TRANSFORMING HEALTH IN PRINCE GEORGE'S COUNTY, MARYLAND: **A PUBLIC HEALTH IMPACT STUDY**

UNIVERSITY OF MARYLAND SCHOOL OF PUBLIC HEALTH

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SECTION II

Technical Reports and Supporting Documents

Section II of the Public Health Impact Study of Prince George's County report includes technical reports that document the methods, findings, limitations and a summary for each of the seven study components. We also include copies of the study instruments, where appropriate. While the findings of these study components formed the basis for the integrated answers to the study's five framing questions, the technical reports include more detailed data than was possible to include in Section I, and also provide insights for the study as a whole.

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TECHNICAL REPORT 1

Random Household Health Survey

Sandra Crouse Quinn, Ph.D.; Stephen B. Thomas, Ph.D.; Susan Passmore, Ph.D.

INTRODUCTION

Improving residents' health and meeting residents' health care needs are priorities of both the state of Maryland and Prince George's County. Both the state and County Health Improvement Plans include ensuring residents receive the health care they need and the prevention and control of chronic diseases among their top goals (State Health Improvement Plan, Maryland Department of Health and Human Services, n.d.; Prince George's County, 2012). Specifically, the Prince George's County Health Improvement Plan, 2011-2014, outlines a comprehensive agenda that seeks to reduce barriers to health care, reduce risk factors for leading causes of death in the County, reduce morbidity and mortality, and enhance access to care (Prince George's County, 2012). Understanding what those health care needs are, what the current health care practices and beliefs include and which chronic diseases are perceived to most affect residents is critical to achieve these goals.

Information about County residents' experiences and perceptions of the health care system within Prince George's County is lacking, yet is critical to the County's plans to design a transformative new health care system. To address this gap, the Public Health Impact Assessment is informed by a random household survey, representative of the population in Prince George's County, in order to garner community insights into health care utilization, pressing health issues and related topics. This is the first survey for the County and the state that delves into these topics. The results can help shape the development of a new ambulatory care health system that will attract an economically viable patient base and impact key health issues faced by the County's diverse population.

OVERVIEW A representative sample of 1,001 residents of Prince George's County completed the survey. The study consisted of a landline component (n=701) and a cell phone component (n=300). The survey instrument was developed by the School of Public Health (SPH) team. All sampling, data collection and subsequent weighting of data was completed by Social Science Research Solutions (SSRS).

METHODS

INSTRUMENT

The survey instrument was developed by the SPH team with input from various stakeholders. Additionally, its development was informed by a review of the Behavioral Risk Factor Surveillance Survey (CDC, 2011) and the Kaiser Family Foundation DC Health Care Access Survey (2003). Please find a copy of the instrument at the end of the technical report.

PRETESTING

The survey was pretested prior to fielding to ensure that proper wording, question sequencing and informational objectives were being met. SPH team members participated in the monitoring of pretests. Information gained through the pre-test was used in the final refinement of the survey instrument.

SAMPLE

To address concerns about coverage, the study employed a dual-frame landline/cell phone random digit dial (RDD) telephone design. The landline sample was disproportionately stratified to provide sufficient numbers of high- and low-income respondents and allow independent analysis of these groups. Table 1 shows the distribution of County households at each income level and the percent and number of interviews allocated to each stratum as targets for the landline sample plan. Table 2 shows the actual number and allocation of interviews after data collection. All samples were generated by SSRS's sister company, Marketing Systems Group (MSG).

The RDD landline sample was drawn from telephone exchanges within Prince George's County. Following generation, the landline sample was prepared using MSG's proprietary procedures that not only limit sample to non-zero banks, but also identify and eliminate approximately 90 percent of all non-working and business numbers and ported cell phones. For the RDD cell phone sample, numbers were initially drawn from the three switch-points (central routing mechanisms that send cell phone calls to different parts of the country) located in the County. Additional analyses were conducted through the Telcordia database that identified telephone numbers in blocks of 1,000 connected with switch-points outside of the County that are in fact routed to households within the County. These blocks were also included in the sample file. Furthermore, specific 100 blocks of cell phone numbers that were found to route specifically to the County were oversampled, since the incidence of finding households that are actually located in the County from the initial sample selected was quite low.

TABLE 1 LANDLINE SAMPLE PLAN WITH STRATIFICATION BY INCOME

Strata	Population	% of Households	Allocation of Interviews	Total Interviews
Low Income (<35K)	69,478	24%	48%	334
Medium Income (35K-100K)	158,592	55%	20%	138
High Income (>100K)	63,101	22%	33%	228
Total	**291,171**	**100%**	**100%**	**700**

TABLE 2
FINAL DISTRIBUTION OF LANDLINE COMPLETES BY STRATUM

Strata	Actual Percent of Total LL Interviews	Actual Number of Interviews
Low Income (<35K)	35%	248
Medium Income (35K-100K)	19%	131
High Income (>100K)	46%	322
Total	100%	701

DATA COLLECTION

The field period for this study was Jan. 30 through March 4, 2012. All interviews were done through the Computer-assisted telephone interviewing(CATI) system. The CATI system ensured that questions followed logical skip patterns and that complete dispositions of all call attempts were recorded. The SPH secured access to a University of Maryland telephone number for SSRS in order to increase the likelihood that residents would respond to the call.

Both landline and cell phone respondents were screened for being residents of Prince George's County. Respondents who either did not live in Prince George's County or who did not know or refused to give their County of residence and ZIP code were eliminated from the process. In order to maximize survey response, SSRS enacted the following procedures during the field period:

- An average of five follow-up attempts were made to contact non-responsive numbers (no answer, busy, answering machine).

- Each non-responsive number was contacted multiple times, varying the times of day, and the days of the week that call-backs were placed using a programmed differential call rule.
- Sample rested for one to two weeks between the first four call attempts and the last two attempts.
- Sample rested for one to two weeks between an initial refusal and a refusal conversion attempt.
- Interviewing staff was limited to the top tier of interviewers, resulting in a slower but more productive field period.
- Respondents were offered the option to set a schedule for a call back.
- Every refusal received one refusal conversion attempt from an experienced interviewer.

TABLE 3 COMPARISON OF BENCHMARK DATA, UNWEIGHTED SAMPLE AND WEIGHTED SAMPLE

Parameter	Value Label	Benchmark*	Unweighted*	Weighted*
Education	Less than High School	13.9%	4.4%	9.5%
	High School Graduate	28.4%	22.8%	28.9%
	Some College	30.5%	32.5%	31.9%
	College+	27.1%	40.3%	29.6%
Gender	Male	47.3%	40.9%	46.7%
	Female	52.7%	59.1%	53.3%
Age	18-29	21.6%	14.8%	21.2%
	30-49	40.6%	29.6%	39.5%
	50-64	25.0%	33.7%	26.0%
	65+	12.3%	21.5%	12.7%
Race	White	18.3%	24.5%	17.5%
	Black (non-Hispanic)	63.6%	60.6%	64.5%
	Hispanic	11.4%	6.9%	10.7%
	Other (non-Hispanic)	4.4%	5.6%	4.7%
Phone Use	Cell phone only	29.9%	10.2%	28.7%
	Not Cell Phone Only	69.7%	89.3%	70.8%

* Percentages may not add to 100 percent to account for cases where respondents refused to provide this demographic information.

WEIGHTING

The final data were weighted to correct for variance in the likelihood of selection for a given case and to balance the sample to known population parameters in order to correct for systematic under- or over-representation of meaningful social categories. Survey data were weighted to census population figures using the American Community Survey (ACS) totals. The ACS provides data for areas down to the PUMA (Public Use Microdata Area) level. Although PUMAs do not overlap perfectly with the boundaries of Prince George's County, we included data in weighting targets from any PUMAs that had any significant portion within the borders of the County.

Phone use (cell phone only, dual users and landline only) was modeled by averaging two techniques for assessing cell phone use at the County level. First, we utilized the same procedure used by the National Health Interview Survey to estimate phone use at the state level. Specifically, a logistic regression was run within National Health Interview Survey data, predicting these three phone-use types separately. Then, Claritas and ACS estimates of the district were utilized to solve the regression equation for Prince George's County specifically. As well, Marketing Systems Group is beta testing their own model of phone use, and they provided us with the percent cell phone-only for the County based on their model. Overall, we found that 30.2 percent of Prince George's County households are cell phone-only, compared to only 12 percent that are landline-only.

The weighting procedure involved the following steps:

1. **PHONE-STATUS CORRECTION (WPS)** Respondents whose household members answer both landlines and cell phones have a higher likelihood of inclusion in the sample. To correct for this, cases from dual-frame

TABLE 4 SAMPLE DISPOSITIONS

	LL	Cell	Total
Eligible, Interview (Category 1)			
Complete	701	300	1,001
Eligible, non-interview (Category 2)			
Refusal (Eligible)	1,067	614	1,681
Physically or mentally unable	11	5	16
Language problem	50	119	169
Unknown eligibility, non-interview (Category 3)			
Always busy	358	34	392
No answer	367	126	493
Answering machine	2,078	1,223	3,301
Call blocking	1	7	8
Technical phone problems	23	16	39
No screener completed	3	0	3
Not eligible (Category 4)			
Fax/data line	612	71	683
Non-working number	11,357	2,716	14,073
Business, government office, other organizations	882	414	1,296
No eligible respondent	95	1,572	1,667
Total phone numbers used	**17,605**	**7,217**	**24,822**

households were assigned a weight equal to half the weight assigned to single-mode households.

2. **WITHIN HOUSEHOLD SELECTION CORRECTION (WHC)** To correct for the fact that only one qualifying adult was selected in any given household, landline cases from households with a single qualifying adult received a weight of one, and those with two or more received a weight of two. Respondents with missing data were assigned the mean weight. Cell phone respondents received a weight of one, as there was no within-household selection on the cell phones.

3. **STRATIFICATION CORRECTION (WST)** The sample was weighted to correct for the disproportionality in the stratification plan. The correction adjusts for the fact that households in the high- and low-income strata were sampled at rates higher than their proportion of the population, and households in the middle-income stratum were sampled at a rate lower than their percent of the population. To adjust for this, data are weighted back to their actual population proportions.

The product of these three stages was the base weight for the sample:

$$BW = W_{PS} \times W_{HC} \times W_{ST}$$

4. **POST-STRATIFICATION WEIGHTING:** The base weight was used as a balancing weight in the iterative proportionate fitting (IPF) process, or "raking." Universe counts were attained—through the procedure described earlier—for age, educational attainment, gender, phone use and race.

We also included a target for population density in the post-stratification weighting. We used self-reported ZIP code to determine the population density (total population divided by total land area in square miles) for the ZIP codes in which the respondent lives and then the ZIP codes are ranked to recode the density variable into quintiles,where 1 equals lowest density and 5 equals highest density. Following the raking stage, the weights were truncated ("trimmed") to control the variance created by the weight and avoid having a small number of cases that affect the data too strongly. The final weights were trimmed to range from 0.25 to just over 4.0.

Weighting procedures increase the variance in the data, with larger weights causing greater variance. Complex survey designs and post-data collection statistical adjustments affect variance estimates and, as a result, tests of significance and confidence intervals. The final design effect for the survey was 2.0, and the margin of sampling error was 3.1 (4.4 with design effect).

RESPONSE RATE

The landline response rate was 32.2 percent and the cell phone response rate was 23.3 percent, for an overall response rate of 29

percent, using American Association for Public Opinion Research's RR3 formula (AAPOR, 2011). Table 4 is a full disposition of the sample selected for the survey.

DATA ANALYSIS

Descriptive statistics and two-way chi-square tests were performed in STATA 11.2 adjusting for complex survey sampling. A weighted proportion is reported for each category in descriptive statistics, while a weighted row or column proportion is reported in a two-way chi-square test. The significances of the two-way chi-square tests were performed using Wald F-test. Alpha was set at .05. We examined selected questions by income, race, education, gender, age and insurance status.

We also examined selected questions by region. According to the U.S. Census Bureau, there are seven non-overlapping PUMAs within Prince George's County. Red indicates statistically significant differences. Figure 1 provides the PUMAs in the County.

SELECTED COMPARISONS WITH THE 2011 PRINCE GEORGE'S PRELIMINARY FINDINGS

Prince George's County had supported an enhanced sample of the Behavioral Risk Factor Surveillance System (BRFSS) for calendar year 2011, and preliminary results are made available in March 2012 (Abt SRBI, 2012). In some instances, results from our survey are compared to data from this 2011 Prince George's County Health Survey (hereafter referred to as PGCBRFSS). The PGBRFSS random digit dial survey was conducted by Abt SRBI in late 2011-January 2012. In total, the sample included 1,624 interviews with 1,245 from the broader County and 379 from an oversample from the Port Towns. Utilizing the survey instituted by CDC in 1984, the BRFSS collects annual information on health risk behaviors, preventive health practices, and access to health care from adults in the U.S. and in U.S. territories (CDC, 2012). The PGCBRFSS was a completely separate effort from our survey, which was conducted as part of the Public Health Impact Assessment of Prince George's County.

FINDINGS

DESCRIPTION OF THE SAMPLE

All results presented in the narrative, tables and charts represent the weighted data and as such can be generalized to the population of Prince George's County.

The majority of sample respondents were African American and residents of the County for at least 10 years. Of the 615 respondents who identified as Black or African American, 10 percent reported either they or their parents were born in the Caribbean and 9 percent reported Africa. Twenty-three percent (n=169) were born outside the U.S. Of those, 31 percent had lived in the U.S. one to 10 years, 31 percent from 11 to 20 years, 24 percent from 21 to 30 years and the remainder more than 31 years. Twenty percent speak a language other than English at home. Thirteen percent had served in the military. Most are homeowners, have household incomes over $50,000 and 49 percent reported being employed full time. Table 5 presents a delineation of sample demographics. Approximately 9.5 percent of respondents reported less than a high school education, making the sample a relatively educated group of respondents with 29 percent stating they were college-educated with bachelor's (15.1 percent) and post-graduate (14.5 percent) degrees.

Although 84 percent reported that they had health insurance, 15 percent (n=93) reported they were not insured. The primary reasons given for not being insured were in order: 43 percent could not afford insurance, 19 percent indicated some other reason, 18 percent were unemployed, 7 percent reported that either their employer or their spouse's employer offers insurance, but they could not afford it, and 6 percent tried to apply for Medicaid/Healthy Families, but were not able to secure insurance. For the insured, the primary companies were CareFirst/Blue Cross/Blue Shield (33 percent), Medicare (15 percent), Aetna (12 percent), Kaiser (12 percent) and United Healthcare (10 percent). All others were less than 10 percent. Our finding of 84 percent insured is slightly higher than the 82.2 percent reported in the County's Children's Health Insurance Program (CHIP), but remains below its goal of 91.1 percent coverage by 2020.

FIGURE 1 **PUBLIC USE MICRODATA AREAS (PUMAS) IN PRINCE GEORGE'S COUNTY**

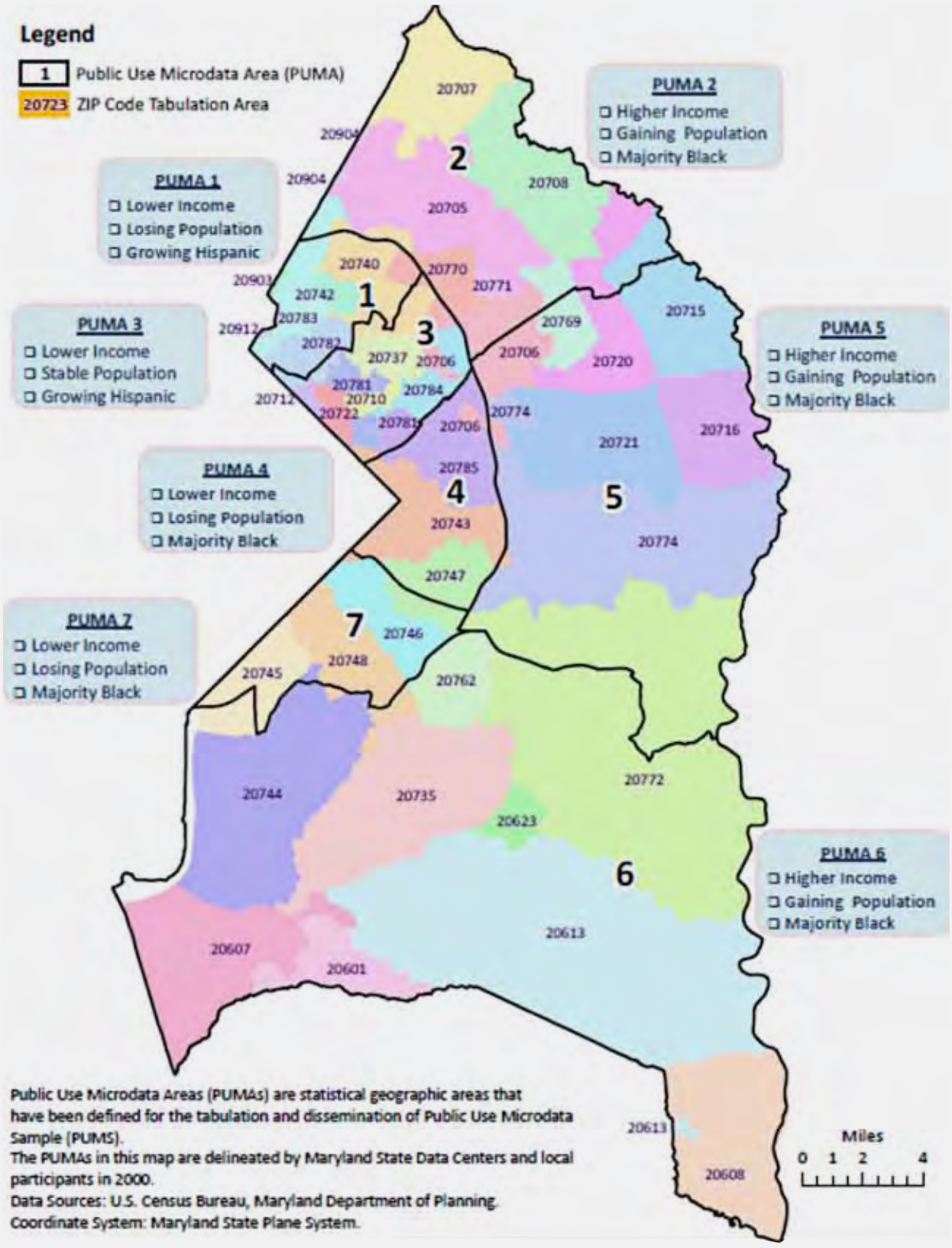


TABLE 5 SAMPLE DEMOGRAPHICS (N=1,001)

Race/Ethnicity	%
White Non-Hispanic	19.0%
Black Non-Hispanic	65.5%
Asian	2.7%
Native Hawaiian or other Pacific Islanders	0.5%
American Indian or Alaska Native	1.0%
Hispanic/Latino	11.1%
Other	0.3%
Gender	
Male	46.7%
Female	53.3%
Years lived in County	
< 1 year	3.0%
1-3 years	5.6%
3-5 years	5.5%
5-10 year	11.3%
10-20 years	21.9%
20+ years	43.7%
All my life	8.6%
Health Insurance	
Yes	83.8%
Employment status	
Full time	49.0%
Part time	7.4%
Self-employed in the home	2.1%
Self-employed outside of the home	4.0%
A homemaker or stay at home parent	2.5%
Retired	15.7%
A student	5.4%
Unemployed	9.1%
Laid off	1.6%
Disabled	3.2%
Education	
Grade school	1.3%
Some high school	8.2%
High school or GED	28.9%
Some college	23.4%
Associate degree	8.5%
Bachelor's degree	15.1%
Postgraduate degree	14.5%
Relationship status	
Single	36.8%
Living together with partner	3.2%
Engaged	2.7%
Married	40.3%
Separated	4.0%
Divorced	6.6%
Widowed	6.1%
Military status	
yes	13.3%
Home	
Own	64.2%
Rent	34.4%
Other arrangement	0.8%
Born in the United States	
yes	77.4%
Income*	
< $20,000	15.2%
$20,000-$40,000	18.4%
$40,000-50,0000	8.6%
$50,000-$65,000	14.0%
$65,000-$100,000	20.0%
$100,000-$150,000	14.9%
$150,000-$200,000	5.7%
$200,000-$250,000	1.9%
>= $250,000	1.4%

* Excluded refused and do not know; reports only valid percent

PRESENTATION OF FINDINGS BY FRAMING QUESTION

The analysis and subsequent presentation of findings are organized by five framing questions posed by Secretary of Health and Mental Hygiene Joshua Scharfstein in planning discussions. These questions are as follows:

1. What are the key health outcomes in the County most amenable to improvement by a new health care system?
2. What elements of a health care system (hospital and community) can affect these outcomes and by how much (model)?
3. What is the geographic distribution of health care resources and where are the areas of greatest need for primary care?
4. What are the key issues to maximize uptake and achieve the potential of the health care system for public health?
5. What resources can be mobilized in the public health sector to complement the impact of the health care system?

The random household survey data will be used to address four of the five questions. These are I, II, III and IV. Results are presented for the entire sample and by PUMA for selected items.

FRAMING QUESTION 1: WHAT ARE THE KEY HEALTH OUTCOMES IN THE COUNTY THAT ARE MOST AMENABLE TO IMPROVEMENT BY A NEW HEALTH CARE SYSTEM?

In this section, we include results on County residents' perception of health issues, current health status and key risk factors that are amenable to improvement.

Respondents were asked, "What do you see as the one most urgent health condition or disease facing residents living in Prince George's County?" (see Table 6). Cancer is perceived as the most urgent health issue facing the County (17.2 percent) followed by Type 2 Diabetes (15.7 percent). However, it is noteworthy that 14.7 percent of County residents stated that they "do not know" the one most urgent health issue facing residents.

Perceptions of the most critical health issues in the County differed by PUMA. Residents in PUMAs 3, 5 and 6 felt diabetes is the most urgent health issue, while 27.6 percent of PUMA 7 and 24.7 percent of PUMA 2 felt cancer is the most urgent issue (Table 7).

Given the focus of the larger assessment on the health care system, we asked about the magnitude of health care access barriers as perceived by County residents. More than 77 percent saw the cost of care and the cost of insurance as major problems. Access and quality were considered major problems by 50 percent and 47 percent, respectively (see Figure 2).

There were significant differences by PUMA in the perceptions about these health care access issues. In Table 8, 58 percent of residents in PUMA 3 felt access to health care was a major problem compared to only 38 percent of residents in PUMA 5. More than 69 percent of residents in PUMA 7 felt quality of health care was a major problem compared to only 37 percent of

TABLE 6 PERCEIVED URGENT HEALTH CONDITION IN THE COUNTY (N=1001)

Condition	%	Condition	%
Cancer	17.2%	Other	4.9%
Diabetes	15.7%	Flu/cold	3.0%
Don't know	14.7%	Lung disease	2.0%
Obesity	10.0%	None	1.6%
High blood pressure/ Hypertension	9.1%	Asthma	1.5%
HIV/AIDS	8.4%	Sexually transmitted diseases	1.4%
Heart disease	8.1%	Substance abuse	1.4%

TABLE 7 TOP PERCEIVED HEALTH ISSUES BY PUMA (N=1,001)

Condition	PUMA 1	PUMA 2	PUMA 3	PUMA 4	PUMA 5	PUMA 6	PUMA 7
Cancer	11.5%	**24.7%**	22.6%	14.0%	15.5%	13.4%	**27.6%**
Diabetes	17.4%	7.3%	**25.2%**	15.0%	**19.1%**	**15.2%**	10.0%
Obesity	13.1%	11.7%	11.6%	5.5%	7.3%	13.4%	6.4%
High blood pressure	2.0%	13.0%	2.6%	10.6%	10.6%	11.2%	11.0%
Don't know	**18.8%**	13.1%	10.4%	**18.3%**	17.2%	10.6%	11.5%

* bold denotes statistically significant difference at p<.05.

FIGURE 2 HEALTH CARE ISSUES POLL NOW, I'M GOING TO READ YOU A LIST OF HEALTH CARE ISSUES. PLEASE TELL ME IF YOU THINK (INSERT ITEM) IS A MAJOR PROBLEM, A MINOR PROBLEM, OR NOT A PROBLEM AT ALL IN PRINCE GEORGE'S COUNTY. HOW ABOUT (INSERT ITEM)? IS THIS A MAJOR PROBLEM, A MINOR PROBLEM OR NOT A PROBLEM AT ALL IN PRINCE GEORGE'S COUNTY?

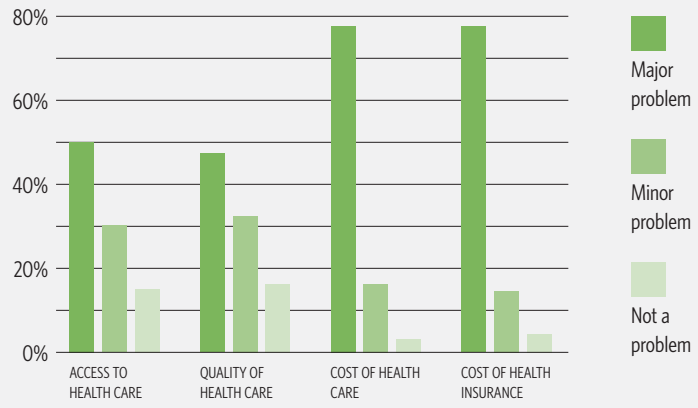


TABLE 8 PERCENT OF RESIDENTS WHO PERCEIVE THESE HEALTH CARE ISSUES AS A MAJOR PROBLEM IN THE COUNTY

Health Care Issue	PUMA 1	PUMA 2	PUMA 3	PUMA 4	PUMA 5	PUMA 6	PUMA 7
Access to health care	51.8%	46.9%	58.0%	57.2%	38.1%	53.2%	49.6%
Quality of health care	41.7%	37.7%	58.7%	56.0%	37.6%	47.7%	69.1%
The cost of health care	77.4%	88.1%	82.9%	77.2%	69.4%	77.5%	82.8%
The cost of health insurance	80.8%	79.5%	84.5%	75.8%	66.9%	80.7%	82.7%

TABLE 9 PERSONAL HEALTH POLL

IN GENERAL, WOULD YOU SAY YOUR HEALTH IS EXCELLENT, VERY GOOD, GOOD, FAIR OR POOR?

	Survey (n=1,001)	PGCBRFSS (n=1,624)
Excellent	20.7%	21.7%
Very good	28.3%	29.5%
Good	35.9%	32.3%
Fair	12.8%	14.1%
Poor	2.3%	3.0%
Don't know	0.1%	**

TABLE 10 DIAGNOSED MEDICAL CONDITIONS YOU MENTIONED THAT YOU HAD BEEN DIAGNOSED WITH A MEDICAL CONDITION OR CHRONIC DISEASE. PLEASE TELL ME WHICH CONDITIONS YOU HAVE BEEN DIAGNOSED WITH (N=1,001)

Other	6.0%
High blood pressure/ hypertension	5.5%
Diabetes	3.7%
Asthma	3.3%
Heart disease	2.6%
High cholesterol	2.6%
Cancer	2.3%
Chronic arthritis	2.0%
Thyroid problem/ Hypothyroidism	1.7%
Mental illness	1.4%
Chronic bronchitis	1.0%

residents in PUMAs 2 and 5.

We included a number of items that assessed the health status of County residents. One common survey measure is self-reported health status. In response to the item, "In general, would you say your health is Excellent, Very Good, Good, Fair or Poor?," 49 percent responded excellent or very good. Only 2.3 percent of County residents reported that their health was poor and 12.8 percent reported their health was fair (see Table 9). In Table 9, responses from residents in our survey are listed alongside data from the 2011 PGCBRFSS. Results from both surveys are similar.

In response to the question, "Have you *ever* been told by your doctor or a health care professional that you have a medical condition or chronic disease?," 37.1 percent of the sample reported they had received such a diagnosis. For that 37.1 percent, the next item was "You mentioned
that you had been diagnosed with a medical condition or chronic disease. Please tell me which conditions you have been diagnosed with?" To garner the most appropriate prevalence estimate for the County, we adjusted the results from that sub-sample of 423 to the entire sample. Therefore, the top conditions of County residents, generalizable to the whole County, are: other, high blood pressure and diabetes (see Table 10).

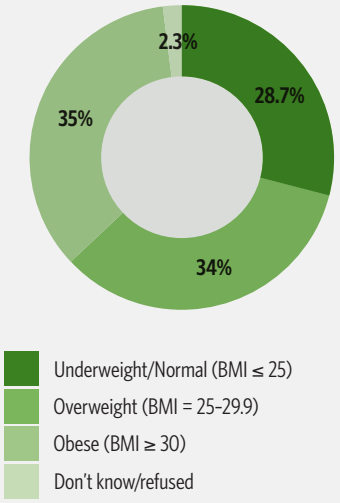
We were further interested in diagnoses of two key conditions that can contribute to significant morbidity and mortality if they are not managed. These data represent additional diagnoses that are not accounted for in the 37.1 percent who reported a disease diagnosis in the previous question. When asked of the entire sample (n=1,001), "Have you ever been told by a doctor or other health care professional that you have pre-diabetes or borderline diabetes?," 16.7 percent reported being diagnosed with pre-diabetes. This is substantially different from the PGCBRFSS finding of 8.9 percent. Further analysis of both data sets would be necessary to understand this difference in magnitude. Diabetes did emerge as an important issue in the stakeholder interviews of the Public Health Impact Study.

Similarly, when asked "Have you ever been told by a doctor or other health care professional that you have pre-hypertension or borderline high blood pressure?," 33.2 percent of County residents reported pre-hypertension.

While the survey only included one item on tobacco risk, we did ask,

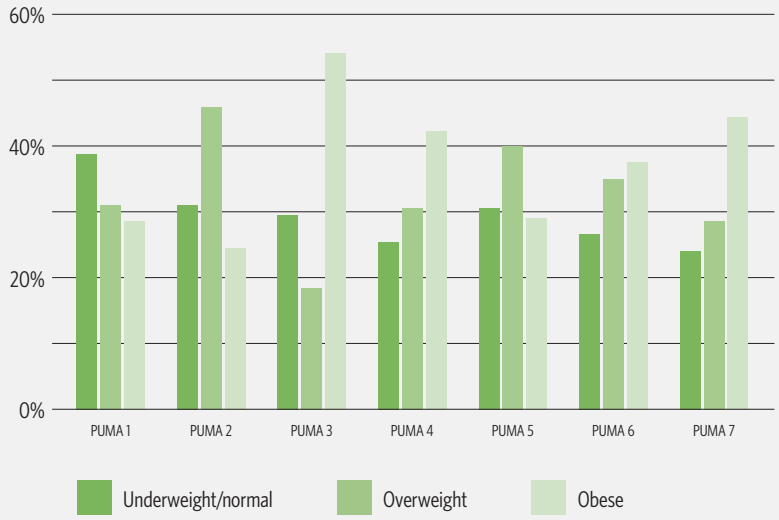
FIGURE 3 BODY MASS INDEX*

(R2; SELECTED RISK FACTORS)



*Calculated from self-reported height and weight.

FIGURE 4 BODY MASS INDEX BY PUMA



"During the past 30 days, on how many days did you smoke cigarettes?" More than 11 percent reported daily use of cigarettes, while 6 percent reported smoking cigarettes between one and 29 days a month (n=997). This differs from the PGCBRFSS, which found that 25.4 percent reported smoking cigarettes every day. Further analyses would be necessary to understand this difference. Although our results indicate a lower prevalence, given the critical nature of tobacco use as a risk factor for multiple chronic diseases, this issue warrants further study.

Body mass index is considered to be an important risk factor for many chronic diseases. In order to assess body mass index (BMI), we asked all participants two questions: About how much do you weigh without shoes? About how tall are you without shoes? We then calculated BMI, finding that 34 percent of County residents are overweight and 35 percent are obese (see Figure 3). However, only 0.5 percent of residents who indicated they had been diagnosed with a chronic condition responded that they had been diagnosed by a health care professional with obesity, and 10 percent of residents reported obesity as the one most urgent health issue facing the County. Clearly, there is some significant disconnect between BMI and diagnosis of obesity by a health care provider as well as a lack of awareness of obesity as an urgent health issue.

Using two-way chi squares tests, we find some statistically significant differences in BMI by PUMA (see Figure 4). Seventy-two percent of residents in PUMA 7 were overweight or obese compared to 59 percent of residents in PUMA 1. Furthermore, although not statistically significant, PUMAs 3, 4, 6 and 7 all have greater than 70 percent in the overweight and obese categories combined.

The data in Appendix B illustrate significant differences between Prince Georgians along a variety of demographic and economic variables, which is consistent with relevant literature. For example, we compared respondents aged 65 and older (late life) with those age 18 to 64 (young and midlife) and found a statistically significant difference in being diagnosed with a chronic disease (58 vs. 35 percent), being told by a physician they had pre-diabetes (27 vs. 14 percent) and being told they had pre-hypertension (65 vs. 29 percent). We also compared the prevalence of disease and found significant differences in being diagnosed with other diseases by late life compared to young and midlife: cancer, 8 percent vs. 2 percent; heart disease, 6 percent vs. 2 percent; diabetes, 13 percent vs. 3 percent; and high blood pressure, 10 percent vs. 5 percent. Asthma was an exception to this pattern where 4 percent of the young and midlife respondents reported being diagnosed by a physician with the disease compared to only 1 percent of the late life respondents. The data also expose other statistically significant differences by gender, insurance status, income and race including:

- Female respondents (20 percent) were more likely to be diagnosed with pre-diabetes compared to 13 percent of males.

- BMI was calculated from self-reported data on height and weight. Approximately, one third of both males and females were normal weight. Overall, 70 percent of males and 71 percent of females were overweight or obese. However, females (42 percent) were significantly more likely than males (28 percent) to be obese.

- Whites (55 percent) were more likely to report being diagnosed with a chronic disease compared to 36 percent of African Americans. The data also revealed a significantly higher prevalence of reported cancer among whites (5 percent) compared to African Americans (2 percent).

- Respondents with health insurance compared to those without were more likely to report being diagnosed with a chronic disease (40 vs. 24 percent), pre-diabetes (19 vs. 6 percent) and pre-hypertension (37 vs. 13 percent). On each of these objective measures, people with health insurance appear sicker than those without insurance. However, when we examine subjective fair/poor self-rated health among people with health insurance (13 percent) to those without (30 percent), a different pattern emerges. The objective vs. subjective health-status measures are complex and will be explored in a more detailed multivariate manner in subsequent analysis.

- We examined daily tobacco use in past 30 days and compared respondents across levels of education, income, race, gender and age. We revealed an expected pattern where smoking changes with educational attainment: bachelor's degree (3 percent), graduate school (7 percent), some college or associate degree (10 percent) and high school or below (17 percent). This was statistically significant. Similarly, there was a statistically significant difference in tobacco use with lower- and mid-income respondents reporting daily use less than higher income respondents.

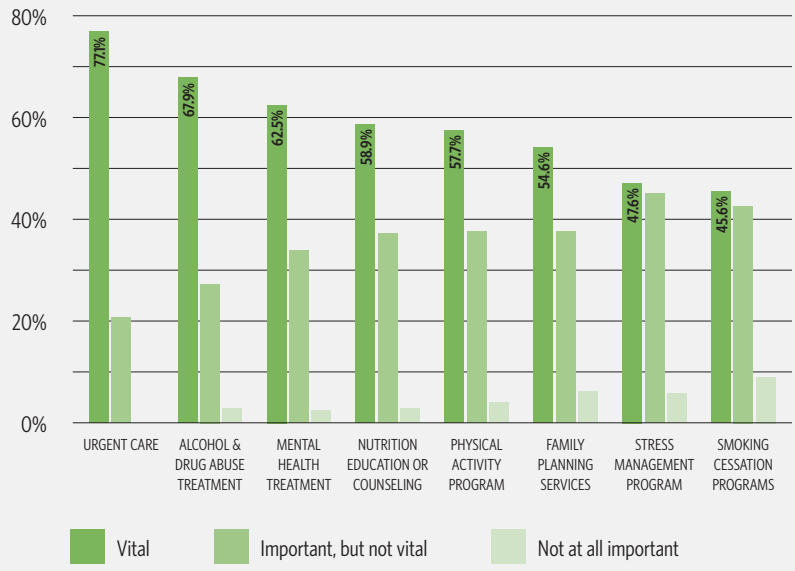
Clearly, our findings confirm the County Health Improvement Plan's focus on reducing chronic disease and the associated risk factors, particularly obesity. However, these results also call for careful consideration of the impact of demographic factors and social determinants of health on the health status of County residents.

