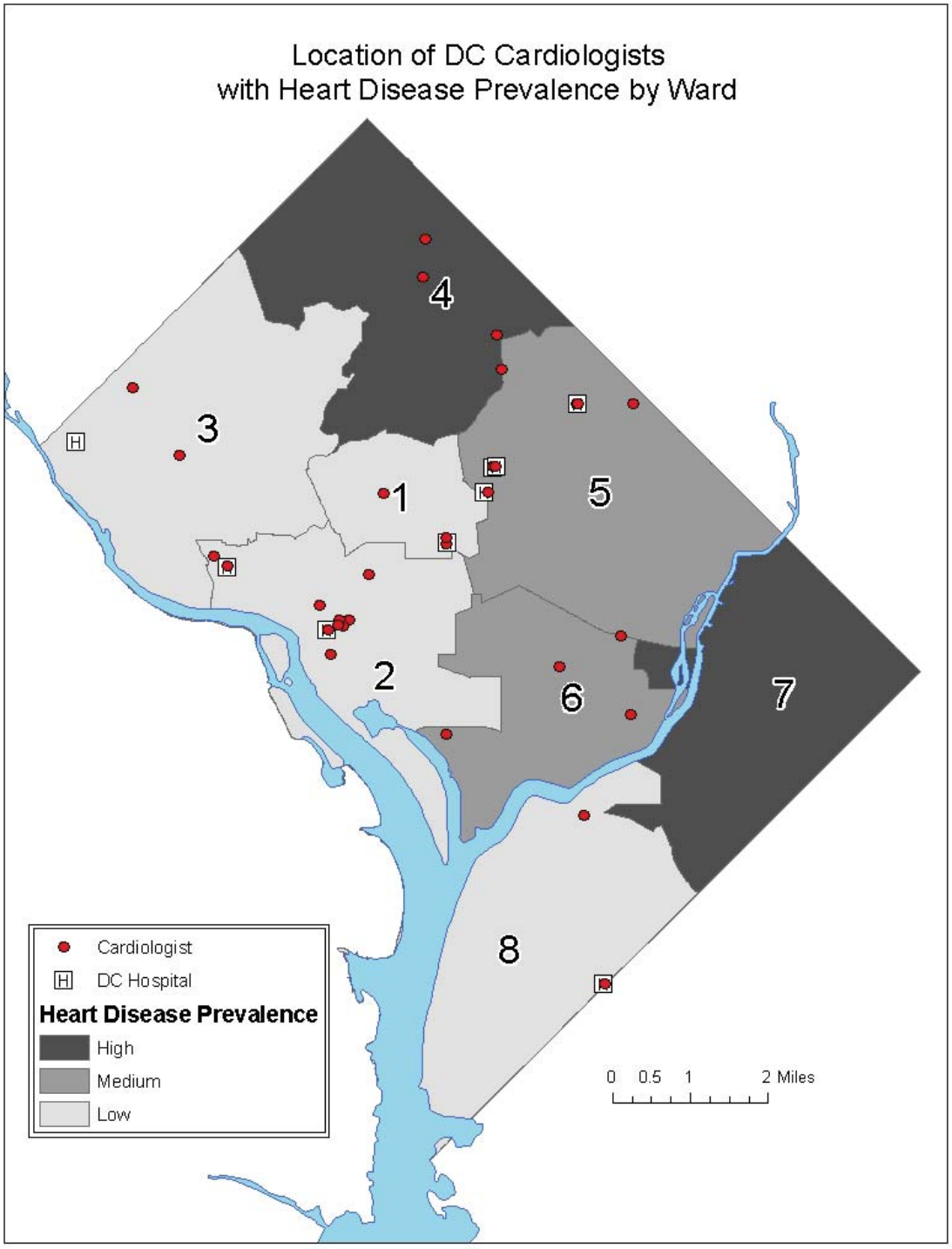


Map MA2.2:

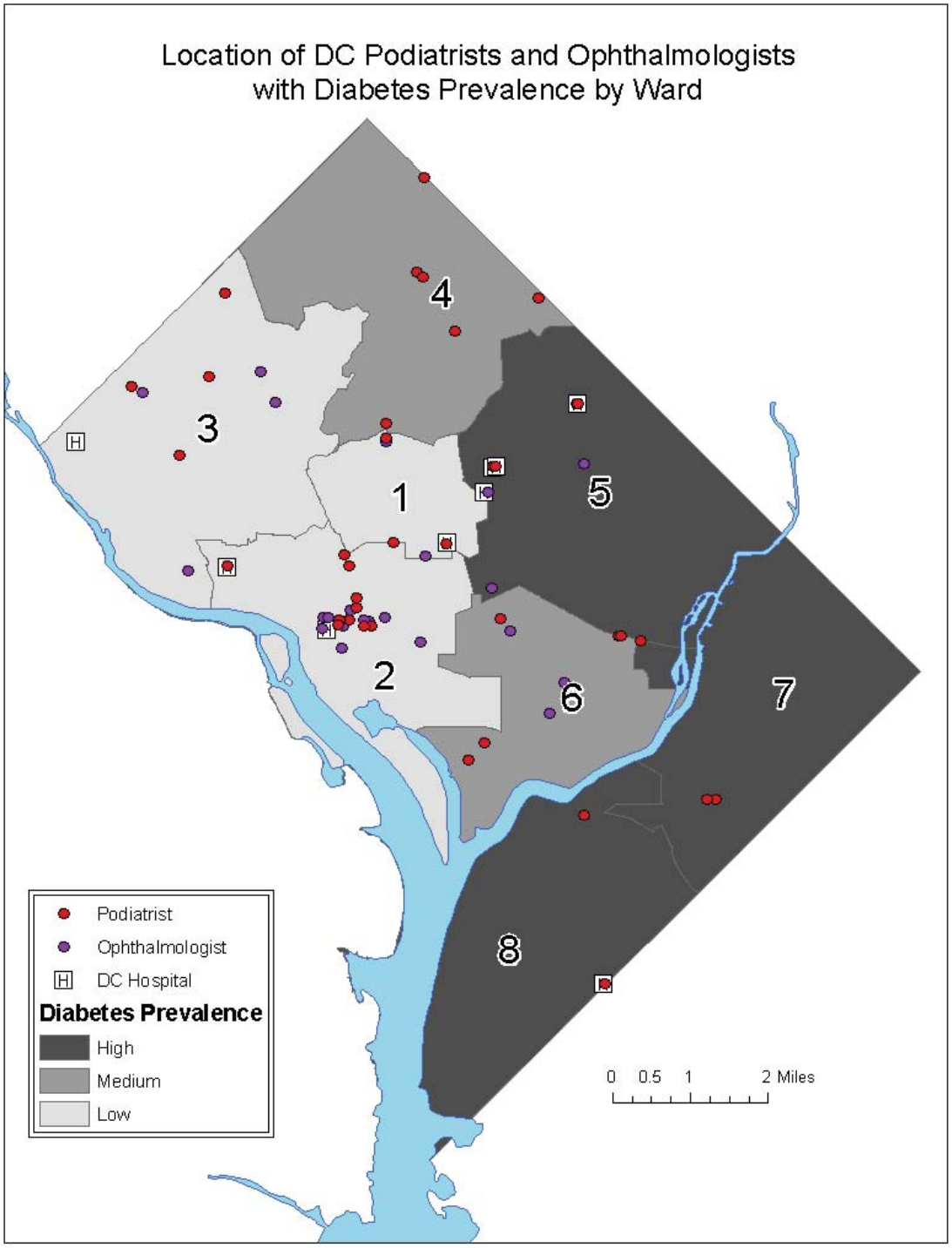

Location of DC Pediatric Primary Care Physicians
with Population Under 18 Years Old by Ward
4
3
1
5
2
6
7
8
Primary Care - Pediatric
DC Hospital
Population Under 18 (2000)
5,676 - 8,559
8,560 - 15,739
15,740 - 25,336
0 0.5 1 2 Miles

MAP APPENDIX 3: Specialty Care Provider and Ancillary Facility Maps

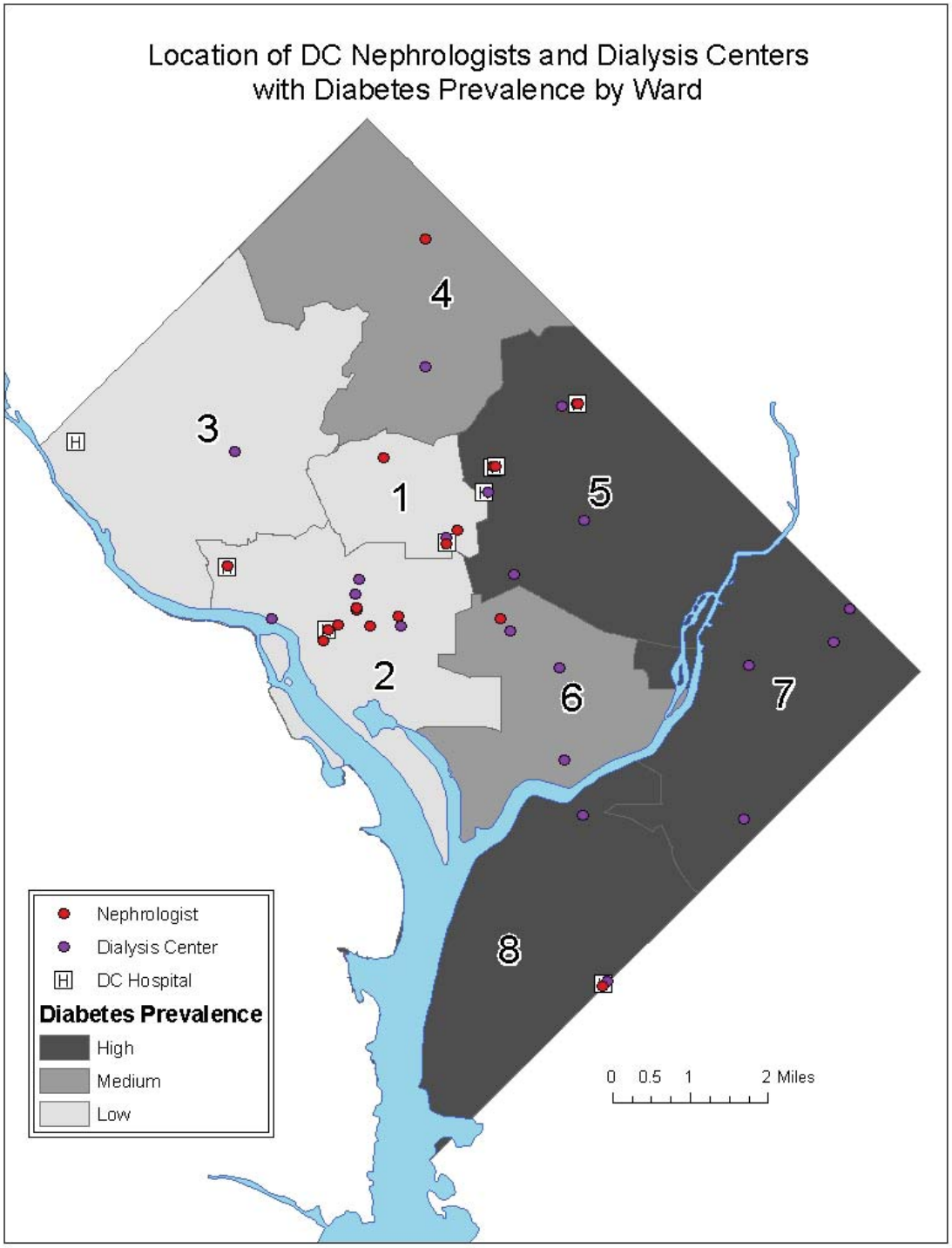
Map MA3.1:



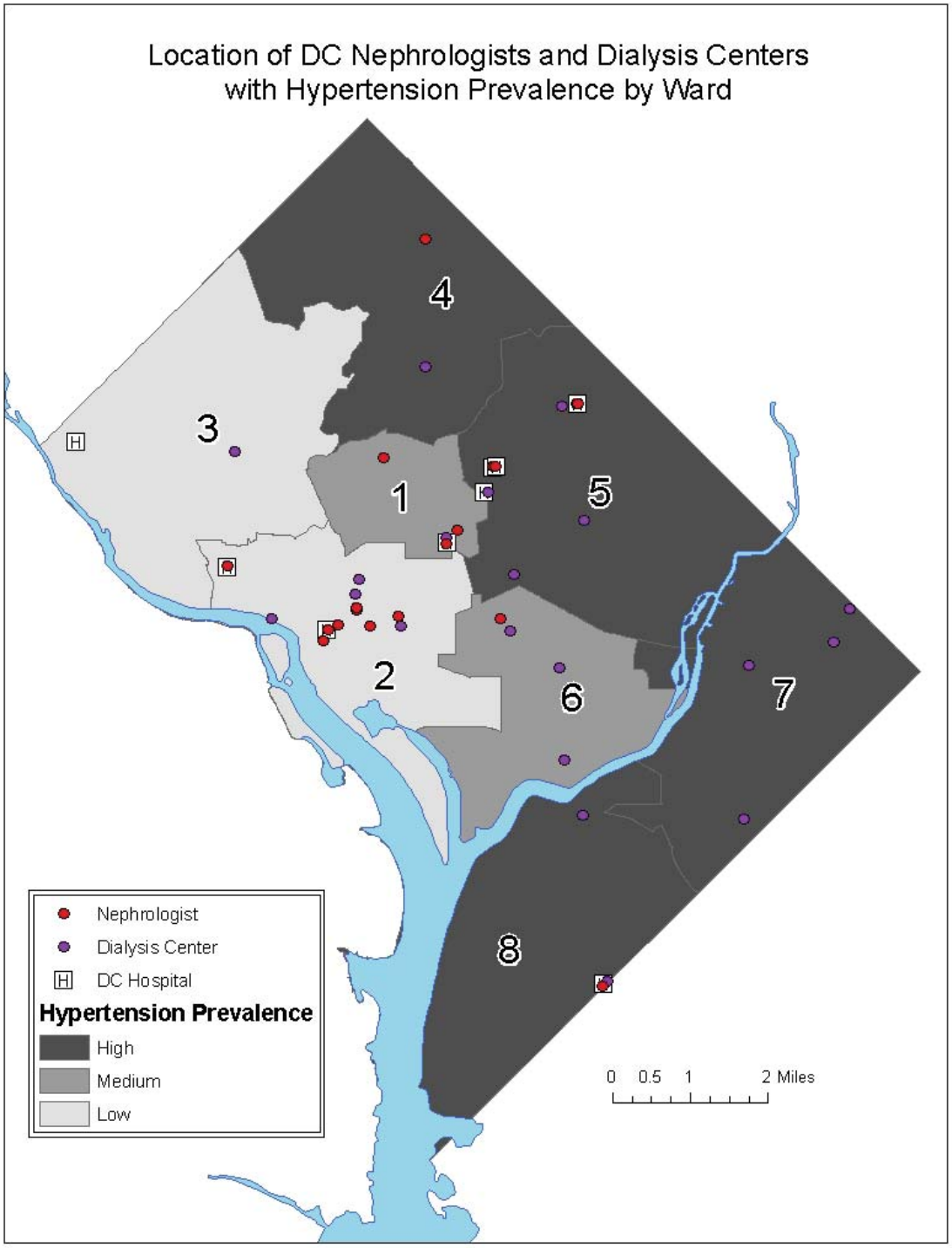
Map MA3.2:


Location of DC Podiatrists and Ophthalmologists
with Diabetes Prevalence by Ward
4
3
1
5
2
6
7
8
Podiatrist
Ophthalmologist
DC Hospital
Diabetes Prevalence
High
Medium
Low
0 0.5 1 2 Miles

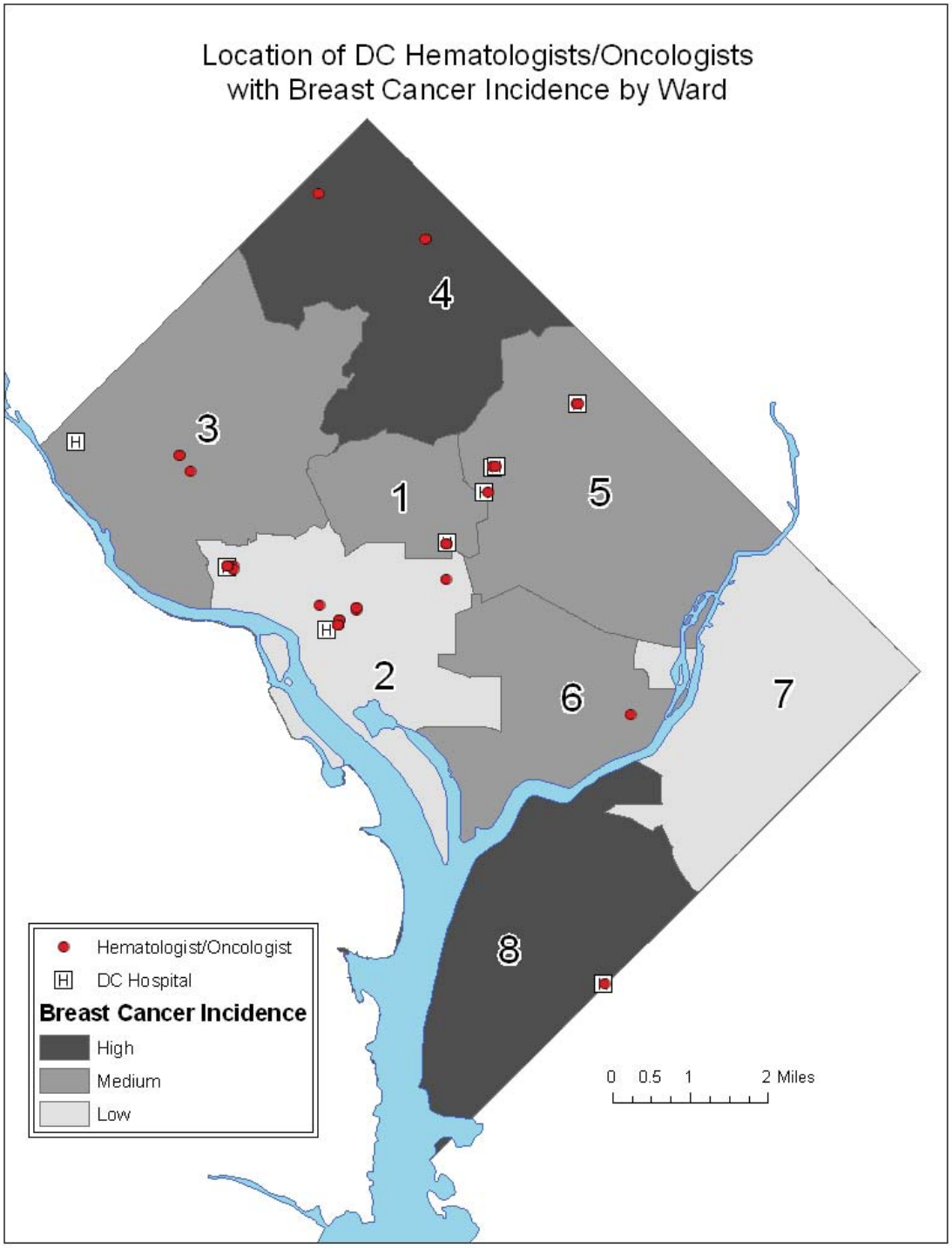
Map MA3.3:


Location of DC Nephrologists and Dialysis Centers
with Diabetes Prevalence by Ward
4
3
1
5
2
6
7
8
Nephrologist
Dialysis Center
DC Hospital
Diabetes Prevalence
High
Medium
Low
0 0.5 1 2 Miles

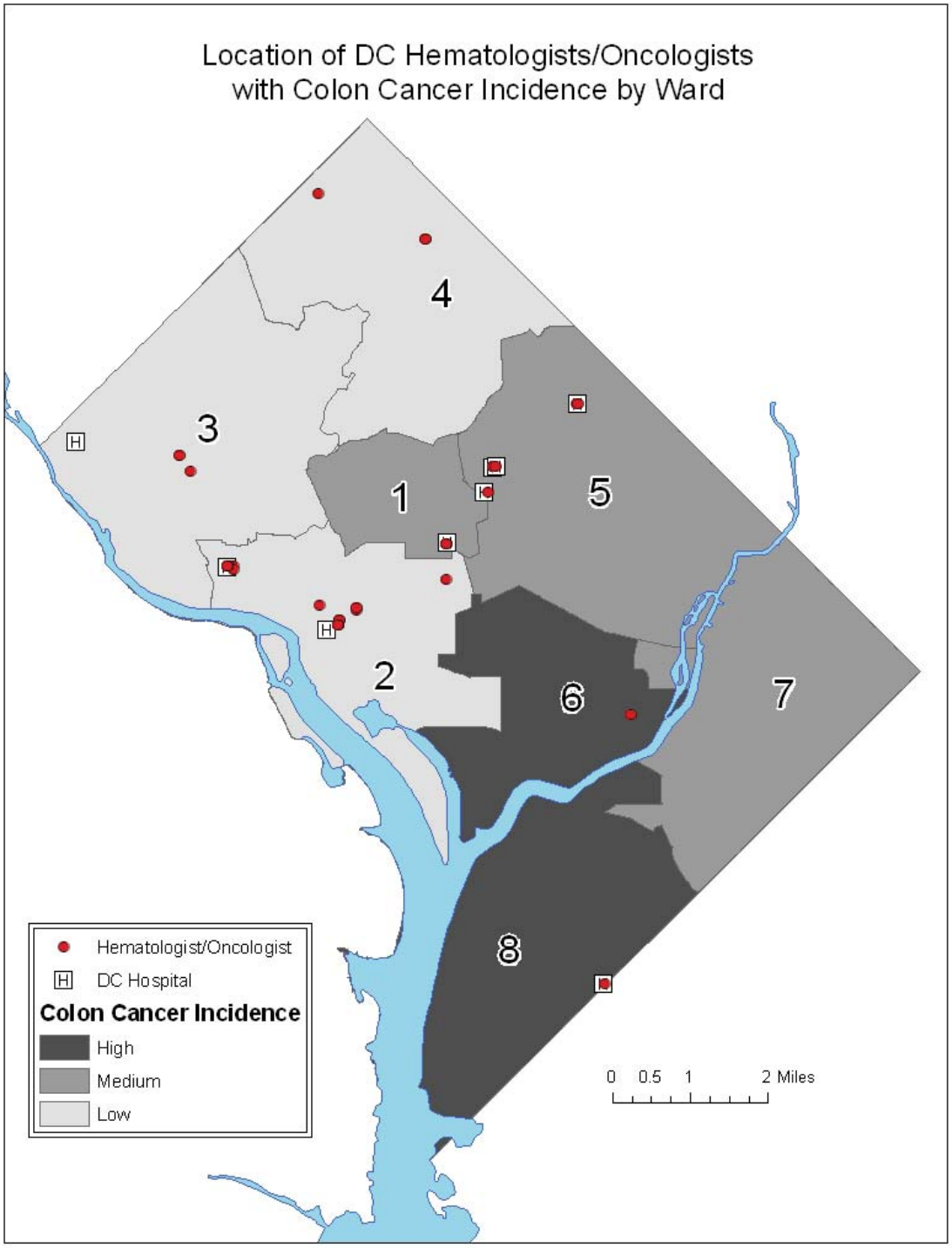
Map MA3.4:


Location of DC Nephrologists and Dialysis Centers
with Hypertension Prevalence by Ward
4
3
1
5
2
6
7
8
Nephrologist
Dialysis Center
DC Hospital
Hypertension Prevalence
High
Medium
Low
0 0.5 1 2 Miles

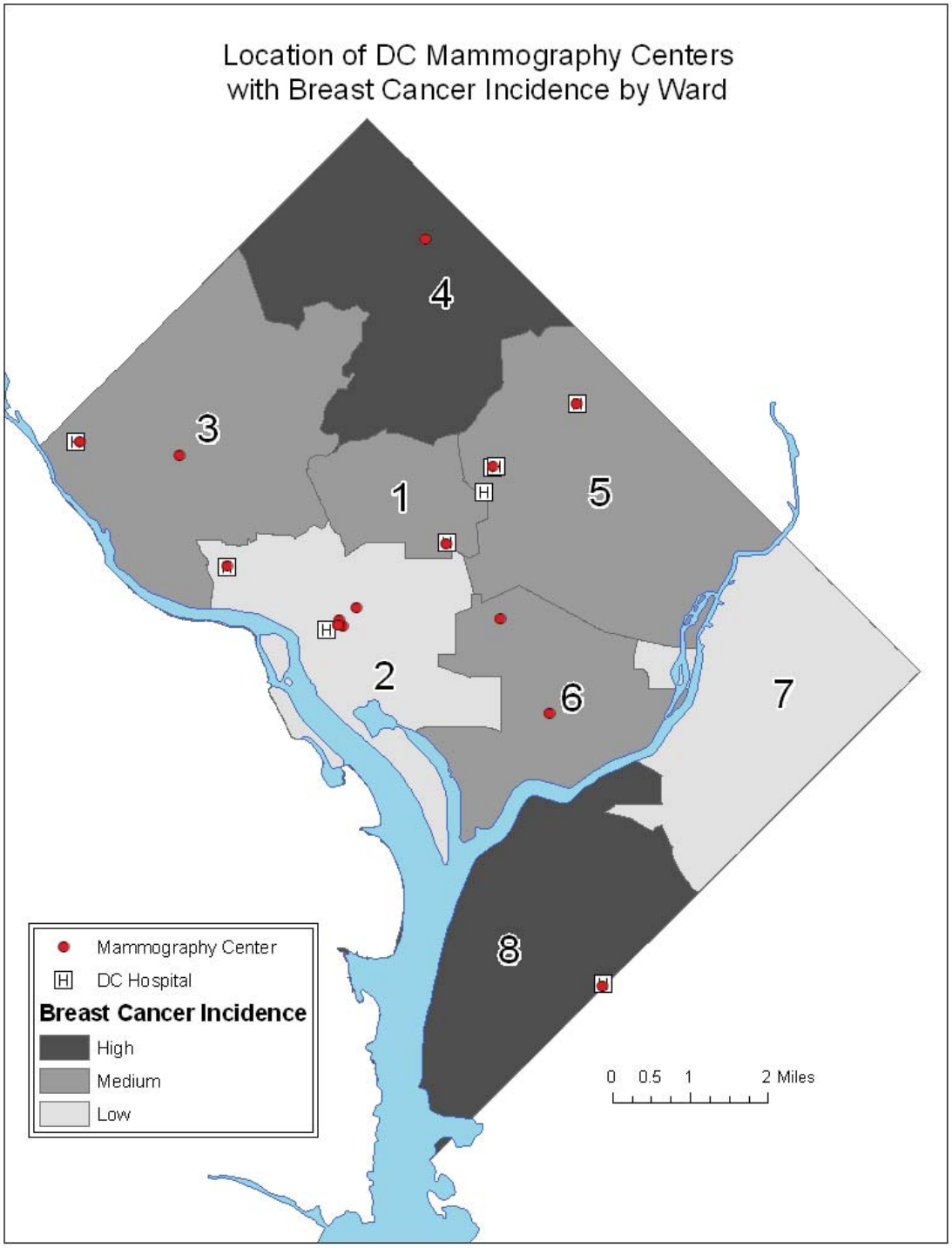
Map MA3.5:


Location of DC Hematologists/Oncologists
with Breast Cancer Incidence by Ward
4
3
1
5
2
6
7
8
Hematologist/Oncologist
DC Hospital
Breast Cancer Incidence
High
Medium
Low
0 0.5 1 2 Miles

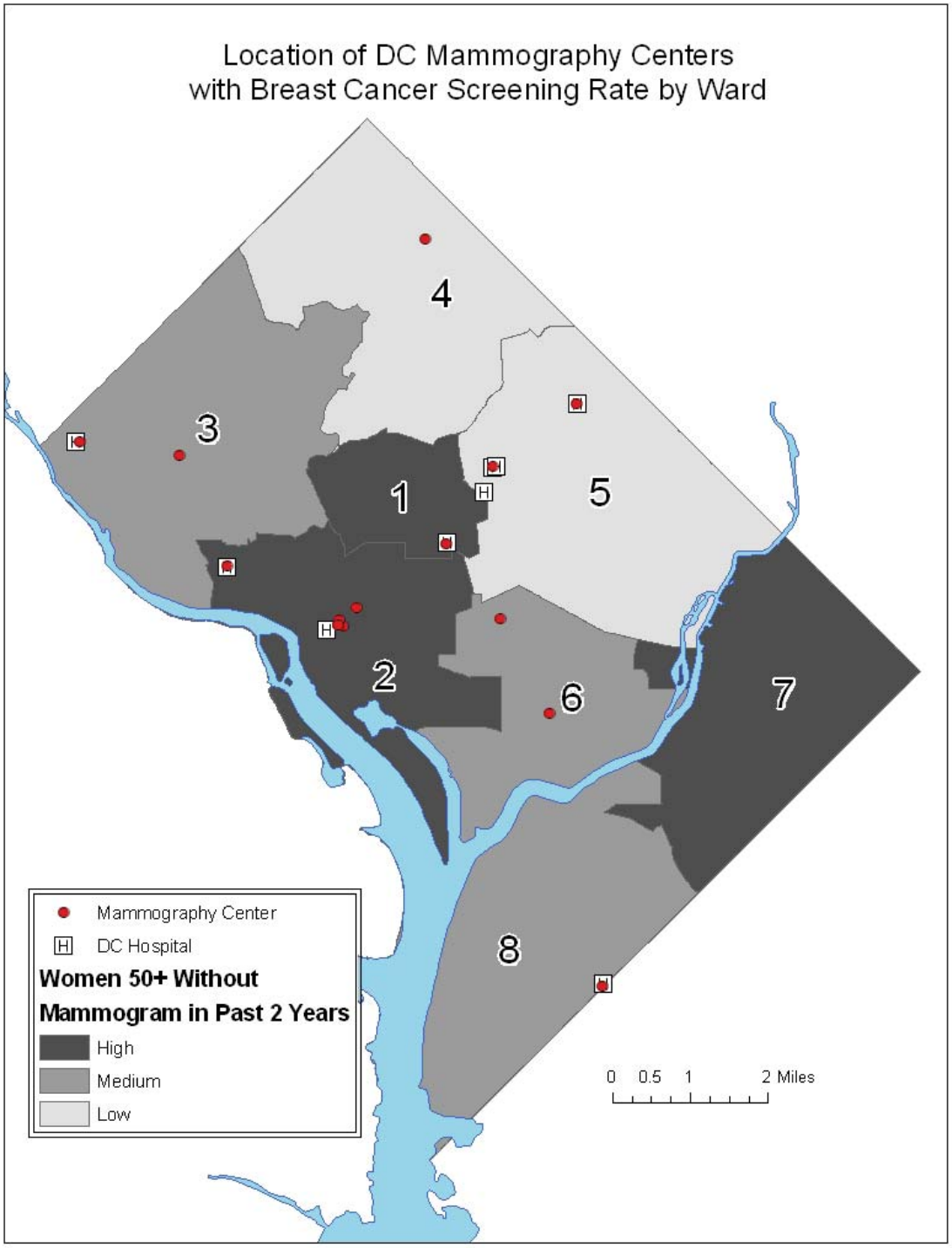
Map MA3.6:


Location of DC Hematologists/Oncologists
with Colon Cancer Incidence by Ward
4
3
1
5
2
6
7
8
Hematologist/Oncologist
DC Hospital
Colon Cancer Incidence
High
Medium
Low
0 0.5 1 2 Miles

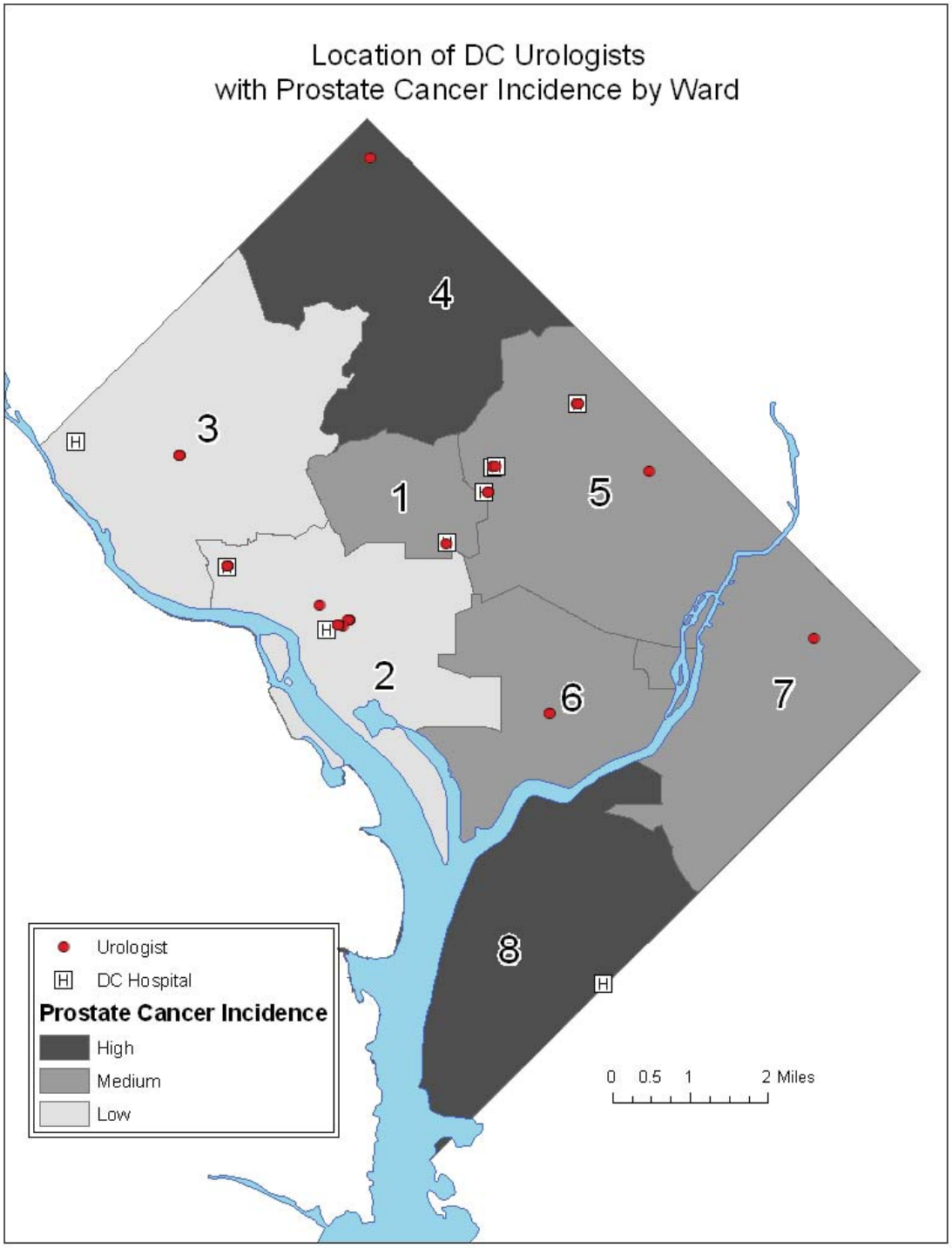
Map MA3.7:


Location of DC Mammography Centers
with Breast Cancer Incidence by Ward
4
3
1
5
2
6
7
8
Mammography Center
DC Hospital
Breast Cancer Incidence
High
Medium
Low
0 0.5 1 2 Miles

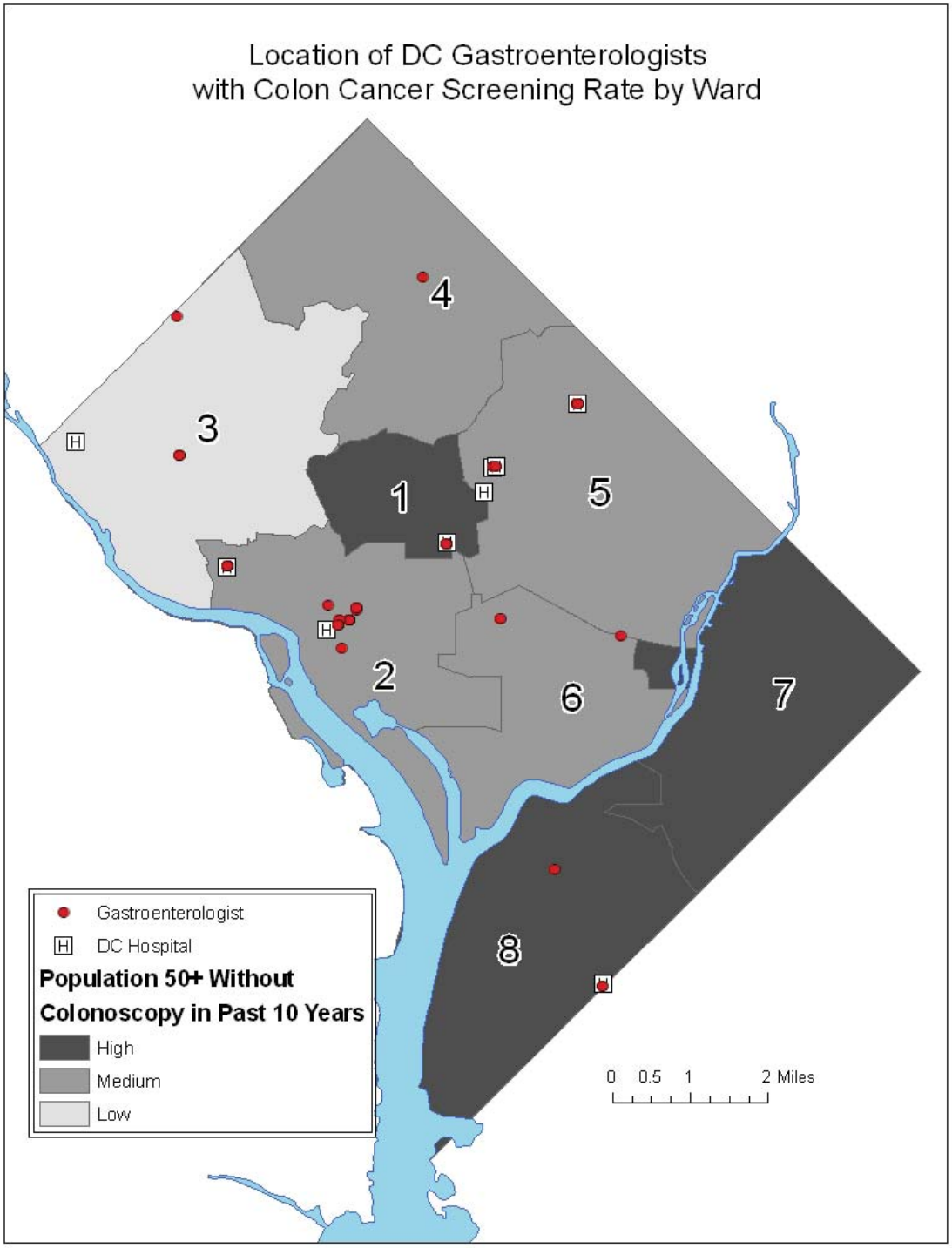
Map MA3.8:


Location of DC Mammography Centers
with Breast Cancer Screening Rate by Ward
4
3
1
5
2
6
7
8
Mammography Center
DC Hospital
Women 50+ Without
Mammogram in Past 2 Years
High
Medium
Low
0 0.5 1 2 Miles