FRAMING QUESTION 2: WHAT ELEMENTS OF A HEALTH CARE SYSTEM (HOSPITAL AND COMMUNITY) CAN AFFECT THESE OUTCOMES?

Planning for a new health care system is a complex endeavor that requires multiple decisions. We asked respondents for their assessment of what services would be vital to the County.

More than 77 percent reported that urgent care services were a vital need for Prince George County; this need was also identified in stakeholder interviews. Alcohol and drug abuse treatment was identified as the second vital health service need. This seems contradictory to the low percent (1.4 percent) reporting substance abuse as a major health concern for the County (see Table 6). However, the CHIP estimates that 8 percent of County residents have a substance abuse problem (Prince George's County, 2012). This proportion is also more consistent with the identification of treatment as the second most-vital need.

FIGURE 5 SERVICE IMPORTANCE IN PLANNING A NEW HEALTH CARE SYSTEM FOR THE COUNTY, DECISIONS HAVE TO BE MADE ABOUT WHAT SERVICES ARE VITAL TO THE COMMUNITY. BASED ON YOUR EXPERIENCES AND THE EXPERIENCES OF YOUR FAMILY, PLEASE TELL ME IF THE AVAILABILITY OF (INSERT SERVICE) IS VITAL, IMPORTANT BUT NOT VITAL, OR NOT AT ALL IMPORTANT TO HAVE IN PRINCE GEORGE'S COUNTY? (N=1,001)



FRAMING QUESTION 3: WHAT IS THE GEOGRAPHIC DISTRIBUTION OF HEALTH CARE RESOURCES AND WHERE ARE THE AREAS OF GREATEST NEED FOR PRIMARY CARE?

The household survey included a series of questions focused on utilization of health care services including, but not limited to, where respondents received care and reasons for seeking medical care outside of Prince George's County.

When asked, "What kind of place do you *usually* go to when you are sick or you need advice about your health? Is it a doctor's office, hospital emergency room, hospital outpatient department, urgent care facility, a clinic or health center, or some other place?," 69.7 percent reported doctor's office, followed by clinic or health center (11.4 percent), hospital emergency room (8 percent), hospital outpatient department (3.7 percent), urgent care facility (3.6 percent) and no place (2.2 percent). There were statistically significant differences in the usual place of care, with higher income, white/non-Hispanic, female, older and insured individuals more likely to report that they go to the doctor's office. In the next question, respondents were asked to rate the quality of health care they receive at their usual location of care. In response, 31.9 percent rated their care as excellent, 34.3 percent as very good and 25.4 percent as good. Quality of care remains an issue for some with 7.4 percent rating the quality of their care as fair and 0.9 percent reporting the quality as poor. We then asked their assessment of care in a more specific question (see Table 11). More than 50 percent of respondents rated their doctor's office or the hospital outpatient department as excellent or very good. For the other locations, the greatest percentage of responses fell into the good rating category.

When asked if they have one person they thought of as their personal doctor or health care provider, 67.9 percent reported they have one person, 7.5 percent reported having more than one person they consider their personal doctor and nearly a quarter of all respondents (24.6 percent) reported not having a personal doctor or health care provider. In the PGCBRFSS, they found that 68.1 percent reported having one person as their health care provider, but a larger proportion, 16.9 percent, reported having two people. The PGCBRFSS found that a smaller proportion, 15 percent, reported that they did not have a provider. When examined by PUMA, we find that there are statistically significant differences in access to a health care provider (see Figure 6)

For those who reported having a provider (75.4 percent), we then asked the following, "Of all the people you consider to be your personal doctors or providers, choose the most important one to you. What is that provider's specialty?" The largest proportion (58 percent) reported family practice, followed by internist (21.1 percent), do not know (7.9 percent), obstetrician (4.7 percent), other (3.1 percent), cardiologist (2.8 percent) and pediatrician (1.3

TABLE 11 PERCEIVED QUALITY OF CARE FROM USUAL SOURCE OF CARE

Location of care	Excellent	Very Good	Good	Fair	Poor	Don't Know
Doctor's office (n=753)	37%	37%	19%	6%	1%	—
Emergency room (n=52)	14%	29%	36%	17%	4%	—
Hospital outpatient department (n=31)	19%	43%	37%	1%	—	—
Urgent care facility (n=33)	17%	20%	56%	7%	—	—
Clinic or health center (n=103)	23%	24%	40%	12%	—	1%

FIGURE 6

ACCESS TO A PERSONAL DOCTOR OR HEALTH CARE PROVIDER BY PUMA

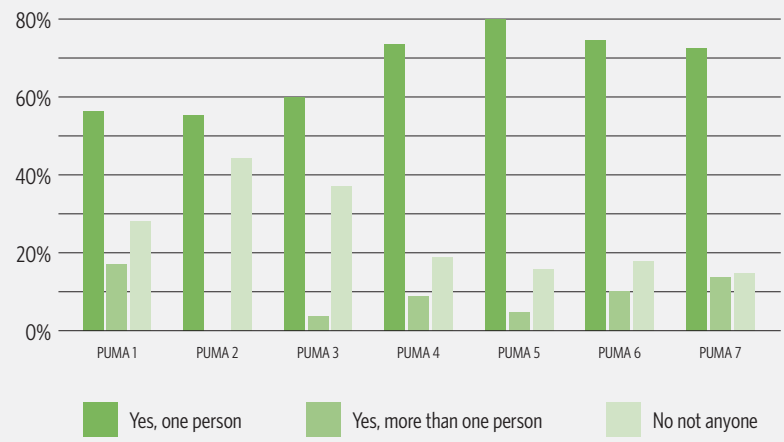


TABLE 12 IN WHAT CITY OR TOWN IS THEIR OFFICE LOCATED?

Washington, D.C.	11.1%	Largo	4.5%
Bowie	9.0%	Lanham	4.2%
Hyattsville	7.3%	Other Prince George's locations	3.5%
Greenbelt	7.0%	Ft. Washington	2.6%
Laurel	6.3%	Upper Marlboro	2.4%
Clinton	5.9%	Riverdale	2.1%
Silver Spring	4.9%		

All other respondents are 1% or below

TABLE 13 REASONS FOR SEEKING CARE OUTSIDE OF PRINCE GEORGE'S COUNTY (N=182)

I prefer to use my own provider	36.5%
The physician I go to was recommended by family or friends	11.3%
Other	10.2%
I commute outside of Prince George's County to work and my physician's office location is more convenient for me	9.0%
My insurance requires that I go see a physician located outside of Prince George's County	7.5%
Can't get an appointment to see a Prince George's County physician with this specialty	7.1%
Better quality of care	5.2%
I am military/a veteran/go to the military facility or veterans' hospital	5.1%
I am not comfortable with the quality of the Prince George's County physicians	3.7%
Refused	1.9%

TABLE 14 REASONS FOR DELAY OR DIFFICULTY IN GETTING HEALTH CARE (N=147)

No insurance at the time	34%
Couldn't afford the cost	24%
Couldn't get an appointment	20%
Other	11%
Insurance company denied coverage for service	8%
Long waiting periods	7%
Lack of transportation	3%
I couldn't find a provider	3%
My own choice	2%

percent). Although the location of their offices varied, 65 percent were in Prince George's County (see Table 12 for the top 13 locations).

Of those reporting they have a provider (n=988), 74.7 percent reported that they drive themselves to their doctor, followed by 11 percent who are driven by someone else and 9.7 percent who take a Metro bus. More than 80 percent of residents in PUMA regions 2 and 6 drive themselves compared to only 60 percent of residents in region 1. About 20 percent of residents in region 1 and 3 take the Metro bus to the doctor's office, as do 15 percent of residents in region 7.

It is critical to understand why County residents go outside the County for care. If they responded that their provider was outside of the County, the following question was asked, "You said that the provider who is most important to you is not located in Prince George's County. Why do you go outside of Prince George's County to seek care?." More than 36 percent reported they preferred using their own provider. Further analyses could identify whether these are newer County residents who had a provider outside the County with whom they preferred to remain. Two items are of particular interest. More than 7 percent indicated that their insurance required them to see a physician outside the County and more than 7 percent reported being unable to get an appointment with a specialist inside the County. Table 13 reports these results.

We examined differences in who has their primary provider outside the County by race, income, education, gender, insurance and age. There were no statistically significant differences.

We were also concerned with delays or difficulty in getting needed health care. We asked about such delays within the last 12 months. A response: "Sometimes people have difficulty getting health care when they need it. By health care, I mean medical care as well as other kinds of care like dental care and mental health services." Approximately 17 percent of respondents stated they had difficulty getting health care they needed. There were differences by PUMA with more than 25 percent of residents in regions 2 and 3 reporting a delay in getting health care in the last 12 months compared to only 5.5 percent in region 7 and 7 percent in region 5.

Of those who reported a delay, 65 percent reported that they delayed seeking medical care, dental care (29 percent), mental health services (4 percent) and other (3 percent). Of particular concern was the reason for the delay or lack of care. When asked, "Why was that care delayed or not received?," the results were interesting. Even though 83.8 percent of County residents had health insurance at the time of the survey, data in Table 14 demonstrate that 34 percent of County residents stated the health service was delayed due to lack of insurance, while 20 percent couldn't get an appointment. The CHIP goal is to reduce those experiencing a delay in treatment to 15 percent by 2014.

TABLE 15 WHAT ARE YOUR TOP THREE PRIORITIES WHEN DECIDING ON THE LOCATION WHERE YOU WILL GET HEALTH CARE SERVICES? (N=1,001)

ACCESSIBILITY TO CARE (NET)	43%
Hours/Appointments (Subnet)	22%
Flexibility of hours	9%
How quickly I can get an appointment/how quickly I can get treated	13%
Accessible to Doctors/Facilities/Services (Subnet)	20%
Having access to specialist care	6%
Having access to my personal doctor	9%
Access to/affiliation with other multiple doctors	*
Hospitals affiliations	1%
Types of treatment/services available at the facility	3%
Other accessible to doctors/facilities/ services mentions	1
Having access to my medical records	1%
Other accessibility to care mentions	*
COST/COVERAGE (NET)	24%
If they accept my insurance	10%
Cost	14%
Other cost/coverage mentions	*
QUALITY OF CARE/REPUTATION (NET)	61%
Reputation/Recommendation (Subnet)	9%
Reputation of doctor/facility (history, Trustworthiness, etc.)	4%
Recommendations/referrals (family/friends/other doctors reviews/etc.)	5%
Whether I will receive a higher quality of care	36%
Professionalism/good customer service/quality of facilities	5%
Competent/quality doctors/medical staff (education/experience/ qualifications)	8%
Caring doctors/medical staff	2%
Other quality of care/reputation mentions	1%
LOCATION-RELATED (NET)	79%
Whether or not the facility or doctor is close to my home	51%
Whether or not the facility or doctor is close to my place of work	6%
Closeness/the distance/proximity (general)	2%
Convenience/easy to get there/accessibility (general/unspecified close, near highways, etc.)	2%
The area/neighborhood (safety of the area, etc.)	2%
Close to other medical services/facilities (labs, hospitals, etc.)	*
Location (general)	2%
Accessible to transportation	12%
Parking (easy/free)	1%
Other location-related mentions	1%
FACILITY-RELATED (NET)	6%
Cleanliness	3%
The setting/facility (appearance, comfort, etc) (general)	1%
Other facility-related mentions	*
Language needs	1%
Depends on factors at the time (medical condition/ time of day, etc.)	1%
SOME OTHER REASON	1%
DON'T KNOW/NOT SURE	6%

FRAMING QUESTION 4: WHAT ARE THE KEY ISSUES TO MAXIMIZE UPTAKE AND ACHIEVE THE POTENTIAL OF A HEALTH CARE SYSTEM FOR PUBLIC HEALTH?

Numerous factors can influence uptake of the services of a new system. We explored several of these factors including priorities for seeking care, awareness of hospitals, quality of care, impact of insurance and providers, health communication and literacy, and the role of culture in health care encounters.

PRIORITIES

Survey participants were asked the question, "What are your top three priorities when deciding on the location where you will get healthcare services?". All responses were then grouped into the following broad categories: accessibility to care, cost of care, quality of care, location of care,

TABLE 16 PRIORITIES SEEKING PRIMARY CARE BY REGION

	PUMA 1	PUMA 2	PUMA 3	PUMA 4	PUMA 5	PUMA 6	PUMA 7
Whether or not the facility or doctor is close to my house	38.2%	46.0%	58.8%	47.7%	55.1%	58.3%	56.5%

TABLE 17 WHEN YOU THINK OF HOSPITALS SERVING PRINCE GEORGE'S COUNTY RESIDENTS, WHICH HOSPITAL COMES TO MIND FIRST?

Prince George's Hospital Center	20.6%
Doctors Community Hospital	16.4%
Washington Hospital Center	12.5%
Southern Maryland Hospital	12.1%
Holy Cross Hospital	6.9%
Washington Adventist Hospital	5.4%
Laurel Regional Hospital	4.6%
Don't know	3.9%
Anne Arundel Medical Center	3.5%
Fort Washington Medical Center	1.8%
George Washington University Hospital	1.7%
Providence Hospital	1.1%
Other	1.0%
Montgomery General Hospital	1.0%
Georgetown University Hospital	0.9%
Malcolm Grove Medical Center	0.8%
Johns Hopkins Hospital	0.7%
Children's National Medical Center	0.7%
Kaiser	0.7%
Suburban Hospital	0.5%
University of Maryland Medical Center	0.5%
Shady Grove Hospital	0.4%
Howard University Hospital	0.4%
Howard County General Hospital	0.3%
Adventist hospital	0.3%
Bowie Health Campus	0.2%
Virginia hospital	0.2%
Bethesda Medical Center	0.2%
United Medical Center	0.2%
National Rehabilitation Hospital	0.2%
Greater Southeast hospital	0.1%
Sibley Memorial Hospital	0.1%
Walter Reed Army Medical Center	0.1%

TABLE 18 WHICH HOSPITAL IS LOCATED CLOSEST TO YOU? (N=1,001)

Prince George's Hospital Center	22.9%
Fort Washington Medical Center	3.6%
Southern Maryland Hospital	18.4%
Holy Cross Hospital	2.9%
Doctors Community Hospital	17.4%
Providence Hospital	2.8%
Laurel Regional Hospital	9.8%
Washington Hospital Center	2.0%
Don't know	5.4%
Bowie Health Campus	1.9%
Washington Adventist Hospital	4.9%
Anne Arundel Medical Center	1.7%

Note: hospitals with less than 1% are not shown in table

care facility and other. Each of the broad categories was then divided into sub-categories and the sub-categories themselves were broken down to further illustrate the responses. For example, 43 percent of the participants gave a response that fell into the category of accessibility to care. These 43 percent were further broken down to hours (22 percent), accessibility to doctors/facilities/services (20 percent) and access to medical records (1 percent). The 22 percent of responses that listed hours as a priority were subdivided into flexibility of hours (9 percent) and how quickly treatment or an appointment is available (13 percent). Overall, 51.4 percent stated that proximity to home was their top priority, followed by accessibility of care (43 percent) and quality of care (36). Table 15 includes more detailed sub-categories of responses given by residents.

However, when we analyzed these priorities by region, we found that there were no significant differences for most priorities given, with the exception of the following factor. There were significant differences between region on proximity, with PUMA 1 reporting this as a priority significantly less than PUMAs 3 and 6 (Table 16). Interestingly, 1, 3 and 6 are all adjacent to the District of Columbia.

HOSPITALS

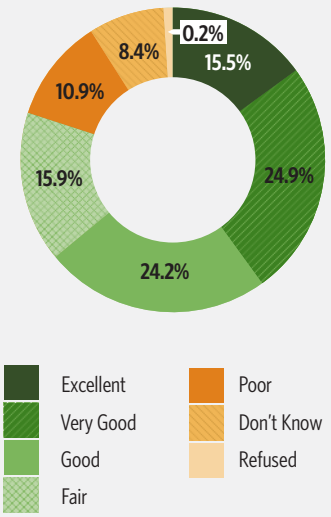
In an effort to better understand respondents' perceptions of hospitals in Prince George's County, we asked them to tell us what hospital came to mind first. Table 17 reports that Prince George's Hospital Center topped the list with 20 percent of respondents followed by Doctors Community Hospital (16.4 percent), Washington Hospital Center (12.5 percent) and Southern Maryland Hospital (12.1 percent) as the first hospital that comes to mind serving County residents.

The largest proportion (22.9 percent) of residents reported that Prince George's Hospital Center was the closest to them (see Table 18).

QUALITY OF CARE AND HOSPITAL CHOICE

When asked about the service quality of the hospital closest to them, 40.4 percent of respondents stated the service was Excellent/Very Good, 24.2 person stated it was Good and 26.8 percent stated the hospital services were Fair/Poor. Figure 7 illustrates a breakdown of each response category.

FIGURE 7 HOSPITAL SERVICE QUALITY (N=951)



We asked respondents to identify their choice of local hospitals for specific medical services. In a separate question, we also asked them to rate the overall quality of hospitals. In Table 19, we focus on choice of hospital for two key services, general hospitalization and care for the leading cause of death, heart attack. The table also includes the percentage of respondents' overall best quality ranking of the hospital. In terms of respondent choice for general hospitalization, a plurality of respondents selected Washington Hospital Center (15.3 percent) followed by Doctors Community Hospital (13.5 percent), which was essentially tied with Holy Cross (13.3 percent). There were statistically significant differences with higher income, more educated and females more likely to report choosing a hospital outside the County.

There is a similar clustering in how respondents rated the overall best quality of these three institutions, 16.3 percent for Doctors Community Hospital, 11.4 percent for Washington Hospital Center and 10.3 percent for Holy Cross. However, when respondents were asked to identify which hospital they would choose in the event of a heart attack, 31 percent selected Washington Hospital Center while far fewer selected Doctors (7.1 percent) or Holy Cross (6.4 percent). Prince George's Hospital Center was in single digits for general hospitalization (7.3 percent) and overall best quality (7.8 percent). It is noteworthy that in the event of a heart attack, 8.1 percent of respondents selected Prince George's Hospital Center, placing it second to Washington Hospital Center and tied with Washington Adventist Hospital. However, Washington Hospital Center is clearly the people's choice for cardiac care. For choice of hospital for a heart attack, again, there were statistically significant differences with those with higher incomes choosing a hospital outside of the County.

When we examine which hospital respondents would choose for care by PUMA, respondents do not choose the hospital that is closest to them (see Figure 8). For example, in PUMA 1, 10 percent live closest to Holy Cross, but 18 percent choose this hospital for procedures. In PUMA 2, only 2.2 percent live closest to Holy Cross, but 24.6 percent choose this hospital for procedures. In PUMA 4, 67.4 percent live closest to Prince George's Hospital

TABLE 19 CHOICE OF HOSPITAL FOR GENERAL HOSPITALIZATION AND HEART ATTACK SORTED BY BEST OVERALL QUALITY (N=1,001)

Hospitals	Choice for general hospitalization	Choice for heart attack	Overall best quality
Doctors Community Hospital	13.5%	7.1%	16.3%
Washington Hospital Center	15.3%	30.8%	11.4%
Holy Cross Hospital	13.3%	6.4%	10.3%
Southern Maryland Hospital	6.8%	5.2%	9.1%
Prince George's Hospital Center	7.3%	8.1%	7.8%
Anne Arundel Medical Center	5.8%	2.7%	3.9%
Washington Adventist Hospital	4.6%	8.1%	3.7%
Laurel Regional Hospital	2.2%	1.1%	2.8%

Hospitals	Choice for general hospitalization	Choice for heart attack	Overall best quality
Johns Hopkins Hospital	2.7%	5.4%	2.5%
George Washington University Hospital	4.1%	3.5%	2.2%
Shady Grove Hospital	0.5%	0.6%	1.7%
Georgetown University Hospital	1.9%	1.0%	1.4%
Children's National Medical Center	1.3%	0.8%	1.2%
Providence Hospital	1.8%	1.0%	1.2%
Fort Washington Medical Center	1.9%	0.6%	1.0%

Note: hospitals with less than 1% responding to "overall best" are excluded from table

FIGURE 8 TO WHICH HOSPITAL WOULD YOU CHOOSE TO BE ADMITTED IF YOU NEEDED HOSPITALIZATION FOR ANYTHING OTHER THAN AN EMERGENCY? (N=1,001)

FIGURE 9 TO WHICH HOSPITAL WOULD YOU CHOOSE TO BE ADMITTED IF YOU NEEDED HOSPITALIZATION FOR A HEART ATTACK? (N=1,001)

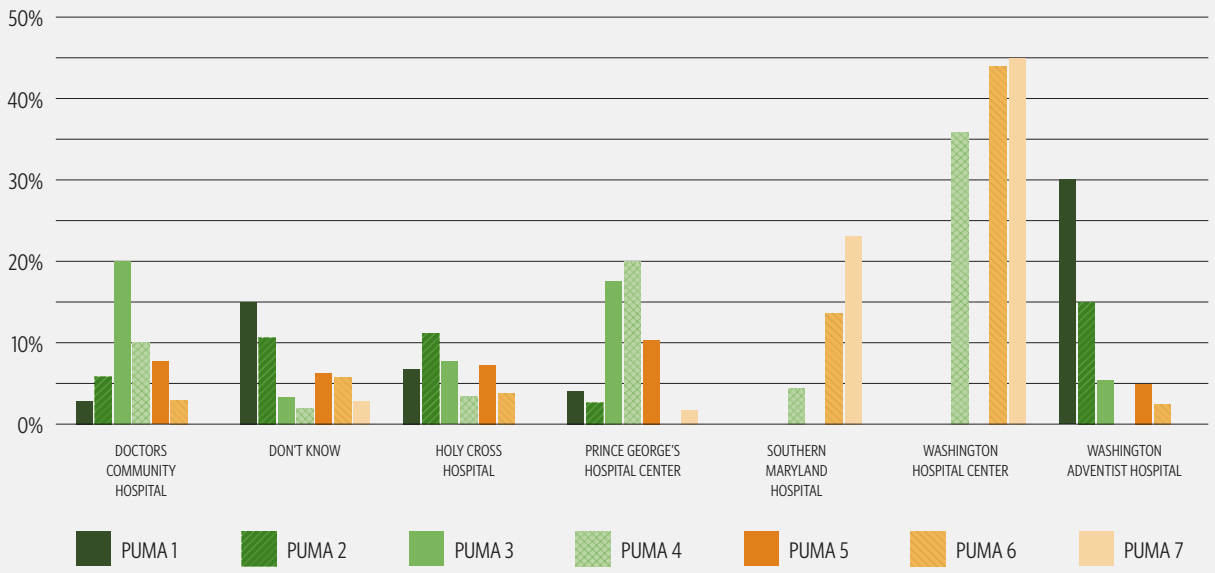


TABLE 20 THINKING OF THE LAST HOSPITAL STAY BY YOU OR SOMEONE IN YOUR HOUSEHOLD, IN WHICH HOSPITAL WAS THAT LAST STAY? (N=932)

Doctors Community Hospital	11.8%
Washington Hospital Center	11.2%
Holy Cross Hospital	10.4%
Southern Maryland Hospital	8.3%
Prince George's Hospital Center	8.2%
Washington Adventist Hospital	7.2%
Don't know	6.8%
Other	5.9%
Laurel Regional Hospital	4.4%
Children's National Medical Center	3.7%
Anne Arundel Medical Center	3.1%
Johns Hopkins Hospital	2.1%
Providence Hospital	1.9%
Shady Grove Hospital	1.8%
Fort Washington Medical Center	1.5%
Georgetown University Hospital	1.4%
Howard University Hospital	1.2%
Virginia hospital	1.1%
Walter Reed Army Medical Center	1.1%
George Washington University Hospital	1.0%

FIGURE 10 HOW PLEASED WERE YOU WITH YOUR HOSPITAL EXPERIENCE? (N=932)

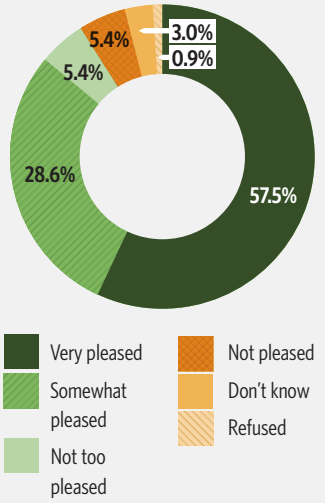


TABLE 21 WHY DID YOU NOT USE A HOSPITAL LOCATED WITHIN PRINCE GEORGE'S COUNTY? (N=399)

Referred to hospital by primary or specialty care physician	31%
Have insurance that dictated where I could go to receive hospital care	13%
The hospital had a better reputation than those within Prince George's County	12%
Closer/closest to me/household member	11%
Do not have positive perceptions of hospitals located within Prince George's County	10%
Some other reason	8%
Had a medical condition that required utilizing a hospital outside of Prince George's County	7%
Familiarity	6%
Don't know	4%
Refused	2%
All of my records are already at that hospital I went to	2%
Work outside of Prince George's County	0.2%

Center, but only 15.6 percent would choose to go there.

However, there is variation in preferred hospital for different medical needs. For example, Washington Hospital Center was the top choice for the treatment of heart attack and general surgery for the residents of all PUMAs except region 1. The residents of region 1 chose Washington Adventist Hospital for heart attack (30.1 percent) and Holy Cross Hospital (19.6 percent) for general surgery (see Figure 9).

We asked Prince Georgians, "When was the last time you or someone in your household stayed overnight as a patient in a hospital?" Approximately 36.4 percent stated it was three or more years, followed by 31.3 percent reporting less than one year, 14 percent reporting one to two years, 9.6 percent stated two to three years with 7.1 percent responding "never" and 1.6 percent responding that they did not know. When asked "In which hospital was the last stay for you or someone in your household," 11.8 percent reported Doctors Community Hospital, followed closely by 11.2 percent for Washington Hospital Center and 10.4 percent for Holy Cross Hospital (see Table 20).

Figure 10 displays their responses to the question, "How pleased were you with your hospital experience?" More than 57 percent indicated they were very pleased, followed by more than 28 percent who were somewhat pleased.

If respondents reported using a hospital outside the County, they were asked their reasons for doing so (Table 21). Almost 31 percent were referred to a hospital outside the County by their physician, followed by 13 percent who reported that their insurance coverage dictated their hospital choice. Additionally, two quality measures were also important factors with 12 percent reporting that the hospital they chose had a better reputation and 10 percent reporting that they do not have positive perceptions of hospitals within the County. We did further analyses in which we collapsed all responses into three categories: quality of care, insurance and location. We then examined those by demographic variables. There were no statistically significant differences.

PERCEPTIONS OF PRINCE GEORGE'S HOSPITALS

We were interested in perceptions of existing hospitals in Prince George's County, particularly those associated with Dimensions Healthcare. When asked, "Thinking specifically of Prince George's Hospital Center in Cheverly, whether you have ever been a patient there or not, what is your overall opinion of the hospital?," 47.2 percent reported a favorable view and 34.9 percent reported their view was unfavorable. More than 17 percent did not know. There were no statistically significant differences in perceptions of the hospital center by demographic characteristics except with insurance. Those with insurance were more likely to have less favorable perceptions of the hospital center than those without insurance.

If they responded with unfavorable, we asked what would change their opinion (see Figure 11). Most important factors in changing their opinion were adding more quality staff (31 percent), followed by 20.7 percent who reported that adding quality staff, adding quality physicians and improving or building a new facility were all equally important. We did find some differences in opinions by group for this question. Significantly more minorities reported that a new facility would improve their

perception of the hospital as compared to whites. There was a statistically significant difference by gender with women reporting that more quality staff was important as compared to men. Residents over 65 years of age were significantly less likely to see a new facility as important; older residents were also more likely than other age groups to see the combination of facility, physicians and staff as important.

We asked the same set of questions about Laurel Regional Hospital. We saw interesting results when we asked for their overall opinion of the hospital (see Figure 12). Just over 50 percent viewed it favorably but 12.6 percent had never heard of the hospital and 20.6 percent had no opinion.

If they reported an unfavorable opinion, we asked what would change that opinion (see Figure 13). In this case, adding more quality staff and quality physicians were the most important factors in modifying opinions of the hospital.

We asked, "If there was a new state-of-the-art hospital built in Prince George's County, how likely would you be to use it?" The results indicated a high degree of willingness with 55.1 percent indicating they were very likely, 37.1 percent reporting likely and 3.5 percent reporting they did not know. For the proportion (9.7 percent) who indicated they were not likely to use the hospital, we would need to do further analysis to determine whether insurance provider or physician would be the inhibiting factor. When examined by PUMA, there were no significant differences in likelihood of use by region. There were no statistically significant differences by income with all income categories from 50 to 62 percent very likely to use a new hospital. There were statistically significant differences between racial and ethnic groups with only 40 percent of whites reporting they were very likely to use a new hospital compared to 62 percent of all other races. Age was a significant factor with 62 percent of those between 35 and 64 years reporting they were very likely to use a new hospital compared to 40 percent of those over 65.

Of critical importance is to understand what factors would contribute to residents' use of a new hospital. We asked them to rate the importance of specific factors in their decision to use the hospital (Figure 14). Quality of care was the most critical factor followed closely by insurance coverage and specialist care.

FIGURE 11 WHAT WOULD CHANGE YOUR UNFAVORABLE OPINION OF PRINCE GEORGE'S COUNTY HOSPITAL? (N=377)

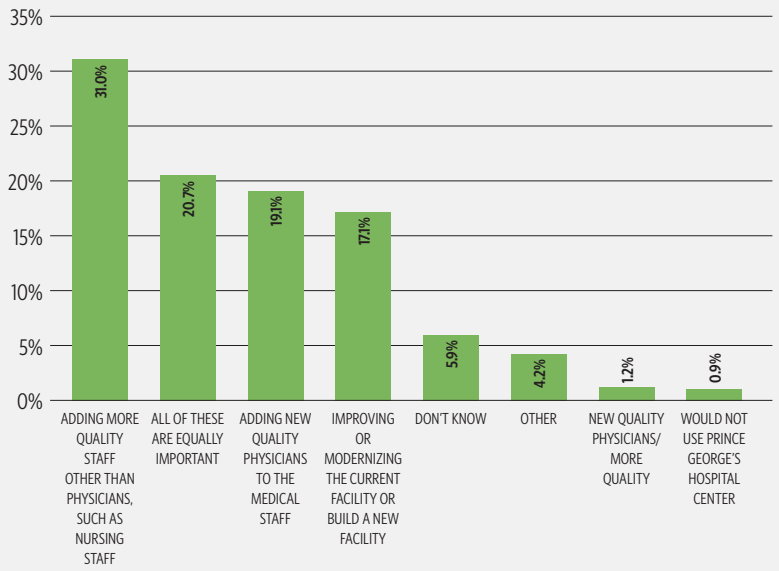


FIGURE 12 THINKING SPECIFICALLY OF LAUREL REGIONAL HOSPITAL, WHETHER YOU HAVE EVER BEEN A PATIENT THERE OR NOT, WHAT IS YOUR OVERALL OPINION OF THE HOSPITAL? (N=1,001)

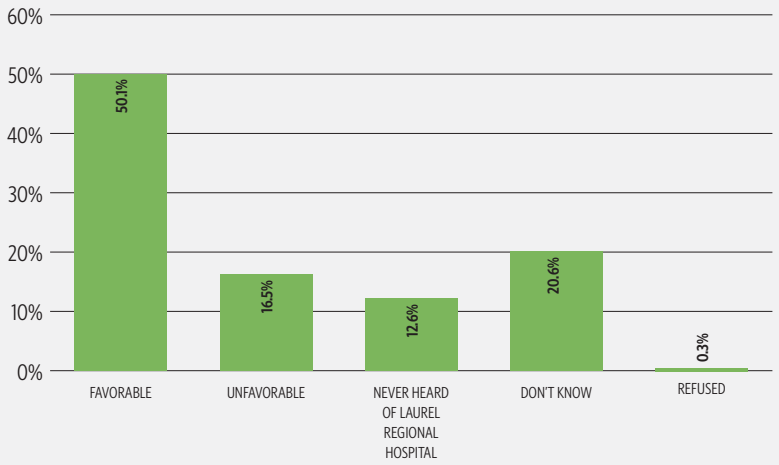


FIGURE 13 WHAT WOULD CHANGE YOUR UNFAVORABLE OPINION OF LAUREL REGIONAL HOSPITAL (N=153)

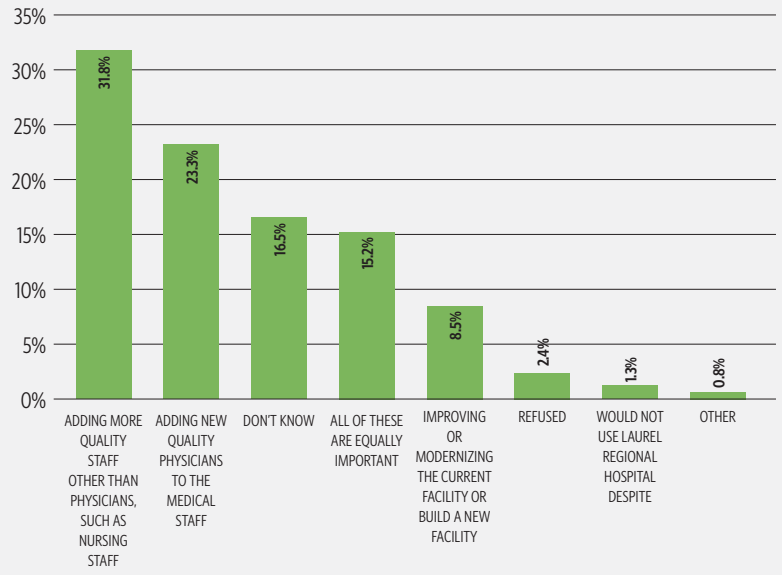


FIGURE 14 IMPORTANCE OF FACTORS IN DECISION TO USE NEW HOSPITAL (N=1,001)

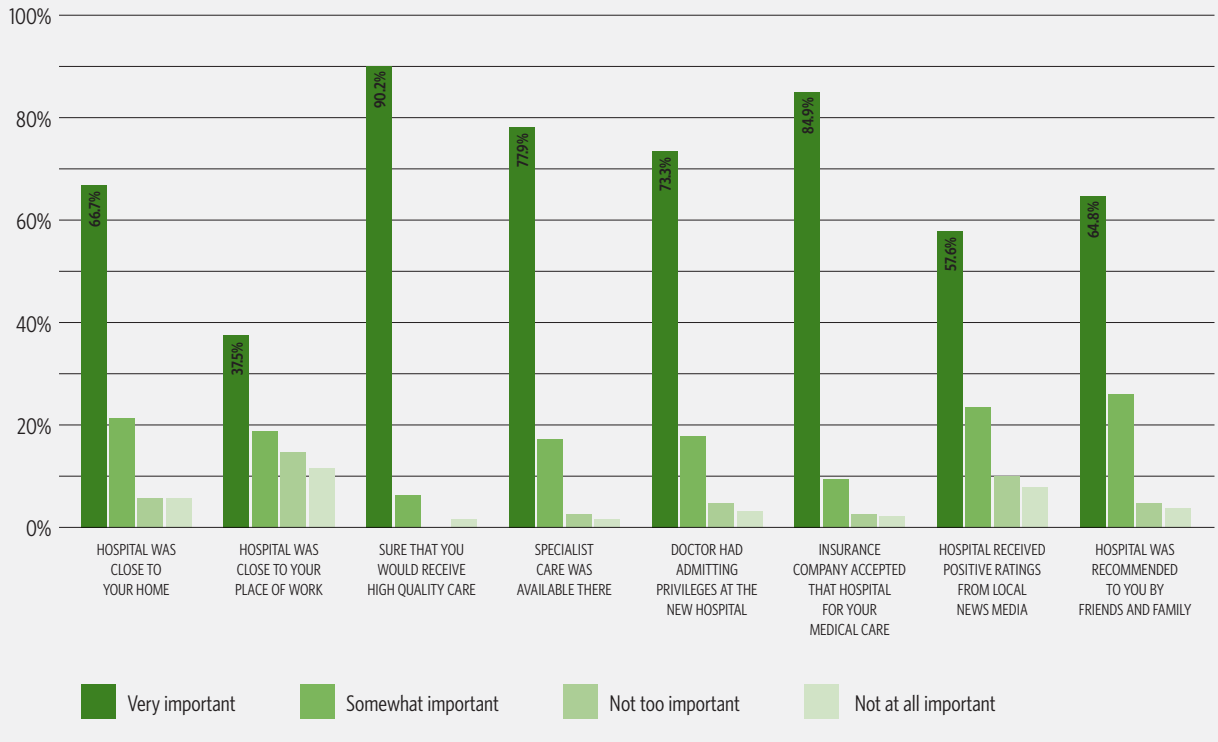


TABLE 22 HEALTH LITERACY (N=1,001)

Item	Always	Very often	Sometimes	Rarely	Never	Don't Know	Refused
How often do you have someone help you read medical materials?	3.9%	4.3%	17.0%	18.4%	56.2%	0.1%	**
How often do you have problems learning about your medical condition because of difficulty understanding the written information?	1.6%	3.0%	18.4%	25.3%	51.2%	0.1%	0.2%

EXPERIENCES IN A MULTI-CULTURAL HEALTH CARE SETTING

Critical to ensuring the successful uptake of the new system and realizing its promise for health is effective communication, particularly in the multi-cultural context of the County. The survey included a number of questions on health literacy and communication across cultures. Overall, respondents did not report difficulty understanding medical information and materials (see Table 22). Almost 74.6 percent reported never or rarely needing help reading medical materials and 76.8 percent reported feeling very confident or extremely confident filling out medical forms (see Table 22 and Figure 15). This is not surprising given the overall high education level of survey respondents. Further analysis is needed to explore the association between race, ethnicity, income and education with health literacy.

Another point of interest regarding patient/provider communication was to what extent respondents had experienced difficulties due to discordance—that is, difference on the basis of gender, race/ethnicity or culture. We asked this overall question, "Please tell me if the following has been a major problem for you, a minor problem for you, or not a problem at all during the last 12 months: a) being treated by a doctor or other health care provider who is from another country; b) being treated by a doctor or other health care provider who is not of your race/ethnic group; c) being treated by a doctor or other health care provider who is not a man/woman; d) communicating with doctors or other health care providers because of language differences." Overall, respondents reported little difficulty communicating with providers of another country, different race/ethnicity, or different gender (Figure 16). While 21.6 percent of respondents reported experiencing a problem due to language differences, only 3.5 percent considered this to have been a major problem.

However, communication may be a concern for those respondents who do not have access to providers who speak their language, since few reported having been provided with interpreter services. Of those respondents reporting a primary language other than English, a little less than half (48.5 percent) have access to professionals who speak their language. Of this small group of respondents who are limited in their ability to directly communicate with their providers, only 20.9 percent reported access to interpreter services.

REACTIONS TO RACE

The literature on provider bias in health care is well documented. We were interested in a number of factors that can shape County residents' responses to the health care system. From the Reactions to Race segment of the Behavioral Risk Factor Surveillance System, we asked this question, "Within the past 12 months, when seeking health care, do you feel your experiences were worse than, the same as, or better than for people of other races?" Just over 81 percent responded they were treated the same as other races, 7.5 percent reported worse than other races, 6.1 percent reported better than other races and 3.3 percent did not know.

FIGURE 15 HOW CONFIDENT ARE YOU FILLING OUT MEDICAL FORMS BY YOURSELF?

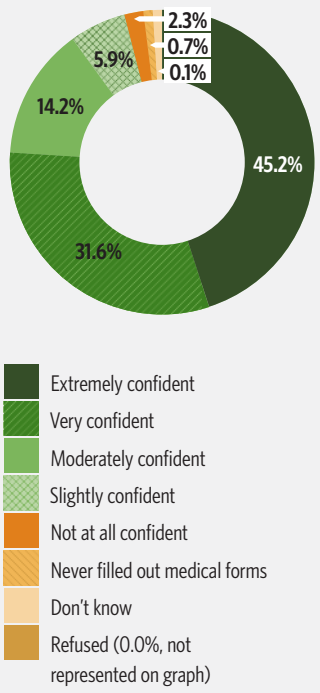
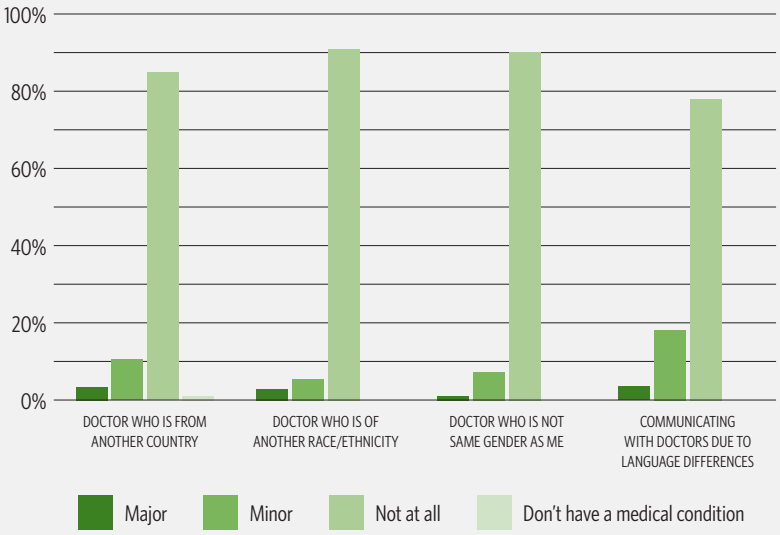


FIGURE 16 PLEASE TELL ME IF THE FOLLOWING HAS BEEN A MAJOR PROBLEM FOR YOU, A MINOR PROBLEM FOR YOU, OR NOT A PROBLEM AT ALL DURING THE LAST 12 MONTHS?



Note: Zero percent of sample chose "don't know" or refusal as preferred option.

DISCUSSION

This household survey provides valuable insights into the current utilization of health care services including local hospitals, as well as offers some understanding of the factors that drive decisions by County residents. Of critical importance is that it is representative of the County's population, thereby allowing us to make generalizations about the County as a whole.

In 2008, Prince George's County contracted with RAND Corporation to study the health care needs of County residents and to assess the ability of the County to meet those needs. Results of the RAND study began to form the picture of health and health care concerns specific to Prince George's County, and in particular how these needs and concerns compared to the neighboring counties and the state. The RAND study indicated that while, overall, Prince George's County residents were no more likely than the rest of the state to self-report fair or poor health, Prince George's County residents were more likely to report being overweight or obese and having been diagnosed with diabetes relative to Maryland as a whole, as well as the neighboring jurisdictions of Howard and Montgomery Counties (Lurie et al. 2009).

While the reports of other chronic diseases were similar between Prince George's County and other jurisdictions within Maryland, the health status of residents within the County varies widely, and is dependent largely upon educational attainment and income. Residents with more education were significantly less likely to report having a chronic condition, including heart disease, cerebrovascular disease, diabetes, asthma and disability. Likewise, residents with household incomes greater than $50,000 per year were less likely to report that they had been diagnosed with heart disease, cerebrovascular disease, or disability than residents with lower annual incomes. Furthermore, the RAND report indicates that Prince George's County residents are uninsured at relatively high rates, especially as compared to residents of Montgomery and Howard counties, with 14 percent of adult residents reporting that they were uninsured. Additionally, 10 percent of residents reported missing needed care because the cost was too high, and nearly 16 percent reported having no regular source of care. Access to care was dependent

on specific demographic and socio-economic characteristics. For example, males were nearly four times more likely to lack a regular source of care than females, and were almost three times less likely as females to have had a routine check-up within the past two years. Blacks were less likely than whites to report having a usual source of care (Lurie et al., 2009).

RAND found that Prince George's County has fewer primary care physicians per capita than any other area jurisdiction, and many of the primary care doctors in the County are located outside of the areas where they would have the most impact on reducing the number of preventable hospitalizations and emergency department visits. While in 2009 RAND assessed hospital capacity as adequate, the County had a relatively low supply of emergency department slots, even though residents used the emergency department more intensively than residents of other jurisdictions. Finally, many residents of Prince George's County seek medical care outside of the County, a practice that is likely driven by a combination of convenience, preferences, and provider availability and referral patterns (Lurie et al., 2009).

The results from the RAND report help identify some areas of heath and health care concern for residents of Prince George's County. One major limitation of that report, however, was that it lacked information about residents' experiences with and attitudes toward health care services within the County. Our random household survey has helped fill that gap. Overall, our results lend support to many of the goals identified in the County's Health Improvement Plan while we also identify a few areas of difference. For example, only 8 percent of residents identified HIV/AIDS as a major concern for the County and infant mortality was not identified as an issue at all. Other health conditions and risk behaviors—from diabetes, cardiovascular disease, obesity, cancer and the associated behaviors—are consistent across our survey and the CHIP.

We clearly found that while 65 percent of residents were receiving care from their doctor within the County, the use of hospitals outside the County remains an issue, driven by insurance, provider referrals, availability of specialty care and perceptions. Addressing these issues will require a multi-pronged effort aimed at County residents, health care providers and insurers.

FUTURE ANALYSES

As with all research studies, the data provides other opportunities for a more sophisticated examination of critical questions. Specific areas for further analyses include:

- A more detailed analysis of health care utilization by categories of insurance (private insurance/public insurance);
- Further comparisons with the PGCBRFSS on risk behaviors and chronic conditions;
- Future examination of choices for hospital care in specific conditions in a more complex analysis with key demographic variables;
- Examination of the health literacy and patient/provider communication variables by race, ethnicity, income, education, length of time in the U.S. and other demographic variables; and
- Examination of the Reactions to Race module by demographic variables and perceived socio-economic position.

LIMITATIONS The primary limitation was that lack of resources limited the length of the survey, in particular curtailing questions about health behaviors. Additionally, our questions about race and ethnicity provided only limited data about sub-groups within racial categories, thereby limiting our ability to conduct sub-group analyses.

SUMMARY

This household survey provides valuable data on the perceptions, experiences and health care behaviors of a representative sample of County residents, thereby filling gaps in existing reports and strengthening the planning process for a new health care system.

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APPENDIX A THE PRINCE GEORGE'S COUNTY PUBLIC HEALTH IMPACT ASSESSMENT SURVEY

The study was conducted for the University of Maryland via telephone by SSRS, an independent research company. Interviews were conducted from January 30–March 4, 2012 among a sample of 1,001 residents of Prince George's County in Maryland. The margin of error for total respondents is +/-4.3% at the 95 percent confidence level. More information about SSRS can be obtained by visiting *www.ssrs.com*.

KEY Em dash (—) means item was not mentioned. Asterisk (*) indicates a less than 1 percent response.

First, I'd like to ask some general background questions.

INITIAL DEMOGRAPHIC DATA

D1. WHAT IS YOUR AGE?

18-29	21
30-49	40
50-64	26
65+	13
Refused	1

D1A. HOW LONG HAVE YOU LIVED IN PRINCE GEORGE'S COUNTY?

Less than 1 year	3.0
1 to less than 3 years	5.6
3 to less than 5 years	5.5
5 to less than 10 years	11.3
10 to less than 20 years	21.9
20 years or more	43.7
All my life	8.6
Don't know	1
Refused	—

D2. IN WHAT TOWN OR CITY DO YOU WORK?

CITIES IN PRINCE GEORGE'S COUNTY (NET)	25
Accokeek	—
Adelphi	*
Andrews Air Force Base	*
Aquasco	—
Beltsville	1
Bladensburg	*
Bowie	2
Brandywine	*
Brentwood	*
Camp Springs	*
Capitol Heights	1
Cheltenham	—
Cheverly	*
Clinton	1
College Park	3

District Heights	*
Fort Washington	*
Glenn Dale	—
Greenbelt	1
Hyattsville	2
Landover	2
Lanham	2
Largo	1
Laurel	3
Mount Rainier	*
Mitchellville	—
Oxon Hill	1
Riverdale	*
Southern MD Facility	—
Suitland	1
Temple Hills	1
Upper Marlboro	1
Other Prince George's County Cities	2
OTHER MARYLAND CITIES (NET)	14
Annapolis	1
Baltimore	1
Bethesda	1
Columbia	1
Dundalk	--
Ellicott City	--
Frederick	--
Gaithersburg	1
Germantown	—
Silver Spring	2
Wheaton	*
Other Anne Arundel County	1
Other Montgomery County	3
Other Maryland	3

VIRGINIA CITIES (NET)	8
Alexandria	1
Arlington	2
Chesapeake	—
Hampton	*
Newport News	*
Norfolk	—
Portsmouth	—
Richmond	—
Roanoke	—
Virginia Beach	*
Other Virginia	5
WASHINGTON D.C.	19
Other	1
Retired/not currently employed	31
Don't know	1
Refused	*

D2A. AND WHAT STATE IS THAT IN?

Maryland	—
Virginia	—
Washington DC	—
Other	100
Don't know/	—
Not sure	—
Refused	—

Also, so we can include people of all races and ethnicities …

D3. DO YOU CONSIDER YOURSELF TO BE HISPANIC OR LATINO?

Yes	11
No	89
Don't know	—
Refused	—

D4. WHICH ONE OR MORE OF THE FOLLOWING WOULD YOU SAY IS YOUR RACE?

White	19.0
Black or African American	65.5
Asian	2.7
Native Hawaiian or Other Pacific Islander	0.5
American Indian or Alaska Native	1.0
Hispanic/Latino	11.1
Other	0.3

(Asked of total respondents who are Black or African American or Haitian/Other Caribbean; n=615)

D4A. WERE YOU OR EITHER OF YOUR PARENTS BORN IN THE CARIBBEAN, OR NOT?

Yes	10
No	89
Don't Know	*
Refused	1

(Asked of total respondents who are Black or African American or Haitian/Other Caribbean; n=615)

D4B. WERE YOU OR EITHER OF YOUR PARENTS BORN IN AFRICA, OR NOT?

Yes	9
No	90
Don't know	1
Refused	1

D5. GENDER

Male	53.3
Female	46.7

COUNTY HEALTH ISSUES

CH1. WHAT DO YOU SEE AS THE ONE MOST URGENT HEALTH CONDITION OR DISEASE FACING RESIDENTS LIVING IN PRINCE GEORGE'S COUNTY?

Cancer	17.2
Heart disease	8.1
Diabetes	15.7
HIV/AIDS	8.4
High blood pressure/Hypertension	9.1
Asthma	1.5
Stroke	*
Dental/Oral health	*
Sickle cell anemia	*
Lung disease	2.0
Mental illness	0.7
Substance abuse	1.4
Infant Mortality	*
Obesity	10.0
STDs	1.4
Flu/colds	3.0
Other	4.9
None	1.6
Don't Know/Not sure	14.7
Refused	--

CH2. NOW, I'M GOING TO READ YOU A LIST OF HEALTH CARE ISSUES. PLEASE TELL ME IF YOU THINK (INSERT ITEM) IS A MAJOR PROBLEM, A MINOR PROBLEM, OR NOT A PROBLEM AT ALL IN PRINCE GEORGE'S COUNTY?

	PROBLEM					
	NET	Major	Minor	Not a problem	Don't know/ not sure	Refused
a. access to health care	80.2	50.0	30.2	15.1	4.6	0.2
b. quality of health care	79.7	47.3	32.4	16.2	4.1	0.1
c. the cost of health care	93.9	77.7	16.2	3.2	2.9	0.1
d. the cost of health insurance	92.2	77.6	14.6	4.3	3.3	0.2

HEALTH STATUS

S1A. IN GENERAL, WOULD YOU SAY YOUR HEALTH IS EXCELLENT, VERY GOOD, GOOD, FAIR OR POOR?

Excellent	20.7
Very Good	28.3
Good	35.9
Fair	12.8
Poor	2.3
Don't Know/not sure	0.1
Refused	—

S2A. HAVE YOU EVER BEEN TOLD BY YOUR DOCTOR OR A HEALTHCARE PROFESSIONAL THAT YOU HAVE A MEDICAL CONDITION OR CHRONIC DISEASE?

(If needed: by healthcare professional, I mean a nurse practitioner, physician's assistant, or some other licensed professional.)

Yes	37.1
No	62.9
Don't know/not sure	—
Refused	—

S3A. (IF FEMALE INSERT: OTHER THAN DURING PREGNANCY) HAVE YOU EVER BEEN TOLD BY A DOCTOR OR OTHER HEALTHCARE PROFESSIONAL THAT YOU HAVE PRE-DIABETES OR BORDERLINE DIABETES?

Yes	16.7
No	83.2
Don't know/not sure	0.1
Refused	—

S4A. (IF FEMALE INSERT: OTHER THAN DURING PREGNANCY) HAVE YOU EVER BEEN TOLD BY A DOCTOR OR OTHER HEALTHCARE PROFESSIONAL THAT YOU HAVE PRE-HYPERTENSION OR BORDERLINE HIGH BLOOD PRESSURE?

Yes	33.2
No	66.6
Don't know/not sure	0.1
Refused	0.1

(Asked of total respondents who have ever been told by their doctor or a healthcare professional that they have a medical condition or chronic disease; n=423)

S5. YOU MENTIONED THAT YOU HAD BEEN DIAGNOSED WITH A MEDICAL CONDITION OR CHRONIC DISEASE.

(PN: IF S3a=YES INSERT: Other than pre-diabetes or borderline diabetes ...) (PN: IF S4a=YES INSERT: Other than pre-hypertension or borderline high blood pressure...) (PN: IF S3a AND S4a = YES INSERT: Other than pre-diabetes or borderline diabetes OR pre-hypertension or borderline high blood pressure...) Please tell me which conditions you have been diagnosed with.

Cancer	2.3
Heart disease	2.6
Diabetes	3.7
Asthma	3.3
High blood pressure	5.5
High cholesterol	2.6
Sickle cell anemia	0.2
Stroke	0.5
HIV/AIDS	0.4
Alcoholism	—
Drug addiction	—
(COPD) chronic obstructive pulmonary disease	0.4
Emphysema—	
Chronic bronchitis	1.0
Chronic arthritis	2.0
Gout	—
Lupus	0.3
Fibromyalgia	0.2
Mental illness (depression, etc)	1.4
Obesity	0.5
Thyroid problems/Hypothyroidism	1.7
Other	6.0

SELECTED RISK FACTORS

R1. DURING THE PAST 30 DAYS, ON HOW MANY DAYS DID YOU SMOKE CIGARETTES?

None	83.0
1-29 days	6.0
30 days or more	11.1
Don't know	*
Refused	—

R2. ABOUT HOW MUCH DO YOU WEIGH WITHOUT SHOES?

Less than 70 pounds	—
70-100 pounds	1
101-150 pounds	24
151-200 pounds	49
201-250 pounds	19
251 pounds-599 pounds	6
More than 600 pounds	—
Don't know/not sure	1
Refused	1

R3. ABOUT HOW TALL ARE YOU WITHOUT SHOES?

Less than 4ft	*
4ft 6 inches-4ft 11 inches	2
5ft 0 inches-5ft 6 inches	51
5ft 7 inches-5ft 11 inches	33
6ft 0 inches-6ft 6 inches	13
6ft 7 inches-6ft 10 inches	*
More than 8ft	—
Don't know/not sure	*
Refused	*

R2/R3 BMI CONVERSION	
Underweight/Normal = <25	28.7
Overweight = 25-29.9	34.0
Obesity = BMI of 30 or greater	35.0
Don't know/refused	2.3

HEALTHCARE UTILIZATION

U1. WHAT KIND OF PLACE DO YOU USUALLY GO TO WHEN YOU ARE SICK OR YOU NEED ADVICE ABOUT YOUR HEALTH? IS IT A DOCTOR'S OFFICE, HOSPITAL EMERGENCY ROOM, HOSPITAL OUTPATIENT DEPARTMENT, URGENT CARE FACILITY, A CLINIC OR HEALTH CENTER, OR SOME OTHER PLACE?

Doctor's Office	69.7
Hospital Emergency Room	8.0
Hospital Outpatient Department	3.7
Urgent Care Facility	3.6
Clinic or Health Center	11.4
Some other place	0.9
I don't have a place where I usually go	2.2
Don't Know/not sure	0.4
Refused	0.1

U2. HOW WOULD YOU RATE THE QUALITY OF HEALTH CARE YOU RECEIVE AT THE PLACE YOU USUALLY GO WHEN YOU ARE SICK OR NEED ADVICE ABOUT YOUR HEALTH?

NET	
Excellent	31.9
Very Good	34.3
Good	25.4
Fair	7.4
Poor	0.9
Don't know	0.1
Refused	—

U3. DO YOU HAVE ONE PERSON YOU THINK OF AS YOUR PERSONAL DOCTOR OR HEALTH CARE PROVIDER?

YES	
NET	75.4
One person	67.9
More than one person	7.5
No, not anyone	24.6
Don't know/not sure	—
Refused	—

(Asked of total respondents who think of one person as their personal doctor or health care provider; n=757)

U3_1. WHAT IS THAT PROVIDER'S SPECIALTY?

Family Practice/General Practice	58
Internist (Internal Medicine)	21
Cardiologist	3
Obstetrician/Gynecologist	5
Surgeon/General Surgeon	*
Pediatrics	1
Orthopedics	—
Nurse practitioner	—
Physician's assistant	—
Endocrinologist	1
Other	3
Don't know/not sure	8
Refused	—

(Asked of total respondents who think of more than one person as their personal doctor or health care provider; n=79)

U3_2. OF ALL THE PEOPLE YOU CONSIDER TO BE YOUR PERSONAL DOCTORS OR PROVIDERS, CHOOSE THE MOST IMPORTANT ONE TO YOU. WHAT IS THAT PROVIDER'S SPECIALTY?

Family Practice/General Practice	56
Internist (Internal Medicine)	6
Cardiologist	2
Obstetrician/Gynecologist	6
Surgeon/General Surgeon	—
Pediatrics	1
Orthopedics	—
Nurse practitioner	—
Physician's assistant	—
Endocrinologist	—
Other	16
Don't know/not sure	12
Refused	1

(Asked of total respondents who think of someone as their personal doctor or health care provider; n=836)

U3_3. IN WHAT CITY OR TOWN IS THEIR OFFICE LOCATED?

CITIES IN PRINCE GEORGE'S COUNTY (NET)	66
Accokeek	—
Adelphi	—
Andrews Air Force Base	0.8
Aquasco	—
Beltsville	—
Bladensburg	1.3
Bowie	9.0
Brandywine	—
Brentwood	0.5
Camp Springs	1.7
Capitol Heights	—
Cheltenham	—
Cheverly	—
Clinton	5.9
College Park	1.1
District Heights	1.9
Fort Washington	2.6
Glenn Dale	—
Greenbelt	7.0
Hyattsville	7.3
Landover	1.3
Lanham	4.2
Largo	4.5
Laurel	6.3
Mount Rainier	—
Mitchellville	0.5
Oxon Hill	1.1
Riverdale	2.1
Southern MD Facility	—
Suitland	—
Temple Hills	1.1
Upper Marlboro	2.4
Other Prince George's County Cities	3.4
OTHER MD CITIES (NET)	15.9
Annapolis	0.7
Baltimore	—
Bethesda	1.7
Columbia	0.6
Dundalk	—
Ellicott City	—
Frederick	—
Gaithersburg	—
Germantown	—
Silver Spring	4.9
Wheaton	—
Other Anne Arundel Coutnty	1.1
Other Montgomery County	3.6
Other Maryland	3.3
WASHINGTON D.C.	11.1
VA CITIES	1.8
Alexandria	0.7

Arlington	0.5
Chesapeake	—
Hampton	—
Newport News	—
Norfolk	—
Portsmouth	—
Richmond	—
Roanoke	—
Virginia Beach	—
Other Virginia	0.6
Other	—
Don't know	2.3
Refused	*

(Asked of total respondents who said their personal doctor or provider is not located in one of the cities or towns already specified; n = 1)

U3_3A. AND WHAT STATE IS THAT IN?

Maryland	100
Virginia	—
Washington DC	—
Other	—
Don't know/not sure	—
Refused	

(Asked of total respondents whose healthcare provider is not located in Prince George's County; n = 182)

U3_4. YOU SAID THAT (IF U3=1 READ: YOUR PROVIDER) (IF U3=2 READ: THE PROVIDER WHO IS MOST IMPORTANT TO YOU) IS NOT LOCATED IN PRINCE GEORGE'S COUNTY. WHY DO YOU GO OUTSIDE OF PRINCE GEORGE'S COUNTY TO SEEK CARE?

My provider is located within Prince George's County	5.2
Can't get an appointment to see a Prince George's County physician with this specialty	7.1
My insurance requires that I go see a physician located outside of Prince George's County	7.5
The physician I go to was recommended by my primary care physician	1
The physician I go to was recommended by family or friends	11.3
I am not comfortable with the quality of the Prince George's County physicians	3.7
I commute outside of Prince George's County to work and my physician's office location is more convenient for me	9.0
I prefer to use my own provider	36.5
I am military/a veteran/go to the military/veterans hospital	5.1
Better quality of care	5.2
Other	10.2
Don't know/ not sure	—
Refused	2

(Asked of total respondents who have some usual place to go when they are sick or need advice about their health; n= 988)

U3_5. HOW DO YOU USUALLY GET TO (THIS DOCTOR'S OFFICE/THE PLACE THAT YOU USUALLY GO WHEN YOU ARE SICK OR NEED ADVICE ABOUT YOUR HEALTH)?

Drive yourself	75
Get a ride from someone else in a personal vehicle	11
Walk	1
Take Metro Bus Or Train	10
Use "Call A Bus Service" Or "Call A Cab Service"	1
Use a standard Taxi service	1
Use Metroaccess	1
Other	*
Don't Know /Not sure	*
Refused	—

U4. SOMETIMES PEOPLE HAVE DIFFICULTY GETTING HEALTH CARE WHEN THEY NEED IT. BY HEALTH CARE, I MEAN MEDICAL CARE AS WELL AS OTHER KINDS OF CARE LIKE DENTAL CARE AND MENTAL HEALTH SERVICES. DURING THE PAST 12 MONTHS, WAS THERE ANY TIME WHEN YOU NEEDED HEALTH CARE, BUT IT WAS DELAYED OR NOT RECEIVED?

Yes	16.9
No	83.1
Don't know/not sure	—
Refused	—

(Asked of total respondents who have delayed or not received healthcare when they needed it; n= 147)

U4_1. WHAT TYPE OF CARE WAS DELAYED OR NOT RECEIVED? WAS IT MEDICAL CARE, DENTAL CARE, MENTAL HEALTH SERVICES, OR SOMETHING ELSE?

Medical Care	65
Dental Care	29
Mental health services	4
Something else	3
Don't know/not sure	—
Refused	—

(Asked of total respondents who have delayed or not received healthcare when they needed it; n= 147)

U4_2. WHY WAS THAT CARE DELAYED OR NOT RECEIVED?

Didn't think the problem was serious	1
Couldn't get the time off work	—
No insurance at the time	34
Insurance company denied coverage for service	8
Couldn't afford the cost	24
Couldn't get an appointment	20
Already owed money for medical bills and didn't want to owe any more	—

Lack of child care	—
Lack of transportation	3
Long Waiting Periods	7
Unaware of what Services are available	—
I couldn't find a provider	3
My own choice (various mentions)	2
Other	11
Don't know/not sure	—
Refused	—

U5. IN PLANNING A NEW HEALTHCARE SYSTEM FOR THE COUNTY, DECISIONS HAVE TO BE MADE ABOUT WHAT SERVICES ARE VITAL TO THE COMMUNITY. BASED ON YOUR EXPERIENCES AND THE EXPERIENCES OF YOUR FAMILY, PLEASE TELL ME IF THE AVAILABILITY OF (INSERT SERVICE) IS VITAL, IMPORTANT BUT NOT VITAL, OR NOT AT ALL IMPORTANT TO HAVE IN PRINCE GEORGE'S COUNTY?

	NET	Vital	Important but not vital	Not at all important	Don't know/ not sure	Refused
a. Mental health treatment	96.8	62.5	34.3	2.1	1.1	—
b. Urgent care	98.2	77.1	21.1	—	1.3	—
c. Family planning services	92.3	54.6	37.7	6.0	1.8	—
e. Alcohol and drug abuse treatment	95.6	67.9	27.7	2.8	1.6	—
f. Nutrition education or counseling	96.5	58.9	37.6	2.7	0.9	—
g. Stress management programs	92.8	47.6	45.2	5.8	1.4	—
h. Physical activity programs	95.7	57.7	38.0	3.9	—	—
i. Smoking cessation programs	88.2	45.6	42.6	9.1	2.5	—

U6. WHAT ARE YOUR TOP THREE PRIORITIES WHEN DECIDING ON THE LOCATION WHERE YOU WILL GET HEALTH CARE SERVICES?

ACCESSIBILITY TO CARE (NET)	43
Hours/appointments (subnet)	22
Flexibility of hours	9
How quickly I can get an appointment/how quickly I can get treated	13
Accessible to doctors/facilities/services (subnet)	20
Having access to specialist care	6
Having access to my personal doctor	9
Access to/affiliation with other multiple doctors	*
Hospitals affiliations	1
Types of treatment/services available at the facility	3
Other accessible to doctors/facilities/services mentions	1
Having access to my medical records	1
Other accessibility to care mentions	*
COST/COVERAGE (NET)	24
If they accept my insurance	10
Cost	14
Other cost/coverage mentions	*
QUALITY OF CARE/REPUTATION (NET)	61
Reputation/recommendation (subnet)	9
Reputation of doctor/facility (history, trustworthiness, etc.)	4
Recommendations/referrals (family/friends/ other doctors reviews/etc.)	5
Whether I will receive a higher quality of care	36
Professionalism/good customer service/quality of facilities	5
Competent/quality doctors/medical staff (education/ experience/qualifications)	8
Caring doctors/medical staff	2
Other quality of care/reputation mentions	1
LOCATION-RELATED (NET)	79
Whether or not the facility or doctor is close to my home	51
Whether or not the facility or doctor is close to my place of work	6
Closeness/the distance/proximity (general)	2
Convenience/easy to get there/accessibility (general/ unspecified close, near highways, etc.)	2
The area/neighborhood (safety of the area, etc.)	2
Close to other medical services/facilities (labs, hospitals, etc.)	*
Location (general)	2
Accessible to transportation	12
Parking (easy/free)	1
Other location-related mentions	1
FACILITY-RELATED (NET)	6
Cleanliness	3
The setting/facility (appearance, comfort, etc.)—general	1
Other facility-related mentions	*
Language needs	1
Depends on factors at the time (medical condition/ time of day, etc.)	1
Some other reason	1
Don't know/Not sure	6
Refused	*

HOSPITAL SERVICES

Now I have a set of questions about hospitals in the region available to Prince George's County residents. These can include hospitals in Prince George's County or in another county or Washington D.C. or elsewhere.

H1. WHEN YOU THINK OF HOSPITALS SERVING PRINCE GEORGE'S COUNTY RESIDENTS, WHICH HOSPITAL COMES TO MIND FIRST? REMEMBER YOU MIGHT CHOOSE A HOSPITAL LOCATED OUTSIDE OF THE COUNTY.

Anne Arundel Medical Center (Annapolis)	3.5
Bowie Health Campus	*
Children's National Medical Center	0.7
Civista Medical Center	—
Doctors Community Hospital	16.4
Fort Washington Medical Center	1.8
George Washington University Hospital	1.7
Georgetown University Hospital	0.9
Holy Cross Hospital	6.9
Howard County General Hospital	*
Howard University Hospital	*
Johns Hopkins Hospital (Baltimore)	0.7
Laurel Regional Hospital	4.6
Montgomery General Hospital	1.0
National Rehabilitation Hospital	*
Prince George's Hospital Center	20.6
Providence Hospital	1.1
Shady Grove Hospital	*
Sibley Memorial Hospital	*
Southern Maryland Hospital	12.1
Suburban Hospital	0.5
University of Maryland Medical Center (Baltimore)	0.5
Washington Adventist Hospital	5.4
Washington Hospital Center (Washington, DC)	12.5
Adventist Hospital (unspecified)	*
Bethesda Medical Center	*
Virginia Hospital	*
Greater Southeast Hospital	*
Kaiser	0.7
Malcolm Grove Medical Center (Andrew Air Force base)	0.8
United Medical Center	*
Walter Reed Army Medical Center	*
Other military/veterans hospitals	—
Other	1.0
Don't know/Not sure	3.9
Refused	—

(Asked of total respondents who are aware of at least one hospital that serves Prince George's County residents; n = 966)

H2. WHAT OTHER HOSPITALS ARE YOU AWARE OF THAT SERVE PRINCE GEORGE'S COUNTY RESIDENTS? REMEMBER YOU MIGHT CHOOSE HOSPITALS LOCATED OUTSIDE OF THE COUNTY.

Anne Arundel Medical Center (Annapolis)	4
Bowie Health Campus	3
Children's National Medical Center	8
Civista Medical Center	1
Doctors Community Hospital	21
Fort Washington Medical Center	5
George Washington University Hospital	3
Georgetown University Hospital	5
Holy Cross Hospital	16
Howard County General Hospital	1
Howard University Hospital	1
Johns Hopkins Hospital (Baltimore)	3
Laurel Regional Hospital	10
Montgomery General Hospital	*
National Rehabilitation Hospital	—
Prince George's Hospital Center	33
Providence Hospital	7
Shady Grove Hospital	2
Sibley Memorial Hospital	2
Southern Maryland Hospital	17
Suburban Hospital	2
University of Maryland Medical Center (Baltimore)	*
Washington Adventist Hospital	7
Washington Hospital Center (Washington, DC)	19
Adventist Hospital (unspecified)	*
Bethesda Medical Center	*
Virginia Hospital	2
Greater Southeast Hospital	1
Kaiser	1
Malcolm Grove Medical Center (Andrew Air Force base)	1
United Medical Center	1
Walter Reed Army Medical Center	1
Other military/veterans hospitals	*
Other	3
No others	6
Don't know/Not sure	4
Refused	—

H3. WHICH HOSPITAL IS LOCATED CLOSEST TO YOU?

Anne Arundel Medical Center (Annapolis)	1.7
Bowie Health Campus	1.9
Children's National Medical Center	0.7
Civista Medical Center	*
Doctors Community Hospital	17.4
Fort Washington Medical Center	3.6
George Washington University Hospital	*

Georgetown University Hospital	—
Holy Cross Hospital	2.9
Howard County General Hospital	*
Howard University Hospital	*
Johns Hopkins Hospital (Baltimore)	—
Laurel Regional Hospital	9.8
Montgomery General Hospital	*
National Rehabilitation Hospital	—
Prince George's Hospital Center	22.9
Providence Hospital	2.8
Shady Grove Hospital	*
Sibley Memorial Hospital	—
Southern Maryland Hospital	18.4
Suburban Hospital	*
University of Maryland Medical Center (Baltimore)	*
Washington Adventist Hospital	4.9
Washington Hospital Center (Washington, DC)	2.0
Adventist Hospital (unspecified)	*
Bethesda Medical Center	—
Virginia Hospital	—
Greater Southeast Hospital	1.0
Kaiser	0.7
Malcolm Grove Medical Center (Andrew Air Force base)	0.8
United Medical Center	1.0
Walter Reed Army Medical Center	—
Other military/veterans hospitals	*
Other	*
Don't know/Not sure	5.4
Refused	—

(Asked of total respondents who mentioned a specific hospital; n= 951)

H4. IN YOUR OPINION, WOULD YOU SAY THAT THE SERVICES AT (IF CODE 01–97 IN H3 INSERT NAME OF HOSPITAL FROM H3) ARE ...?

Excellent	15.5
Very Good	24.9
Good	24.2
Fair	15.9
Poor	10.9
Don't know	8.4
Refused	0.2

H5. TO WHICH HOSPITAL WOULD YOU CHOOSE TO BE ADMITTED IF YOU NEEDED HOSPITALIZATION FOR ANYTHING OTHER THAN AN EMERGENCY?

Anne Arundel Medical Center (Annapolis)	5.8
Bowie Health Campus	1.0
Children's National Medical Center	1.3
Civista Medical Center	*
Doctors Community Hospital	13.5
Fort Washington Medical Center	1.9
George Washington University Hospital	4.1
Georgetown University Hospital	1.9
Holy Cross Hospital	13.3
Howard County General Hospital	0.6
Howard University Hospital	0.6
Johns Hopkins Hospital (Baltimore)	2.7
Laurel Regional Hospital	2.2
Montgomery General Hospital	0.7
National Rehabilitation Hospital	*
Prince George's Hospital Center	7.3
Providence Hospital	1.8
Shady Grove Hospital	0.5
Sibley Memorial Hospital	*
Southern Maryland Hospital	6.8
Suburban Hospital	0.6
University of Maryland Medical Center (Baltimore)	*
Washington Adventist Hospital	4.6
Washington Hospital Center (Washington, DC)	15.3
Adventist Hospital (unspecified)	0.6
Bethesda Medical Center	0.7
Virginia Hospital	*
Greater Southeast Hospital	—
Kaiser	0.9
Malcolm Grove Medical Center (Andrew Air Force base)	1.7
United Medical Center	—
Walter Reed Army Medical Center	*
Other military/veterans hospitals	0.6
Other	2.1
No preference	0.9
Don't know/Not sure	4.1
Refused	*

H6. TO WHICH HOSPITAL WOULD YOU CHOOSE TO BE ADMITTED IF YOU NEEDED HOSPITALIZATION FOR A HEART ATTACK?