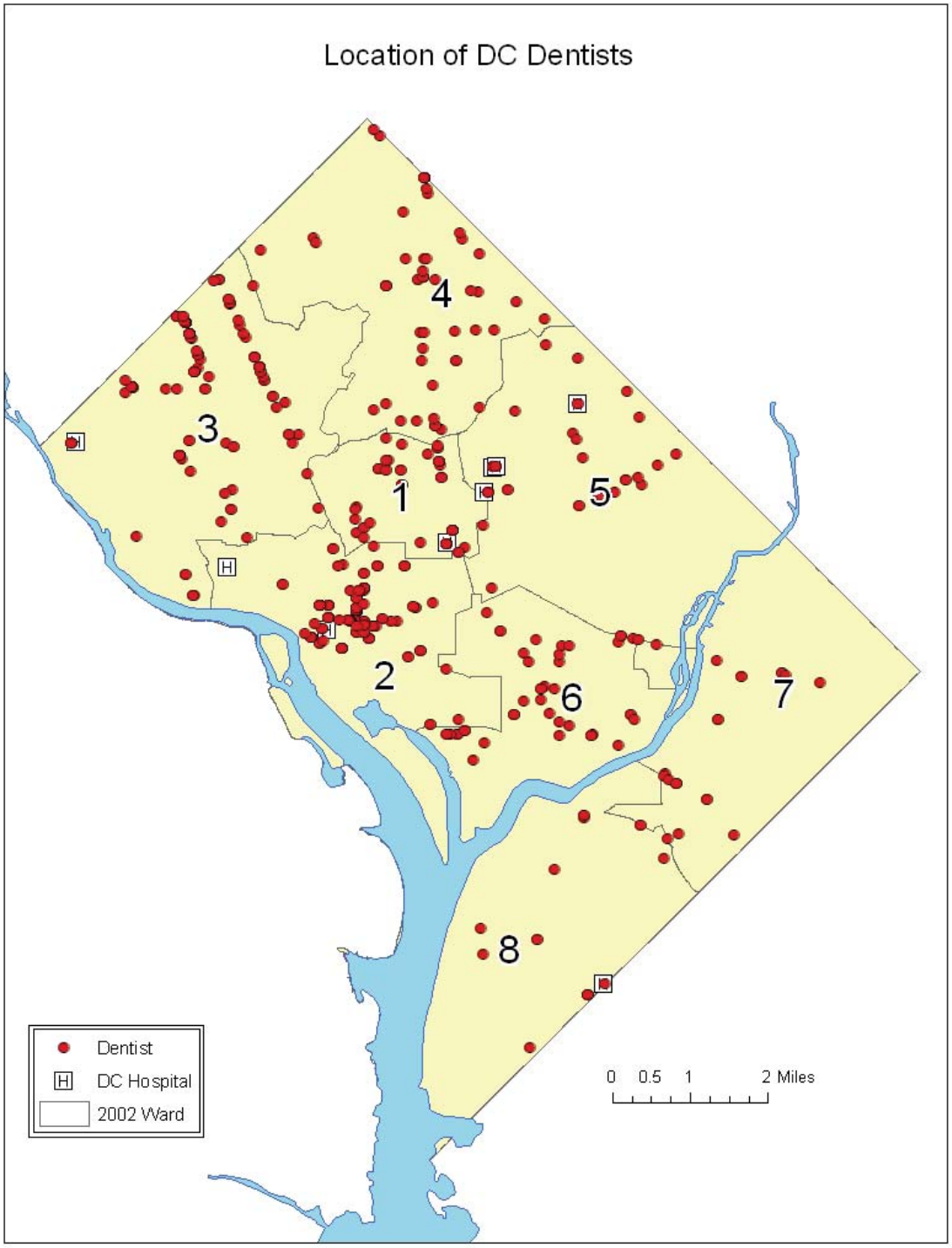
Map MA3.9:


Location of DC Urologists
with Prostate Cancer Incidence by Ward
4
3
1
5
2
6
7
8
H
Urologist
DC Hospital
Prostate Cancer Incidence
High
Medium
Low
0 0.5 1 2 Miles

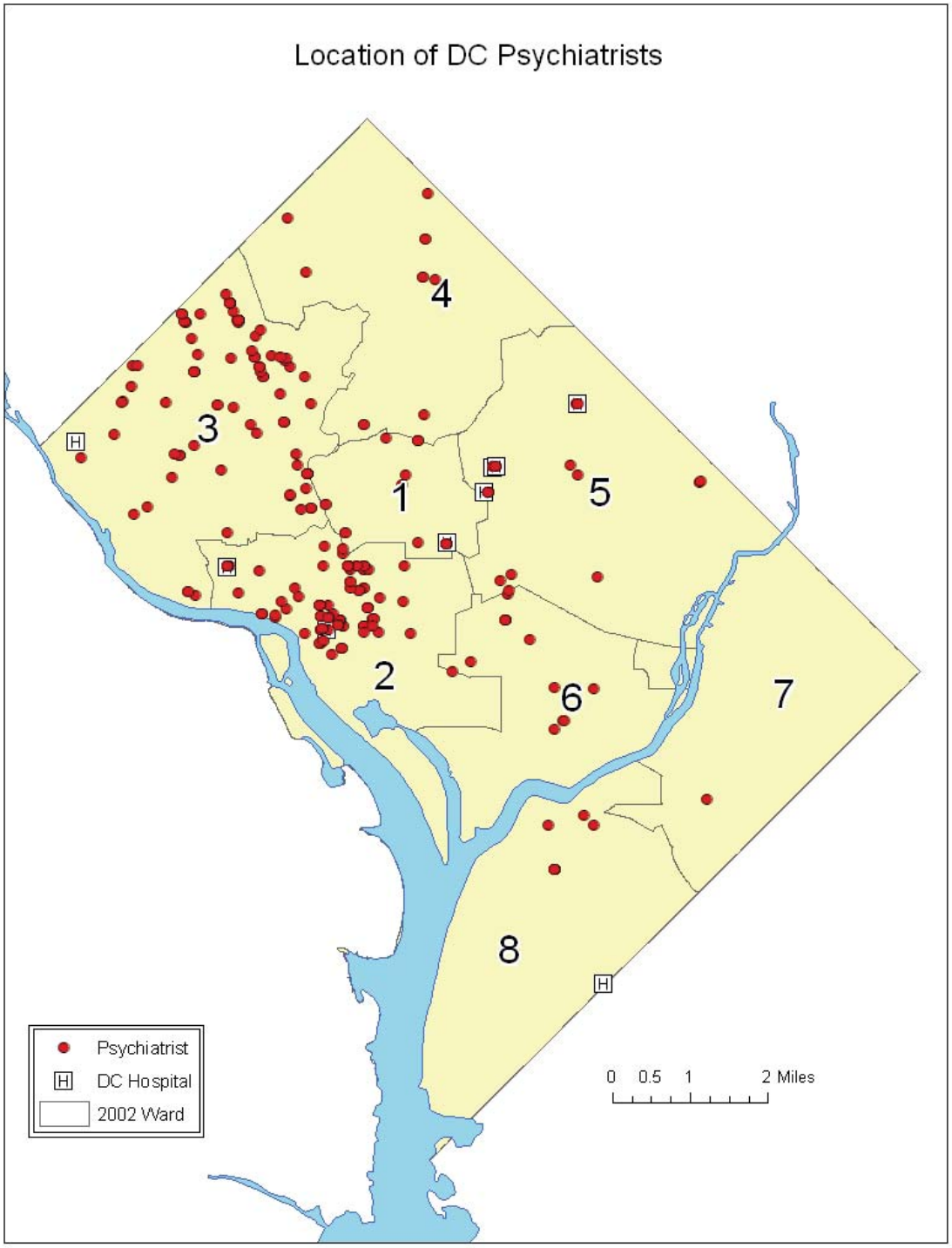
Map MA3.10:


Location of DC Gastroenterologists
with Colon Cancer Screening Rate by Ward
4
3
1
5
2
6
7
8
Gastroenterologist
DC Hospital
Population 50+ Without
Colonoscopy in Past 10 Years
High
Medium
Low
0 0.5 1 2 Miles

Map MA3.11:

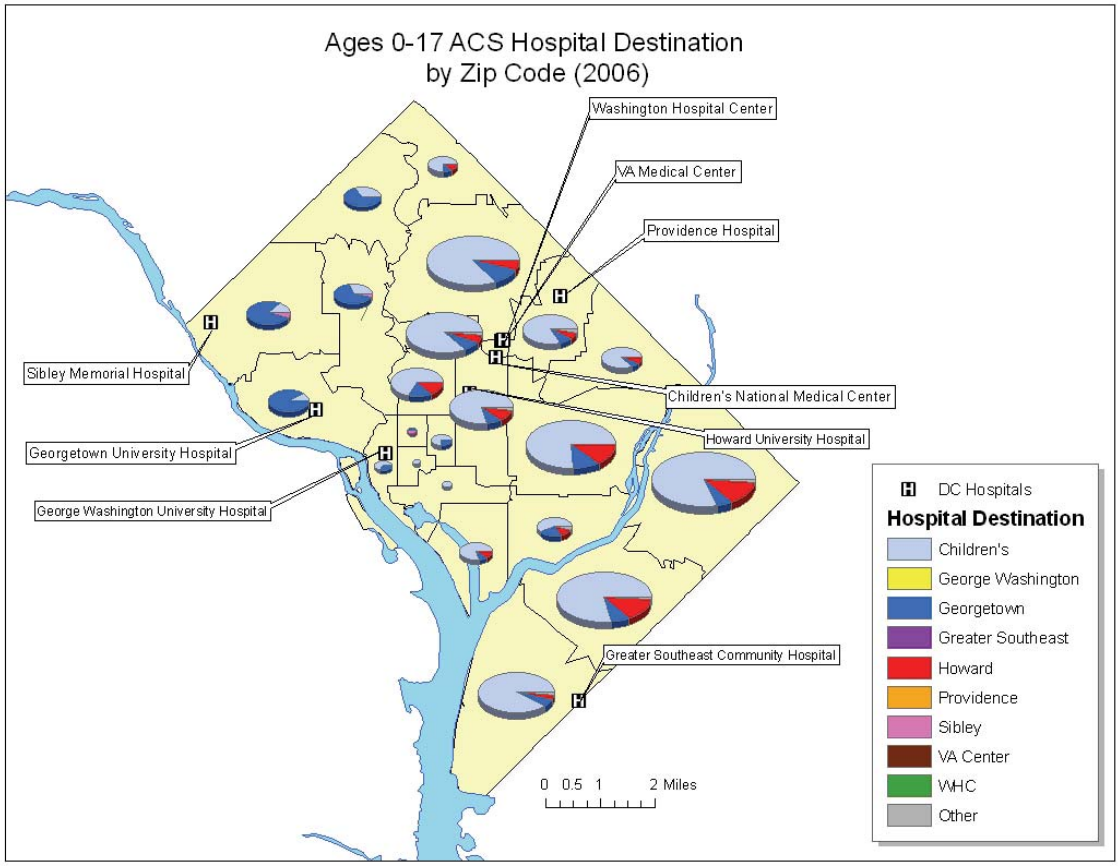

Location of DC Dentists
4
3
1
5
2
6
7
8
Dentist
DC Hospital
2002 Ward
0 0.5 1 2 Miles

Map MA3.12:

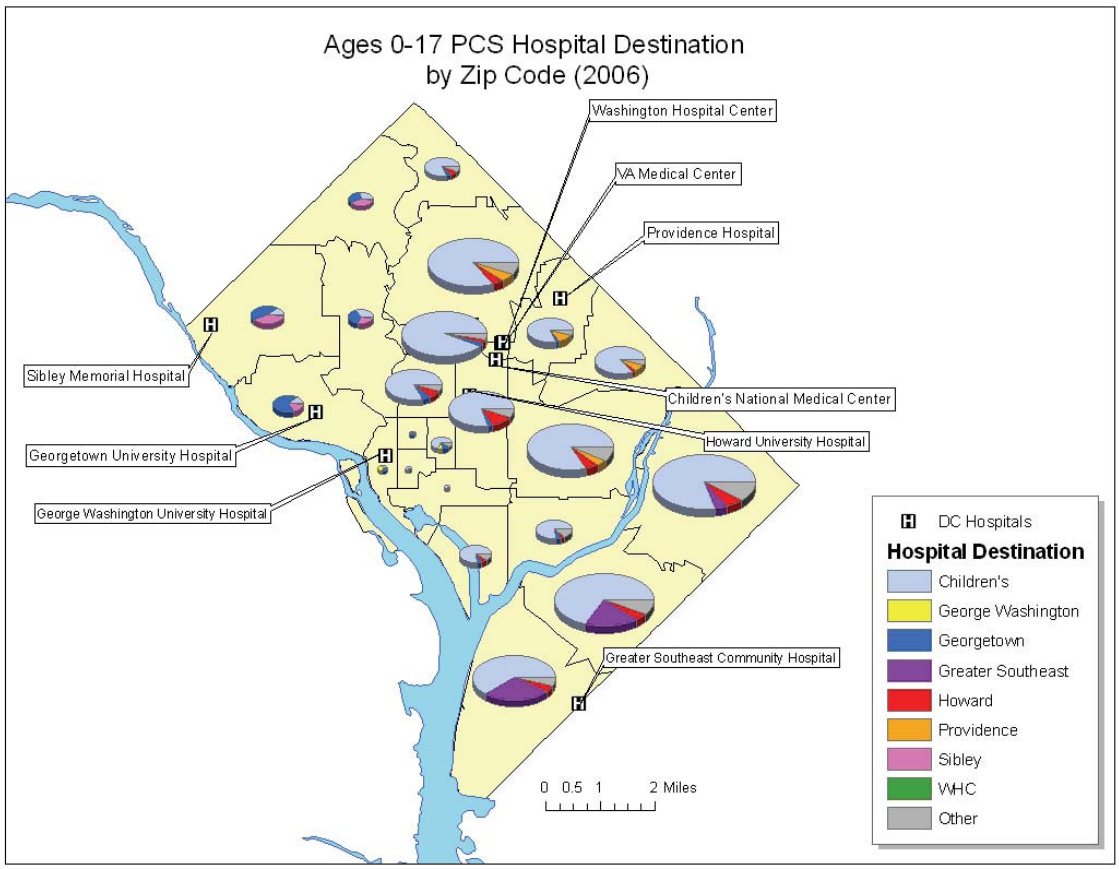

Location of DC Psychiatrists
4
3
1
5
2
6
7
8
Psychiatrist
DC Hospital
2002 Ward
0 0.5 1 2 Miles