Anne Arundel Medical Center (Annapolis)	2.7
Bowie Health Campus	*
Children's National Medical Center	0.8
Civista Medical Center	—
Doctors Community Hospital	7.1
Fort Washington Medical Center	0.6
George Washington University Hospital	3.5
Georgetown University Hospital	1.0
Holy Cross Hospital	6.4
Howard County General Hospital	*
Howard University Hospital	0.7

Johns Hopkins Hospital (Baltimore)	5.4
Laurel Regional Hospital	1.1
Montgomery General Hospital	*
National Rehabilitation Hospital	*
Prince George's Hospital Center	8.1
Providence Hospital	1.0
Shady Grove Hospital	0.6
Sibley Memorial Hospital	*
Southern Maryland Hospital	5.2
Suburban Hospital	1.0
University of Maryland Medical Center (Baltimore)	0.5
Washington Adventist Hospital	8.1
Washington Hospital Center (Washington, DC)	30.8
Adventist Hospital (unspecified)	—
Bethesda Medical Center	0.7
Virginia Hospital	*
Greater Southeast Hospital	*
Kaiser	*
Malcolm Grove Medical Center (Andrew Air Force base)	1.2
United Medical Center	—
Walter Reed Army Medical Center	*
Other military/veterans hospitals	*
Other	1.3
No preference	0.9
Don't know/Not sure	7.4
Refused	—

H7. TO WHICH HOSPITAL WOULD YOU CHOOSE TO BE ADMITTED IF YOU NEEDED HOSPITALIZATION FOR GENERAL SURGERY?

Anne Arundel Medical Center (Annapolis)	4.5
Bowie Health Campus	*
Children's National Medical Center	0.6
Civista Medical Center	0.8
Doctors Community Hospital	10.4
Fort Washington Medical Center	0.6
George Washington University Hospital	4.7
Georgetown University Hospital	2.9
Holy Cross Hospital	11.0
Howard County General Hospital	0.7
Howard University Hospital	0.8
Johns Hopkins Hospital (Baltimore)	3.7
Laurel Regional Hospital	1.1
Montgomery General Hospital	0.6
National Rehabilitation Hospital	*
Prince George's Hospital Center	8.2
Providence Hospital	1.6
Shady Grove Hospital	1.0
Sibley Memorial Hospital	0.7
Southern Maryland Hospital	6.7
Suburban Hospital	1.2
University of Maryland Medical Center (Baltimore)	*
Washington Adventist Hospital	3.9
Washington Hospital Center (Washington, DC)	18.8
Adventist Hospital (unspecified)	—
Bethesda Medical Center	1.1
Virginia Hospital	—
Greater Southeast Hospital	—
Kaiser	0.6
Malcolm Grove Medical Center (Andrew Air Force base)	1.1
United Medical Center	—
Walter Reed Army Medical Center	0.6
Other military/veterans hospitals	0.6
Other	1.1
No preference	1.0
Don't know/Not sure	7.7
Refused	—

H8. WHICH HOSPITAL DO YOU MOST ASSOCIATE WITH HAVING THE BEST MATERNITY CARE FOR THE DELIVERY OF BABIES?

Anne Arundel Medical Center (Annapolis)	4.6
Bowie Health Campus	—
Children's National Medical Center	3.3
Civista Medical Center	*
Doctors Community Hospital	1.3
Fort Washington Medical Center	*
George Washington University Hospital	2.3
Georgetown University Hospital	0.7
Holy Cross Hospital	17.9
Howard County General Hospital	0.8
Howard University Hospital	*
Johns Hopkins Hospital (Baltimore)	1.1
Laurel Regional Hospital	1.2
Montgomery General Hospital	*
National Rehabilitation Hospital	*
Prince George's Hospital Center	8.4
Providence Hospital	2.9
Shady Grove Hospital	1.1
Sibley Memorial Hospital	0.7
Southern Maryland Hospital	4.4
Suburban Hospital	—
University of Maryland Medical Center (Baltimore)	*
Washington Adventist Hospital	1.5
Washington Hospital Center (Washington, DC)	11.7
Adventist Hospital (unspecified)	—
Bethesda Medical Center	—
Virginia Hospital	—
Greater Southeast Hospital	—

Kaiser	—
Malcolm Grove Medical Center (Andrew Air Force base)	0.6
United Medical Center	—
Walter Reed Army Medical Center	—
Columbia Hospital for Women	1
Other	2.2
No preference	2.9
Don't know/Not sure	26.9
Refused	*

H9. WHICH HOSPITAL SERVING THE PRINCE GEORGE'S COUNTY AREA DO YOU BELIEVE HAS THE BEST QUALITY OVERALL?

Anne Arundel Medical Center (Annapolis)	3.9
Bowie Health Campus	0.5
Children's National Medical Center	1.2
Civista Medical Center	*
Doctors Community Hospital	16.3
Fort Washington Medical Center	1.0
George Washington University Hospital	2.2
Georgetown University Hospital	1.4
Holy Cross Hospital	10.3
Howard County General Hospital	*
Howard University Hospital	*
Johns Hopkins Hospital (Baltimore)	2.5
Laurel Regional Hospital	2.8
Montgomery General Hospital	0.5
National Rehabilitation Hospital	*
Prince George's Hospital Center	7.8
Providence Hospital	1.2
Shady Grove Hospital	1.7
Sibley Memorial Hospital	0.5
Southern Maryland Hospital	9.1
Suburban Hospital	0.8
University of Maryland Medical Center (Baltimore)	*
Washington Adventist Hospital	3.7
Washington Hospital Center (Washington, DC)	11.4
Adventist Hospital (unspecified)	—
Bethesda Medical Center	—
Virginia Hospital	*
Greater Southeast Hospital	—
Kaiser	0.5
Malcolm Grove Medical Center (Andrew Air Force base)	*
United Medical Center	—
Walter Reed Army Medical Center	*
Other military/veterans hospitals	*
Other	0.8
No preference	2.4
Don't know/Not sure	15.5
Refused	*

H10. WHICH HOSPITAL SERVING THE PRINCE GEORGE'S COUNTY AREA DO YOU BELIEVE HAS THE WORST QUALITY OVERALL?

Anne Arundel Medical Center (Annapolis)	—
Bowie Health Campus	*
Children's National Medical Center	—
Civista Medical Center	*
Doctors Community Hospital	5.3
Fort Washington Medical Center	1
George Washington University Hospital	—
Georgetown University Hospital	*
Holy Cross Hospital	*
Howard County General Hospital	—
Howard University Hospital	0.5
Johns Hopkins Hospital (Baltimore)	—
Laurel Regional Hospital	2.5
Montgomery General Hospital	—
National Rehabilitation Hospital	—
Prince George's Hospital Center	36.1
Providence Hospital	1.1
Shady Grove Hospital	*
Sibley Memorial Hospital	—
Southern Maryland Hospital	6.3
Suburban Hospital	—
University of Maryland Medical Center (Baltimore)	—
Washington Adventist Hospital	1.2
Washington Hospital Center (Washington, DC)	*
Adventist Hospital (unspecified)	—
Bethesda Medical Center	—
Virginia Hospital	—
Greater Southeast Hospital	2.5
Kaiser	—
Malcolm Grove Medical Center (Andrew Air Force base)	—
United Medical Center	0.8
Walter Reed Army Medical Center	—
Other military/veterans hospitals	*
Other	0.7
No preference	5
Don't know/Not sure	35.9
Refused	*

H11. WHEN WAS THE LAST TIME YOU OR SOMEONE IN YOUR HOUSEHOLD STAYED OVERNIGHT AS A PATIENT IN A HOSPITAL?

Less than a year ago	31.3
One year but less than 2 years	14.1
Two years but less than 3 years	9.6
Three years or more	36.4

Never	7.1
Don't know/not sure	1.6
Refused	—

(Asked of total respondents who stayed overnight as a patient in a hospital; n = 932)

H12. THINKING OF THE LAST HOSPITAL STAY BY YOU OR SOMEONE IN YOUR HOUSEHOLD, IN WHICH HOSPITAL WAS THAT LAST STAY?

Anne Arundel Medical Center (Annapolis)	3.1
Bowie Health Campus	*
Children's National Medical Center	3.7
Civista Medical Center	*
Doctors Community Hospital	11.8
Fort Washington Medical Center	1.5
George Washington University Hospital	1.0
Georgetown University Hospital	1.4
Holy Cross Hospital	10.4
Howard County General Hospital	*
Howard University Hospital	1.2
Johns Hopkins Hospital (Baltimore)	2.1
Laurel Regional Hospital	4.4
Montgomery General Hospital	*
National Rehabilitation Hospital	*
Prince George's Hospital Center	8.2
Providence Hospital	1.9
Shady Grove Hospital	1.8
Sibley Memorial Hospital	0.6
Southern Maryland Hospital	8.3
Suburban Hospital	0.6
University of Maryland Medical Center (Baltimore)	*
Washington Adventist Hospital	7.2
Washington Hospital Center (Washington, DC)	11.2
Adventist Hospital (unspecified)	*
Bethesda Medical Center	0.7
Virginia Hospital	1.1
Greater Southeast Hospital	0.9
Kaiser	*
Malcolm Grove Medical Center (Andrew Air Force base)	0.7
United Medical Center	*
Walter Reed Army Medical Center	1.1
Other military/veterans hospitals	*
Columbia Hospital for Women	*
Other	5.9
Don't know/Not sure	6.8
Refused	*

(Asked of total respondents who stayed overnight as a patient in a hospital; n = 932)

H13. HOW PLEASED WERE YOU WITH YOUR HOSPITAL EXPERIENCE? WERE YOU ...?

PLEASED	NET	86.1
	Very	57.5
	Somewhat	28.6
NOT PLEASED	NET	10.8
	Not too	5.4
	Not at all	5.4
Don't know/not sure		3.0
Refused		*

(Asked of total respondents who stayed overnight in a hospital that is not in Prince George's County; n = 399)

H14. WHY DID YOU NOT USE A HOSPITAL LOCATED WITHIN PRINCE GEORGE'S COUNTY?

Referred to hospital by primary or specialty care physician	31
Do not have positive perceptions of hospitals located within Prince George's County	10
Had a medical condition that required utilizing a hospital outside of Prince George's County	7
Have insurance that dictated where I could go to receive hospital care	13
Work outside of Prince George's County	*
The hospital had a better reputation than those within Prince George's County	12
All of my records are already at that hospital I went to	2
Closer/closest to me/household member at the time (near previous home, was an emergency, etc.)	11
Familiarity (been there before, self/family member worked there, etc.)	6
Some other reason	8
Don't know/Not sure	4
Refused	2

H15. THINKING SPECIFICALLY OF PRINCE GEORGE'S HOSPITAL CENTER IN CHEVERLY, WHETHER YOU HAVE EVER BEEN A PATIENT THERE OR NOT, WHAT IS YOUR OVERALL OPINION OF THE HOSPITAL?

Would you say overall you have a favorable or unfavorable opinion of Prince George's Hospital Center in Cheverly?

Favorable	47.2
Unfavorable	34.9
Don't know/not sure	17.5
Refused	*

(Asked of total respondents who had an unfavorable opinion of Prince George's Hospital Center in Cheverly; n = 377)

H16. WHICH OF THE FOLLOWING WOULD CHANGE YOUR OPINION OF PRINCE GEORGE'S HOSPITAL IN CHEVERLY?

They would need to improve or modernize the current facility or build a new facility	17.1
They would need to add new quality physicians to the medical staff	19.1
They would need to add more quality staff other than physicians, such as nursing staff	31.0

All of these are equally important	20.7
New quality physicians/more quality staff other than physicians, such as nursing staff	1.2
Other	4.2
Would not use Prince George's Hospital Center despite any improvements made	0.9
I already use Prince George's Hospital Center	—
Don't know/not sure	5.9
Refused	—

H17. IF THERE WAS A NEW STATE OF THE ART HOSPITAL BUILT IN PRINCE GEORGE'S COUNTY, HOW LIKELY WOULD YOU BE TO USE IT? WOULD YOU BE ...?

LIKELY	NET	86.8
	Very	55.1
	Somewhat	31.7
NOT LIKELY	NET	9.7
	Not too	6.0
	Not at all	3.7
Don't know/not sure		3.5
Refused		*

H18. IF THERE WAS A NEW STATE OF THE ART HOSPITAL BUILT IN PRINCE GEORGE'S COUNTY, PLEASE TELL ME IF IT BE WOULD BE VERY IMPORTANT, SOMEWHAT IMPORTANT, NOT TOO IMPORTANT OR NOT AT ALL IMPORTANT TO YOU (INSERT ITEM) IN MAKING A DECISION WHETHER TO USE IT OR NOT.

	IMPORTANT			NOT IMPORTANT				
	NET	Very	Some-what	NET	Not too	Not at all	Don't know/ not sure	Refused
a. if the hospital was close to your home	88.1	66.7	21.4	11.5	5.9	5.6	*	—
b. if the hospital was close to your place of work (respondents that answered "do not work/retired" = 16.4)	56.6	37.5	19.1	26.2	14.4	11.8	0.8	—
c. if you could be sure that you would receive high quality care	96.8	90.2	6.6	2.4	1.0	1.4	0.6	*
d. if specialist care was available there	95.3	77.9	17.4	4.1	2.5	1.6	0.5	—
e. if your doctor had admitting privileges at the new hospital	91.2	73.3	17.9	7.8	4.7	3.1	1.0	—
f. if your insurance company accepted that hospital for your medical care	94.2	84.9	9.3	4.9	2.8	2.1	0.7	*
g. if the hospital received positive ratings from local news media	81.1	57.6	23.5	17.6	9.9	7.7	1.1	*
h. if the hospital was recommended to you by friends and family	91	64.8	26.2	8.4	4.9	3.5	0.6	—

H19. THINKING SPECIFICALLY OF LAUREL REGIONAL HOSPITAL, WHETHER YOU HAVE EVER BEEN A PATIENT THERE OR NOT, WHAT IS YOUR OVERALL OPINION OF THE HOSPITAL?

Would you say overall you have a favorable or unfavorable opinion of Laurel Regional Hospital?

Favorable	50.1
Unfavorable	16.5
Never heard of Laurel Regional Hospital	12.6
Don't know/not sure	20.6
Refused	*

(Asked of total respondents who had an unfavorable opinion of Laurel Regional Hospital; n = 153)

H19B. WHICH OF THE FOLLOWING WOULD CHANGE YOUR OPINION OF LAUREL REGIONAL HOSPITAL?

They would need to improve or modernize the current facility or build a new facility	8.5
They would need to add new quality physicians to the medical staff	23.3
They would need to add more quality staff other than physicians, such as nursing staff	31.8
All of these are equally important	15.2
New quality physicians/more quality staff other than physicians, such as nursing staff	*
Other	0.8
Would not use Laurel Regional Hospital despite any improvements made	1.3
I already use Laurel Regional Hospital	—
Don't know/not sure	16.5
Refused	2.4

HEALTH INSURANCE

Now, I have a few questions about health insurance.

I1. DO YOU CURRENTLY HAVE ANY KIND OF HEALTH CARE COVERAGE, INCLUDING HEALTH INSURANCE, PREPAID PLANS SUCH AS HMOS, OR GOVERNMENT PLANS SUCH AS MEDICARE OR INDIAN HEALTH SERVICES?

Yes	83.8
No	16.2
Don't know/not sure	—
Refused	*

(Asked of total respondents who said they currently do not have any kind of health care coverage; n = 93)

I2. JUST TO CONFIRM, YOU DO NOT HAVE ANY TYPE OF HEALTH INSURANCE, IS THAT CORRECT?

Yes	96
No	4
Don't know/not sure	—
Refused	—

(Asked of total respondents who have confirmed they don't currently have any type of health insurance; n = 89)

I3. PLEASE TELL ME THE MAIN REASON WHY YOU DON'T HAVE HEALTH INSURANCE RIGHT NOW?

Don't need insurance because I am healthy	2
Don't know how to get insurance	3
Cannot afford insurance	43
Tried to apply for Medicaid/Healthy Families but could not get it	6
Employer or spouse's employer doesn't offer insurance	7
Employer or spouse's employer offers insurance but I can't afford it	1
Unemployed	18
Some other reason	19
Don't Know/not sure	*
Refused	—

(Asked of total respondents who currently have health insurance coverage; n = 906)

I4. WHAT HEALTH INSURANCE PROVIDERS DO YOU HAVE?

Aetna	12
Amerigroup	3
Care First (Blue Cross) (Blue Cross/Blue Shield)	33
Cigna	5
Coventry	*
Kaiser	12
MAMSI (United)	*
Maryland Physicians Care	1
Medicare	15
Medicaid	4
Priority Partners	1
United Healthcare	10
TRICARE/CHAMPUS	5
Veterans Administration	1
Alliance/OneNet	1
GEHA-Government Employees Health Association	1
MDIPA	1
Other	6
Don't Know/Not sure	4
Refused	3

We are almost at the end of the interview ...

I5. I WOULD LIKE TO CONFIRM YOUR EMPLOYMENT STATUS? ARE YOU CURRENTLY ...?

Employed full time	49.0
Employed part time	7.4
Self employed in the home	2.1
Self employed outside of the home	4.0
A homemaker or stay at home parent	2.5
Retired	15.7
A student	5.4
Unemployed	9.1
Laid off	1.6
Disabled	3.2
Don't know/Not sure	*
Refused	—

CDC/BRFSS MODULE: REACTIONS TO RACE

The next set of questions ask about race and were developed by the United States Centers for Disease Control and Prevention. Your response will help us better understand the relationship between race and health.

R1. HOW DO OTHER PEOPLE USUALLY CLASSIFY YOU IN THIS COUNTRY? WOULD YOU SAY: WHITE, BLACK OR AFRICAN AMERICAN, HISPANIC OR LATINO, ASIAN, NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER, AMERICAN INDIAN OR ALASKA NATIVE, OR SOME OTHER GROUP?

White	18.8
Black or African American	65.0
Hispanic or Latino	8.9
Asian	2.7
Native Hawaiian or Other Pacific Islander	—
American Indian or Alaska Native	0.7

Some other group	2.5
Don't know / Not sure	1.1
Refused	*

R2. HOW OFTEN DO YOU THINK ABOUT YOUR RACE? WOULD YOU SAY NEVER, ONCE A YEAR, ONCE A MONTH, ONCE A WEEK, ONCE A DAY, ONCE AN HOUR, OR CONSTANTLY?

Never	35.9
Ever (NET)	59
Once a year	10.5
Once a month	10.1
Once a week	6.7
Once a day	12.7
Once an hour	0.7
Constantly	18.4
Don't know/Not sure	4.4
Refused	0.6

(Asked of total respondents who are employed; n = 596)

R3. WITHIN THE PAST 12 MONTHS AT WORK, DO YOU FEEL YOU WERE TREATED WORSE THAN, THE SAME AS, OR BETTER THAN PEOPLE OF OTHER RACES?

Worse than other races	16.3
The same as other races	76.1
Better than other races	3.6
Worse than some races, better than others	*
Only encountered people of same race	*
Don't know/not sure	2.1
Refused	1.6

R4. WITHIN THE PAST 12 MONTHS, WHEN SEEKING HEALTH CARE, DO YOU FEEL YOUR EXPERIENCES WERE WORSE THAN, THE SAME AS, OR BETTER THAN FOR PEOPLE OF OTHER RACES?

Worse than other races	7.5
The same as other races	81.1
Better than other races	6.1
Worse than some races, better than others	*
Only encountered people of same race	1.1
Don't know/not sure	3.3
Refused	*

R5. WITHIN THE PAST 30 DAYS, HAVE YOU EXPERIENCED ANY PHYSICAL SYMPTOMS, FOR EXAMPLE, A HEADACHE, AN UPSET STOMACH, TENSING OF YOUR MUSCLES, OR A POUNDING HEART, AS A RESULT OF HOW YOU WERE TREATED BASED ON YOUR RACE?

Yes	7.5
No	91.5
Don't know/not sure	0.8
Refused	*

R6. WITHIN THE PAST 30 DAYS, HAVE YOU FELT EMOTIONALLY UPSET, FOR EXAMPLE ANGRY, SAD, OR FRUSTRATED, AS A RESULT OF HOW YOU WERE TREATED BASED ON YOUR RACE?

Yes	13.8
No	85.3
Don't know/not sure	0.7
Refused	*

HEALTH COMMUNICATION

C1. HOW OFTEN DO YOU HAVE SOMEONE HELP YOU READ MEDICAL MATERIALS? WOULD YOU SAY ... (READ LIST)?

EVER (NET)		43.6
	Always	3.9
	Very Often	4.3
	Sometimes	17.0
	Rarely	18.4
Never		56.2
Never read medical materials		*
Don't know/Not sure		*
Refused		—

C2. HOW CONFIDENT ARE YOU FILLING OUT MEDICAL FORMS BY YOURSELF? ARE YOU (READ LIST)?

Confident (NET)		96.9
	Extremely confident	45.2
	Very confident	31.6
	Moderately confident	14.2
	Slightly confident	5.9
Not at all confident		2.3
Never filled out medical forms		0.7
Don't know/Not sure		*
Refused		—

C3. HOW OFTEN DO YOU HAVE PROBLEMS LEARNING ABOUT YOUR MEDICAL CONDITION BECAUSE OF DIFFICULTY UNDERSTANDING THE WRITTEN INFORMATION? WOULD YOU SAY ... (READ LIST)?

EVER (NET)		48.3
	Always	1.6
	Very Often	3.0

C4. PLEASE TELL ME IF THE FOLLOWING HAS BEEN A MAJOR PROBLEM FOR YOU, A MINOR PROBLEM FOR YOU, OR NOT A PROBLEM AT ALL DURING THE LAST 12 MONTHS? HAS (INSERT) BEEN A MAJOR PROBLEM, A MINOR PROBLEM OR NOT A PROBLEM AT ALL FOR YOU IN THE LAST 12 MONTHS?

	PROBLEM						
	NET	Major	Minor	Not a Problem	Don't have this type of physician or health care provider	Don't know/ not sure	Refused
a. being treated by a doctor or other health care provider who is from another country (other than the US)	13.6	2.9	10.7	84.8	1.4	*	*
b. being treated by a doctor or other health care provider who is not of your same race or ethnic group	8.2	2.6	5.6	91.0	0.7	*	—
c. being treated by a doctor or other health care provider who is not the same gender as you	8.5	1.3	7.2	90.2	0.9	*	—
d. Communicating with doctors or other health care providers because of language differences	21.6	3.5	18.1	77.7	*	*	*

Sometimes	18.4
Rarely	25.3
Never	51.2
Don't have a medical condition	*
Don't know/Not sure	*
Refused	*

C5. DO YOU REGULARLY SPEAK A LANGUAGE OTHER THAN ENGLISH WHEN YOU ARE HOME OR WITH FAMILY AND FRIENDS?

Yes	20.4
No	79.6
Don't know/not sure	—
Refused	—

(Asked of total respondents who speak a language other than English; n = 143)

C6. DO YOU HAVE ACCESS TO PHYSICIANS OR OTHER HEALTH PROFESSIONALS WHO SPEAK THAT LANGUAGE?

Yes	51.5
No	48.5
Don't know/not sure	*
Refused	—

(Asked of total respondents who don't have access to physicians or other health professionals who speak their language; n = 67)

C7. DOES YOUR HEALTH PROVIDER HAVE AN INTERPRETER AVAILABLE OR ACCESS TO AN INTERPRETER SERVICE?

Yes	20.9
No	43.6
Doesn't need an interpreter	16.2
Don't know/not sure	19.3
Refused	—

DEMOGRAPHICS

D1. WHAT IS THE HIGHEST LEVEL OF EDUCATION YOU HAVE COMPLETED?

No formal education	—
Grade school (1 to 8 years)	1.3
Some high school (9 to 11 years)	8.2
High school graduate or GED (received a high school equivalency diploma)	28.9
Some college/technical or vocational school/training after high school	23.4
Associate's degree (2 years of college)	8.5
Bachelor's Degree (4 years of college)	15.1
Postgraduate degree/study (Masters degree/PhD/MBA)	14.5
Don't know/Not sure	*
Refused	—

D2. WHAT IS YOUR CURRENT RELATIONSHIP STATUS?

Single	36.8
Living together with partner (Common Law)	3.2
Engaged	2.7
Married	40.3
Separated	4.0
Divorced	6.6
Widowed	6.1
Don't Know/Not sure	*
Refused	*

D3. HAVE YOU EVER SERVED IN THE MILITARY?

Yes	13.3
No	86.7
Don't know/not sure	—
Refused	—

D4. IS YOUR HOME OWNED OR RENTED?

Owned	64.2
Rented	34.4
Other arrangements	0.8
Don't know/not sure	*
Refused	*

D5. WERE YOU BORN IN THE UNITED STATES?

Born in the U.S.	77.4
Born in another country	22.6
Don't know/not sure	—
Refused	—

(Asked of total respondents who were not born in the United States; n = 169)

D6. HOW MANY YEARS HAVE YOU LIVED IN THE UNITED STATES?

YEARS (NET)	100
Less than 1 year	1
1-10 years	31
11-20 years	31
21-30 years	24
31-40 years	6
41-50 years	4
51+ years	3
Don't know/Not sure	—
Refused	*

D7. WHICH OF THE FOLLOWING CATEGORIES BEST DESCRIBES YOUR TOTAL ANNUAL HOUSEHOLD INCOME BEFORE TAXES, FROM ALL SOURCES IN 2011?

Less than $40,000 (NET)	33.6
Under $20,000	15.2
$20,000 to under $40,000	18.4
$40,000 to under $100,000 (NET)	42.6
$40,000 to under $50,000	8.6
$50,000 to under $65,000	14.0
$65,000 to under $100,000	20.0
$100,000 or more (NET)	23.9
$100,000 to under $150,000	14.9
$150,000 to under $200,000	5.7
$200,000 to under $250,000	1.9
$250,000 or more	1.4

D8. WHICH NEWSPAPER DO YOU READ MOST FREQUENTLY?

PRINCE GEORGE'S COUNTY NEWSPAPERS (NET)	2
Prince George's "The Sentinel"	--
The Prince George's Post	*
Prince George's County News	*
Prince George Journal	*
Bowie Blade News	*
Laurel Leader	*
The Gazette	2
WASHINGTON D.C. NEWSPAPERS (NET)	70
Washington Post	66
The Washington Times	2
The Express	2
NATIONAL NEWSPAPERS (NET)	2
NY Times	1
USA Today	1
Other	5
I don't read any newspapers	19
Don't know/not sure	*
Refused	*

D9. WHICH RADIO STATION DO YOU LISTEN TO MOST FREQUENTLY?

AM RADIO STATIONS (NET)	4
WPGC (1580 AM)	1
ESPN radio (980 AM)	2
WMAL (630 AM)	1
FM RADIO STATIONS (NET)	51
WJMD (94.7 FM)	1
WPGC (96.7 FM)	*
WPGC (95.5 FM)	6
WWDC (101.1 FM)	2
WPOC (93.1 FM)	*
WAMU (88.5 FM)	2
WHUR (96.3 FM)	9
WAVA (105.1 FM)	1
WRBS (95.1 FM)	*
Praise DC (104.1 FM)	9
WPOT (97.5 FM)	1
HOT (99.5 FM)	6
MAGIC (102.3 FM)	8
WASH (97.1 FM)	1
WKYS (93.9 FM)	4
WTOP (103.5 FM)	7
Satellite Radio	2
Other	20
I don't listen to the radio	12
WPGC (don't know if AM/FM/#'s)	1
Don't know/not sure	4
Refused	*

D10. THINK OF A LADDER WITH 10 STEPS AS REPRESENTING WHERE PEOPLE STAND IN THE UNITED STATES. ON THE TOP OR TENTH STEP OF THE LADDER ARE PEOPLE WHO ARE THE BEST OFF—THOSE WHO HAVE THE MOST MONEY, THE MOST EDUCATION AND THE MOST RESPECTED JOBS. ON THE BOTTOM OR FIRST STEP OF THE LADDER ARE THE PEOPLE WHO ARE THE WORST OFF—WHO HAVE THE LEAST MONEY, LEAST EDUCATION, AND THE LEAST RESPECTED JOBS OR NO JOB. WHAT STEP WOULD YOU PLACE YOURSELF ON THE LADDER? REMEMBER, THE HIGHER YOU ARE ON THE LADDER, THE CLOSER YOU ARE TO THE PEOPLE WHO ARE BEST OFF; THE LOWER YOU ARE, THE CLOSER YOU ARE TO THE PEOPLE WHO ARE THE WORST OFF.

01 (Worst off)	1.8
02	2.3
03	5.8
04	9.7
05	28.7
06	17
07	16.7
08	12.3
09	1.4
10 (Best off)	4.5

APPENDIX B **HEALTH STATUS, DEMOGRAPHICALLY**

	SA1 (Self reported health)					S2A Diagnosed condition		S3A Pre-diabetes		S4A Pre-hypertension	
	Excellent	**Very good**	**good**	**fair**	**poor**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
Education	(p=.288)					(p=.315)		(p=.367)		(p=.529)	
High school or below	18%	23%	41%	15%	3%	33%	67%	19%	81%	33%	67%
Some college or associate degree	22%	31%	31%	14%	2%	39%	61%	13%	87%	35%	65%
Bachelor's degree	22%	33%	31%	10%	3%	37%	63%	17%	83%	27%	73%
Graduate school	24%	31%	38%	7%	1%	44%	56%	18%	82%	37%	63%
Age	(p<.001)					(p<.001)		(p<.001)		(p<.001)	
18 to 64 years old	23%	29%	34%	12%	2%	35%	65%	14%	86%	29%	71%
65 and older	6%	23%	49%	18%	4%	58%	42%	27%	63%	65%	35%
Gender	(p=.135)					(p=.067)		(p=.033)		(p=.685)	
Male	22%	29%	39%	9%	2%	33%	67%	13%	87%	32%	68%
Female	20%	28%	33%	16%	2%	41%	59%	20%	80%	34%	66%
Insurance	(p<.001)					(p=.021)		(p=.015)		(p<.001)	
Yes	21%	30%	37%	10%	3%	40%	60%	19%	81%	37%	63%
No	21%	16%	32%	30%	0%	24%	76%	6%	94%	13%	87%
Income	(p<.001)					(p=.412)		(p=.932)		(p=.485)	
Less than $50,000	17%	19%	38%	21%	4%	34%	66%	16%	84%	31%	69%
$50,000 - $99,999	22%	33%	35%	10%	1%	41%	59%	17%	83%	37%	63%
$100,000 or more	24%	38%	34%	4%	1%	36%	64%	16%	84%	34%	66%
Race	(p=.213)					(p=.004)		(p=.647)		(p=.885)	
White NH	14%	34%	33%	16%	3%	55%	45%	19%	81%	37%	63%
Black NH	21%	30%	36%	11%	2%	36%	64%	17%	83%	36%	64%

R1 tobacco use last 30 days			BMI			S5						
No	1-29 days	30 days	Underweight/ Normal	Overweight	Obesity	Cancer	Heart disease	Diabetes	Asthma	High blood pressure	High cholesterol	Other
(p=.006)			(p<.001)			(p=.010)	(p=.324)	(p=.497)	(p=.239)	(p=.150)	(p=.712)	(p=.982)
76%	7%	17%	31%	30%	39%	1%	2%	4%	5%	4%	2%	6%
85%	6%	10%	30%	27%	43%	2%	4%	3%	2%	6%	2%	7%
89%	8%	3%	27%	45%	28%	3%	2%	6%	2%	10%	4%	6%
91%	2%	7%	26%	54%	20%	5%	1%	2%	4%	4%	4%	6%
(p=.680)			(p=.261)			(p<.001)	(p=.024)	(p<.001)	(p=.023)	(p=.036)	(p=.373)	(p=.057)
82%	6%	12%	30%	34%	36%	2%	2%	3%	4%	5%	3%	5%
86%	5%	9%	23%	41%	27%	8%	6%	13%	1%	10%	4%	11%
(p=.285)			(p=.002)			(p=.520)	(p=.891)	(p=.302)	(p=.985)	(p=.768)	(p=.025)	(p=.287)
80%	7%	12%	30%	42%	28%	2%	3%	3%	3%	5%	1%	5%
85%	5%	10%	29%	29%	42%	3%	2%	4%	3%	6%	4%	7%
(p=.833)			(p=.037)			(p=.050)	(p=.166)	(p=.211)	(p=.029)	(p=.113)	(p=.368)	(p=.863)
83%	6%	11%	26%	36%	37%	3%	2%	4%	3%	6%	2%	6%
82%	5%	13%	43%	28%	29%	1%	5%	1%	1%	2%	4%	5%
(p=.023)			(p=.005)			(p=.915)	(p=.737)	(p=.943)	(p=.379)	(p=.924)	(p=.026)	(p=.478)
78%	9%	13%	34%	28%	38%	2%	3%	4%	2%	6%	1%	5%
82%	4%	14%	20%	38%	42%	2%	2%	3%	5%	5%	5%	8%
91%	3%	6%	27%	44%	29%	2%	2%	4%	3%	6%	2%	5%
(p=.059)			(p=.315)			(p=.007)	(p=.270)	(p=.762)	(p=.988)	(p=.860)	(p=.644)	(p=.007)
76%	6%	19%	32%	35%	33%	5%	5%	5%	4%	6%	3%	13%
85%	5%	10%	26%	34%	40%	2%	3%	4%	4%	6%	3%	5%

TECHNICAL REPORT 2

Interviews with Key Stakeholders

Lead Researcher and Interviewer: Linda Aldoory, Ph.D.
Interviewers: Brad Boekeloo, Ph.D.; Alice Horowitz, Ph.D.; Dushanka Kleinman, DDS, MScD; Sandra Crouse Quinn, Ph.D.; Stephen Thomas, Ph.D.
April 21, 2012

According to a 2009 RAND report (Lurie, Harris, Shih, Ruder, Price, Martin, Acosta, & Blanchard, 2009), improving the health status of Prince George's County residents will require an improved health care system among other strategies. These strategies included strengthening the public health initiatives in the County and addressing non-medical determinants of health. Furthermore, RAND reported no ambulatory care safety net and significant out-of-County use of inpatient and emergency care by Prince George's residents (Lurie et al., 2009). In another report, data indicated that Prince George's County had higher hospitalization and mortality rates than Frederick or Montgomery counties, and African Americans with diabetes in the County have a higher rate of hospitalization than whites and a much higher mortality rate than the rates from surrounding counties (Partnering Toward a Healthier Future, 2007).

For much of the affluent populations in the County, there is a high proportion of residents that work and receive medical care outside the County (Lurie et al., 2009). The RAND report indicated that out-of-County use is perhaps driven by resident preferences, convenience and provider referral patterns. The authors argued that out-of-County health care use has policy implications:

> *If, for instance, County residents perceive the quality of out-of-County hospitals to be better, then anticipated economic growth in Prince George's may perpetuate existing demand patterns. If, on the other hand, residents prefer to use care inside the County but are unable because of out-of-County commuting, then strategies aimed at building a stronger physician referral network, increasing the number of primary care physicians in the County, and increasing the availability of care on weekends and before and after hours may keep more patients in the County.*

Key stakeholder interviews were conducted to address these and other issues. While data on diseases and conditions, hospital use and provider capacity contribute essential information for the design of a new health care system, stakeholders provide critical insights in to the success of a system. Results of studies strongly recommend the involvement of stakeholders in formative research for program planning (Morcke, Wichmann-Hansen, Nielsen, & Eika, 2006). Scholars in communication have asserted that stakeholder interviews are advantageous because they provide detailed information about individuals' perceptions (Darnall & Jolley, 2004). Interviews are two-way and thus, also allow for interviewers to clarify and restate questions to avoid miscommunication that might occur from survey data (Darnall & Jolley, 2004). Both formal and informal leaders can offer community perspectives on appropriate and effective public health and medical interventions.

Therefore, individual interviews with 40 key stakeholders were conducted for three main purposes. First, we wanted to gather and synthesize the opinions and perceptions of individuals who can inform the process of developing an effective and financially viable health care delivery system in Prince George's County. Second, the interviewees might help to detect and pinpoint the potential constraints and solutions to developing and operating a viable delivery system in the County. Finally, the interviews can help capture the diverse perspectives of key influencers who can contribute to and who are affected by the health care system in Prince George's County.