MAP APPENDIX 4: Hospital Destination maps

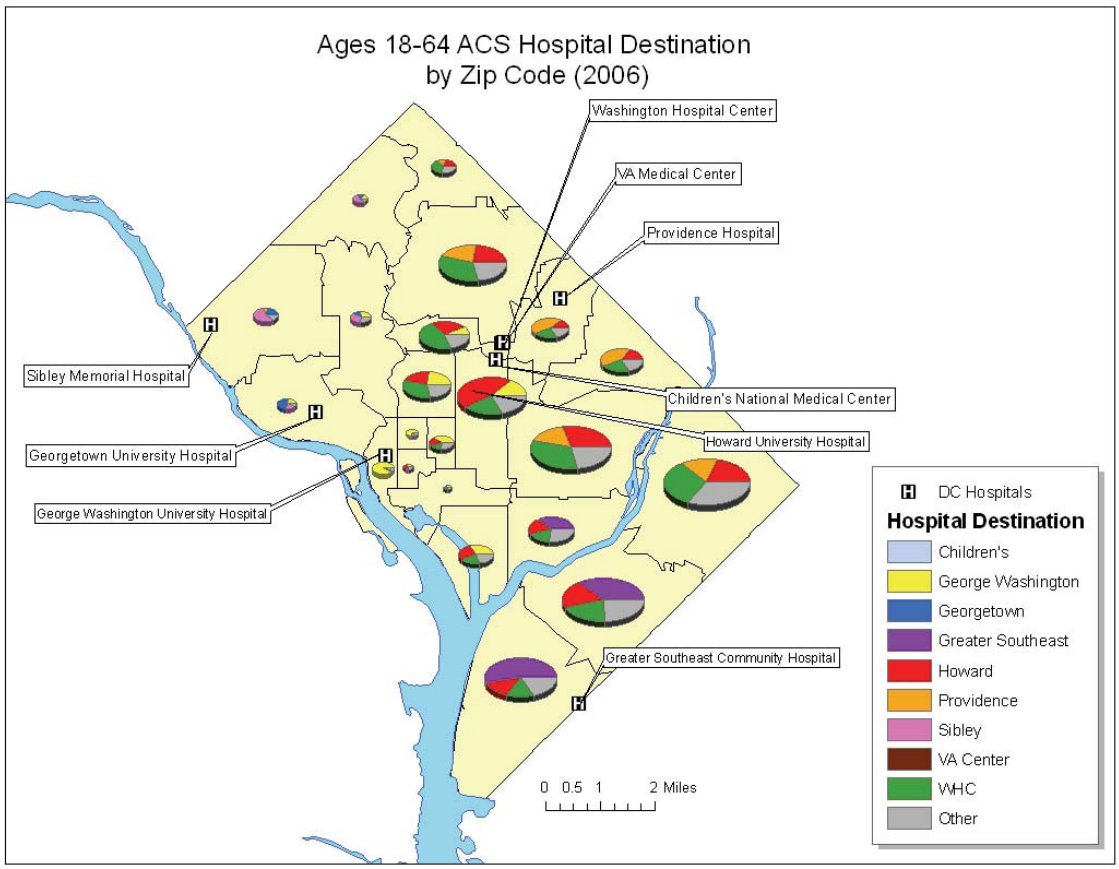
Map MA4.1:



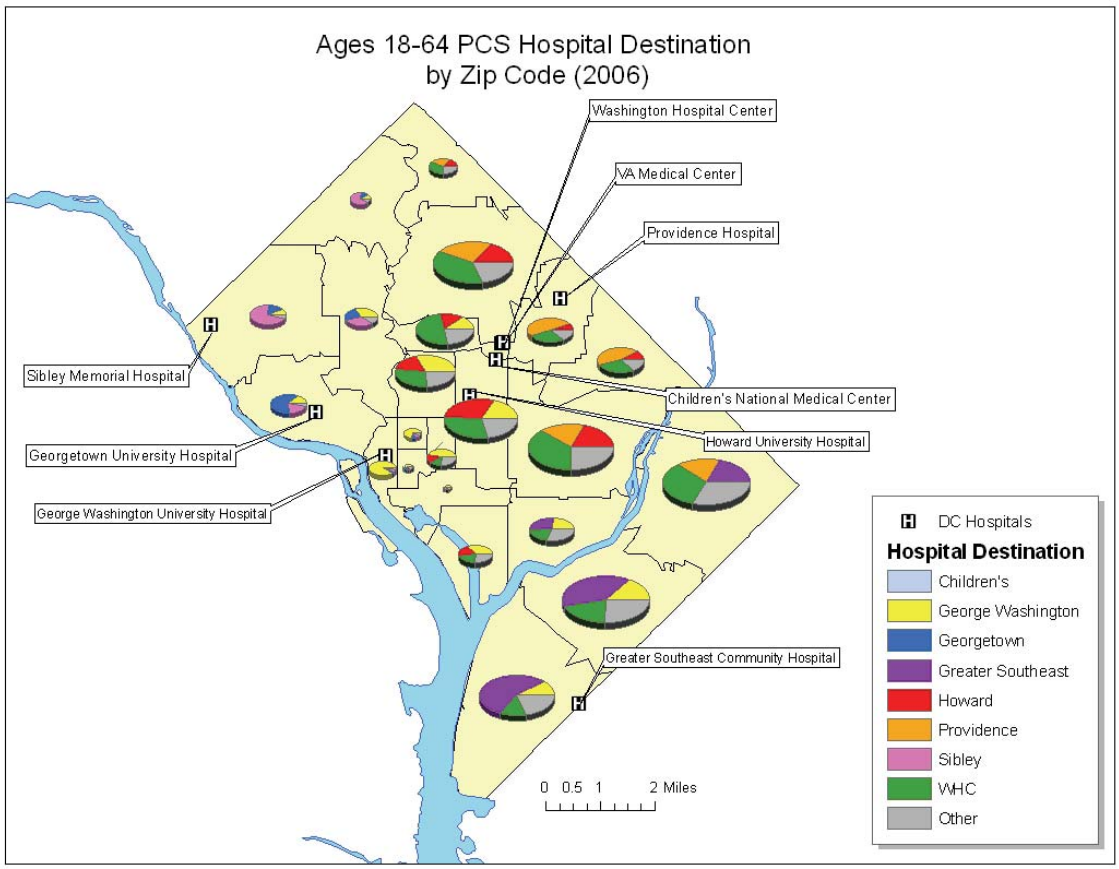
Map MA4.2:


Ages 0-17 PCS Hospital Destination
by Zip Code (2006)
Washington Hospital Center
VA Medical Center
Providence Hospital
Sibley Memorial Hospital
Children's National Medical Center
Howard University Hospital
Georgetown University Hospital
George Washington University Hospital
Greater Southeast Community Hospital
0 0.5 1 2 Miles
DC Hospitals
Hospital Destination
Children's
George Washington
Georgetown
Greater Southeast
Howard
Providence
Sibley
WHC
Other

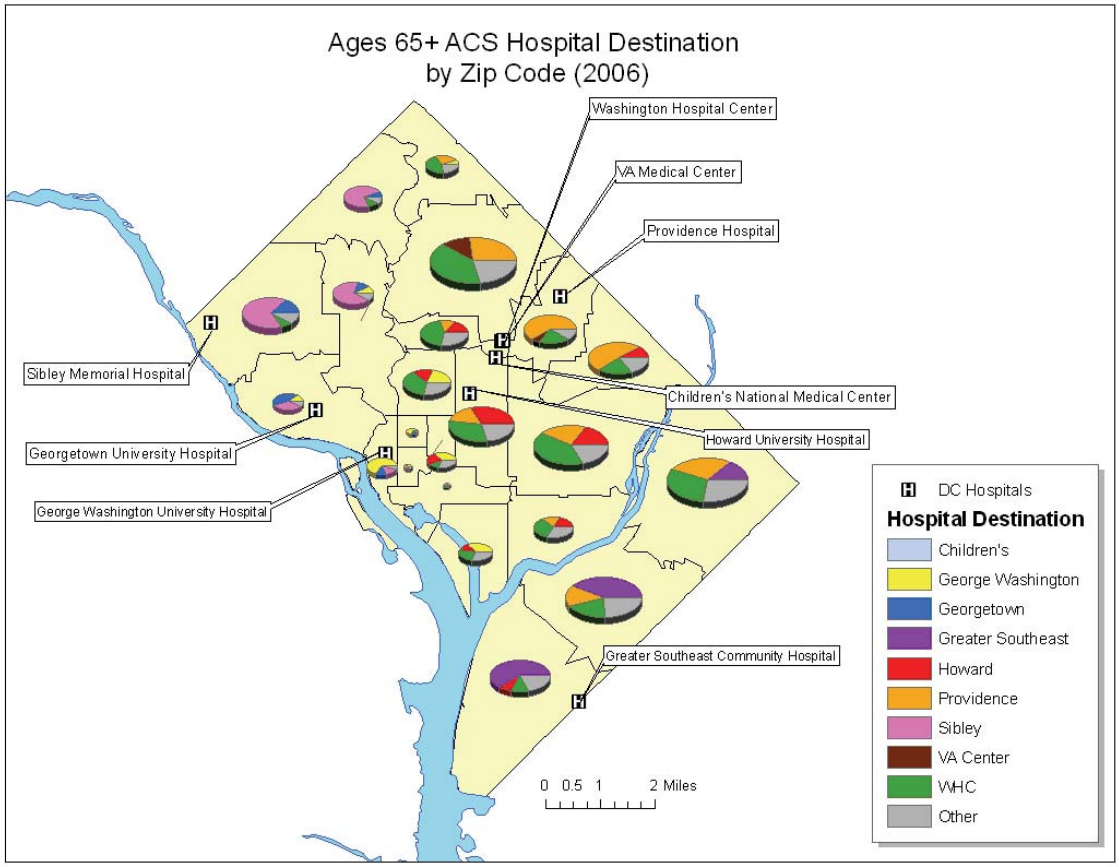
Map MA4.3:


Ages 18-64 ACS Hospital Destination
by Zip Code (2006)
Washington Hospital Center
VA Medical Center
Providence Hospital
Sibley Memorial Hospital
Children's National Medical Center
Howard University Hospital
Georgetown University Hospital
George Washington University Hospital
Greater Southeast Community Hospital
0 0.5 1 2 Miles
DC Hospitals
Hospital Destination
Children's
George Washington
Georgetown
Greater Southeast
Howard
Providence
Sibley
VA Center
WHC
Other

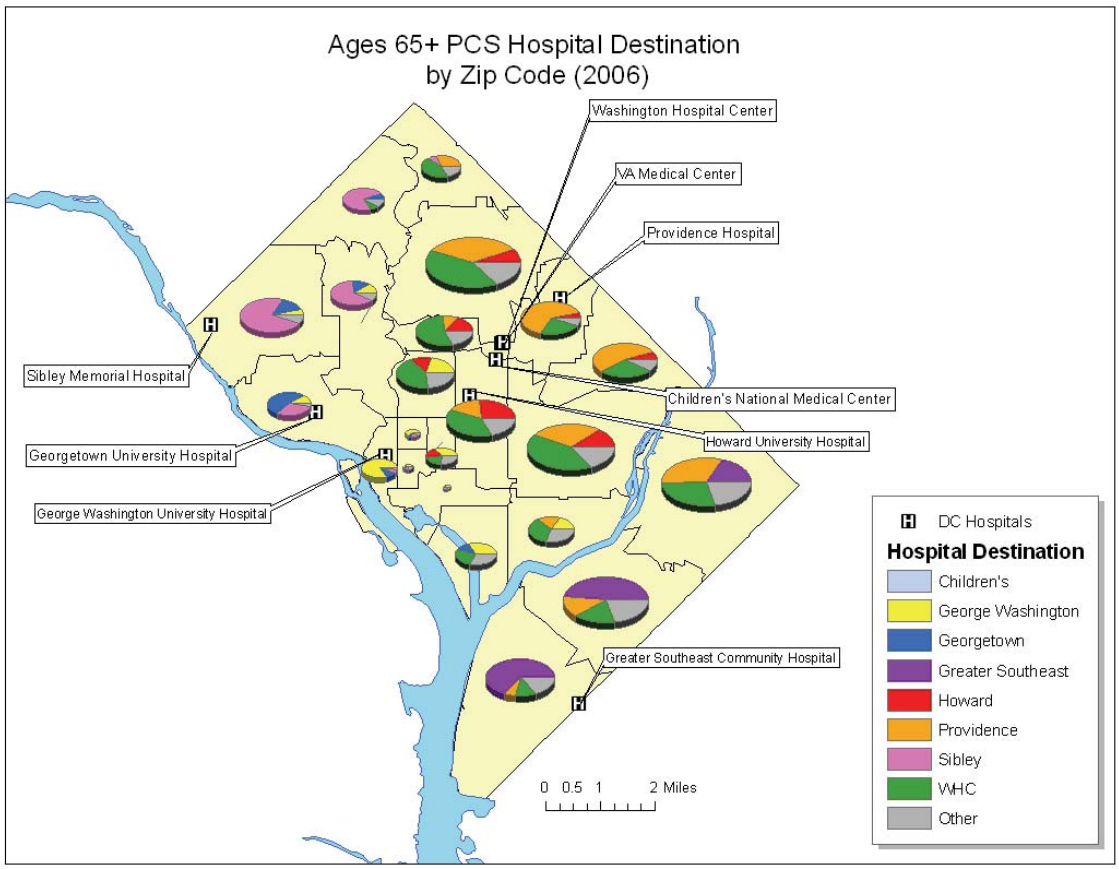
Map MA4.4:


Ages 18-64 PCS Hospital Destination
by Zip Code (2006)
Washington Hospital Center
VA Medical Center
Providence Hospital
Sibley Memorial Hospital
Children's National Medical Center
Howard University Hospital
Georgetown University Hospital
George Washington University Hospital
Greater Southeast Community Hospital
0 0.5 1 2 Miles
DC Hospitals
Hospital Destination
Children's
George Washington
Georgetown
Greater Southeast
Howard
Providence
Sibley
WHC
Other

Map MA4.5:

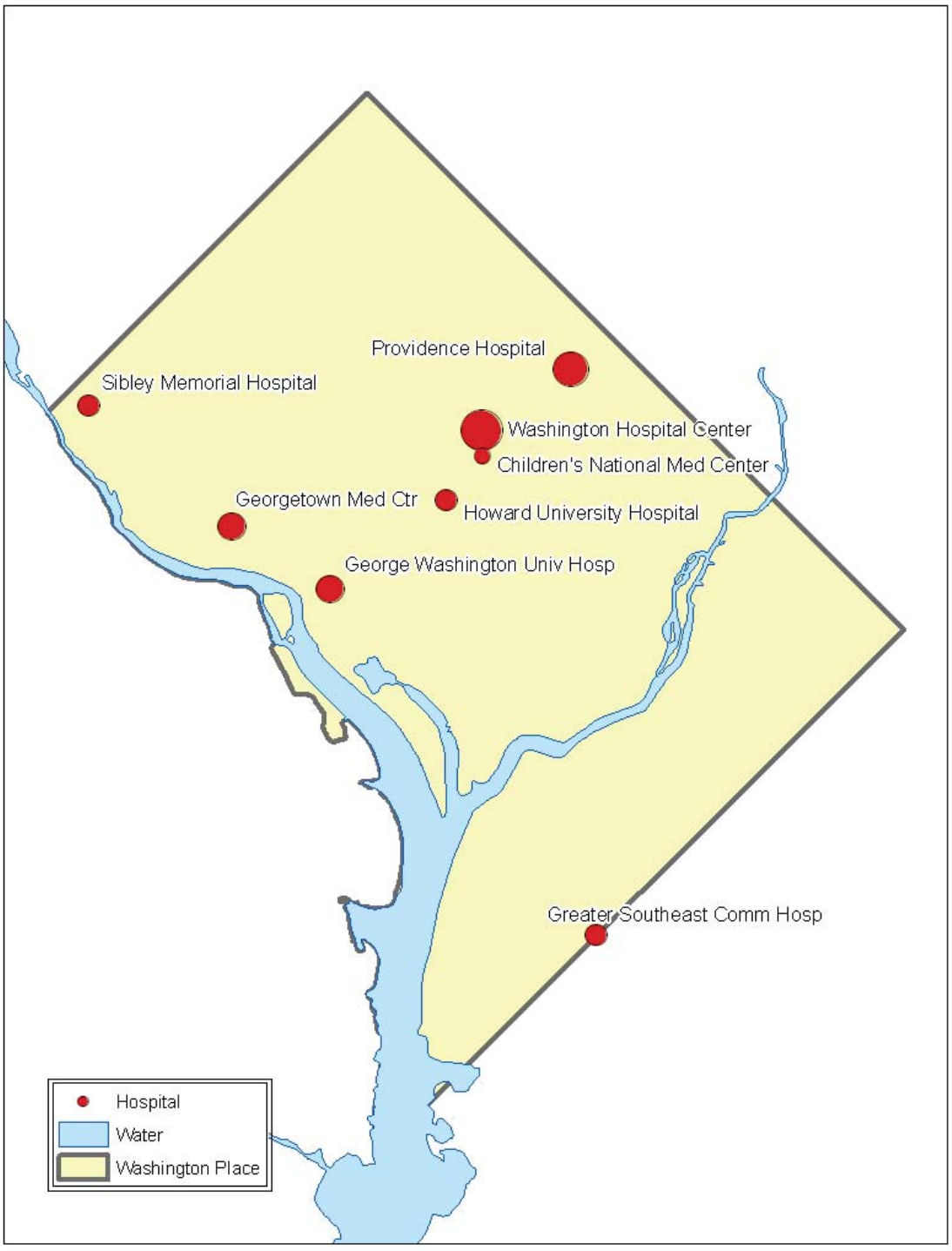

Ages 65+ ACS Hospital Destination
by Zip Code (2006)
Washington Hospital Center
VA Medical Center
Providence Hospital
Sibley Memorial Hospital
Children's National Medical Center
Howard University Hospital
Georgetown University Hospital
George Washington University Hospital
Greater Southeast Community Hospital
0 0.5 1 2 Miles
DC Hospitals
Hospital Destination
Children's
George Washington
Georgetown
Greater Southeast
Howard
Providence
Sibley
VA Center
WHC
Other

Map MA4.6:

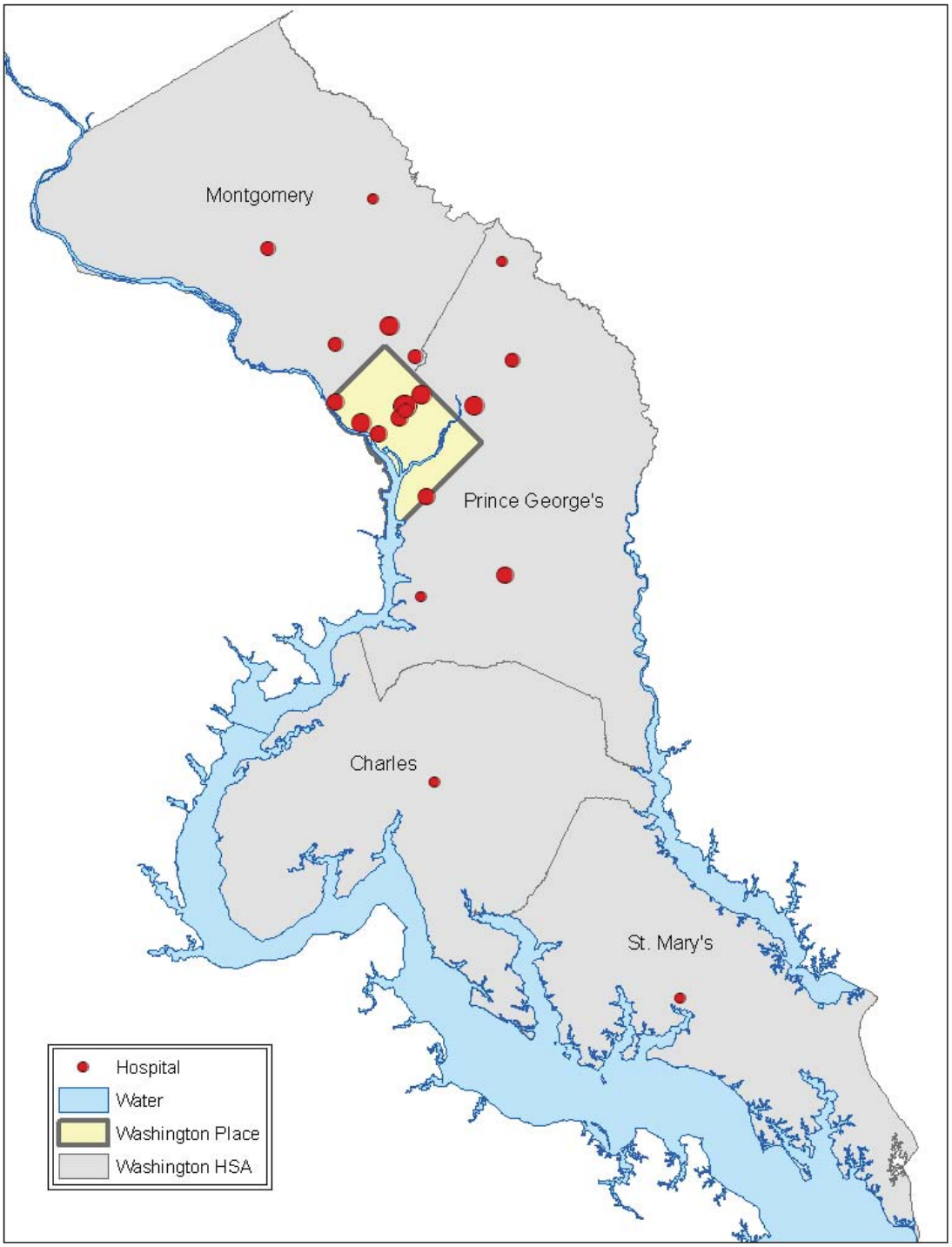

Ages 65+ PCS Hospital Destination
by Zip Code (2006)
Washington Hospital Center
VA Medical Center
Providence Hospital
Sibley Memorial Hospital
Children's National Medical Center
Howard University Hospital
Georgetown University Hospital
George Washington University Hospital
Greater Southeast Community Hospital
0 0.5 1 2 Miles
DC Hospitals
Hospital Destination
Children's
George Washington
Georgetown
Greater Southeast
Howard
Providence
Sibley
WHC
Other