Similar studies of stakeholders were previously conducted for purposes of

understanding health care in Prince George's County. For example, focus groups of community leaders and service providers assessed perceived health risk factors among children and adolescents (Child & Adolescent Health Assessment, 2002). The qualitative data from the assessment and two surveys of parents and adolescents described health care experiences in the County. Findings from these surveys and focus groups provided implications for health care and policy that were significant. For example, 41 percent of parents experienced difficulties accessing health care for their adolescent in the past year. Among the most prevalent barriers that either prevented or delayed treatment were: inconvenient office hours, appointment availability and cost (of doctor care and prescriptions). Problems with access were particularly prevalent among families living below the 200 percent poverty threshold. The community leaders in the study cited health care access concerns for the Hispanic and Asian communities, including problems relative to culture, language and documentation. In addition to access to health care services, obesity and diet were among parents' top concerns (Child & Adolescent Health Assessment, 2002).

A 2007 study included interviews with community leaders and compared Prince George's County with Frederick and Montgomery Counties across a range of health issues (Partnering Toward a Healthier Future, 2007). The study report cited lack of culturally competent providers, diminished access to care and reduced rates of health insurance as chief contributors to poor health status among African Americans in the region. According to the report, "Health illiteracy and lingering discrimination in the health care system also contribute to the health challenges faced by African Americans" (p. 29). African Americans had the highest prevalence of diabetes, hypertension and HIV in the region. In Prince George's County specifically, African Americans with diabetes had a higher rate of hospitalization than whites and higher mortality rates.

These studies show the value of stakeholder interviews and the implications of findings on decisions regarding a new health care system that will be developed for the County. We describe the methodology used to identify the stakeholders, conduct the interviews, analyze the data and summarize the findings.

METHOD

IDENTIFICATION OF KEY STAKEHOLDERS

We developed a framework of stakeholder categories that would provide a diverse and comprehensive perspective (Table 1). These categories were selected to include sectors and groups of individuals who have influence in decision making or who contribute to decision making, would have experience in the region and state, have worked with or been part of health and /or health care programs, and who have positions that permit them to view a diversity of policies and initiatives. We developed an initial list of names and through an iterative process with the advisory committee a final list of 40 was created. The final list included state and local government representatives, health providers and health care administrators, and community leaders.

TABLE 1 STAKEHOLDER GROUPS FROM WHICH PARTICIPANTS WERE RECRUITED COMMUNITY STAKEHOLDERS IN PRINCE GEORGE'S COUNTY

Public Sector/Government: state, County	**Health care Services and Administration:** health care services, professional associations	**Community-based Organizations:** community organizations, interest groups
Elected Officials: state, County, municipalities	**Media:** local, broadcast, *The Washington Post*	**Residents and Health Consumers:** random household survey
Health Professionals: primary care physicians, professional societies, unions	**Business and Education Partners:** local businesses, school district, community college, universities	

PROCEDURES

IRB REVIEW

The research methodology was submitted to the University of Maryland's Institutional Review Board and approved. Participants who agreed to be interviewed read and signed a consent form that also requested their approval for being audio-tape recorded.

IDENTIFICATION AND SCHEDULING OF STAKEHOLDERS

To support an efficient process, stakeholders to be interviewed were first aligned with study team members who had familiarity with the individual. In addition, advisory committee members offered support for encouraging participation of other stakeholders. Initial contacts with stakeholders were made by phone or through email with a formal follow-up by phone. Interviews were scheduled on dates and times convenient for the stakeholders and within a two-month time frame to keep to the project's time limit. Interviews were conducted between February 1, 2012 and March 21, 2012.

INTERVIEW PROTOCOL

Each interview was guided by a set of open-ended questions that were pilot tested and that varied somewhat according to the profession of the participant: whether the stakeholder's position was government, health or community based. For example, for participants in health care, specific questions were added about recruitment of primary care physicians to work in the County. The interview guides are in Appendices A, B and C.

Specifically, interview questions addressed the five main study questions and augmented with specific prompts:

Question 1: What are the key health outcomes in the County most amenable to improvement by a new health care system?

- What stakeholders believe are the key health issues facing County residents
- Specific health indicators they believe to be priority for developing new health care system
- Stakeholder perceptions of the health needs of under-insured and uninsured populations

Question 2: What elements of a health care system (hospital and community) can effect these outcomes and by how much (model)?

- Health care services that might have greatest potential for improving the health status of Prince George's County

Question 3: What is the geographic distribution of health care resources and where are the areas of greatest need for primary care?

- What stakeholders believe to be the changing demographics in the County and their effect on health status indicators

Question 4: What are the key issues to maximize uptake and achieve the potential of health care system for public health?

- Stakeholder explanations for why County residents travel to other, regional health care services Stakeholder recommendations for how the new County system can attract residents back to County for local health care services
- Stakeholder opinions about the supply and quality of the existing primary and specialty-care physicians and other health care providers serving the County, identification of the physician/health care provider needs gap and suggestions for closing it
- Recommendations for recruitment and retention of physicians and nursing staff
- Stakeholder input on what would "differentiate" and "rank" the new County health care system over other, regional health care services available to residents. Opinions about services that could uniquely position the new health care system as a leader, for example in health literacy or in preventive care through quality primary care

Question 5: What resources can be mobilized in the public health sector to complement the impact of the health care system?

- Stakeholder recommendations on how to build a broad base of community support

INTERVIEW PROCESS

Interviews were conducted by six interviewers, experts in public health research and trained in interviewing techniques. They were oriented ahead of time to the sets of questions that were developed for participants and were trained on equipment to use for audio recording the interviews. Each interview was initiated with a brief overview of the purpose of the study and a review of the consent form. Interviewees agreed to participate according to the conditions of the study by either signing the consent form in person or agreeing by phone to participate. The consent form asked and documented

whether or not the interviewee agreed to audio recording.

Twenty-one interviews were conducted in person (n=21) and the rest by phone (n=19). The interviews averaged 45 minutes and ranged from 25 minutes to 1 hour. Twenty-four interviewees agreed to be audio recorded. If no approval was given for audio recording, interviewers took detailed notes. In a few cases an additional person accompanied the interviewer to help with taking notes.

DATA ANALYSIS

Twenty-four audiotapes were transcribed verbatim and together with the typed notes provided the basis for analyses. Initial themes that emerged were identified. We also analyzed responses by question, by stakeholder category and by familiarity of the stakeholder with the health and health care in the County. The investigators reviewed the documentation of the interviews and developed an initial framework of themes. After all interviews were conducted, the interviewers met to provide additional feedback and suggest refined themes they noticed in the interviews they conducted. Themes were organized into a list. Then each of the transcripts and sets of notes were reviewed to determine the variation in the support, refutation and extension of the list of themes. The transcripts were used to collect quotes that supported each of the themes. Any alternative explanations and unique perspectives were added to the analysis. After general themes were summarized, the five main study questions were used as a framework and data were synthesized to respond to each.

FINDINGS

PARTICIPANT PROFILES

The stakeholders that participated in the interviews represented a wide range of professional and community perspectives on the current and future health care system in Prince George's County. Table 2 presents the number of participants by category of stakeholders.

There was no consistent pattern of responses that correlated with stakeholder category or type of profession. Health care providers overall were most familiar with the County's current state of health care and the status of primary care providers. However, there were state-level policy leaders who were just as familiar with the health care status of residents and the constraints on local physicians. Not surprisingly, the participants who expressed the least knowledge of local health issues and health expertise were those who worked and lived outside County borders.

STAKEHOLDER EXPERIENCES AND RESPONSE CONTEXT

A little over half of the stakeholders worked in the County, and at least one-quarter lived and worked in Prince George's County. All those interviewed who worked but did not live in the County did not utilize health care services in the County. Some of the participants who did live in the County did not always use health care services within the County. One participant admitted, "I always go to a District hospital, because I have health care [insurance and] because it's better..." A local leader said, "[I am] living here [but] my primary physicians are in the District of Columbia. And the reason I selected those is because they're close to where I work. So I am not overly familiar with [provider status for County]." Another person who worked in the County said, "I personally leave the County to get health care because that's where my insurance said the specialist was." One stakeholder encourages pediatric patients to go to Children's Hospital "... And that concerns me."

TABLE 2 STAKEHOLDER GROUPS CAPTURED THROUGH INDIVIDUAL INTERVIEWS

Group	Number of Participants
State level policy leaders and administrators	7
Local policy leaders	7
Health practitioners	8
Academic administration	4
Health and hospital administration	6
Community level (from two counties)	8

The responses and discussions centered on two main topics, the current health care system in Prince George's County and a future health care system in the County. Findings are organized below first according to the current status.

The findings that address the current status of health care in the County coalesced around seven main themes. Five themes reflected interviewer question topics: prevalent health risks, recommendations for local services, lessons learned from County and other services, reasons for leaving County for health care, and perceptions of Dimensions Healthcare System. Two additional themes emerged in open discussion with participants: a negative perception of health care services and undue burdens on County physicians. Each of the themes are described and supported below with illustrative quotes from the interviews.

PREVALENT HEALTH RISKS

Overall, infant mortality and chronic diseases topped all the participant lists of prevalent health risks for the County. The specific chronic diseases mentioned were diabetes and heart disease, and related risks included obesity and hypertension. One stakeholder explained, "[Obesity] is connected to most of those diseases that we are faced with dealing with as a community at large." Other health concerns mentioned (by one or two participants) were HIV/AIDS, and kidney disease and mental health.

While not an illness or disease, access to primary care and preventive services ranked as a priority concern for all stakeholders interviewed as a health risk. This included lack of primary care, access to hospitals and access to specialty care. As one stakeholder commented, "There's just not enough primary care. … There's never enough specialty care." Another participant said, "One of the greatest challenges in the County is the lack of primary care resources." As someone explained, "for a new patient to try and schedule services … the waiting list is unconscionably long. …But the need for people to have a place to go is overwhelming in this County."

INSURED VERSUS UNDERINSURED. Responses were inconsistent as to whether health risks differed by insurance status. Most participants believed the health risks were more prevalent in the underinsured and uninsured County populations, and a few believed the prevalent health risks cut across all populations in the County regardless of ability to pay. One participant who reported a difference commented that "people who have insurance in our County fare pretty well." Another explained, "People who are insured are more likely to get health care when they feel they need it. Those who are uninsured will attempt to hold off as long as possible for both themselves and family members until it's almost an emergency or crisis." One of the stakeholders who did not believe there was a marked difference said, "bad eating habits" cut across all socio-economic status groups in the County and led to obesity County-wide.

STAKEHOLDER RECOMMENDATIONS FOR HEALTH CARE SERVICES IN THE COUNTY/REGION

When asked where they currently recommend acquisition of health care services for others in the County, participants frequently responded with university-based health care options outside of the County or National Children's Medical Center, if asked about children. As one participant remarked, "I'd love to say Doctor's Hospital, but for the most part I would advise [person with hypertension] to go to the District, George Washington or Washington Hospital Center." Another participant explained that she would refer them to the teaching hospitals in the District of Columbia because they are "more research-oriented and probably had expanded resources." Another stakeholder said, "The hospitals that our patients go to or are sent to are largely Montgomery County hospitals and Children's." A few of the participants referred to National Children's Medical Center as a model to emulate in structuring a new health care system. If not a model then a strong partnership for pediatric care would be desirable. One participant said, "Partnerships with Children's would go a long way with me if I was moving, if I was that family that you just described coming in (to the County). I would probably still, for most of the care, go to Children's if I had a child that needed some specialty help."

LESSONS LEARNED FROM CURRENT HEALTH CARE SYSTEMS

A few of the participants suggested lessons learned from current services offered in the County. For example, one stakeholder viewed the current mobile vans as a program in need of expansion, "You have the vans that can go to different sites and that actually works well." Others referred to the quality of care at the Trauma Care Center at Prince George's Hospital and at the Neonatal Intensive Care Unit at Prince

George's Hospital. One participant was "very impressed with that unit there." Another said, "If you have a trauma, Prince George's Hospital is the place to go. And I think that's what they do very well." Other services of Prince George's Hospital to keep included pediatrics, and "they have a good heart center, but they don't have enough doctors." Wound care at Doctor's Hospital was exceptional to one participant, who said, "A lot of people don't know some of the neat things that they've got going on there."

A couple of participants listed Bowie Health Center and Laurel Health Center as facilities to retain in the new system, because they represent convenient access to health care for residents located near them, reducing emergency room visits by those residents. One person added that Laurel was "known for psychiatric services." Also, a participant believed Anne Arundel County offered best practices in terms of emergency services, "The technology is streamlined; the wait isn't as long as in some of our hospitals."

A few of the stakeholders instead offered general "lessons learned" from their professional experiences. One participant said that residents will retain original physicians from other locations when they move to the County. "People do not want to leave the health care provider that they are comfortable with. They just don't." Also, residents use services close to them, so if the services closest to them are in Takoma Park or D.C. they will use them. Another lesson was to measure perceptions continuously and create a feedback loop for consumers, insurance companies and others to tell their side of the story so that management can stay aware of changes in perceived reputation.

Other lessons pertained to organizational structure and function. For example, "Coordination is needed if we're going to overcome." One participant offered a financial lesson, "Not to let immediate economics drive long-term economics. ...What we spend now will save millions of dollars later on." Someone referred to a paradigm guiding the structure of a new health care system:

> *I guess the biggest thing for best practice is changing it from what's best for us as an organization and an entity and a structure and flipping that paradigm to what's best for the resident or the client or the customer. How are we going to provide what we need for "Rosa"? We know what she needs, but we've not made it convenient for her.*

PERCEPTION OF COUNTY'S CURRENT HEALTH CARE QUALITY

All the stakeholders said that the negative reputation of the County's health care quality was a primary reason for residents choosing outside the County for their health care services. For about half the participants, the poor *reputation* of health care in Prince George's County trumped the *actual* quality of health care, which for these participants was quite good. One participant said:

> *I live close to Southern Maryland Hospital and ... as much as it's developing and it's getting better, it's still overcoming some people's negative connotations about if you go there with a heart problem you're going to die. And I haven't found that to be true, although it's one of those things that's always in the back of your mind.*

Another stakeholder who lives in the County described the pervasiveness of the perception, "I hear it at church; I hear at work. You hear it all over, your neighbors, everywhere, what the perceptions are about what the hospitals are."

Stakeholders said that the positive qualities of the current health care system go unrecognized. They believe there are good physicians in the County, but not enough of them. A participant said, "All of the doctors I go to or have to see are located in Prince George's County. I'm very pleased with all of them so I would say that we have good doctors who do services here."

Participants were asked why there might be a conflict between perception and reality. One believed it was because Prince George's Hospital "serves the underserved and those who can't pay." Another participant responded, "We just think that the white people have more resources, better doctors and if you're good you're going to be recruited into a better system. I'm not saying that's the case; I'm saying that I know a lot of people who believe that to be the case." As one stakeholder put it, "Perception becomes reality unless otherwise challenged and the perception is that we don't have a good hospital system and for some parts they're right, but there are other parts of the hospital system that ought to be duplicated."

For other stakeholders, the quality of health care in the County is poor and the reputation reflects the quality. One participant remarked, "Quality, that's what we lack ...The clinical data states that the quality of care of primary care providers in Prince George's County is way below what's in surrounding jurisdictions." Another participant summarized, "We have a pair of hospitals in the County whose reputation is not very good because the care there is not very good." This person felt the County needed strong management over the health care system. The staff in hospitals is unstable because they work within the constant threat of financial demise, which "translates to poor

service." "The health care system is broken, so I see an obvious opportunity to be able to try to help put something together." A different stakeholder suggested that one reason for the reputation is a lack of cultural competency, "When I think of Prince George's I think of ... lack of cultural understanding or lack of cultural competencies. I think of people being shuffled from one place to another ...I don't think it's positive."

The reputation in the County also derives from having so few primary care providers. One local leader quipped, "Oh, it's horrible. We'd laugh. It's a running joke in the community that there are only three primary physicians that everybody goes to ... every female knows there's three places where you can get a mammogram." Residents deal with long waits for the good providers who are in the area. Sharing a personal story, one stakeholder said, "My dad, as sick as he is, does not want to go to his primary care physician because he doesn't want to be in the waiting room for three or four hours." Another stakeholder said that the constraint on providers has also led to a perception of rigid appointment scheduling, so that if patients are a few minutes late to an appointment, they will allegedly not be seen by a provider. This participant responded, "Just having a little more flexibility and thinking about the population that they're serving and all the incredible barriers that they have to get where they're going."

REASONS FOR LEAVING COUNTY FOR HEALTH CARE

While poor reputation and limited access (time) for available primary care providers might be viewed as a main factor for residents who leave the County for their health care, the stakeholders listed other priority reasons as well. For example, some participants assert that residents work outside the County and select a provider close to where they work. Participants also said that proximity to health care over a close geographic border offers greater access than a health care service in the County. Therefore, primary care physicians inside the County refer patients to outside the County for specialty care or for surgery. "If your physician only will admit there, that's where you're going."

Participants also mentioned that insurance companies also play a role in sending residents out of County for health care if they have restrictions on where to go. However, a couple of participants also argued that, "people do self-select." What is available in D.C. is perceived as better because of the options for university hospitals, "People put value on that."

Many residents in the County originated from the District of Columbia or other local jurisdictions and continue to travel to those locations for their original health care provider. As one stakeholder commented, "A lot of Prince Georgians were once Washingtonians, and so it's kind of their inclination towards their own set. I think that most of the African Americans primary physicians are practicing in Washington, D.C., so you still have that, a lot of folks still go to physicians that look like them."

A couple of participants wished to emphasize cultural distinctions and the migration of Latino populations into the County. "There is a tension between African Americans and Hispanics. And it plays out in health care. And I think that in some way has to get into the debate."

One participant explained that residents travel outside of the County to seek health care because of a status perception. "The people in Prince George's County are not overly proud to be calling themselves Prince George's County—or to say that they're from Prince George's with the way that the County is viewed in the surrounding areas."

PERCEPTIONS OF DIMENSIONS HEALTHCARE SYSTEM

Responses were mixed to the question about Dimensions Healthcare System: Most participants did not respond. Some stakeholders asked to be informed about what aspects of health care in the County fall within the purview of the Dimensions System. Several stakeholders spoke positively of the Bowie facility and remarked that more such facilities are needed in the County. A couple of stakeholders who worked with Dimensions management had positive perceptions and stated that lack of public relations has been a barrier to informing the region of the services provided. One stakeholder who had personal experiences with Prince George's Hospital held negative perceptions of the system based on the experience, "It was awful ... the receptionist person was ridiculous. ... In leaving the hospital, they only let you out one door because of security reasons. ... There was no privacy. ...These were just things that I have not seen at other facilities." Another participant who lived in the County said, "I think they have been politicized beyond politicizing for years. They have been the sole bidder, the sole recipient of everything in Prince George's County so we have not gotten better. So I would like to see some competition."

The mixed perceptions were illustrated by one who said, "Politics played too much of a role in it and I think the lack of services that it's able to provide based on the care that it gives and the money it has to deal with, has had negative impacts on the whole hospital and the ancillary services it provides." Comments from stakeholders who have visited, but who do not

work at Dimensions, as well as those who work there, mentioned the state of the physical facility of Prince George's Hospital and the need to "modernize" it. Another comment reflected on the perceived low proportion of medical residents who graduated from U.S. accredited medical schools.

PERCEIVED BURDENS ON COUNTY PHYSICIANS

A couple of the participants commented on what they perceived as administrative and insurance burdens placed on physicians. There are constraints in practicing medicine in the County. First, one stakeholder said that compared to neighboring jurisdictions, Prince George's County procurement process is so cumbersome that it deters physicians from wanting to practice full time in the County. As the participant concluded, "If the local contracting problem is still a problem, then we're still not going to have any doctors." Second, insurance companies guide reimbursement rates but, as one stakeholder argued, locations as well, and "If they're not going to reimburse for services provided by Prince George's Hospital System or the paying mechanism isn't there in the relationship to the payers and the non-payers, raising the rates to help the cash flow only puts the insurance companies in a position to refer you to other hospitals where they are a one-fourth or a one-half percent cheaper." The argument is that physicians do not wish to work in the County because they believe they might not get paid or paid at a rate that meets a national standard.

TOPIC 2: RECOMMENDATIONS FOR THE DESIGN OF A NEW HEALTH CARE SYSTEM

There were numerous and varied responses from interviewers that pertained to recommendations for a new health care system for Prince George's County. Interestingly, there were similar patterns in responses across stakeholders, where most or several of the participants offered the same recommendations. The consistent themes across interviews were: need for strong marketing campaign, academic/university framework, acute care centers, centers of excellence, culturally appropriate health education and prevention, integrated electronic health record system, community partnerships, multicultural health care, aesthetics, patient-centered medical home model, more federally qualified health centers, status, location preference and recruiting primary care providers.

ACADEMIC/UNIVERSITY FRAMEWORK

The reputation of the County's health care system would greatly improve if it were associated with a teaching hospital and related university research. All participants referred to this desire for an academically based regional health care system that included a teaching hospital. This factor also was mentioned when respondents remarked about their own health care seeking behaviors or what they look for when they recommend health care facilities to others. One stakeholder said that County residents get their care in neighboring jurisdictions because they have this option, "You don't have the big name like a Hopkins. You don't have a G.W. You don't have a Georgetown." Another stakeholder argued that a regional teaching hospital in the County would help build the infrastructure to support ambulatory primary care centers, "I think it's going to be difficult to build the infrastructure if we move without it." In addition some stakeholders mentioned the value of providing team-based care and interprofessional training that could benefit a new university health care system.

A couple of stakeholders explained that the physicians in the County are not connected to a research-based infrastructure and therefore become "stagnant" in their knowledge. "I participated in a clinical trial at NIH and I felt like I never wanted to go back to my physician once they kicked me out of the study, because of the level of care that I received. There was just no comparison." The other participant shared experiences with physicians in the County not being up to date on the latest available medications, "We've experienced that with several physicians in the community."

STRONG MARKETING CAMPAIGN

There was consistent support for a new system of health care for the County. All participants recommended a bold marketing campaign to dispel current beliefs about health care in the County and to brand a new image for the health care system based on its new academic framework. One stakeholder commented about image restoration, "They need to polish their own apple." Another used Mercy Hospital in Baltimore City as a model for an aggressive campaign that recruited well-known physicians, "Heavy, heavy

marketing on TV and magazines and high-end kind of magazines [for] that the insured population who is reading, lots of radio advertising, with the doctors' pictures in the paper, in the magazines, on the TV."

The marketing campaign would focus on certain elements of the new system. The stakeholders suggested a message referring to the County having "the best minds in the business" and a "state of the art facility." One participant remarked, "Some people don't know what board certified means, but if it sounds good, it's great." A couple of participants suggested linking the marketing of a new brand for the health care system with the prevention health programs sponsored by the new system. Then, according to one interviewee, "There are people who will say, 'That's our [health care system].' And that's where you want to get them to, 'That's our [health care system].'"

The campaign would promote the multicultural aspect of the health care system and the communication found in the new setting. Have translators, because, as one participant said, "We have such a diverse population I think residents coming here would want to know, okay, I can go somewhere where Spanish is spoken or this language is spoken and that the services are quality."

EFFECTIVE AND FREQUENT COMMUNICATION WITH RESIDENTS

Some of the participants emphasized the need for better messages to be sent in a variety of ways to the residents about health care in the County. How the County and the health care system communicates to residents, patients and potential health care consumers will likely impact the success of a health care system in Prince George's County. One stakeholder related the power of word-of-mouth in the County and its influence on perceptions of where to go for health care. Also, there is a need to promote having translators and the multicultural aspect of the care setting.

ACUTE CARE CENTERS

Many participants emphasized the need for acute care centers or "urgent care" centers to be located throughout the County. Acute care centers are "at the front line that people could go to for their care instead of their emergency room visit." Participants suggested that these centers would offer services on the weekend, flexible appointments and "dental for children and adults." A participant said that these centers are "not your emergency room. It's your place where if I can go in my neighborhood to get my shots." One participant argued that even those with insurance use the emergency room for acute care due to lack of access to other qualified services. "If there are doctors, and if there are extended hours, and if there are urgent care sites," argued one participant, emergency room rates would drop.

CENTERS OF EXCELLENCE

Most of the participants suggested the development of specialty care centers around the County, although there was no agreement to what specialties to focus on, "something that you could say we're the best at." The Centers of Excellence would not only be accessible to residents, but would also attract the best practitioners to the County to live and work. Areas of specialty that were mentioned included: cancer, heart disease, diabetes and "I think OB/GYN and pediatric services are primary." A participant commented on where to recruit for the centers' providers, "You choose certain specialties and say it's chosen to be a cancer center or a heart center or a diabetes center, then you got to go and recruit those well-known docs and bring them from D.C. … You have to bring some of those D.C. docs or Montgomery County docs over, for like one or two days a week or one day a week so that their practice is split, and then gradually you'll bring more."

Several stakeholders mentioned the opportunity to "think regionally" as part of the design of the new health care system. This would include doing an assessment that includes the metropolitan area surrounding the District of Columbia and considering emergency preparedness plans and other surge needs.

CULTURALLY APPROPRIATE HEALTH EDUCATION AND PREVENTION

Almost all of the participants listed preventive services and health education as a strong component they wished to see in the County's health care system. Some of the stakeholders emphasized the need for culturally sensitive prevention messages, particularly as the County sees an increase in its number of Spanish-language residents. One stakeholder explained, "Definitely culture has a lot to do with people's decisions about health care, want to generally, maybe, speak with someone who can relate and understand that particular culture. It doesn't mean that they have to have someone in their same, say, ethnic group, but at least someone that I call culturally competent that understands and can talk that language." A few wanted to see health education classes and workshops offered through the new hospital. Prenatal care was also mentioned as a preventative service to include. One stakeholder asserted, "I think that we need to do better at marketing preventive services and having classes at different hospitals throughout the County and have that

advertised so that people know that they can go and get information about how to remain healthy."

INTEGRATED ELECTRONIC HEALTH RECORD SYSTEM

A few of the stakeholders discussed the role of technology in the new health care system and how important it could be to both the reputation and the efficiency of a new health care system if it incorporated an electronic health record (EHR) system that linked all the regional health services. An integrated EHR system reduces multiplication of services for individual patients and cost of care. It also increases efficiency in treatment by reducing time to search for and find patient information from other sources. One participant said, "I think using technology is fantastic, that we have that technology to provide high-quality care, that there's an electronic record that can go from the hospital to my physician, to wherever so that I don't have to carry these things along each time."

COMMUNITY PARTNERSHIPS

The health care system would benefit from not just continuing some of the partnerships currently forged in the County, but also by developing new, varied and extensive partnerships across County and with various levels of leadership. As one stakeholder put it, "There's not been a lot of collaboration with regards to how we attack problems in the community, not a lot of talking to each other." Developing coalitions, like the County's new Health Care Coalition, offers opportunities to communicate across organizational borders and view health care from various "lenses." Partnerships were viewed as an approach for tackling wellness and prevention goals as well: the County government, schools and wellness programs working together to prevent obesity and tobacco use, for example. Other recommendations for collaboration include co-sponsoring events with community-based organizations, employers in the County and religious organizations. Have a name and services in "different environments" of the County, as one stakeholder put it. "What I'm finding also with the agencies in the community and then community-based organizations, they really don't talk to each other and pull together to do an event or this is what I do well, I've got this. You do this well; can you do that? And then bring it to a place where it's around that." The County government, the new health care system, and community-based clinics and organizations work together to support legislation or development community resources. Another participant named Children's National Medical Center, Community Clinics Inc. and the University of Maryland Medical System as strategic partnerships to foster.

MULTICULTURAL HEALTH CARE AND COMMUNICATION

A few of the participants added the importance of multicultural sensitivity in health care communication across the County and within each health care setting. According to a stakeholder, "There seems to be a very high Spanish-speaking population and also a very high population of individuals from African countries, and it seems like there isn't a lot of availability for them to get care in a language that they understand."

A few stakeholders recommended implementing a multicultural patient navigator/outreach program to assist consumers with managing their care. "It's kind of like having a patient navigator, helping them make their appointments, helping them arrange for transportation, helping them to understand how to be a health care consumer because a lot of people are coming from countries that they don't know. They don't have preventive health where they're coming from and ... and they have so many competing life priorities that it's not their top priority so they don't necessarily know what's expected of them."

AESTHETICS

Some participants spoke about the physical location, cleanliness and other visual aspects of a hospital and doctors' offices that influence how consumers feel about their health care. One stakeholder commented, "What does the place look like when you go there, whether it's the doctor's office or the hospital? ... I think if you wanted people preferring to use the hospital, the hospital has to be in a place that looks like a nice place to go to and looks nice when you get there."

PATIENT-CENTERED MEDICAL HOMES AND ACCOUNTABLE CARE ORGANIZATIONS

A few participants espoused the medical home model as a possible framework for primary care in the County. The medical home model would integrate behavioral health care and dental services with primary care allowing for a comprehensive care management plan for each patient as needed. Community health workers would be involved in the system, helping with outreach to consumers in need of health care and with education for preventative goals. The medical home model also allows for the development of an integrated electronic patient record system that links patient data across services. As one stakeholder explained the model,

"If a patient of ours goes to [one clinic] and then the next day goes to [another health care facility] it's all there." The medical home model would decrease the number of emergency room visits. Several mentioned the opportunity afforded by the accountable care organizations in supporting population health. In addition, the importance of having clear and appropriate benchmarks and routine monitoring of the care delivered was highlighted.

MORE FEDERALLY QUALIFIED HEALTH CENTERS (FQHCS)

Instead of acute care centers, some participants believed that the County should invest in applying for and developing more FQHCs. One of these stakeholders, who is not employed by an FQHC, said "The expansion of the FQHC has been a benefit to the County." These clinics are mandated to provide specialty care, care management and outreach. They have to provide a full range of primary care services for all ages and for all people regardless of ability to pay. In addition, Medicaid reimburses FQHCs at over double the rate for private practitioners. The board of advisors for each FQHC is required to comprise 51 percent of health consumers, so patients dominate the voice of decision making and have a role in maintaining quality. Furthermore, FQHCs are required to provide culturally sensitive services, so they are adept at reaching out to patients in the different communities that make up the County.

ACHIEVING "HIGH STATURE"

Stakeholders believed that what is perceived as high stature resonates with County residents. A new health care system would achieve perceived stature through: an academic link to the University of Maryland, the centers of excellence moniker for ambulatory centers, and perceived "top-notch quality" through "well-renowned surgeons and private care." As one participant described the beliefs of affluent County residents, "I'm affluent. I can afford to pay for anything I want." Another stakeholder argued that the affluent, educated communities in the County would follow "state-of-the-art evidence" provided by a university-based hospital in the County because they seek out the "best" in health care specialists.

LOCATION PREFERENCE

Limited specific suggestions were provided when stakeholders were asked about location of facilities. One mentioned that as long as there were ways to travel by public transportation and the quality of the care was high, the location did not matter. Many participants did not believe they were qualified to answer this question, as one said, "I'm not the expert. I don't have the expertise to decide where it should be." However, one participant offered specific recommendations, "I would do something in Landover where Landover Mall used to be. I would come down and I would be in the Capitol Heights/Suitland community, close to the Census Bureau. It will come out closer to Bowie State University, right off of 295 on the southern end; it might be towards where Southern Hospital is, in the more rural setting, at the Maryland Hospital, and then of course, in the far Washington area, I'd be over by Silver Spring. I think that touches the whole of the County." Another stakeholder said, "[The regional center] needs to move from where it is in Cheverly to some place that's centralized to Prince George's County off major road accesses both public and private."

In other cases, some general comments were shared about the location of an anchor care facility, such as having it accessible from a major highway or transportation such as the Metro, and having the space to expand the buildings if necessary in the future. A couple of participants recommended the regional center be relocated to a more southern location than where Prince George's Hospital is currently, "Not close to the Charles County line but definitely a little bit southern than where we are." Similarly, one participant suggested that if an acute care center or center of excellence is located near D.C. inside the beltway, residents from D.C. will go to it because it would offer accessible and better health care for the D.C. residents as well.

RECRUITING PRIMARY CARE PROVIDERS

Most of the stakeholders held professional positions unrelated to primary care, so the topic of physician recruitment was perceived as outside their purview. When primary care physicians were discussed in detail, it was suggested that group practices be made available to easily join so that new physicians do not have to handle the administrative burden. As one stakeholder put it, "Young people are looking for a decent salary, a decent lifestyle and help with learning things." One stakeholder alleged that the local medical society did not engage its membership in being committed and active for the County and this might be indicative of the type of challenging factors that might constrain the recruitment of quality physicians. According to this participant, "There is not that infrastructure or environment here in our County to get them to come out to work together, to talk together."

Stakeholders who were not

physicians had few recommendations for recruiting physicians to the County. Most of the participants responded by asserting only that, "We need to provide incentives for our primary care providers." A few suggested loan forgiveness plans. Others referred to the reputation of what will be the centers of excellence, and a connection with a teaching hospital and university as incentives to bring new physicians to the area. One stakeholder suggested developing an integrated strategic plan for aggressively recruiting physicians from other nearby jurisdictions.

RESPONSES TO FIVE MAIN QUESTIONS

Participant responses were analyzed also to answer the five main questions that framed the project. Below is a summary of how data responded to each question.

1. KEY HEALTH OUTCOMES IN THE COUNTY MOST AMENABLE TO IMPROVEMENT BY A NEW HEALTH CARE SYSTEM?

The key health outcomes to address through a new health care system are chronic disease, specifically diabetes and heart disease, and infant mortality. Related risks, such as obesity, hypertension and poor prenatal care should be addressed not only through health services, but also through a comprehensive and strategic preventive health education program implemented throughout the new system.

2. HEALTH CARE SYSTEM ELEMENTS THAT CAN AFFECT OUTCOMES?

Chronic disease and infant mortality can be reduced once access to primary care and specialty care increases. Access is a key factor in improving health outcomes in the County, according to the stakeholders. Access to primary care will be significantly improved through a set of elements in the new health care system. These elements include the following:

- Ambulatory care centers that address acute care needs in communities. Also referred to as urgent care centers, these facilities will have hours of operation in evenings and weekends, flexible appointments and locations near public transportation. The utilization of urgent care centers will reduce emergency room visits, which will impact key health outcomes in the County.
- Additional Federally Qualified Health Centers (FQHCs). Mandates for FQHCs offer opportunities to increase access to health care, improve culturally appropriate health communication and implement case management. Primary care services are reimbursed at over twice the standard rate, and health consumers fully participate in board decisions.
- Development of a patient-centered medical home model. The County is already preparing to implement medical homes, and stakeholders believe this initiative should be expanded and strengthened.
- Additional mobile health vans

Access to specialty care will improve health outcomes and can be addressed through the development of centers of excellence. Stakeholders suggest building a national leadership reputation through the creation of specialized care services located within the regional center or around the County. National experts would be recruited to operate the services and the County would be promoted as the leader in those specific care areas. Importance should be placed on clear and appropriate benchmarks and routing monitoring of the care delivered. An assessment should include the metropolitan area surrounding the District of Columbia and should consider emergency preparedness plans and other surge needs.

The key health outcomes can also be affected by retaining or modeling certain specialized elements of the current health care provided in the County. These elements include:

- The Critical Care unit of Prince George's Hospital
- Maternal and Child Health unit and neonatal intensive care unit of Prince George's Hospital
- Cardiac Rehabilitation unit of Prince George's Hospital
- Center for Wound Healing at Doctor's Hospital
- Bowie Health Center
- Laurel Regional Hospital's Behavioral Health unit

The new health care system will better address health outcomes in coordination with government, community-based organizations and citizen groups.

3. GEOGRAPHIC DISTRIBUTION OF HEALTH CARE RESOURCES AND AREAS OF GREATEST NEED FOR PRIMARY CARE?

Some of the stakeholder suggestions for geographic distribution address access to Metro, and differences between quality of care inside the Beltway and outside the Beltway. Specific recommendations included the following, "I would do something in Landover where Landover Mall used to be. I would be in the Capitol Heights/ Suitland community, close to the Census Bureau. It will come out closer to Bowie State University, right off of 295 on the southern end; it might be towards where Southern Hospital is, in the more rural setting, at the Maryland Hospital, and then of course, in the far Washington area..." Others suggested moving the regional center to a centralized location accessible from a major highway or transportation such as the metro, and having the space to expand the buildings if necessary in the future. A couple of stakeholders recommended the regional center be relocated to a more southern location.

4. KEY ISSUES TO MAXIMIZE UPTAKE AND ACHIEVE THE POTENTIAL OF A HEALTH CARE SYSTEM?

Reputation and perceived excellence are key issues to be addressed in order for the new health care system to reach its potential. All the stakeholders cited perceived poor quality of services as the main reason that 1) leads residents out of the County for health care and 2) influences physicians to refer out of the County for specialized services. While several stakeholders believed that the poor reputation is in perception only, all acknowledged that perception is reality when it comes to health care decisions. Since many of the stakeholders believed that the "true" story of Prince George's County health care has gone untold, a bold and broad marketing campaign is recommended to maximize uptake of the new services. The campaign's goals would include: creating a positive "brand" for the County's health care system; increasing perceived stature of the quality of care that will be available and increasing use of the new health care services. Resident perspectives would be incorporated in the designing of strategy and messages for the campaign. All local media and mobile channels will disseminate campaign messages, in addition to strategic use of opinion leaders in communities to share messages by word of mouth. The campaign would promote differing messages to be sensitive to cultural and language differences in the County.

An evidence-based university framework for the new system will significantly improve the reputation of health care in the County. Stakeholders believe that a teaching hospital will increase the stature of the health care services, actually improve quality of care provided by physicians and compete with the university-based health care available in Washington, D.C.

A basic need is that of recruitment and retention of qualified primary care and specialty physicians. There are three gaps that need to be addressed: the quantity, the quality and the type of physician working in the County. One suggestion was to propose part-time appointments for well-known providers from surrounding jurisdictions. Another suggestion was to incentivize medical school graduates with a loan repayment program.

How the County and the health care system communicates to residents, patients and potential health care consumers will likely impact the success of a health care system in Prince George's County. The new health care system will be able to reduce key health risks by developing a comprehensive and culturally appropriate prevention and health education program. The program would include trained, multicultural health promoters in the community. Another suggestion was to place electronic kiosks in waiting rooms so that patients can find preventive health information while waiting. Furthermore, within the clinical setting, resources should support a large and mobile translator/interpreter program. One stakeholder related the power of word of mouth in the County and its influence on perceptions of where to go for health care. These communication and translation efforts would harness the power of the word of mouth in the County. Finally, a mass media campaign would reinforce the new brand images. At its initial development, consider structuring the new health care system so as to incorporate prevention education at every phase of care and community outreach.

Another key issue is related to the health insurance options and reimbursement rates that guide physician referrals as well as physician recruitment and retention efforts. The new health care system must find ways to address the financial motives that are driving residents out of the County for care.

One mark of distinction compared to neighboring health services would be the implementation of a coordinated, linked electronic health record system. The paperless system would incorporate clinical, administrative and billing services all on a single platform. All ambulatory centers as well as the regional hospital would be linked so that a patient seen by one physician in one facility would have his/her information shared with any referred provider electronically.

5. RESOURCES IN THE PUBLIC HEALTH SECTOR TO COMPLEMENT THE IMPACT OF THE HEALTH CARE SYSTEM?

The health care system would benefit from not just continuing the partnerships currently forged in the County, but also from developing new, varied

and extensive collaborations with public health initiatives. Developing coalitions, like the County's Health Care Coalition, offers opportunities to communicate across organizational borders and view health care from various "lenses." Partnerships were viewed as an approach for tackling wellness and prevention goals as well: the County government, schools and wellness programs working together to prevent obesity and tobacco use. Other recommendations for collaboration included co-sponsoring events with community-based organizations, employers in the County and religious organizations.

DISCUSSION

The stakeholder interviews supported the results of previous reports about health and health care in Prince George's County. For example, similar to the RAND findings, stakeholders lamented the lack of an ambulatory care safety net and the significant out-of-County use of health care services (Lurie et al., 2009). Also, as in the RAND report, several stakeholders worked and received medical care outside the County, and they discussed the impact of residents traveling out of the County for their health care.

The RAND report indicated that out-of-County use is perhaps driven by resident preferences, convenience and provider referral patterns (Lurie et al., 2009). Here, stakeholders viewed all three of these factors as influencing out-of-County health care use. It was a combination of factors, both structural and individual, that will need to be addressed in the development of a new health care system. Since one main finding here was that residents might prefer to use care inside the County if they did not work outside the County or get referred to outside the County by their physicians, then, as RAND suggested, "strategies aimed at building a stronger physician referral network, increasing the number of primary care physicians in the County, and increasing the availability of care on weekends and before- and after- hours may keep more patients in the County."

In previous research, the most prevalent barriers that either prevented or delayed treatment for parents were: inconvenient office hours, appointment availability and cost (of doctor care and prescriptions) (Child & Adolescent Health Assessment, 2002; Partnering Toward a Healthier Future, 2007). Community leaders in the previous study cited problems relative to culture, language and documentation (Child & Adolescent Health Assessment, 2002). Similar concerns were cited by stakeholders in the current study as well. Access emerged here as the priority health care concern today, and the ways to address it included acute care centers that offered appointment availability and convenient access. Also, stakeholders discussed a multicultural perspective for the development of communication in the clinical settings and in the community.

The stakeholder study not only supported previous research on the County, but also offered a unique perspective of the County's health care, because it derives from community-based leaders, those on the front lines of health services, but who also have a "bird's eye" view of patient experiences. The combination insider/outsider roles of these stakeholders contributed significantly to our understanding of the current health care services and the desire for certain elements for a new health care system. The 40 stakeholders interviewed reflected a wide swath of professions that represent today's Prince George's County: health administrator, physician, legislator, businessman, resident, union leader. And yet all of the participants were optimistic about the plan for the University of Maryland Medical System (UMMS) to redevelop a County-wide health care system and committed to doing what they can to assist the effort.

LIMITATIONS The stakeholder study reflects perceptions and insights from a limited number of individuals. We had identified additional stakeholders, however, some individuals who were invited to participate did not respond to our requests or did not wish to be part of the study. These voices, while only five, left a gap in the overall picture of what County stakeholders perceived for the future of health care.

SUMMARY

While data on diseases and conditions, hospital utilization and provider capacity contribute essential information for the design of a new health care system, stakeholders provide critical insights in to the success of a system. Individual interviews with 40 key stakeholders were conducted to capture the diverse perspectives of key influencers who can contribute to and who are affected by the health care system in Prince George's County. We wanted to gather and synthesize the opinions and perceptions of individuals who could inform the process of developing an effective and financially viable health care delivery system in Prince George's County. Findings from the interviews addressed both current status of the health care system in the County and future recommendations for a new health care system. Overall, infant mortality and chronic disease topped lists of prevalent health risks for the County. All the stakeholders said that the negative reputation of the County's health care quality was a primary reason for residents choosing outside the County for their health care services. For about half the participants, the poor reputation of health care in Prince George's County trumped the actual quality of health care, which for these participants was quite good. The reputation in the County also derives from having so few primary care providers. Participants also mentioned that insurance companies play a role in sending residents out of County for health care. The recommendations for a future health care system included: using and promoting an academic/university framework with community partnerships, creating acute care centers and centers of excellence, developing culturally appropriate health education and prevention materials and activities; implementing a strong marketing campaign, building an electronic health record system, emphasizing multicultural health care; paying attention to physical aesthetics, furthering a patient-centered medical home model, and recruiting primary care providers. All of the participants were optimistic about the plan for UMMS to redevelop a County-wide health care system and were committed to doing what they can to assist the effort.

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APPENDIX A: **INTERVIEW GUIDE FOR HEALTH CARE PRACTITIONERS** *(text in italics not to be read)*

INTRODUCTORY SCRIPT AT TIME OF INTERVIEW Thank you for spending time with me today. We are gathering information that will help contribute to the design of a new health care system in Prince George's County. We are conducting several interviews as part of a larger project that includes a survey and other types of research, and we want to find out what key stakeholders, such as yourself, think about the health care in the County and about particular characteristics that could go into a new health care system. You are being interviewed because you play an important role in health care and can offer valuable advice about health care services.

CONSENT FORM Before we begin, I have to make sure that you approve of being interviewed and audio recorded, so I would like to go through the consent form with you and ask you to sign it. *(Present and read consent form. If over the phone, ask if participant read it and send it back signed, or confirm your receipt of signed consent form).*

Thanks. So let's get started, I'll begin with a couple of background questions:

1. Do you live or work in Prince George's County? How long have you lived here or worked in the County?
    - 1.1 *(If work)* What is your current work in the County?
    - 1.2 *(If not)* What is your connection to Prince George's County?

The rest of the questions address health and health care in the County.

2. First, I want to ask about health issues that impact the County: When you think of the greatest health risks facing County residents today, what comes to your mind? Why? *(probes below are used if participant does not share responses that address these Qs)*
    - 2.1 Are there other priority health concerns you would add?
    - 2.2 If you had to pick three, which three would it be? Which one would you put as most critical, which next, etc.? And for which particular populations?
    - 2.3 How would you compare the health risks and needs of the under-insured in the County with the health needs of the insured populations here?
3. How have the health problems in the County changed during your time here?
    - 3.1 What else with regard to health has changed in the County since your time here?
4. Okay, now imagine for a moment a person with [priority health risk mentioned earlier] who develops a health problem related to the risk. If you could advise them where to go for care and treatment, where would you advise them to go? Why?
    - 4.1 What are some specific factors that influenced you when you answered where to go for care?
    - 4.2 In this County, how does location of residence influence where people go for health care?
5. We would like to hear your opinions about what a new health care system might look like for the County, one that includes a regional center for acute care and also outpatient surgery and a primary care network *(Be prepared to define these types of services)*. If you could offer up your wish list of health care services—ones you think would have the greatest potential for improving the health status of Prince Georgians—what health care services would you list? Why?
6. Consider for a moment the current health care services in the County. What are some good points or strong elements about the current health services that you would wish to keep in a new system?
    - 6.1 What are lessons learned from the current health services in the County that you can share?
7. In your experiences, can you share with us some best practices in health care that you have learned about from other jurisdictions?
8. [*If interviewee previously talked about residents going outside of County for care, then begin this Q with* "As you mentioned earlier"], County residents have been traveling outside the County to other, regional health care services to get their health care. According to a RAND Report in 2009, about 25,000 residents receive care outside the County. Why do you think this is the case?
    - 8.1 Do you believe cultural differences between residents and health care providers impact choices in health care? How so or why not?

8.2 How do you think insurance affects residents' decisions to get their health care outside the County?

8.3 What do you think might motivate certain residents who currently utilize Washington D.C. and other area health care to stay in the County for their health care?

8.4 *(only for non-hospitals)* What is your impression of Dimensions Healthcare System?

9. In thinking about a new health care system, are there particularly unique services or an attractive characteristic that would be appealing to residents AND important to quality of health care?

9.1 What factors do you think would most influence a change in current health care usage for people? Is it the advice of primary care providers, the presence of a highly regarded provider, access to new or specialty services?

10. One critical characteristic of is access to good primary care. If you could define what good primary care would mean to you, what would you say you look for in a good primary care physician?

11. And what do you think are some challenges providers face in this County?

11.1 In deciding to affiliate with a health care center or hospital, what do physicians consider?

11.2 How can the County's new health care system help to overcome these challenges?

12. Think about what might be some important characteristics in a new health care system that would be specifically attractive to excellent physicians. And imagine that you know of a colleague who is interested in moving to the County. What might you say to this colleague about the County's new health care services to convince her to move her practice here?

13. Those are all the questions I planned for today. Do you have any information, materials, or reports that I could have that addresses any of the issues we talked about today?

14. And is there anything I should have asked but didn't?

15. Would it be okay to contact you if I have any follow-up questions or need clarification about something we talked about today?

Thank you for your time and help with this project, it is greatly appreciated!

APPENDIX B: **INTERVIEW GUIDE FOR GOVERNMENT** *(text in italics not to be read)*

INTRODUCTORY TEXT Thank you for spending time with me today. We are gathering information that will help contribute to the design of a new health care system in Prince George's County. We are conducting several interviews as part of a larger project that includes a survey and other types of research, and we want to find out what key stakeholders, such as yourself, think about the health care in the County and about particular characteristics that could go into a new health care system. You are being interviewed because of your important role in the County and you can offer valuable advice about health care services.

CONSENT FORM Before we begin, I have to make sure that you approve of being interviewed and audio recorded, so I would like to go through the consent form with you and ask you to sign it. *(Present and read consent form. If over the phone, ask if read it and sent it back signed or confirm your receipt of signed consent form).*

Thanks. So let's get started, I'll begin with a couple of background questions:

1. Do you live or work in Prince George's County? How long have you lived here or worked in the County?

1.1 *(If work)* What is your current work in the County?

1.2 *(If not)* What is your connection to Prince George's County?

The rest of the questions address health and health care in the County.

2. First I want to ask about health issues that impact the County: When you think of the greatest health risks facing County residents today, what comes to your mind? Why? *(Probes below are used if participant does not share responses that address these Qs).*

2.1 Are there other priority health concerns you would add?

2.2 If you had to pick three, which three would it be? Which one would you put as most critical, which next, etc.? And for which particular populations?

2.3 How would you compare the health risks and needs of the under-insured in the County with the health needs of the insured populations here?

3. How have the health problems in the County changed during your time here?

3.1 What else with regard to health has changed in the County since your time here?

4. We would like to hear your opinions about what a new health care system might look like for the County, one that includes a regional center for acute care and also outpatient surgery and a primary care network *(Be prepared to define these types of services).* If you could offer up your wish list of health care services—ones you think would have the greatest potential for improving the health status of Prince Georgians—what health care services would you list? Why?

4.1 Where might you locate the services? Why?

4.2 What particular populations in the County do you think would use the different services? Why?

5. Consider for a moment the current health care services in the County. What are some good points or strong elements about the current health services that you would wish to keep in a new system?

5.1 What are lessons learned from the current health services in the County that you can share?

6. In your experiences, can you share with us some best practices in health care that you have learned about from other jurisdictions?

7. [*If interviewee previously talked about residents going outside of County for care, then begin this Q with* "As you mentioned earlier"], County residents have been traveling outside the County to other, regional health care services to get their health care. According to a RAND Report in 2009, about 25,000 residents receive care outside the County. Why do you think this is the case?

7.1 What do you think it would take to convince Prince George's County residents who currently utilize Washington D.C. and other area hospitals, to utilize a hospital located within Prince George's County?

7.2 What factors do you think would most influence a change in current health care usage for people? Is it the advice of primary care providers, the presence of a highly regarded provider, access to new or specialty services?

7.3 How do you think insurance affects residents' decisions to get their health care outside the County?

7.4 What is your impression of Dimensions Healthcare System?

8. Okay, now take a moment to imagine a particular family who recently moved to one of the County's more affluent neighborhoods from Washington, D.C., and consider what might be their particular needs and preferences for health care. Please describe what you think they would be looking for in quality health care?

8.1 What do you think might be some factors that would motivate this family to stay in the County for their health care?

9. With regard to keeping residents in the County for health care, how could the new health care system distinguish itself from the other local options for health care?

9.1 Are there particularly unique services or an attractive characteristic that would be appealing to residents AND important to quality of health care?

10. If there was a state-of-the-art specialty care hospital center in Prince George's County, would you or members of your family use it as your first choice for health care?

11. One critical characteristic of health care quality is access to good primary care. What is your opinion about the quality of primary care serving the County?

12. What do you think are some challenges residents face with regard to primary care providers?

12.1 How can the County's new health care system help to overcome these challenges?

13. Do you have any suggestions for how the County might retain and recruit excellent physicians and nursing staff for a new health care system?

14. To develop and operate a quality health care system, the County will obviously need a great deal of community support. What organizations or community groups do you feel should be involved in order to help support a successful health care system?

    14.1 How should planners build community support from these groups?

    14.2 What other resources can be utilized to help with a new health care system?

15. Those are all the questions I planned for today. Do you have any information, materials, or resources that I could have that addresses any of the issues we talked about today?

16. And is there anything I should have asked but didn't?

17. Would it be okay to contact you if I have any follow-up questions or need clarification about something we talked about today?

Thank you for your time and help with this project, it is greatly appreciated!

APPENDIX C: **INTERVIEW GUIDE FOR COMMUNITY-BASED LEADERS** *(text in italics not to be read)*

INTRODUCTORY TEXT Thank you for spending time with me today. We are gathering information that will help contribute to the design of a new health care system in Prince George's County. We are conducting several interviews as part of a larger project that includes a survey and other types of research, and we want to find out what key stakeholders, such as yourself, think about the health care in the County and about particular characteristics that could go into a new health care system. You are being interviewed because of your important role in the County and you can offer valuable advice about health care services.

CONSENT FORM Before we begin, I have to make sure that you approve of being interviewed and audio recorded, so I would like to go through the consent form with you and ask you to sign it. *(Present and read consent form. If over the phone, ask if participant read it and sent it back signed, or confirm your receipt of signed consent form).*

Thanks. So let's get started, I'll begin with a couple of background questions:

1. Do you live or work in Prince George's County? How long have you lived here or worked in the County?

    1.1 *(If work)* What is your current work in the County?

    1.2 *(If not)* What is your connection to Prince George's County?

The rest of the questions address health and health care in the County.

2. First I want to ask about health issues that impact the County: When you think of the greatest health risks facing County residents today, what comes to your mind? Why? (*Probes below are used if participant does not share responses that address these Qs*).

    2.1 Are there other priority health concerns you would add?

    2.2 If you had to pick three, which three would it be? Which one would you put as most critical, which next, etc.? And for which particular populations?

    2.3 How would you compare the health risks and needs of the under-insured in the County with the health needs of the insured populations here?

3. How have the health problems in the County changed during your time here?

    3.1 What else with regard to health has changed in the County since your time here?

4. Okay, now imagine for a moment a person with [priority health risk mentioned earlier] who develops a health problem related to the risk. If you could advise them where to go for care and treatment, where would you advise them to go? Why?

    4.1 In this County, how does location of residence influence where people go for health care?

5. We would like to hear your opinions about what a new health care system might look like for the County, one that includes a regional center for acute care and also outpatient surgery and a primary

care network (*Be prepared to define these types of services*). If you could offer up your wish list of health care services—ones you think would have the greatest potential for improving the health status of Prince Georgians—what health care services would you list? Why?

5.1 Where might you locate the services? Why?

5.2 What particular populations in the County do you think would the different services? Why?

6. Consider for a moment the current health care services in the County. What are some good points or strong elements about the current health services that you would wish to keep in a new system?

6.1 What are lessons learned from the current health services in the County that you can share?

7. [*If interviewee previously talked about residents going outside of County for care, then begin this Q with* "As you mentioned earlier"], County residents have been traveling outside the County to other, regional health care services to get their health care. According to a RAND Report in 2009, about 25,000 residents receive care outside the County. Why do you think this is the case?

7.1 What do you think it would take to convince Prince George's County residents who currently utilize Washington D.C. and other area hospitals, to utilize a hospital located within Prince George's County?

7.2 What factors do you think would most influence a change in current health care usage for people? Is it the advice of primary care providers, the presence of a highly regarded provider, access to new or specialty services?

7.3 How do you think insurance affects residents' decisions to get their health care outside the County?

7.4 What is your impression of Dimensions Healthcare System?

8. Okay, now take a moment to imagine a particular family who recently moved to one of the County's more affluent neighborhoods from Washington, D.C., and consider what might be their needs and preferences for health care. Describe what you think they would look for in quality health care?

8.1 What do you think might be some factors that would motivate this family to stay in the County for their health care?

9. In keeping residents in the County for health care, how could the new health care system distinguish itself from the other local options for health care?

9.1 Are there particularly unique services or an attractive characteristic that would be appealing to residents AND important to quality of health care?

10. One critical characteristic of health care quality is access to good doctors. What is your opinion about access to physicians in the County?

10.1 How would you describe the quality of general physicians who serve the County?

11. What do you think are some challenges residents face with regard to good doctors?

11.1 How can the County's new health care system help to overcome these challenges?

12. To develop and operate a quality health care system, the County will obviously need a great deal of community support. What organizations or community groups do you feel should be involved in order to help support a successful health care system?

12.1 How should community support be developed with these groups?

12.2 What other resources can be utilized to help with a new health care system?

13. If there was a state-of-the-art specialty care hospital center in Prince George's County, would you or members of your family use it as your first choice for health care?

14. Those are all the questions I have for today. Do you have any information, materials, or resources that I could have that addresses any of the issues we talked about today?

15. And is there anything I should have asked but didn't?

16. Would it be okay to contact you if I have any follow-up questions or need clarification about something we talked about today?

Thank you for your time and help with this project, it is greatly appreciated!

TECHNICAL REPORT 3

Physician Counts and Categorization and Characteristics of Physicians in the State of Maryland and Prince George's County

Mei-Ling Ting Lee Ph.D., Raul Cruz-Cano Ph.D.

INTRODUCTION

In this technical report, we document our approach to quantifying physician supply for the state of Maryland and for Prince George's County. We also provide updated results on physician supply and selected practice characteristics.

The quantitative analysis was customized to make use of appropriate measures for each specialty group and cluster category, using the most current relicensure data provided by the Department of Health and Mental Hygiene (DHMH) Maryland Board of Physicians. Assessing the adequacy of the physician workforce involves considering the supply of primary care physicians and other specialists. The latter specialty groups are categorized into medical specialties, surgical specialties and hospital specialties to facilitate comparisons with the 2009 RAND report findings (2009 RAND ref). The procedures used to derive physician counts and to classify each specialty and category are described in our methods.

For the Public Health Impact Study of Prince George's County, we were interested in assessing physician workforce capacity, defined as actively providing quality clinical care to Maryland residents. Simply stated, our approach focused on identifying physicians who are board-certified, who provide patient care at least 20 hours a week and who have at least one practice in the state/County. We also wanted to compare the County data with that of surrounding jurisdictions and the state. While we documented all physicians, we were particularly interested in primary care specialties, those specialties that serve as the initial point of contact and who serve to coordinate care. The resulting counts were used to inform the geographic mapping, the econometric model and the comparisons with previous studies.

METHODS

A TWO-STEP APPROACH TO JUSTIFY PHYSICIAN COUNT

A critical component in assessing physician capacity is the ability to accurately and systematically quantify the number of providers. We benefited from the process delineated in the Maryland Health Care Commission (MHCC) report that applied the Health Resources and Services Administration Method to the Maryland data (MHCC Hogan Report, 2011) and assessed the differences between Maryland Physician Workforce Study report (Boucher & Associates Med Chi, 2008) and the Area Resource File. We applied the majority of the steps used in the MHCC Hogan Report in order to facilitate future comparisons (Appendix A Table 1 delineates the similarities and differences in our respective approaches).

Listed below is a description of our general two-step approach and additional steps taken for the Prince George's County counts. This is illustrated in the flow chart for physician count management (Figure 1) and with resulting respective counts for Maryland and for Prince George's County (Table 1).

STEP 1 We excluded physicians working for the federal government, physicians with primary practice as federal military and physicians with primary practice as federal civilian. However, we retained physicians working for Veterans Affairs, since the patients they care for are civilian veterans who are now part of the general population. We also excluded interns and fellows as well as physicians aged 75 or older. Only active physicians who stated they provide direct medical care to Maryland patients were retained.

STEP 2 We deleted physicians with data missing in their primary certification. We looked at the possibility of substituting the secondary certification, which included 23 physicians, but decided they were not sufficient to include (Appendix B).

We retained physicians who worked 20 hours or more in patient care or in their primary or secondary locations. We also deleted physicians who declared they were not certified.

FIGURE 1 APPROACH TO PHYSICIAN COUNT MANAGEMENT

From the resulting 12,093 physicians in Maryland, the selection of the 922 board-certified active licensed physicians in Prince George's County was performed based on the ZIP codes declared by the physicians, not on the jurisdiction. There were 48 physicians who did not declared a ZIP code in Prince George's County, but who had the County as their jurisdiction. Because our analyses were based on ZIP codes, these were not considered in this analysis (see Appendix C for listing of their specialties). For the comparison counties, the selection of physicians was based on the declared jurisdiction only. In Table 1 we also calculated primary care physicians with and without pediatricians in order to provide counts used for the econometric model and for a separate assessment of capacity for children and youth and adults.

APPROACH USED IN CLASSIFYING PHYSICIANS INTO SPECIALTIES AND FOUR CATEGORIES

The approach we used to categorize the 241 certifications available to physicians in the 2009–2010 Maryland Board of Physicians' Renewal License database is described below.

1. We used the American Board of Medical Specialties' list of Recognized Medical Specialties and Subspecialties as a primary reference (*www.abms.org/who_we_help/physicians/specialties.aspx*). These are recognized specialties and subspecialties listed according to examining boards.

2. The procedure used to select the board-certified physicians who declare they are in direct patient care in the state of Maryland from the 25,687 physicians in the 2009–2010 renewal license dataset is described in previous section.

3. We placed physicians into four specialty categories: primary care specialties, medical specialties, surgical specialties and hospital specialties, for purposes of comparisons with the 2009 RAND report (specifically Table 6.1; RAND 2009 Report). We describe our approach for each of the four categories.

In the RAND 2009 report, physicians trained in family and general medicine, internal medicine, pediatrics, and obstetrics and gynecology are considered as primary physicians. We contacted RAND but were not able to identify the specific codes they used for their general categorization.

TABLE 1 GUIDE TO PHYSICIAN COUNT MANAGEMENT

Adj.		State	County
	Maryland Renewal License Data	25,687	1,375
1	Deleting the physicians who work for the federal government	23,217	1,334
2	Deleting the physicians who setting of the primary practice is federal military	23,133	1,329
3	Deleting the physicians who setting of the primary practice is federal civilian	23,065	1,327
4	Excluding interns and fellows	22,276	1,326
5	Deleting physicians aged 75 or older	21,442	1,289
6	Keeping only active physicians who provide direct medical care to Maryland Patients	17,209	1,175
7	Keeping only physicians who declare that their primary or secondary practice or the non-public address is in the state of Maryland	14,236	1,174
8	Filling Prince George's County ZIP code**		
9	Selecting only Physicians in Prince George's County Census ZIP codes***		1,126
	These 14,236 physicians are the licensed physicians	14,236	1,126
10	Deleting physicians who have missing data in their primary certification	14,227	1,125
11	Keeping only physicians who work 20 hours or more in patient care or in their primary and secondary locations	13,699	1,108
12	Excluding non-certified physicians	12,093	922
	These 12,093 physicians are the board-certified physicians	12,093	922
13	Selecting primary care physicians according to HRSA	4870	465
	These 4,870 physicians are the primary care physicians	4,870	465
14	Selecting primary care physicians without pediatrics	3,860	384
	These 3,860 physicians are the primary care physicians (no pediatrics)	3,860	384

*Criteria to select physicians in Prince George's County is if they declare it to be the jurisdiction of their primary practice.

**The adjustments to ZIP codes in Prince George's County are: Drop the + 4 code from the ZIP codes and change Prince George's post office ZIP codes into Census ZIP codes. If the jurisdiction of their primary practice is Prince George's County but the ZIP code of the Primary Practice is not, then the ZIP code of the secondary practice and the ZIP code of the non-public address were used. If none of these three ZIP codes are in Prince George's County, then these physicians were dropped from the survey. There are 43 board-certified physicians in this category. For the rest of the jurisdiction the selection was performed exclusively on the declared jurisdiction of their primary practice.

***Prince George's Census ZIP codes are: 20601, 20607, 20608, 20613, 20623, 20705, 20706, 20707, 20708, 20710, 20712, 20715, 20716, 20720, 20721, 20722, 20735, 20737, 20740, 20742, 20743, 20744, 20745, 20746, 20747, 20748, 20762, 20769, 20770, 20772, 20774, 20781, 20782, 20783, 20784 and 20785.

TABLE 2 PHYSICIAN COUNTS PER 100,000 RESIDENTS, BY JURISDICTION* AND SELECTED SPECIALTIES**

		Prince George's	Montgomery	Howard	Baltimore	Anne Arundel	State
	Primary Care Total	53.9	94.9	75.2	101.2	66.6	84.4
1	Family medicine	10.7	13.4	13.6	12.3	14.7	14.7
2	General practice	0.6	0.4	0.3	0.1	—	0.4
3	Internal medicine	26.1	42.8	27.9	57.1	29.0	40.0
4	Pediatrics	9.4	22.8	18.8	17.4	14.1	17.5
5	OB/GYN general	7.2	15.4	14.6	14.3	8.7	11.7
	Medical Specialties Total	20.0	56.9	48.4	52.9	32.7	47.4
1	Allergy and immunology	0.7	1.6	2.4	1.4	0.9	1.3
2	Cardiovascular disease	2.3	6.0	4.9	5.0	3.7	5.7
3	Dermatology	0.8	6.5	2.8	4.6	3.9	3.4
4	Diabetes and endocrinology	0.9	1.1	2.1	1.6	0.9	1.3
5	Gastroenterology	2.3	4.5	3.5	4.2	4.1	3.8
6	Internal medicine subspecialties	5.8	8.8	6.6	8.0	8.0	8.9
7	Neurology	1.6	4.2	5.6	2.2	2.8	4.0
8	Pediatrics subspecialties	0.9	3.0	—	1.5	0.7	2.1
9	Psychiatry	3.5	18.1	19.2	20.4	4.1	13.1
10	Pulmonary medicine	0.7	1.5	0.7	2.4	2.2	2.0
11	Other primary care special	0.1	0.4	0.3	0.4	0.2	0.6
12	Other medical specialties	0.3	1.0	0.3	1.4	1.1	1.3
	Hospital-Based Total	16.2	47.0	20.2	45.3	29.8	43.2
1	Anesthesiology	4.3	17.6	7.7	13.0	10.8	14.7
2	Emergency medicine	3.8	9.7	3.5	8.2	6.7	8.8
3	Pathology	1.3	4.2	0.3	4.2	1.9	4.0
4	Physical medicine and rehabilitation	1.3	2.7	1.7	2.7	2.4	2.6
5	Diagnostic radiology	2.4	9.0	4.2	12.7	5.8	8.5
6	Radiology other	2.7	2.6	2.4	4.2	1.1	4.0
7	Other hospital based specialties	0.5	1.3	0.3	0.2	1.1	0.7
	Surgical Specialties Total	16.7	36.5	19.2	42.7	27.5	34.4
1	General surgery	3.8	6.0	3.5	9.3	4.8	8.2
2	Colon & rectal surgery	—	0.4	0.3	0.9	0.6	0.3
3	Neurosurgery	0.6	0.7	0.7	1.9	1.1	1.5
4	OB/GYN surgical	0.2	0.8	0.3	0.6	0.2	0.4
5	Ophthalmology	4.2	9.5	2.8	9.1	5.0	6.7
6	Orthopedic surgery	3.6	8.2	3.8	10.2	6.7	7.2
7	Otolaryngology	1.2	3.7	1.0	3.2	3.2	3.1
8	Plastic surgery	0.5	4.1	3.1	3.0	1.9	2.7
9	Thoracic surgery	0.7	0.7	—	0.9	0.6	0.9
10	Urology	1.9	2.1	3.5	3.5	3.3	3.2
11	Other	0.1	0.3	—	0.2	0.2	0.4

*The physicians counted in these rates are considered to be board-certified active physicians in Maryland selected from the 2009–2010 Maryland Board of Physician's Renewal License File and assigned to a jurisdiction using the procedure described in Table 1.

**The procedures used to classify each certification into a subcategory are described in Section 2.2 on "Approach Used in Classifying Physicians into Four Specialty Categories."

PRIMARY CARE SPECIALTIES

In this technical report, primary care physicians were identified by codes for the primary certification provided to us by the DHMH Office of Primary Care as specified by the Health Resources and Services Administration (HRSA). These codes include:

- 010-Family practice—general
- 012-General practice
- 015-Gynecology
- 019-Internal medicine—general
- 030-Obstetrics and gynecology—general
- 038-Pediatrics—general

We then placed other related subspecialties for the primary care specialties under medical specialties or surgical specialties as noted. The specific listing of specialties and related codes per category of specialties are provided in Appendix D.

SELECTED FINDINGS

PHYSICIAN COUNTS, COMPARISONS WITH PREVIOUS STUDIES AND TRENDS

Table 2 provides the physician counts for 100,000 residents for the state, Prince George's County and for surrounding jurisdictions. For all four major categories of physician specialty certifications (primary care, medical specialties, hospital-based specialties and surgical specialties), Montgomery County and Baltimore County ranked as the first and second highest in physician counts, respectively. Physician counts in Prince George's County, however, are significantly lower than Montgomery County, Baltimore County, Howard County and Anne Arundel

TABLE 3 COMPARISON OF PHYSICIAN COUNTS

	2005 ARF[1]	Maryland Physician Workforce Study[2]		County Public Health Impact Study*
Specialty	**Counts**	**Counts**	**FTEs**	**Counts**
Primary Care				
Family med+	140	123	96	92
General internal medicine	311	217	181	225
Pediatrics	142	130	102	81
Medical Specialties				
Allergy and immunology	11	6	4.8	6
Cardiovascular disease	49	90	76.8	20
Dermatology	26	11	7.6	7
Gastroenterology	24	39	31.6	20
Pulmonary disease	13	15	14.5	6
Psychiatry	53	53	42.5	30
Neurology	18	19	15.8	14
Surgical Specialties				
General	72	48	34.9	33
Neurological	9	11	9	5
Ophthalmology	27	45	31.9	36
Orthopedic	55	66	53.3	31
Otolaryngology	13	16	12.4	10
Plastic	9	6	5.7	4
Thoracic	6	10	9.1	6
Urology	24	30	21.6	16
Hospital-based				
050-Diagnostic radiology**	20	49	39.8	21
Emergency medicine	59	78	66.9	33
Anesthesiology	44	44	39.5	37
035-Pathology, anatomical/clinical**	22	17	11.8	9
120-Radiation oncology**	8	7	6.0	9
042-Physical medicine/rehabilitation**	13	5	4.8	5

*These physicians are considered to be part of the 922 board-certified active physicians in Prince George's County selected from the 2009-2010 Maryland Board of Physicians Renewal License File using the procedure described in Table 1 "Guide to Physician Count Management."

**Indicates that a specific Primary Certification has been used for the counts, not a subcategory from the "Guide to Categorizing Physician specialties."

[1]Area Resource File 2005 www.arfsys.com/ derived from the American Medical Association Master File www.ama-assn.org/ama/pub/category/2673.html.

[2]Maryland Physician Workforce Study. (2008, April). Boucher and Associates. Sponsored by Maryland State Medical Society and the Maryland Hospital Association.

County. Overall, physician counts in Prince George's County are below the state average.

COMPARING RESULTS

Table 3 is adapted from Table A 4.1 from the 2009 RAND report and includes the same data plus the counts from the Public Health Impact Study. The purpose of this table is to compare the counts among different approaches used to derive the counts. The Area Resource File data come from the American Medical Association's Physician master file, a file that includes current and historical data, such as inactive physicians. The Maryland Physician Workforce Study was conducted by Boucher and Associates in 2008 for the Maryland State Medical Society and Maryland Hospital Association using the Maryland relicensure data. Subsequently MHCC commissioned a study of the Maryland Physician Workforce Study that applied the HRSA method and resulted in the "Hogan" report that we used to derive our counts. For the Prince George's County Public Health Impact Study, these physicians are considered to be part of the 922 physicians board-certified active physicians in Prince George's County selected from the 2009–2010 Maryland Board of Physician's Renewal License File using the procedure described.

TREND COMPARISON

Table 4 provides comparisons of rates for 100,000 residents of Prince George's County for the different specialties previously described for the combination of years 2006–2007 and 2009–2010. These counts are based on raw renewal license datasets. Given that many of the variables used to select the licensed physicians

TABLE 4 PHYSICIAN COUNTS PER 100,000 RESIDENTS IN PRINCE GEORGE'S COUNTY, BY YEAR* AND SELECTED SPECIALTIES**

		2006–2007	2009–2010
	Primary Care Total	67.7	65.0
1	Family medicine	14.5	13.8
2	General practice	0.2	0.7
3	Internal medicine	30.4	29.9
4	Pediatrics	14.7	12.0
5	OB/GYN general	7.8	8.6
	Medical Specialties Total	26.9	24.9
1	Allergy and immunology	1.0	0.8
2	Cardiovascular disease	3.3	2.7
3	Dermatology	1.8	1.6
4	Diabetes and endocrinology	1.4	1.0
5	Gastroenterology	2.8	2.5
6	Internal medicine subspecialties	6.5	6.6
7	Neurology	1.3	2.0
8	Pediatrics subspecialties	0.6	1.2
9	Psychiatry	4.8	4.7
10	Pulmonary medicine	1.4	1.0
11	Other primary care special	1.0	0.2
12	Other medical specialties	1.0	0.5
	Hospital Based Total	23.6	21.4
1	Anesthesiology	5.4	6.1
2	Emergency medicine	6.8	5.6
3	Pathology	1.7	1.7
4	Physical medicine and rehabilitation	1.3	1.5
5	Diagnostic radiology	3.7	2.8
6	Radiology other	3.5	3.0
7	Other hospital based specialties	1.2	0.7
	Surgical Specialties Total	24.5	20.8
1	General surgery	6.2	4.4
2	Colon & rectal surgery	—	—
3	Neurosurgery	0.8	0.7
4	OB/GYN surgical	0.2	0.2
5	Ophthalmology	5.9	5.4
6	Orthopedic surgery	5.6	4.9
7	Otolaryngology	1.4	1.6
8	Plastic surgery	0.5	0.5
9	Thoracic surgery	0.8	0.7
10	Urology	2.9	2.3
11	Other	0.1	0.1

*These counts are based on the raw renewal license datasets. Given that many of the variables used to select the licensed physicians and board-certified physicians in "Guide to Physician Count Management" were not collected in 2006 or 2007 it is not possible to perform the same set of adjustments.