MAP APPENDIX 5: Benchmark Cities

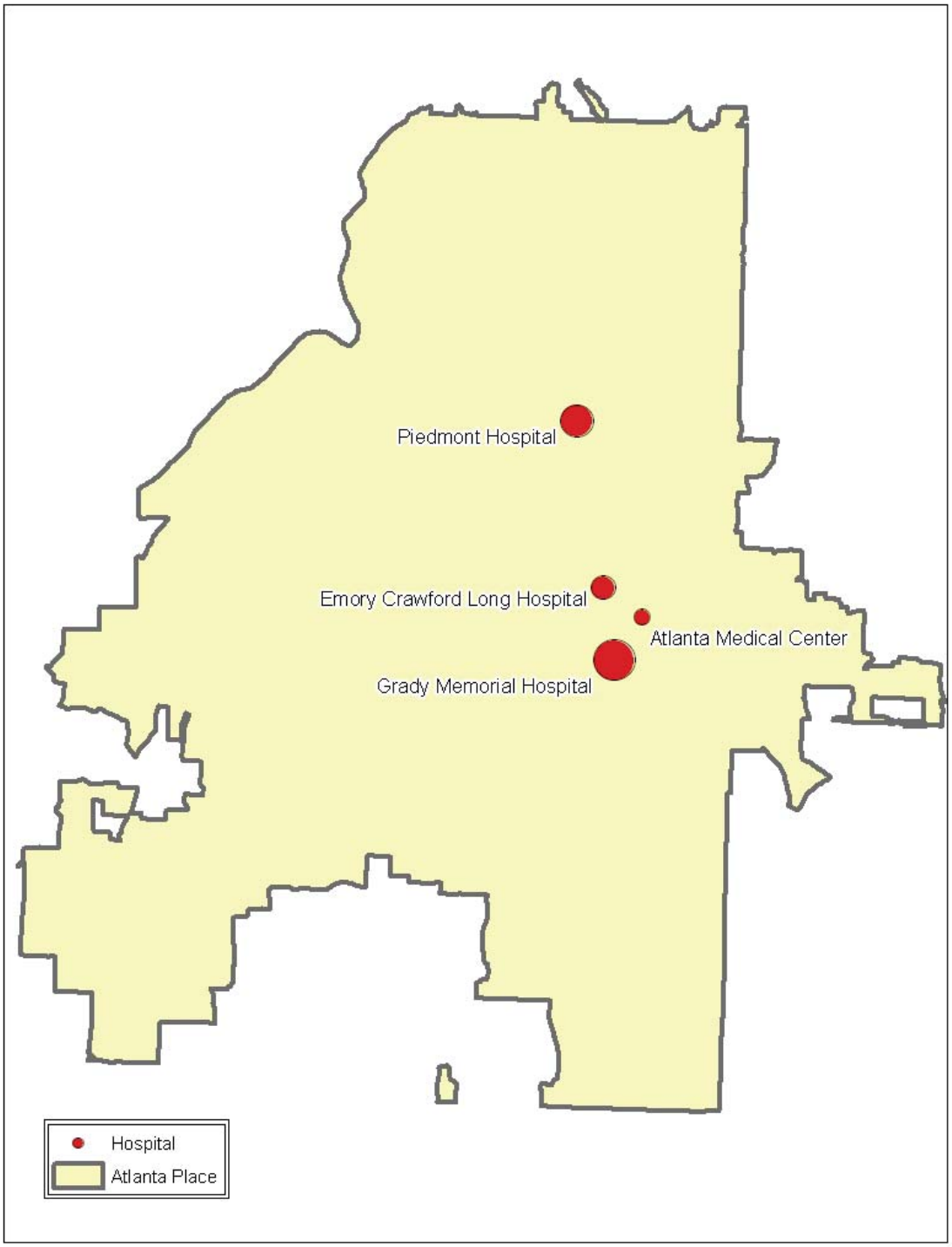
Map MA5.1: DC



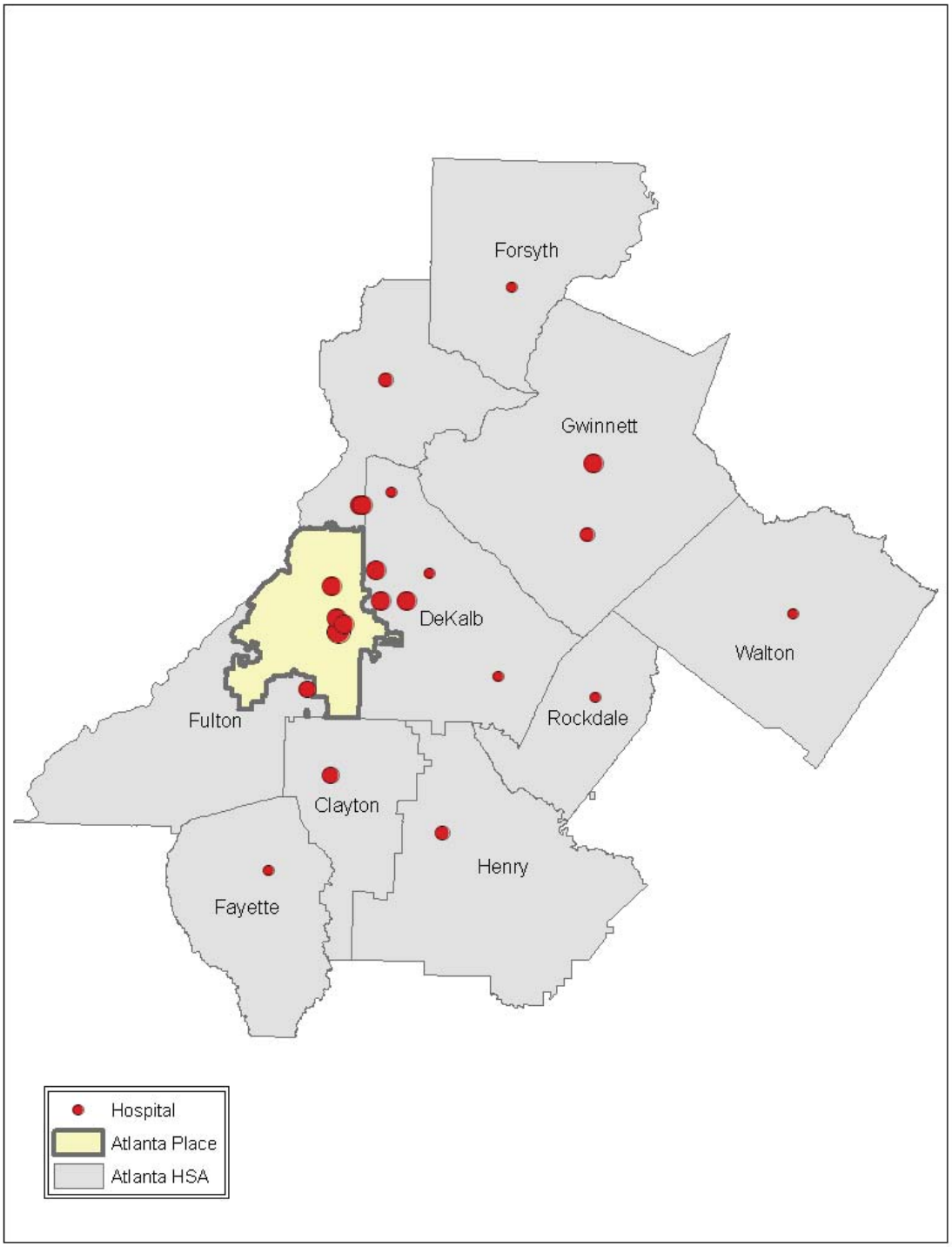
Map MA5.2: DC HSA



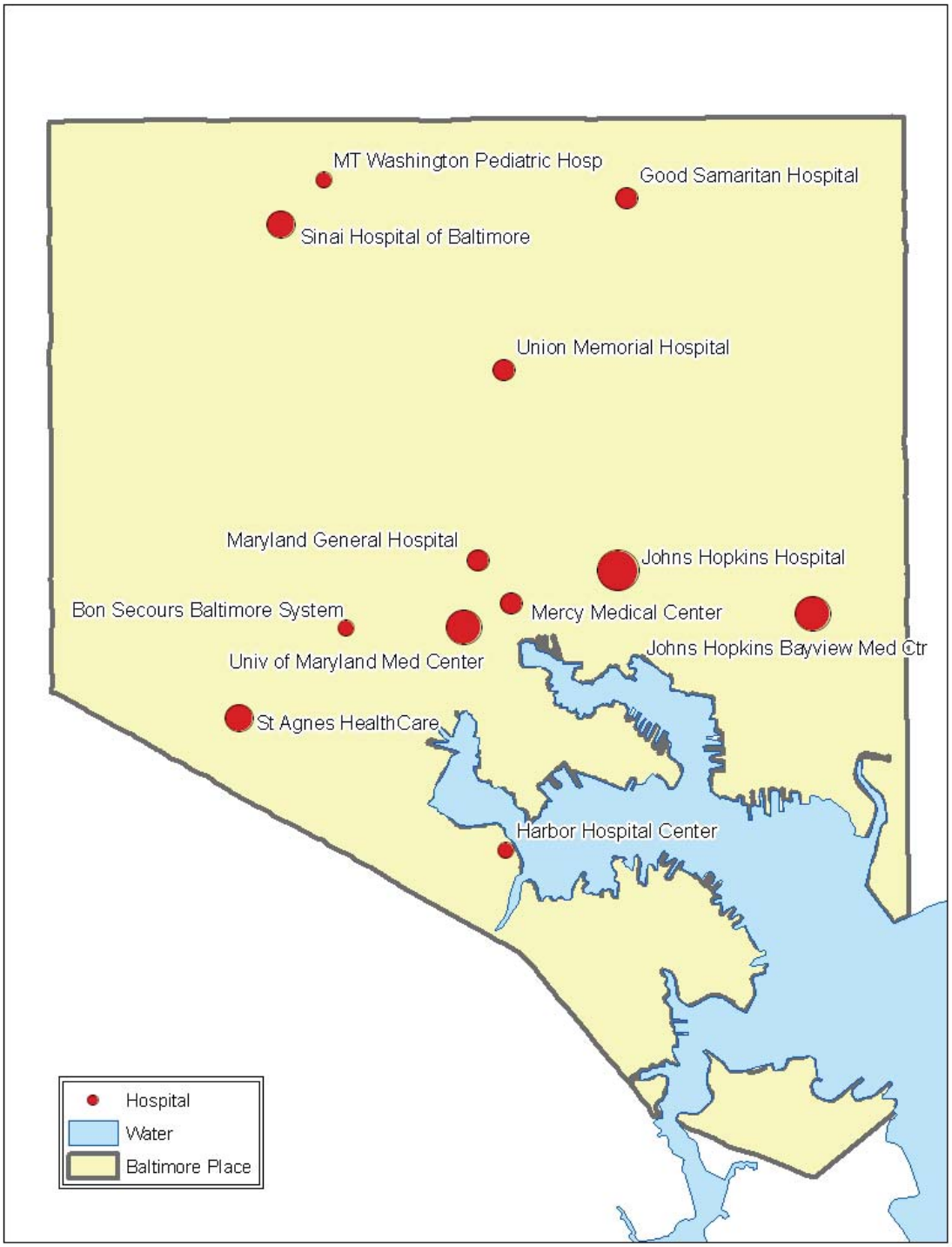
Map MA5.3: Atlanta



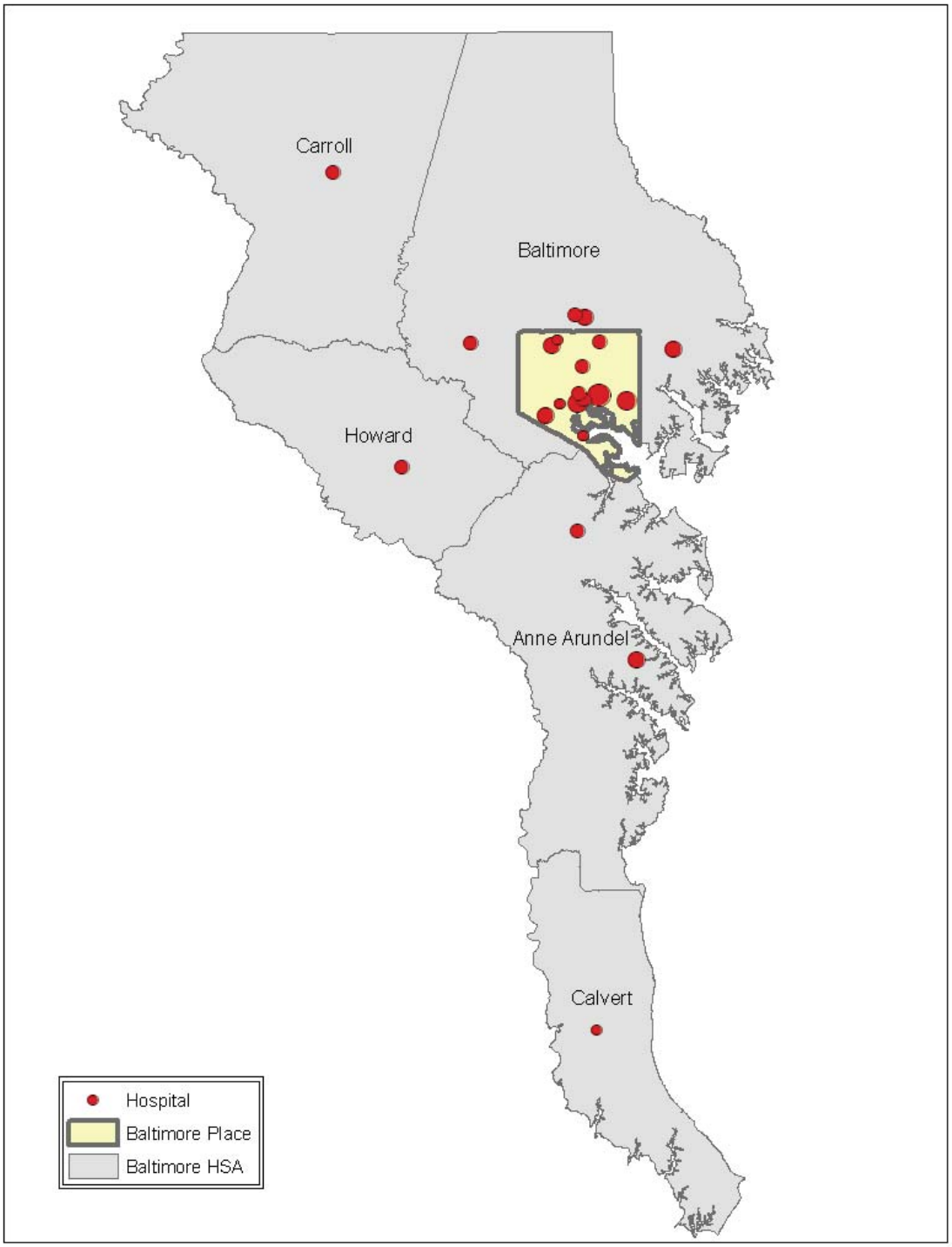
Map MA5.4: Atlanta HSA



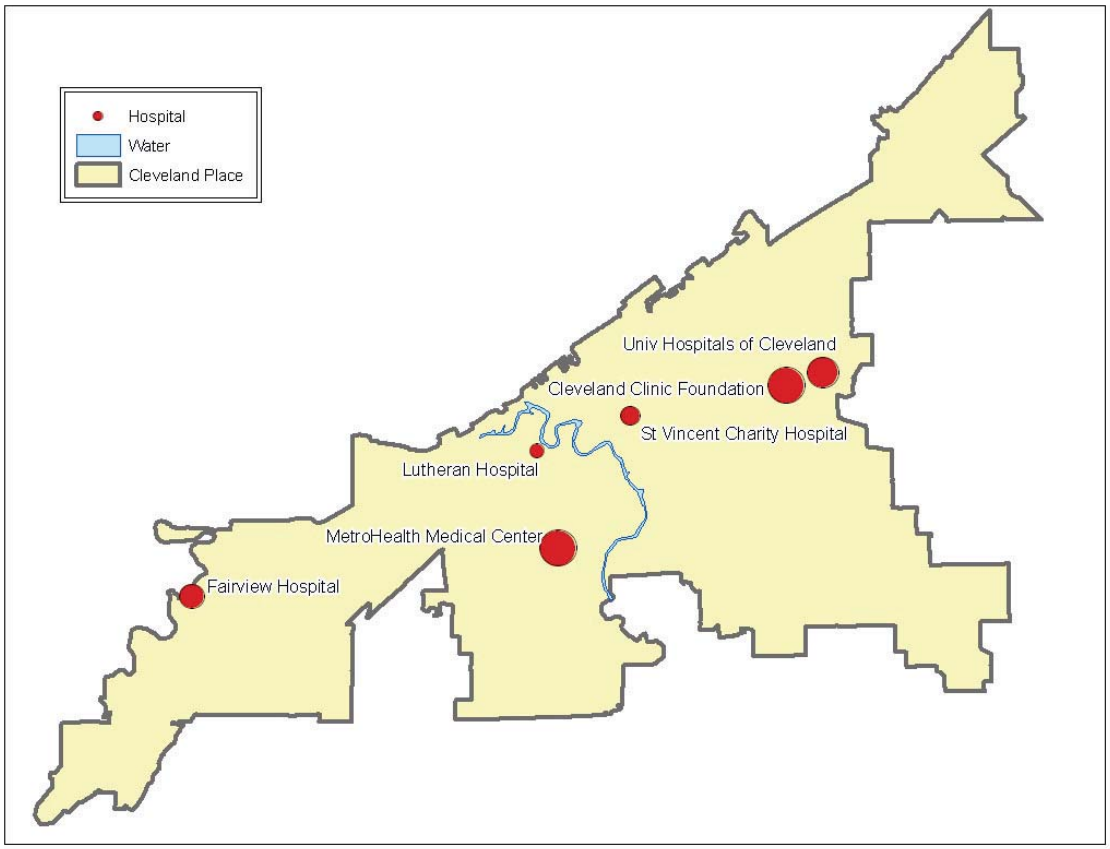
Map MA5.5: Baltimore