**The procedures used to classify each certification into a subcategory are described in section 2.2.

and board-certified physicians in Table 1 were not collected in 2006 or 2007, it is not possible to perform the same set of adjustments and thus the counts per 100,000 are not identical to those in Table 3 The renewal license datasets are grouped in sets of two years because the physicians are required to renew their licenses every two years. Using this alternate approach in all the four major categories, the count of physicians per 100,000 Prince George's County residents in the 2009–2010 cycle falls below that of the 2006–2007 cycle.

PEDIATRICIANS, ADULT PRIMARY CARE AND MEDICAL SPECIALISTS

For purposes of future planning we also provide physician counts by ZIP code for pediatricians, adult primary care and medical specialists in Appendix F. We used these counts to ascertain the primary care physician rate per 1,000 population for specific age ranges. Table 5 provides the rates for pediatrician rates for the population that is 17 years or younger, adult primary care physician rates for the population that is 18 years old and older, and the rate for the medical specialist category.

PRACTICE CHARACTERISTICS OF BOARD-CERTIFIED PHYSICIANS

We analyzed the relicensure survey responses for board-certified physicians in order to get a better understanding of their capacity. We looked at both all board-certified physicians and board-certified primary care physicians for both the state of Maryland and for Prince George's County. No statistical tests were applied. Appendix G includes preliminary tables for select items from the 2010 relicensure survey.

The following narrative predominately highlights findings for physicians in Prince George's County there are some major differences with overall physicians in Maryland.

INVOLVEMENT IN PATIENT CARE, RESEARCH, TEACHING AND ADMINISTRATION

The survey asks physicians to identify their involvement in one of four types of activities: patient care, research, teaching and administration. About a third of board-certified physicians are involved in patient care only (Maryland 32 percent; County 38 percent). For primary care physicians this is about the same for the state as a whole (37 percent), but higher for primary care physicians in Prince George's County (42 percent). Involvement in teaching was reported by 36 percent of board-certified Maryland physicians and 30 percent of Maryland primary care physicians. The percent of all County physicians and primary care physicians involved in teaching was lower (23 percent and 21 percent, respectively). Twice as many Maryland physicians report they are involved in research activities (20 percent) as compared with those in the County (10 percent). This difference remains when looking at the primary care physicians, although the percent is lower for both Maryland primary care physicians (10 percent)

TABLE 5 PRINCE GEORGE'S COUNTY PHYSICIAN RATES PER 1,000 BY PRIMARY CARE AND OTHER SPECIALTIES

	Supply of Pediatricians for 17 years old or younger	Supply of Adult Primary Care Physicians for 18 years old or older	Supply of Medical Specialists
2010 Census Data*	205,999	657,421	863,420
Rate per 1,000	0.39	0.58	0.20

*Data from the report QT-P1-Geography-Prince George's County, Maryland: Age Groups and Sex: 2010 (factfinder2.census.gov.)

TABLE 6 SELECTED PRACTICE CHARACTERISTICS FOR PRINCE GEORGE'S COUNTY BOARD CERTIFIED TOTAL AND PRIMARY CARE PHYSICIANS BY PERCENT AND NUMBER, 2010

	Prince George's County Physicians (ALL) (n=922)	Prince George's County Primary Care Physicians (n=465)
Practice only in Maryland	84% (722)	89% (414)
Practice in and outside of Maryland	16% (145)	11% (50)
Primary practice private for profit	67% (621)	66% (306)
Primary practice private non-profit	20% (185)	21% (96)
Primary practice in solo practice	29% (266)	33% (152)
Primary practice in single specialty group	36% (335)	27% (127)

and County primary care physicians (6 percent). A small percent of physicians were involved in all four activities, with Maryland physicians more likely than County physicians to be involved in all four: all Maryland board-certified physicians (15 percent), Maryland primary care physicians (9 percent), Prince George's County physicians (6 percent) and primary care physicians (4 percent).

Practice locations and primary practice characteristics Table 6 provides a summary of the Prince George's County physician practice characteristics. The majority of both Maryland (89 percent) and County primary care physicians practice only in Maryland. Eleven percent of County primary care physicians practice both in and outside of Maryland whereas 16 percent of all County physicians practice in both locations. The average number of practices reported by physicians in the County is 1.4 and ranges from 1 to 6. For County primary care physicians, the average is 1.3 with 1 to 5 practices as the range. The primary practice of the majority of these physicians is private for-profit and is either a solo or a single specialty group practice. About one-fifth of the physicians, either all or primary care, practice in private non-profit offices. Physicians in the County are less likely to practice as hospital staff as their primary practice (6 percent) than physicians in the state (15 percent), and are more likely to practice in a HMO group as staff (County 10 percent, state 3 percent) than the physicians in the state.

INFORMATION TECHNOLOGY USE IN PRIMARY PRACTICE

The pattern of information technology (IT) being used by physicians, whether in the County or the state is similar. The majority of physicians are using IT to find general information such as information about treatment alternatives and guidelines and information on potential patient drug interactions (70–85 percent). A smaller proportion of physicians are using IT to communicate with patients. For County primary care physicians, 42 percent send reminders of preventive medicine to patients and 33 percent communicate clinical issues with patients. Also 52 percent of County primary care physicians use IT to exchange clinical data and images with hospitals and laboratories and 41 percent use IT to share this information with other physicians. With regard to using IT to send prescriptions to pharmacists, 43 percent of County primary care physicians use IT for this purpose and more than two-thirds send more than 75 percent of their prescriptions in this manner.

USE OF ELECTRONIC MEDICAL RECORDS

About a quarter of all physicians in the state (26 percent) and the County (25 percent) are using all-electronic medical records. Slightly more of the primary care physicians are using only electronic medical records (state 30 percent, County 31 percent). Another portion of primary care physicians are using part-paper and part-electronic records (state 29 percent, County 22 percent). A higher proportion of County physicians are not using any electronic records (48 percent) than those in the state as a whole (37 percent). The predominate reasons provided for those not using electronic medical records by all physicians was capital cost outlays (state 44 percent, County 52 percent) and the fact that it wasn't their decision (state 30 percent, County 26 percent).

PARTICIPATION IN INSURANCE PROGRAMS

More than 90 percent of all physicians participate in private insurance networks, while about three-quarters participate in the Maryland Medical Assistance Program. Of those participating in the Medical Assistance Program, most are accepting new patients (state 87 percent, County 88 percent). About two-thirds participate in both the Medical Assistance Program and Medicare. Also of those participating in Medicare, most are accepting new patients (state 94 percent, County 95 percent).

HOSPITAL PARTICIPATION

Table 7 presents the hospital admitting and other related activities for County physicians. A quarter of all County physicians have hospital admitting privileges only outside the County. This is about 60 percent higher than for all state physicians (15 percent). Also state physicians (15 percent) are more than twice as likely to have their primary practice as staff in a hospital than County physicians (6 percent).

TABLE 7 HOSPITAL CHARACTERISTICS FOR ALL PRINCE GEORGE'S COUNTY AND ALL STATE BOARD-CERTIFIED PHYSICIANS BY PERCENT AND NUMBER, 2009–2010

	All Physicians in Prince George's County (n=922)	All Physicians in State (n=12,093)
Proportion with hospital privileges only in Maryland	73% (671)	74% (8,961)
Proportion with hospital privileges only outside Maryland	25% (234)	15% (1,869)
Have primary practice as staff in hospital	6% (51)	15% (1,819)

SUMMARY

This paper provides a detailed overview of the approach used to determine the counts and categorization of board-certified licensed physicians in Maryland and in Prince George's County. These data were used for additional analyses presented in other technical reports, specifically for the geographic mapping of physicians, documentation of the ratio of physicians per population by category and jurisdiction, and for application in the econometric model that assessed the association of factors with hospital events. Further discussion with others who are involved in deriving physician counts for purposes of planning healthcare systems would be beneficial.

This paper also provides several select findings:

- The ratio of physicians per 100,000 population in Prince George's County for each of the four categories of physicians (primary care, medical, hospital and surgical specialties) continues to be below that of the surrounding jurisdictions and the state as a whole. For example, the ratio of primary care physicians per 100,000 for Prince George's County, when compared with Montgomery County, is between half to two-thirds lower.

- There appears to be a decrease in the count of physicians in the County per 100,000 population. When looking at all four major categories of physicians, the count of physicians per 100,000 Prince George's County residents in the 2009–2010 cycle falls below that of the 2006–2007 cycle.

- The County has 81 pediatricians (0.39 per 1,000), 384 adult primary care specialists (0.58 per 1,000) and 173 (0.20 per 1,000) physicians with medical specialties with ZIP codes in Prince George's County.

In general, the practice profile of County physicians is similar to that of the state of Maryland. A few noteworthy differences include:

- County physicians are more likely to have hospital privileges only outside Maryland (25 percent) compared with the state (15percent).

- Physicians in the County are less likely to practice as hospital staff as their primary practice (6percent) than physicians in the state (15percent), and are more likely to practice in a HMO group as staff (County 10percent, state 3percent) than the physicians in the state.

- While about one-third of board-certified physicians are involved in patient care only (Maryland 32percent, County 38percent), twice as many state physicians report they are involved in research activities (20percent) as compared with those in the County (10percent).

These findings are preliminary and descriptive and warrant additional analyses.

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APPENDIX A

TABLE A1 A COMPARISON OF SELECTION CRITERIA USED FOR PHYSICIAN COUNTS OF THE MARYLAND PHYSICIAN WORKFORCE STUDY (HOGAN) WITH THAT USED BY THE PRINCE GEORGE'S COUNTY PUBLIC HEALTH IMPACT STUDY

Maryland Physician Workforce Study	Public Health Impact Study
Deleted physicians working for the federal government, setting of the primary practice is federal military and setting of the primary practice is federal civilian.	SAME
Deleted physicians whose primary practice setting is Veterans Affairs	MAINTAINED We consider that the patients they serve, the veterans, are not in the military hence we retained them.
Excluded interns and fellows	SAME
Deleted physicians aged 75 or older	SAME
Retained only active physicians	Retained only active physicians who provide direct medical care to Maryland patients
Retained only physicians who declare that their primary practice is in the state of Maryland. Gap filled using the ZIP code of the principal practice or the ZIP code of their public address	Retained only physicians who declare that their primary or secondary practice or the non-public address is in the state of Maryland (in that order)
Used principal concentration to classify physicians in the different categories but not to exclude them from the counts	Deleted physicians who have missing data in their primary certification or are not certified.
Retained only physicians who work 20 hours or more in patient care or in their primary and secondary locations.	SAME
Adjust for missing initial license data (Add 4% to the number of physicians in Maryland)	No adjustment to account for initial license data. We could not add 4 percent adjustment to account for initial license data in the County Health Impact Study, because we could not accurately estimate the distribution of physicians with missing initial license data.

APPENDIX B

LICENSED PHYSICIANS IN THE STATE OF MARYLAND WHO HAVE SECONDARY CERTIFICATION BUT NOT PRIMARY CERTIFICATION*

Secondary Certification	Frequency
Acupuncture	1
Addiction medicine	1
Allergy	1
Allergy & immunology/ clinical & laboratory immunology	2
Family practice general	1
General preventive medicine	1
Internal medicine general	5
Pain medicine	2
Pediatrics—general	3
Pediatric cardiology	1
Colon & rectal surgery	1
General surgery	1
Other (unspecified)	3
Total	**23**

*The criteria to decide which licensed physicians do not have a primary certification is described in the "Approach to Physician Count Management"

APPENDIX C

LICENSED PHYSICIANS WHO DECLARED PRINCE GEORGE'S AS THE JURISDICTION OF THE PRIMARY PRACTICE, BUT WITH ZIP CODE OUTSIDE OF IT*

Specialty	Frequency
Anatomic/clinical pathology	1
Anesthesiology	8
Cardiovascular disease	2
Child neurology	1
Dermatology—general	1
Diagnostic radiology	1
Emergency medicine	1
Emergency medicine or trauma	1
Endocrinology, diabetes & metabolism	1
Family practice—general	2
Internal medicine—general	12
Nephrology—general	1
Ophthalmology—general	2
Orthopedics—general	2
Otolaryngology	1
Pediatrics—general	4
Psychiatry—general	1
Pulmonary diseases	1
Transitional year—internship	5
Total	**48**

*See Step 9 of Table 1

APPENDIX D

MEDICAL SPECIALTIES

For family medicine beyond code 010 used in the primary care category, we placed any family medicine-related subspecialties as part of other primary care subspecialties under the category medical specialties. These are:

105-Geriatric medicine (family practice)
210-Family medicine, adolescent medicine
211-Family medicine, sleep medicine
232-Family medicine, hospice and palliative medicine

For **Pediatrics Subspecialties beyond code 038** used in primary care, we placed these under medical specialties as pediatric subspecialties. The pediatric subspecialty codes include:

081-Adolescent medicine
248-Child abuse pediatrics
189-Developmental-behavioral pediatrics
235-Hospice and palliative medicine
148-Medical toxicology
072-Neonatal-perinatal medicine
190-Neurodevelopmental disabilities
040-Pediatric cardiology
107-Pediatric critical care medicine
104-Pediatric emergency medicine
090-Pediatric endocrinology
092-Pediatric gastroenterology
098-Pediatric hematology-oncology
188-Pediatric infectious diseases
114-Pediatric nephrology
135-Pediatric pulmonology
138-Pediatric rheumatology
220-Pediatric transplant hepatology
221-Sleep medicine (pediatric)
112-Sports medicine (pediatric)

For **internal medicine beyond general internal medicine**, we placed the internal medicine subspecialties under medical specialties. We extracted four subspecialties from internal medicine to stand alone. These include cardiovascular disease (005); endocrinology, diabetes and metabolism (009); gastroenterology (011); and pulmonary medicine. The internal medicine specialties include:

244-Advanced heart failure and transplant
005-Cardiovascular disease
106-Critical care medicine
009-Endocrinology, diabetes and metabolism
011-Gastroenterology
014-Geriatric medicine
016-Hematology
233-Hospice and palliative medicine
018-Infectious disease
084-Medical oncology
023-Nephrology
048-Pulmonary disease
053-Rheumatology
165-Sleep medicine
111-Sports medicine
099-Transplant hepatology

ALLERGY AND IMMUNOLOGY
- 002-Allergy
- 039-Pediatric allergy
- 074-Allergy & immunology
- 075-Allergy & immunology/ clinical and laboratory immunology
- 077-Immunology

CARDIOVASCULAR DISEASE
- 005-Cardiovascular disease

DERMATOLOGY
- 006-Dermatology—general
- 080-Pediatric dermatology
- 208-Dermatology, dermatopathology
- 240-Dermatology, clinical and laboratory

ENDOCRINOLOGY, DIABETES AND METABOLISM
- 007-Diabetes
- 009-Endocrinology, diabetes & metabolism

FAMILY MEDICINE

GASTROENTEROLOGY
- 011-Gastroenterology—general

INTERNAL MEDICINE SUBSPECIALTIES
(listed above)

NEUROLOGY
- 024-Neurology—general
- 025-Child neurology
- 196-Neurophysiology—general

PEDIATRICS SUBSPECIALTIES
(listed above)

PSYCHIATRY
- 043-Psychiatry—general
- 044-Child & adolescent psychiatry
- 045-Psychoanalysis
- 046-Psychosomatic medicine
- 078-Addiction medicine
- 087-Geriatric psychiatry
- 134-Addiction psychiatry
- 159-Psychiatry neurology
- 197-Forensic psychiatry
- 224-Psychiatry and neurology, sleep medicine
- 225-Psychiatry and neurology, vascular neurology
- 246-Psychiatry and neurology, neurodevelopmental disabilities

PULMONARY DISEASE
- 048-Pulmonary diseases
- 161-Pulmonology
- 169-Pulmonary diseases/critical care

OTHER PRIMARY CARE SUBSPECIALTIES
- 013-General preventive medicine
- 014-Geriatric medicine (internal medicine)
- 028-Nutrition
- 047-Public health & general preventive medicine
- 105-Geriatric medicine (family practice)
- 149-Medical toxicology (preventive medicine)
- 210-Family medicine, adolescent medicine
- 211-Family medicine, sleep medicine
- 232-Family medicine, hospice and palliative medicine
- 249-Preventive medicine, public health and general preventive med

OTHER
- 001-Aerospace medicine
- 021-Legal medicine
- 022-Neoplastic diseases
- 026-Neuropathology
- 027-Nuclear medicine
- 031-Occupational medicine
- 089-Cardiac electrophysiology
- 097-Medical genetics (Phd)
- 108-Pain medicine
- 113-Underseas medicine
- 122-Adult reconstructive orthopedics
- 152-Maternal & fetal medicine
- 153-Ostepathic manipulative medicine
- 156-Comeal/external disease
- 164-Accupuncture
- 181-Medical genetics
- 183-Otology—neurotology
- 192-Spinal cord injury medicine
- 195-Occupational environmental medicine
- 198-Neurodevelopmental disabilities
- 200-Research medical
- 250-Medicine, spine

SURGICAL SPECIALTIES

GENERAL SURGERY
- 056-Abdominal surgery
- 057-Cardiovascular surgery
- 059-General surgery
- 060-Hand surgery—general
- 061-Head & neck surgery
- 064-Pediatric surgery (surgery)
- 067-Traumatic surgery
- 068-Urological surgery
- 069-Other (unspecified)
- 076-Vascular surgery
- 086-Urology
- 139-Surgical critical Care (Surgery)
- 150-Pediatric urology
- 229-Surgery, pediatric

COLON AND RECTAL SURGERY
- 058-Colon & rectal surgery

NEUROLOGIC SURGERY
- 062-Neurological surgery
- 140-Neurological—critical care—surgery
- 141-Pediatric surgery (neurology)

OB/GYN
- 029-Obstetrics
- 116-Critical care medicine (obstetrics & gynecology)
- 216-Obstetrics & gynecology, maternal and fetal medicine
- 217-Obstetrics & gynecology, reproductive
- 218-Obstetrics & gynecology, endocrinology/ Infertility

OPHTHALMOLOGY
- 032-Ophthalmology—general
- 117-Pediatric ophthalmology

ORTHOPEDICS
- 063-Orthopedic surgery
- 121-Orthopedics general
- 123-Pediatric orthopedics
- 124-Orthopedics trauma
- 142-Hand surgery (orthopedic surgery)
- 143-Orthopedic surgery of the spine
- 144-Sports medicine (orthopedic surgery)

OTOLARYNGOLOGY
- 033-Otology
- 034-Otolaryngology
- 125-Pediatric otolaryngology
- 171-Surgery head and neck/otolaryngology

PLASTIC SURGERY
- 065-Plastic surgery
- 145-Facial plastic surgery
- 146-Surgery of the hand (plastic surgery)
- 184-Plastic within head and neck surgery
- 194-Plastic within hand and neck surgery

THORACIC SURGERY
- 066-Thoracic surgery
- 204-Surgery cardio—thoracic

UROLOGY
- 024-Neurology—general
- 025-Child neurology

HOSPITAL SPECIALTIES

ANESTHESIOLOGY
- 003-Anesthesiology
- 085-Critical care medicine (anesthesiology)
- 151-Pain management (anesthesiology)
- 230-Anesthesiology, hospice and palliative medicine

EMERGENCY MEDICINE
- 008-Emergency medicine or trauma
- 109-Sports medicine (emergency medicine)
- 147-Medical toxicology (emergency medicine)
- 209-Emergency medicine
- 231-Emergency medicine, hospice and palliative medicine

PATHOLOGY
- 035-Anatomic/clinical pathology
- 036-Clinical pathology
- 037-Forensic pathology
- 103-Medical microbiology
- 126-Anatomic pathology
- 127-Chemical pathology
- 128-Cytopathology
- 129-Dermatopathology
- 130-Hematology (pathology)
- 132-Pediatric pathology
- 186-Pathology—general
- 215-Genetics, molecular genetic pathology

PHYSICAL MEDICINE AND REHABILITATION
- 042-Physical medicine & rehabilitation
- 191-Pain management (Physical medicine and rehabilitation)
- 193-Pediatrics rehabilitation medicine
- 223-Physical medicine and rehabilitation, neuromuscular medicine
- 236-Physical medicine and rehab, hospice and palliative medicine

DIAGNOSTIC RADIOLOGY
- 050-Diagnostic radiology
- 082-Neuroradiology
- 137-Nuclear radiology
- 226-Radiology, diagnostic radiologic physics
- 227-Radiology, medical nuclear physics

RADIOLOGY OTHER
- 049-Radiology
- 051-Pediatric radiology
- 052-Vascular & interventional radiology
- 120-Radiation oncology
- 199-Therapeutic radiology
- 238-Radiology, hospice and palliative medicine

OTHER HOSPITAL BASED SPECIALTIES
- 041-Clinical pharmacology
- 088-Blood banking transfusion medicine
- 093-Clinical biochemical genetics
- 095-Clinical genetics
- 096-Clinical molecular genetics
- 115-Clinical neurophysiology
- 178-Interventional—cardiology

The specialties mentioned in this document cover all the certifications provided by the physicians in the years 2009–2010.

APPENDIX E

SAS CODES

Adj.		State	County*
	Maryland Renewal License Data	25687	1375
1	**Deleting the physicians who work for the federal government** FG='1' => Employed by the Federal Government IF FG = '1' THEN delete;	23217	1334
2	**Deleting the physicians who work for the federal government (cont.)** PP_PRIPUB='11' => Setting of the primary practice is Federal Military IF PP_PRIPUB ='11' THEN delete;	23133	1329
3	**Deleting the physicians who work for the federal government (cont.)** PP_PRIPUB='13' => Setting of the primary practice is Federal Civilian IF PP_PRIPUB = '13' THEN delete;	23065	1327
4	**Excluding Interns and Fellows** IF intern=1 THEN DELETE; IF fellow=1 THEN DELETE;	22276	1326
5	**Deleting physicians aged 75 or older** APP_DATE=input (COMPLETE_DTE, mmddyy10.); age = floor ((intck('month',dob,APP_DATE) - (day(APP_DATE) < day(dob)))/ 12); IF age<75 ;	21442	1289
6	**Keeping only active physicians who provide direct medical care to Maryland Patients** DIRCARE_MD=1 => Physician is engaged in the direct care of Maryland patients INPRACTICE=1 => Maintain an active license and currently in practice IF DIRCARE_MD EQ '1' AND INPRACTICE EQ '1' THEN PRACT_MD = '1'; ELSE PRACT_MD = '0'; IF PRACT_MD = '1';	17209	1175
7	**Keeping only physicians who declare that their primary or secondary practice or the non-public address is in the state of Maryland** IF (UPCASE(PP_STATE)='MD') or (UPCASE(SP_STATE)='MD') or (UPCASE(NP_STATE)='MD');	14236	1174
8	**Filling County ZIP Code****		
9	**Selecting only Physicians in Karoline's ZIP Codes *** **		1126
	These 14,236 physicians are the Licensed Physicians	14236	1126
10	**Deleting physicians who have missing data in their primary certification** IF compress(trim(PRI_CERT)) in ('.') then delete;	14227	1125
11	**Keeping only physicians who work 20 hours or more in Patient Care or in their Primary and Secondary locations** PP_PCHRS= Hours per week available for ALL PATIENT CARE in the primary practice location SP_PCHRS= Hours per week available for ALL PATIENT CARE in the secondary practice location hrs_total = Total hours dedicated to patient care, teaching, research, or administration and others IF PP_PCHRS = . THEN PP_PCHRS = 0; IF SP_PCHRS = . THEN SP_PCHRS = 0; CCHRS = SUM(PP_PCHRS,SP_PCHRS); IF CCHRS>=20 OR hrs_pc>=20;	13699	1108
12	**Excluding non-certified physicians** PRI_CERT='777' => Fifth Pathway PRI_CERT='888' => Rotating Internship PRI_CERT='999' => Transitional Year-Internship PRI_CERT='073' => None/ Not Applicable IF PRI_CERT IN ('777', '888', '999','073') THEN PRI_DOCS_NON=1 ; ELSE PRI_DOCS_NON=0 ; IF PRI_DOCS_NON=0;	12093	922
	These 12,093 physicians are the Board-Certified Physicians	12093	922
13	**Selecting Primary Care Physicians according to HRSA** /*from "HRSA BOP Code sheet from OPC DHMH.pdf"*/ /*PRI_CERT='010' => Family Practice (General) PRI_CERT='015' => Gynecology PRI_CERT='019' => Medicina, Internal (General) PRI_CERT='030' => Obstetrics and Gynecology (General) PRI_CERT='038' => Pediatrics (General) */ IF PRI_CERT IN ('010', '012', '015','019','030','038') ;	4870	465
	These 4,870 physicians are the Primary Care Physicians	4870	465
14	**Selecting Primary Care Physicians without pediatrics** IF PRI_CERT ^='038' ;	3860	384
	These 3,860 physicians are the Primary Care Physicians (no Pediatrics)	3860	384

*=Selection Criteria to Select Prince George's County Physicians

```
if PP_JUR='16';
```

**= Adjustments to ZIP Codes in Prince George's County

```
PP_ZIP=substr(PP_ZIP,1,5);
SP_ZIP=substr(SP_ZIP,1,5);
NP_ZIP=substr(NP_ZIP,1,5);
if PP_ZIP ='20703' then PP_ZIP='20706';
if PP_ZIP='20704' then PP_ZIP='20705';
if PP_ZIP='20709' then PP_ZIP='20708';
if PP_ZIP='20717' then PP_ZIP='20716';
if PP_ZIP='20718' then PP_ZIP='20715' ;
if PP_ZIP='20719' then PP_ZIP='20720';
if PP_ZIP='20725' then PP_ZIP='20707' ;
if PP_ZIP='20726' then PP_ZIP='20707';
if PP_ZIP='20731' then PP_ZIP='20743';
if PP_ZIP='20738' then PP_ZIP='20737' ;
if PP_ZIP='20741' then PP_ZIP='20742';
if PP_ZIP='20749' then PP_ZIP='20744';
if PP_ZIP='20750' then PP_ZIP='20745';
if PP_ZIP='20752' then PP_ZIP='20746';
if PP_ZIP='20753' then PP_ZIP='20747';
if PP_ZIP='20757' then PP_ZIP='20748';
if PP_ZIP='20768' then PP_ZIP='20770';
if PP_ZIP='20773' then PP_ZIP='20772';
if PP_ZIP='20775' then PP_ZIP='20774';
if PP_ZIP not in ('20601','20607','20608','20613','
20623','20705','20706','20707','20708','20710','
20712','20715','20716','20720','20721','20722','
20735','20737','20740','20742','20743','20744','
20745','20746','20747','20748','20762','20769','
20770','20772','20774','20781','20782','20783','
20784','20785')
and PP_JUR='16' and SP_ZIP in ('20601','20607','
20608','20613','20623','20705','20706','20707','
20708','20710','20712','20715','20716','20720','
20721','20722','20735','20737','20740','20742','
20743','20744','20745','20746','20747','20748','
20762','20769','20770','20772','20774','20781','
20782','20783','20784','20785')
then PP_ZIP=SP_ZIP;
if PP_ZIP not in ('20601','20607','20608','
20613','20623','20705','20706','20707','20708','
20710','20712','20715','20716','20720','20721','
20722','20735','20737','20740','20742','20743','
20744','20745','20746','20747','20748','20762','
20769','20770','20772','20774','20781','20782','
20783','20784','20785')
and PP_JUR='16' and NP_ZIP in ('20601','20607','
20608','20613','20623','20705','20706','20707','
20708','20710','20712','20715','20716','20720','
20721','20722','20735','20737','20740','20742','
20743','20744','20745','20746','20747','20748','
20762','20769','20770','20772','20774','20781','
20782','20783','20784','20785')
then PP_ZIP=NP_ZIP;
```

*** = Selecting only physicians in K.Mortensen's ZIP Codes

```
if PP_ZIP in ('20601','20607','20608','20613','
20623','20705','20706','20707','20708','20710','
20712','20715','20716','20720','20721','20722','
20735','20737','20740','20742','20743','20744','
20745','20746','20747','20748','20762','20769','
20770','20772','20774','20781','20782','20783','
20784','20785');
```

APPENDIX F

The physicians listed as pediatricians and adult primary care are the 465 physicians deemed as primary care physicians in Adjustment 13 of Table 2. For adult primary care physicians, we used codes specified by HRSA provided by the DHMH Office of Primary Care. The codes are: 010-Family practice-general, 012-General practice, 015-Gynecology, 019-Internal medicine-general, and 030-Obstetrics and gynecology—general. For Pediatrics only the code 038-Pediatrics was used. The rules followed to classify a physician as a medical specialist are listed in Section 2.2.

The 2010 Census data shown in Table 6 can be found at *factfinder2.census.gov* from the report QT-P1-Geography-Prince George's County, Maryland: Age Groups and Sex: 2010.

TABLE F1 PEDIATRICIANS, ADULT PRIMARY CARE AND MEDICAL SPECIALISTS COUNTS BY ZIP CODE IN PRINCE GEORGE'S COUNTY*

Zip Codes in Prince George's County	Pediatricians**	Adult Primary Care**	Medical Specialties***
20601	0	1	1
20607	0	0	0
20608	0	0	0
20613	1	0	0
20623	0	0	1
20705	0	3	2
20706	4	29	12
20707	8	38	21
20708	9	5	2
20710	0	2	0
20712	0	0	0
20715	1	9	2
20716	3	21	7
20720	0	2	0
20721	2	9	2
20722	1	3	1
20735	3	29	32
20737	3	10	7
20740	1	21	5
20742	1	3	3
20743	0	0	0
20744	1	20	3
20745	0	11	2
20746	0	20	5
20747	0	8	1
20748	10	21	3
20762	0	0	0
20769	2	9	1
20770	6	33	32
20772	5	7	2
20774	7	30	14
20781	1	4	0
20782	5	8	4
20783	0	2	0
20784	0	6	3
20785	7	20	5
Total Number of Physicians	**81**	**384**	**173**

Based on the above results, the following rates were obtained:

	Supply of Pediatricians for 17 years old or younger	Supply of Adult Primary Care Physicians for 18 years old or older	Supply of Medical Specialists
2010 Census Data****	205,999	657,421	863,420
Rate per 1,000	0.39	0.58	0.20

* The ZIP codes included in this table are the same as those used to define Prince George's County in adjustments 8 and 9 of Table 1.

**The physicians included in the pediatricians and adult primary care are the 465 physicians deemed as primary care physicians in Adjustment 13 of Table 1.

***The rules followed to classify a physician as a medical specialist are listed in step 6 of the "Guide to Categorizing Physician specialties."

**** Data from the report QT-P1-Geography-Prince George's County, Maryland: Age Groups and Sex: 2010 (factfinder2.census.gov.)

APPENDIX G

These tables include physician practice characteristics lifted from preliminary assessments of the 2010 Maryland Board of Physicians relicensure survey.

TABLE G1 DESCRIPTION OF TYPES OF PHYSICIAN ACTIVITIES SURVEY ITEM 13

Activity		Board-Certified Physicians in Maryland	Board Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total physicians		12093	922	4870	465
Patient Care	Patient care only	3895 (32%)	353 (38%)	1791 (37%)	193 (42%)
	Patient care & other activities	8198 (68%)	569 (62%)	3079 (63%)	272 (58%)
Research (any)		2365 (20%)	93 (10%)	618 (13%)	28 (6%)
Teaching (any)		4358 (36%)	214 (23%)	1450 (30%)	96 (21%)
Administration (any)		7398 (61%)	520 (56%)	2763 (57%)	253 (54%)
Combinations (any research and teaching)		1965 (16%)	54 (6%)	508 (10%)	17 (4%)
All four activities		1805 (15%)	52 (6%)	461 (9%)	17 (4%)

TABLE G2 PHYSICIANS WHO CURRENTLY ARE NOT ENGAGED IN PATIENT CARE, BUT INTEND TO RESUME PATIENT CARE ACTIVITIES WITHIN TWO YEARS*

	Physicians in Maryland
Total Physicians not currently providing patient care	2,685 out of 25,687 physicians in the raw License Renewal Dataset
Yes, will resume activities	848 (32%)
No, won't resume activities	1,837 (68%)

*There are no Licensed Physicians in Maryland who are not providing patient care. One of the conditions to be selected as Licensed is to be active physicians and provide direct medical care to Maryland Patients.

Note: Of the 1,837 physicians who don't intent to resume patient care activities, 322 of them are 75 years or older. Their average age is 62.36

PHYSICIANS WITH PLANS TO DISCONTINUE PATIENT CARE IN THE NEXT TWO YEARS SURVEY ITEM 15

Activity	Board-Certified Physicians in Maryland	Board-Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total Physicians	12,093	922	4,870	465
Yes	628 (5%)	51 (6%)	241 (5%)	21 (5%)
No	11,462 (95%)	871 (94%)	4,629 (95%)	444 (95%)

TABLE G3 IN-STATE OR OUT-OF-STATE NUMBER OF PRACTICE LOCATIONS IN WHICH ROUTINELY DELIVER PATIENT CARE FOR REIMBURSEMENT* SURVEY ITEM 16

		Board-Certified Physicians in Maryland	Board-Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total Physicians		12,093	922	4,870	465
Practice only in Maryland		10,214 (84%)	772 (84%)	4,318 (89%)	414 (89%)
	Range	1 to 20	1 to 6	1 to 20	1 to 5
	Average	1.49	1.43	1.32	1.33
Practice only outside Maryland		540 (4%)	4 (0%)	182 (4%)	1 (0%)
	Range	1 to 9	1 to 1	1 to 6	1 to 1
	Average	1.31	1	1.25	1
Inside and outside of Maryland		1,207 (10%)	145 (16%)	316 (6%)	50 (11%)
	Range inside Maryland	1 to 20	1 to 6	1 to 18	1 to 6
	Average inside Maryland	1.59	1.55	1.5	1.5
	Range outside Maryland	1 to 20	1 to 5	1 to 15	1 to 5
	Average outside Maryland	1.54	1.32	1.54	1.28

*Notice that in for the columns for the board-certified physicians in Maryland and for the Primary Care Physicians in Maryland the percentages do not add up to 100 percent. For example, for board-certified physicians in Maryland the percentages are 84 percent (Practice Only in Maryland) + 4 percent (Practice Only outside Maryland) + 10 percent (Practice inside and outside Maryland) =98 percent. The 132 unaccounted physicians either have missing values for this question or declared their number of primary care locations inside and outside of Maryland to be zero. The same can be said for the 54 physicians unaccounted in the Primary Care Physicians in Maryland column.