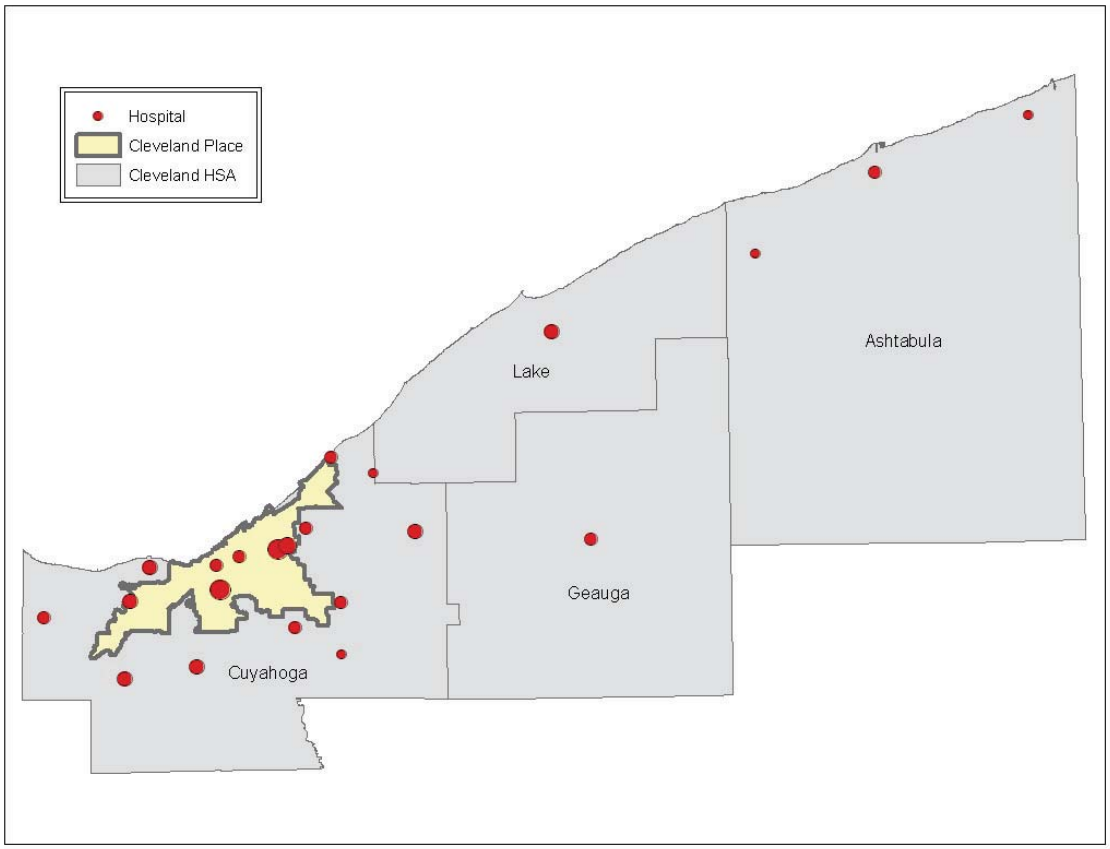
Map MA5.6: Baltimore HSA



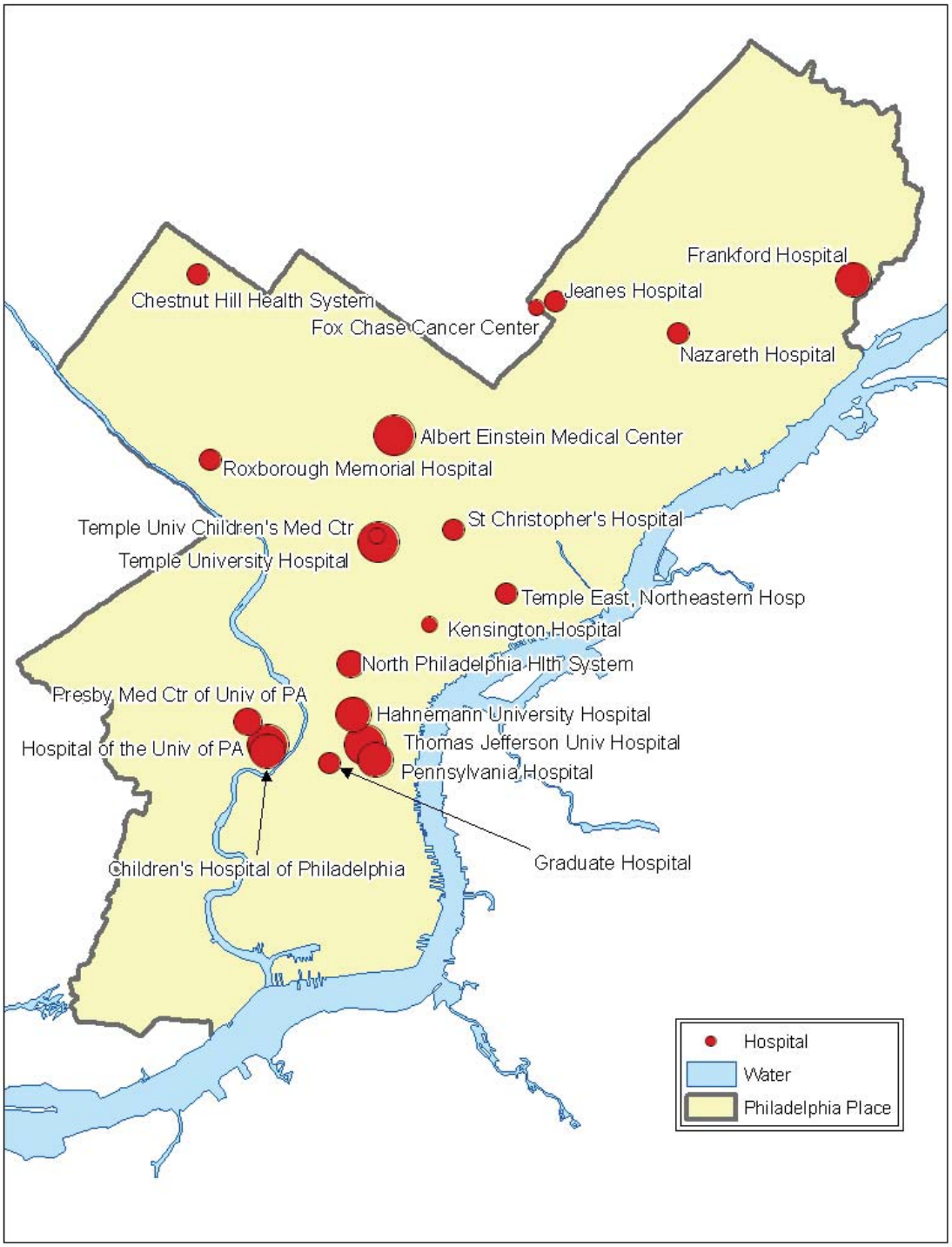
Map MA5.7: Cleveland



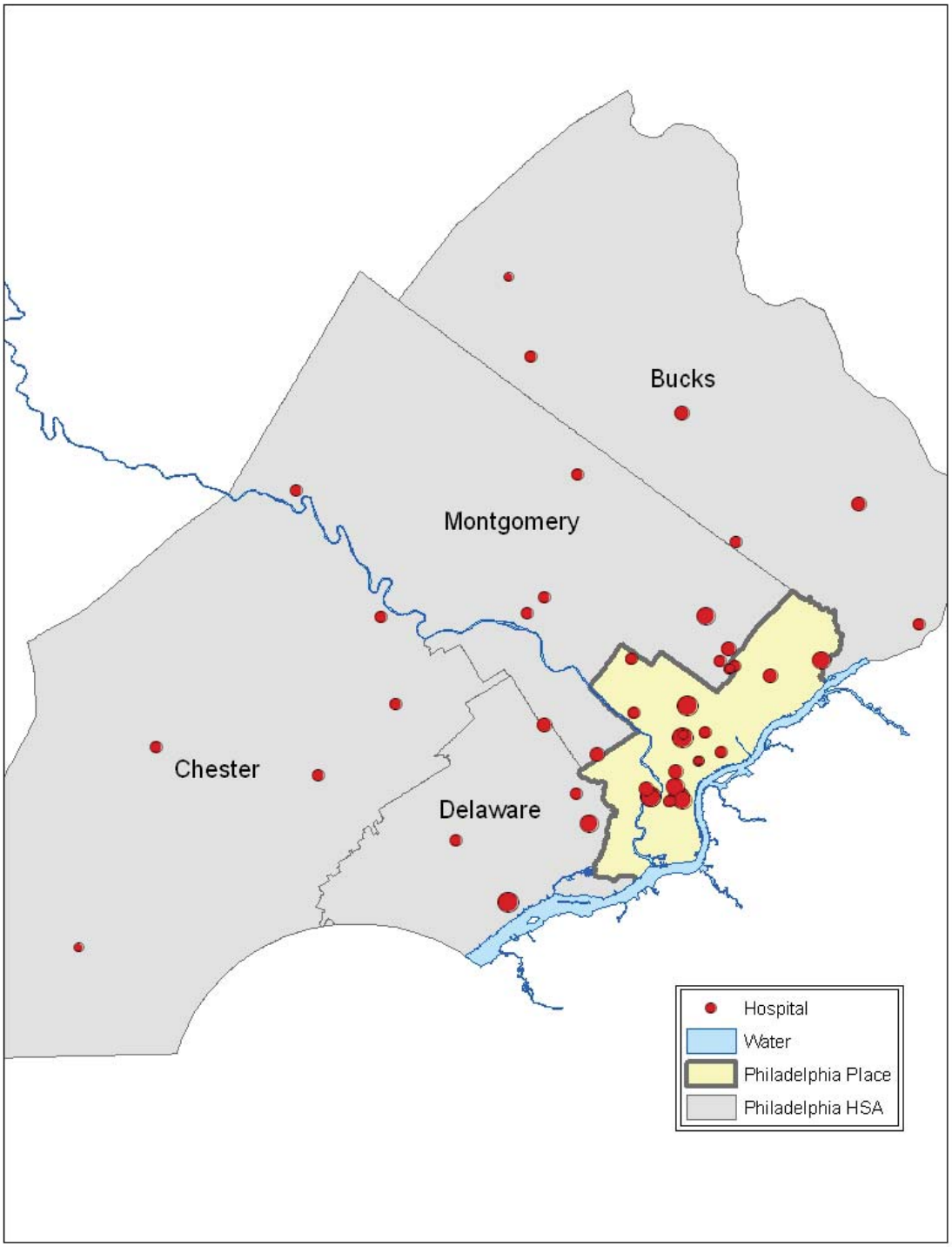
Map MA5.8: Cleveland HSA



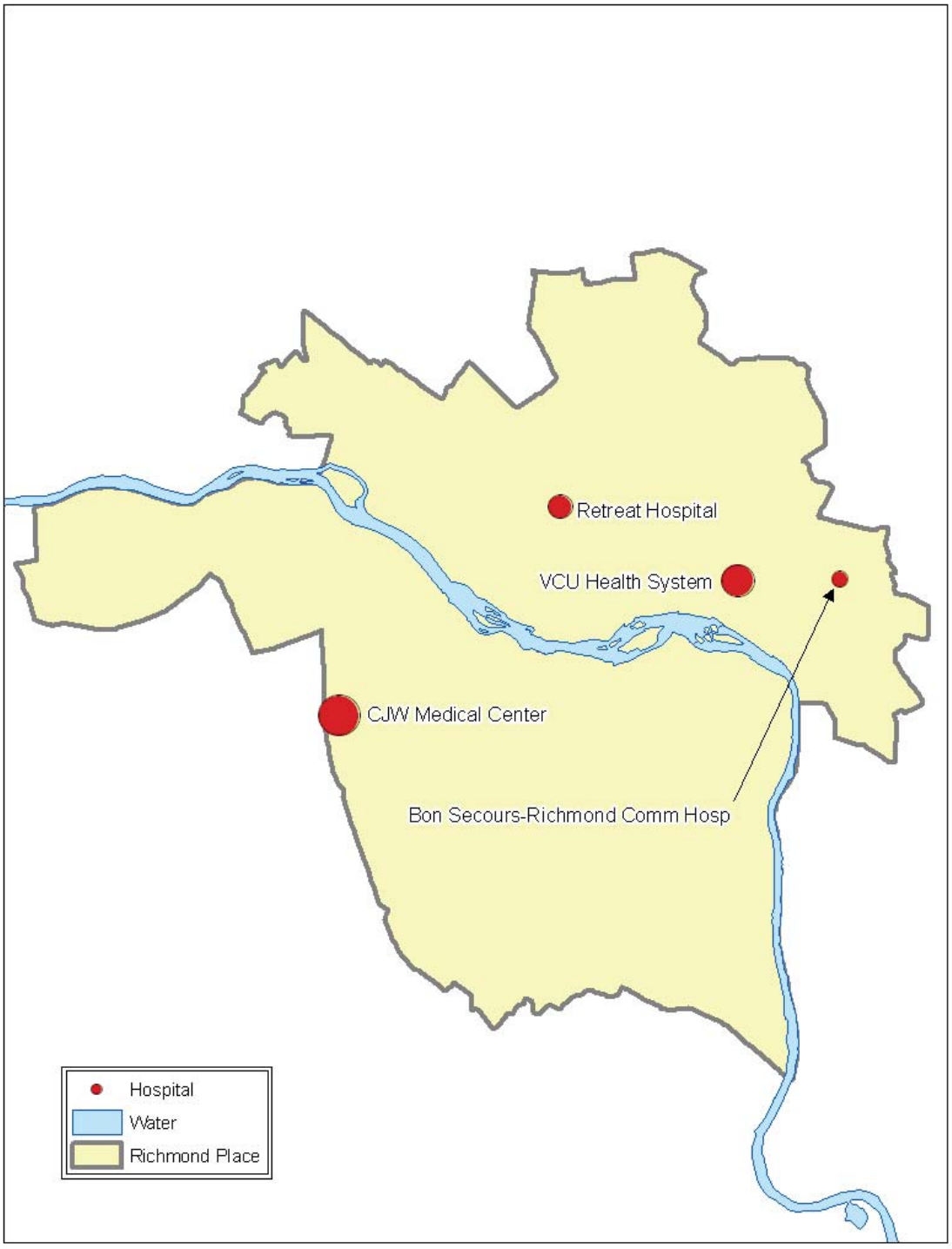
Map MA5.9: Philadelphia



Map MA5.10: Philadelphia HSA



Map MA5.11: Richmond



Map MA5.12: Richmond HSA