TABLE G4 PROPORTIONS OF PHYSICIANS WITH HOSPITAL ADMITTING PRIVILEGES SURVEY ITEM 17

		Board-Certified Physicians in Maryland	Board-Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total Physicians		12,093	922	4,870	465
Only in Maryland hospitals		8961 (74%)	671 (73%)	3749 (77%)	335 (72%)
	Range for the number of hospitals	1 to 17	1 to 8	1 to 9	1 to 5
	Average for the number of hospitals	1.73	1.88	1.58	1.68
Only in hospitals outside of Maryland		1869 (15%)	234 (25%)	649 (13%)	104 (22%)
	Range for the number of hospitals	1 to 20	1 to 6	1 to 11	1 to 6
	Average for the number of hospitals	1.67	1.51	1.52	1.49
Hospitals inside and outside of Maryland		1090 (9%)	173 (19%)	348 (7%)	72 (15%)
	Range for the number inside of Maryland	1 to 17	1 to 8	1 to8	1 to 5
	Average for the number inside of Maryland	1.74	1.84	1.54	1.47
	Range for the number outside of Maryland	1 to 20	1 to 6	1 to 11	1 to 6
	Average for the number outside of Maryland	1.79	1.58	1.60	1.55

TABLE G5 PRIMARY PRACTICE (PRIVATE OR PUBLIC ORGANIZATION TYPE) SURVEY ITEM 18 (L)

Private/Public Practice	Board Certified Physicians in Maryland	Board Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total Physicians	12,093	922	4,870	465
Private non-profit	3,638 (30%)	185 (20%)	1,356 (28%)	96 (21%)
Private for profit	7,045 (58%)	621 (67%)	2,982 (61%)	306 (66%)
Private other	588 (5%)	72 (8%)	264 (5%)	44 (9%)
Public VA	14 (0%)	0 (0%)	2 (0%)	0 (0%)
Public VA	468 (4%)	20 (2%)	138 (3%)	8 (2%)
Public-local	225 (2%)	22 (2%)	84 (2%)	11 (2%)

TABLE G6 TYPE OF PRIMARY PRACTICE SURVEY ITEM 18

Private or Public Practice	Board Certified Physicians in Maryland	Board Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total Physicians	12,093	922	4,870	465
Solo	2313 (19%)	266 (29%)	1065 (22%)	152 (33%)
Single-specialty group	5229 (43%)	335 (36%)	1836 (38%)	127 (27%)
Multi-specialty group	1766 (15%)	142 (15%)	873 (18%)	82 (18%)
HMO group/staff	375 (3%)	94 (10%)	214 (4%)	63 (14%)
Staff hospital	1819 (15%)	51 (6%)	617 (13%)	23 (5%)
Staff non-acute care facility	86 (1%)	7 (1%)	47 (1%)	7 (1%)
Staff other	211 (2%)	14 (2%)	103 (2%)	6 (1%)
Locum tenens	64 (1%)	4 (0%)	26 (1%)	2 (0%)
Other contractual-associate staff (individual only)	119 (1%)	6 (1%)	48 (1%)	2 (0%)
Volunteer	2 (0%)	1 (0%)	1 (0%)	1 (0%)

TABLE G7 SETTING OF PRIMARY PRACTICE SURVEY ITEM 18 (K)

Setting of Practice	Board-Certified Physicians in Maryland	Board-Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total Physicians	12093	922	4870	465
Freestanding physician office	6407 (53%)	560 (61%)	2956 (61%)	289 (62%)
Health maintenance organization (HMO)	383 (3%)	107 (12%)	219 (4%)	72 (15%)
Federally qualified community health center	145 (1%)	5 (1%)	126 (3%)	5 (1%)
Other community health center	69 (1%)	4 (0%)	50 (1%)	2 (0%)
Community mental health center	69 (1%)	3 (0%)	4 (0%)	1 (0%)
Hospital outpatient dept surgical	127 (1%)	2 (0%)	5 (0%)	0 (0%)
Hospital outpatient dept other	524 (4%)	8 (1%)	193 (4%)	5 (1%)
Freestanding ambulatory surgery center	97 (1%)	5 (1%)	2 (0%)	0 (0%)
Rehabilitation physical	18 (0%)	3 (0%)	6 (0%)	2 (0%)
Rehabilitation drug or alcohol	7 (0%)	0 (0%)	1 (0%)	0 (0%)
Free standing medical facility	242 (2%)	23 (2%)	131 (3%)	8 (2%)
Other clinic	179 (1%)	25 (3%)	108 (2%)	20 (4%)
Acute general hospital	2154 (18%)	94 (10%)	653 (13%)	39 (8%)
Psychiatric hospital	105 (1%)	0 (0%)	7 (0%)	0 (0%)
Rehabilitation hospital	29 (0%)	0 (0%)	8 (0%)	0 (0%)
Chronic hospital	19 (0%)	2 (0%)	7 (0%)	2 (0%)
Pediatric hospital	129 (1%)	2 (0%)	75 (2%)	2 (0%)
Hospital laboratory (non research)	92 (1%)	6 (1%)	1 (0%)	0 (0%)
Hospital radiology/nuclear/MRI	173 (1%)	6 (1%)	1 (0%)	1 (0%)
Other hospital	86 (1%)	4 (0%)	23 (0%)	1 (0%)
Comprehensive care facility	38 (0%)	2 (0%)	25 (1%)	2 (0%)
Extended care facility	18 (0%)	2 (0%)	11 (0%)	0 (0%)
Intermediate care facility	19 (0%)	2 (0%)	16 (0%)	2 (0%)
Residential treatment center	15 (0%)	1 (0%)	7 (0%)	1 (0%)
Penitentiary	16 (0%)	1 (0%)	8 (0%)	0 (0%)
Other non-acute care facility	28 (0%)	3 (0%)	12 (0%)	3 (1%)
Local health department	10 (0%)	2 (0%)	8 (0%)	1 (0%)
State health department	13 (0%)	0 (0%)	5 (0%)	0 (0%)
University or college	140 (1%)	1 (0%)	41 (1%)	0 (0%)
School system (K-12)	6 (0%)	0 (0%)	1 (0%)	0 (0%)
Other research facility-research laboratory	1 (0%)	0 (0%)	1 (0%)	0 (0%)
Worksite	23 (0%)	2 (0%)	6 (0%)	1 (0%)
Insurance company	1 (0%)	0 (0%)	0 (0%)	0 (0%)
Hospital emergency room	461 (4%)	31 (3%)	103 (2%)	5 (1%)
Freestanding lab (non research)	37 (0%)	3 (0%)	0 (0%)	0 (0%)
Freestanding imaging center	79 (1%)	10 (1%)	2 (0%)	0 (0%)
Other licensed field	27 (0%)	1 (0%)	8 (0%)	1 (0%)

TABLE G8 **INFORMATION TECHNOLOGY (PRIMARY PRACTICE/OFFICE LOCATION)** SURVEY ITEM 20

Private/Public		Board-Certified Physicians in Maryland	Board-Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total Physicians		12,093	922	4,870	465
Use IT to obtain information about treatment alternatives & guidelines	No	2,143 (18%)	217 (24%)	687 (14%)	100 (22%)
	Yes	9811 (81%)	700 (76%)	4126 (85%)	362 (78%)
Use IT to send prescriptions to pharmacies	No	8,547 (71%)	611 (66%)	2,913 (60%)	263 (57%)
	Yes	3355 (28%)	302 (33%)	1892 (39%)	198 (43%)
Use IT to send reminders of preventive medicine to patients	No	8,272 (68%)	567 (61%)	2,955 (61%)	266 (57%)
	Yes	3,541 (29%)	338 (37%)	1,809 (37%)	193 (42%)
Use IT to access patients notes, medication lists or problems lists	No	3,916 (32%)	404 (44%)	1,749 (36%)	210 (45%)
	Yes	7,983 (66%)	510 (55%)	3,049 (63%)	253 (54%)
Use IT for clinical data and image exchanges with other physicians	No	6,008 (50%)	522 (57%)	2,642 (54%)	270 (58%)
	Yes	5,922 (49%)	393 (43%)	2,165 (44%)	192 (41%)
Use IT for clinical data and image exchanges with hospitals and laboratories	No	4,826 (40%)	444 (48%)	1,849 (38%)	223 (48%)
	Yes	7,105 (59%)	474 (51%)	2,962 (61%)	242 (52%)
Use IT to communicate about clinical issues with patients by email	No	8,673 (72%)	660 (72%)	3,456 (71%)	311 (67%)
	Yes	3,266 (27%)	258 (28%)	1,359 (28%)	153 (33%)
Use IT to obtain information on potential patient drug interactions with other drugs, allergies and/or patient conditions	No	2,795 (23%)	265 (29%)	931 (19%)	113 (24%)
	Yes	9,108 (75%)	649 (70%)	3,863 (79%)	348 (75%)

TABLE G9 **PERCENTAGE OF PRESCRIPTIONS SENT ELECTRONICALLY*** SURVEY ITEM 20B

Percentage of Prescriptions send electronically	Board-Certified Physicians in Maryland	Board-Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total Number of Physicians who use IT to send prescriptions to pharmacies	3355	302	1892	198
Number of physicians who sent electronically more than 0% but less or equal to 25% of their prescriptions	723 (22%)	42 (14%)	308 (16%)	17 (9%)
Number of physicians who sent electronically more than 25% but less or equal to 50% of their prescriptions	552 (16%)	43 (14%)	287 (15%)	28 (14%)
Number of physicians who sent electronically more than 50% but less or equal to 75% of their prescriptions	407 (12%)	24 (8%)	262 (14%)	16 (8%)
Number of physicians who sent electronically more than 75% of their prescriptions	1673 (50%)	193 (64%)	1035 (55%)	137 (69%)

*Only those physicians who use Information Technology to send prescriptions to pharmacies were asked to provide information about what percentage of those prescriptions were sent electronically.

TABLE G10 PERCENTAGE OF MEDICAL RECORDS (NOT INCLUDING BILLING RECORDS) IN THE PRIMARY PRACTICE SURVEY ITEM 21

Electronic Medical Records	Board Certified Physicians in Maryland	Board Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total Physicians	12,093	922	4,870	465
Yes, all electronic	3,101 (26%)	235 (25%)	1,441 (30%)	144 (31%)
Yes, part-paper and part-electronic	4,166 (34%)	223 (24%)	1,403 (29%)	100 (22%)
No	4,426 (37%)	446 (48%)	1,924 (40%)	215 (46%)
Don't Know	265 (2%)	15 (2%)	53 (1%)	4 (1%)

TABLE G11 MOST SIGNIFICANT REASON FOR NOT USING ELECTRONIC MEDICAL RECORDS* SURVEY ITEM 21A

Electronic Medical Records	Board Certified Physicians in Maryland	Board Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total number of Physicians who do not use electronic medical Records	4,426	446	1,924	215
Capital Cost Outlays	1,968 (44%)	233 (52%)	953 (50%)	125 (58%)
Overburdened staff	112 (3%)	9 (2%)	52 (3%)	7 (3%)
Physician Resistance to Adaption	170 (4%)	16 (4%)	81 (4%)	9 (4%)
Risk of privacy breaches	191 (4%)	12 (3%)	50 (3%)	8 (4%)
Lack of technology standards	342 (8%)	32 (7%)	124 (6%)	7 (3%)
Intangible benefits	130 (3%)	14 (3%)	45 (2%)	4 (2%)
Retiring soon	70 (2%)	9 (2%)	31 (2%)	6 (3%)
Not my decision	1,313 (30%)	114 (26%)	529 (27%)	47 (22%)

*Only those physicians who do not use electronic medical records were asked to provide a reason for not adopting this information technology tool.

TABLE G12 PARTICIPATION IN INSURANCE PROGRAMS SURVEY ITEM 22

Electronic Medical Records		Board Certified Physicians in Maryland	Board Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total Physicians		12,093	922	4,870	465
Participates in private insurance networks, including PPO, EPO, HMO, etc.	Yes	10,865 (90%)	842 (91%)	4,440 (91%)	426 (92%)
	No	1221 (10%)	80 (9%)	427 (9%)	39 (8%)
Participates in Maryland Medical Assistance Program	Yes	8,973 (74%)	675 (73%)	3,581 (74%)	342 (74%)
	No	3113 (26%)	247 (27%)	1287 (26%)	123 (26%)
Participates in MEDICARE	Yes	10,269 (85%)	779 (84%)	3,814 (78%)	367 (79%)
	No	1817 (15%)	143 (16%)	1053 (22%)	98 (21%)
Participates in Maryland Medical Assistance Program and MEDICARE	Yes	8,196 (68%)	606 (66%)	2,961 (61%)	283 (61%)
	No	3,897 (32%)	316 (34%)	1,909 (39%)	182 (39%)

TABLE G13 PERCENTAGE OF PHYSICIANS ACCEPTING NEW MARYLAND MEDICAL ASSISTANCE PROGRAM PATIENTS* SURVEY ITEM 22B1

Electronic Medical Records	Board Certified Physicians in Maryland	Board Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total number of physicians who participate in the Maryland Medical Assistance Program	8,973	675	3,581	342
Yes, accepting new Maryland Medical Assistance Program patients	7819 (87%)	592 (88%)	2891 (81%)	287 (84%)
Not accepting new Maryland Medical Assistance Program patients	1153 (13%)	83 (12%)	690 (19%)	55 (16%)

*Only those physicians who currently participate in the Maryland Medical Assistance Program were asked to provide information about their willingness to accept new patients who are members of this program.

TABLE G14 PERCENTAGE OF PHYSICIANS ACCEPTING NEW MEDICARE PATIENTS* SURVEY 22C1

Electronic Medical Records	Board Certified Physicians in Maryland	Board Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total number of physicians who participate in the MEDICARE	10,269	779	3,814	367
Yes, accepting new MEDICARE patients	9,622 (94%)	739 (95%)	3,369 (88%)	337 (92%)
Not accepting new MEDICARE patients	637 (6%)	40 (5%)	442 (12%)	30 (8%)

*Only those physicians who currently participate in MEDICARE were asked to provide information about their willingness to accept new MEDICARE patients.

TABLE G15 PERCENTAGE OF PHYSICIANS ACCEPTING NEW MARYLAND MEDICAL ASSISTANCE PROGRAM AND MEDICARE PATIENTS* SURVEY ITEMS 22B1 AND 22C1 COMBINED

Electronic Medical Records	Board Certified Physicians in Maryland	Board Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total number of physicians who participate in the Maryland Medical Assistance Program and MEDICARE	8,196	606	2,961	283
Yes	7080 (86%)	526 (87%)	2314 (78%)	231 (82%)
No	1116 (14%)	80 (13%)	647 (22%)	52 (18%)

*Only those physicians currently participating in both Maryland Medical Assistance Program and MEDICARE were asked to provide information about their willingness to accept new patients who are members of these programs. Hence, it is not possible to determine accurately the number of physicians who do not currently participate in these programs but are planning to accept new patients from these programs for the first time.

TABLE G16 PERCENTAGE OF PHYSICIANS WHO USE A SLIDING FEE SCALE BASED ON ABILITY TO PAY

Electronic Medical Records	Board Certified Physicians in Maryland	Board Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total Physicians	12,093	922	4,870	465
Yes	3,652 (30%)	259 (28%)	1,574 (32%)	126 (27%)
No	4,841 (40%)	377 (41%)	1,931 (40%)	193 (42%)
N/A	3,592 (30%)	286 (31%)	1,361 (28%)	146 (31%)

TABLE G17 TYPICAL NUMBER OF HOURS PER WEEK FOR DEDICATED TO CHARITY WORK

Electronic Medical Records	Board Certified Physicians in Maryland	Board Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total Physicians	12,093	922	4,870	465
Zero hours	7,865 (65%)	642 (70%)	3,502 (72%)	333 (72%)
Between one and 10 hours	3,940 (33%)	260 (28%)	1,268 (26%)	124 (27%)
Between 11 and 20 hours	163 (1%)	10 (1%)	53 (1%)	5 (1%)
More than 20 hours	118 (1%)	10 (1%)	45 (1%)	3 (1%)

TABLE G18 PERCENTAGE OF PHYSICIANS WHO CHARGES PATIENTS AN ANNUAL FEE TO PARTICIPATE IN PATIENT PANEL

Electronic Medical Records	Board Certified Physicians in Maryland	Board Certified Physicians in County	Primary Care Physicians in Maryland	Primary Care Physicians in County
Total Physicians	12,093	922	4,870	465
Yes	71 (1%)	3 (0%)	62 (1%)	1 (0%)
No	6,099 (50%)	508 (55%)	3,230 (66%)	326 (70%)
N/A	5,923 (49%)	411 (45%)	1,578 (32%)	138 (30%)

TECHNICAL REPORT 4

Identification of Geographic Areas of Need for Primary Care: An Assessment of the Geographic Distribution of Selected Health care Resources

Min Qi Wang Ph.D.

This assessment is aimed at identifying the greatest need for primary care in Prince George's County. This was addressed by defining health care and other parameters of primary care need, documenting the geographic distribution of these parameters and then, based on a synthesis of these findings, identifying areas that reflect differential levels of primary care need. To place the county data in the context of the region and state, the data are presented for four additional jurisdictions: Montgomery, Anne Arundel, Baltimore and Howard counties. These counties either border Prince George's County and/or have similarities in population characteristics.

Primary care has been defined by the Institute of Medicine as the "provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing sustained partnership with patients, and practicing in the context of family and community" (IOM, 1994). This definition remains viable today with its hallmark focus on the patient, family and community, and with care facilitated and augmented by teams of providers working within integrated delivery systems. Integrated care includes the provision and coordination of services that address health care needs at stages throughout a patient's life cycle and continuous over time. This care focuses on disease prevention, chronic disease management and episodic care for acute systems. Mental and behavioral health and dental health are included in the scope of services that support functioning of individuals and work is ongoing to integrate these services within a primary care delivery system.

Three primary types of data were assessed to contribute to the identification of need for primary care at the level of ZIP codes. These include select population characteristics, rates of licensed primary care workforce categories and several measures of health-status based on hospital discharge data. In addition, the geographic location of hospitals and safety net clinics in Prince George's County are mapped. Additional information on public health resources is referenced in another technical report.

POPULATION CHARACTERISTICS

There are a number of characteristics that can be used to assess need for primary care. Three were used for this assessment: education, income and race/ethnicity. Populations with low education and those with low incomes have higher risk for disease and lower use of preventive health services. Race/ethnicity of populations has been associated with differential risks for disease as well. The latter factor was added for comparison purposes and due to the general literature, although it is done with the knowledge that Prince George's County's population reflects a large and diverse majority African-American population and is a county with the wealthiest African-American population in the nation.

PRIMARY CARE PROVIDERS

Primary care providers serve as a principal point of contact for patients seeking to maintain optimum health within a health care system. The parameters of state practice acts define the supervisory structure and settings of the care provided, such as care provided through independent practice or supervised care provided within teams of providers.

For purposes of this study we have taken an initial step to look at a more extensive scope of primary health care providers in the state of Maryland. These licensed providers fall within three major categories: medical, dental and mental/behavioral health.

MEDICAL

Primary care physicians These include medical specialists in family practice, internal medicine, pediatrics and obstetrics and gynecology.

Nurse practitioners These providers are advanced practice registered nurses and provide a full range of medical services with a focus on health promotion and disease prevention. In Maryland they work both independently and in collaboration with physicians.

Physician assistants These providers work under the supervision of licensed physicians and provide a range of diagnostic, therapeutic and preventive health care services as delegated by a physician.

DENTAL

Dentists The majority of these providers are general practice practitioners who provide medical, surgical and disease preventive services for oral and dental disorders and diseases. Additional specialists contributing to primary care include pediatric dental specialists, dental public health specialists and others.

Dental Hygienists These providers work under the supervision of licensed dentists and provide a range of disease preventive health services. In Maryland, licensed dental hygienists can also provide services in public health settings under the general supervision of dentists.

MENTAL AND BEHAVIORAL HEALTH

We include a full range of providers in this category and recognize that their scopes of practice differ, though all focus on improving an individual's mental health or treating mental illness. The most significant differences between these providers are the laws regarding required education and training across the various professions (Cherry, 2007). In Maryland, each of these four provider categories is licensed and can practice independently: psychiatrists (physicians who specialize in psychiatry), psychologists, clinical social workers, and therapists and counselors.

HEALTH STATUS AS CAPTURED BY HOSPITAL DISCHARGE DATA

Hospital inpatient care is often referred to as tertiary care; however, inpatient care that could have been prevented through effective outpatient primary care services (ambulatory care sensitive conditions), or care that is better coordinated between hospital discharge and outpatient care (30-day readmissions), has been used as a measure of primary care need. This study assessment uses three hospital events for Prince George's residents: hospital 30-day readmissions, hospital diseases for select ambulatory care-sensitive conditions and overall hospital discharges. The latter is an additional measure of health status, not necessarily primary care alone. In addition, two case studies provide data that concurrently look at two health conditions, asthma and myocardial infarction, in the context of health care providers.

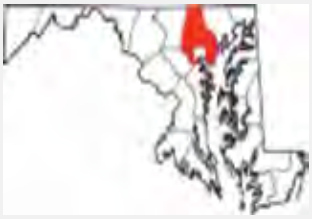
GEOGRAPHIC MAPPING

The centerpiece of this assessment is on geographic mapping based on applying the Geographic Information System. A Geographic Information System, also called GIS, is a computer-based system to aid in the collection, maintenance, storage, analysis, output and display of spatial data (Hanchette, 2003). Geospatial mapping of health data can be instrumental in visualizing patterns and generating questions that may not have otherwise occurred to researchers and the public. Historically, GIS has been used in the management of land and natural resources, and in environmental science. More recently, GIS has emerged as a new technology in public health. In particular, it provides analytical tools for health geography and epidemiological research in cases where geographical display is important. As a spatial analytical tool, GIS serves to advance the knowledge base of health geography and informatics.

METHODS

We conducted the analysis on four selected socio-demographic factors among five jurisdictions. All data were collected at the ZIP code level and were obtained from the Census 2010 except the household income, which was obtained from Census 2000. Figures 1 and 2 show the population size, geographical areas, number of ZIP codes and locations of the five jurisdictions.

FIGURE 1 **GEOGRAPHICAL INFORMATION OF FIVE JURISDICTIONS**

County	Population	Area (Square Miles)	Number of ZIP Codes	Map
Prince George's	863,420	498	37	
Montgomery	971,777	507	50	
Anne Arundel	537,656	588	42	
Baltimore County	805,029	682	55	
Howard	287,085	254	25	

DATA SOURCES

Three data sources have been obtained for the geographical mapping:

Licensed health care providers in the state of Maryland were obtained from the respective Department of Health and Mental Hygiene Licensing Boards. The provider categories (and respective date of data acquired) included:

- Primary care physicians (2010)
- Physician assistants (2011)
- Nurse practitioners (2011)
- Dentists (2011)
- Dental hygienists (2011)
- Licensed psychologists (2011)
- License social workers (2011)
- Counselors and therapists (2011)

The specific approach to identifying primary care physicians is provided in the report on Physician Counts and Categorization and Characteristics of Physicians in the State of Maryland and Prince George's County.

We used 2010 Census when available. Otherwise 2000 Census data were used. Specific census data included:

- Population size
- Median household income
- Percent of black/African-Americans
- Education

Maryland hospital discharge data included:

- 30-day readmissions
- Hospital discharges for selected ambulatory care-sensitive conditions
- Case study-specific data using hospital discharge data for myocardial infarction and asthma

FIGURE 2 GEOGRAPHICAL MAP OF FIVE SELECTED JURISDICTIONS

MEASURES

An age-adjusted rate is a weighted average of the age-specific (crude) rates, where the weights are the proportions of persons in the corresponding age groups of a standard population. The potential confounding effect of age is reduced when comparing age-adjusted rates computed using the same standard population. These include the 2010 U.S. standard population as well as standard millions for the U.S. population. The age-adjusted rate for an age group comprised of the ages x through y is calculated using the following formula:

$$\text{aarate}_{x\text{-}y} = \sum_{i=x}^{y} \left[100{,}000 \left(\frac{\text{count}_i}{\text{pop}_i} \right) \left(\frac{\text{stdmil}_i}{\sum_{j=x}^{y} \text{stdmil}_j} \right) \right]$$

ADDRESS GEOCODING

Geocoding is interpolating spatial locations (X,Y coordinates) from street addresses or any other spatially referenced data such as ZIP codes, parcel lots and address locations. A reference theme is required to geocode individual addresses, such as a road centerline file with address ranges. The individual address locations have historically been interpolated, or estimated, by examining address ranges along a road segment. These are usually provided in the form of a table or database. The GIS will then place a dot approximately where that address belongs along the segment of centerline.

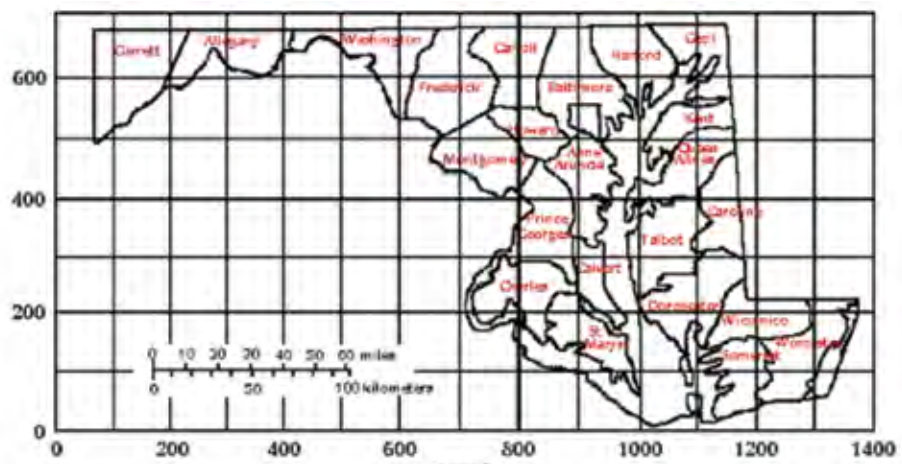
For example, an address point of 500 will be at the midpoint of a line segment that starts with address 1 and ends with address 1000. Geocoding can also be applied against actual parcel data, typically from municipal tax maps. In this case, the result of the geocoding will be an actually positioned space as opposed to an interpolated point. This approach is being increasingly used to provide more precise location information.

Various algorithms are used to help with address matching when the spellings of addresses differ. Address information that a particular entity or organization has data on, such as the post office, may not entirely match the reference theme. There could be variations in street name spelling, community name, etc. Consequently, the user generally has the ability to make matching criteria more stringent, or to relax those parameters so that more addresses will be mapped.

MAPPING COORDINATE SYSTEM

Mapping needs a coordinate system for a location and the common is the use of latitude and longitude—the Maryland State Plane Coordinate System is adopted.

According to the 1987 version of the Maryland Coordinate System (see figure blow), a point's location is designated by actual distances from two imaginary lines, one running east-west and the other north-south through the point of origin. The 1987 system is metric (although conversion to feet is allowed). The origin of the Maryland Coordinate System has been fixed at a point southwest of the state so that all coordinates lie east and north of the imaginary origin. Distance in the east direction is called an Easting; distance north of the origin is called a Northing. Thus, any point can be identified by two values, or distances, from the origin—an Easting and a Northing. In the mathematical sense of graphs, all Maryland coordinates are in the first quadrant, which means Easting ("x values") and Northings ("y values") are positive numbers.



GIS MAPPING SOFTWARE

ArcGIS Desktop is the primary product used by GIS professionals to compile, use and manage geographic information. It includes comprehensive professional GIS applications that support a number of GIS tasks, including mapping, data compilation, analysis, geodatabase management and geographic information sharing.

ArcGIS Desktop is the platform that GIS professionals use to manage their GIS workflows and projects and to build data, maps, models and applications. It's the starting point and the foundation for deploying GIS across organizations and onto the Web.

For this study, we adopted the ArcGIS Desktop 10 (ESRi, 2012) for the geographical mapping. ESRI's ArcGIS Desktop 10 with ArcMap platforms has the industry-recognized, out-of-box spatial analysis tools and Application Programming Interfaces (APIs).

MAPPING METHOD

Most of our geographic mapping in this study used a visual overlay method of several spatial datasets (points, lines, or polygons), which creates a new display, visually similar to stacking two maps of the same region.

THE DEMOGRAPHICS OF SELECTED JURISDICTIONS

Four census variables (population size, percentage of African Americans/blacks, percentage of residents 25 years or over who attended high school but did not receive a diploma (high school/no diploma) and median household income) that can serve as surrogates for need for primary care were selected and compared across the five jurisdictions. In addition to the geographical map, a quintile ranking was used to order and compare the ZIP codes by each of four different variables. A quintile refers to one-fifth of the sample or population. A chart alongside each map displays by jurisdiction a) the number of ZIP codes in the highest or lowest quintile, b) the percent of ZIP codes within the highest or lowest quintile, c) the number of residents associated with those ZIP codes in the highest or lowest quintile and d) the percent of residents associated with those ZIP codes in the highest or lowest quintile. For the patient care workforce, the quintile analysis could serve as a method to identify the areas that are in need of primary care.

POPULATION

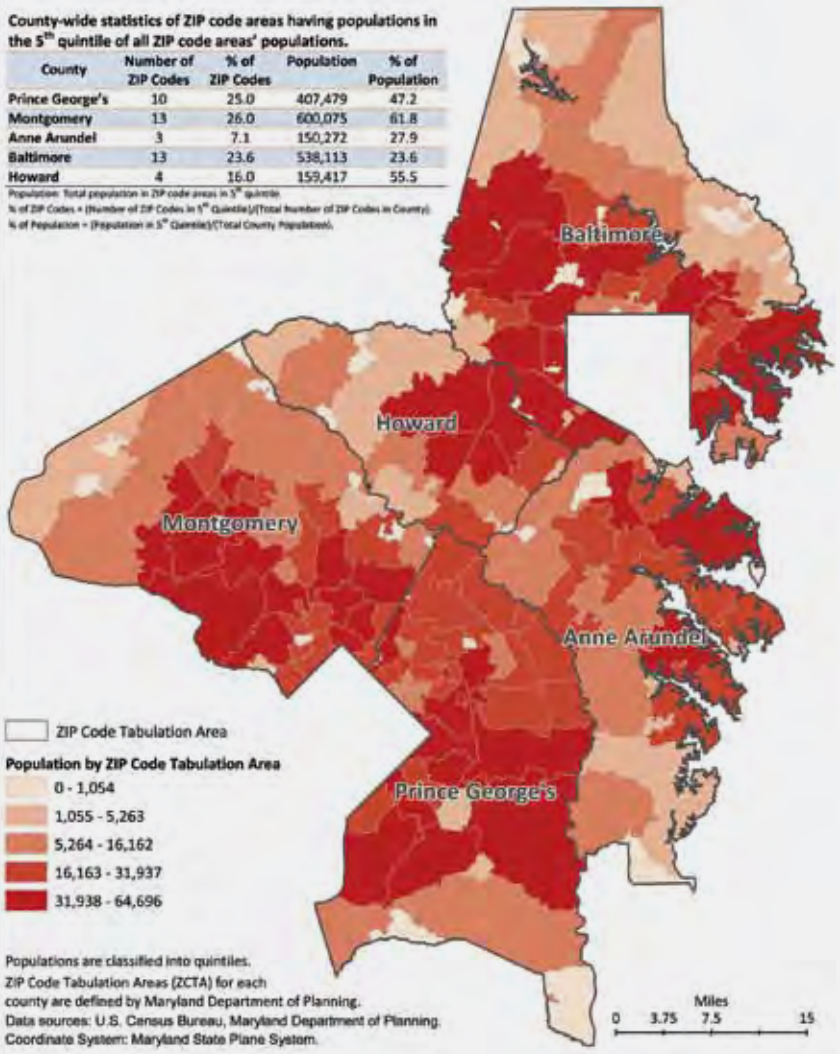
First, we compared Prince George's County to other jurisdictions with populations of similar size. The largest county in Maryland is Montgomery, with a population of 971,777. The next four most-populous counties include Prince George's, with a population of 863,420; Baltimore, with a population of 805,029; Anne Arundel, with a population of 537,656; and Howard, with a population of 287,085. (Note: Baltimore City and Baltimore County are separate entities and Baltimore City is not included in the county's population.) Within these five jurisdictions, Prince George's County ranked third in percentage of population residing within top-quintile ZIP codes (ZIP codes with a population greater than 313, 938). Close to half of Prince George's County residents (47.2 percent) are located in these 10 top-quintile ZIP codes (see Figure 3). The Maryland Census data can be obtained from the Maryland State Data Center website, www.mdp.state.md.us/msdc.

FIGURE 3 GIS ANALYSIS OF POPULATION SIZE BY JURISDICTIONS

County-wide statistics of ZIP code areas having populations in the 5th quintile of all ZIP code areas' populations.

County	Number of ZIP Codes	% of ZIP Codes	Population	% of Population
Prince George's	10	25.0	407,479	47.2
Montgomery	13	26.0	600,075	61.8
Anne Arundel	3	7.1	150,272	27.9
Baltimore	13	23.6	538,113	23.6
Howard	4	16.0	159,417	55.5

Population: Total population in ZIP code areas in 5th quintile
% of ZIP Codes = (Number of ZIP Codes in 5th Quintile)/(Total Number of ZIP Codes in County)
% of Population = (Population in 5th Quintile)/(Total County Population).

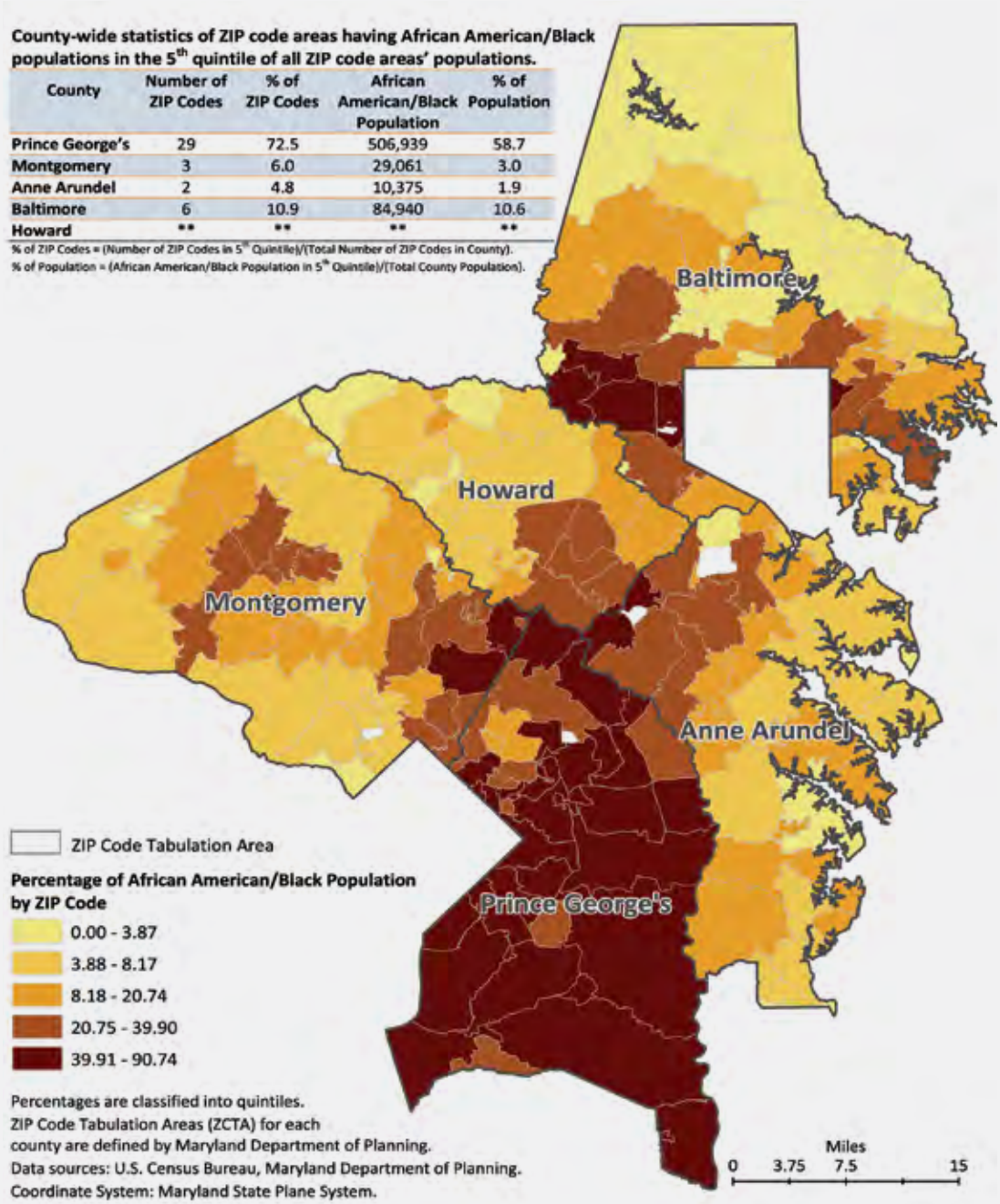


AFRICAN-AMERICAN/ BLACK POPULATION

The 2010 Census indicated that the largest ethnic group in Prince George's County is non-Hispanic blacks (63.52 percent). This percentage is greater than the proportion of blacks across the entire state (nearly 30 percent in the 2010 Census) and the proportion of African-American/black across the entire nation (12.2 percent) (Kaiser Family Foundation, 2011). The geographic analysis indicated that among the five most-populous jurisdictions, Prince George's County has 29 ZIP codes in the top quintile, i.e., ZIP codes having populations with greater than 39.9 percent of African-Americans/ blacks. These 29 ZIP codes consisted of more than half a million residents. Baltimore County ranked second, with six ZIP codes in the top quintile, consisting of 84,940 residents. No other jurisdictions had more than three ZIP codes in the top quintile (see Figure 4).

FIGURE 4 GIS ANALYSIS OF AFRICAN-AMERICAN/BLACK POPULATION BY JURISDICTIONS

NOTE ** INDICATES THE SUPPRESSED DATA WHEN THE NUMBER OF THE RESIDENTS WAS BELOW SIX

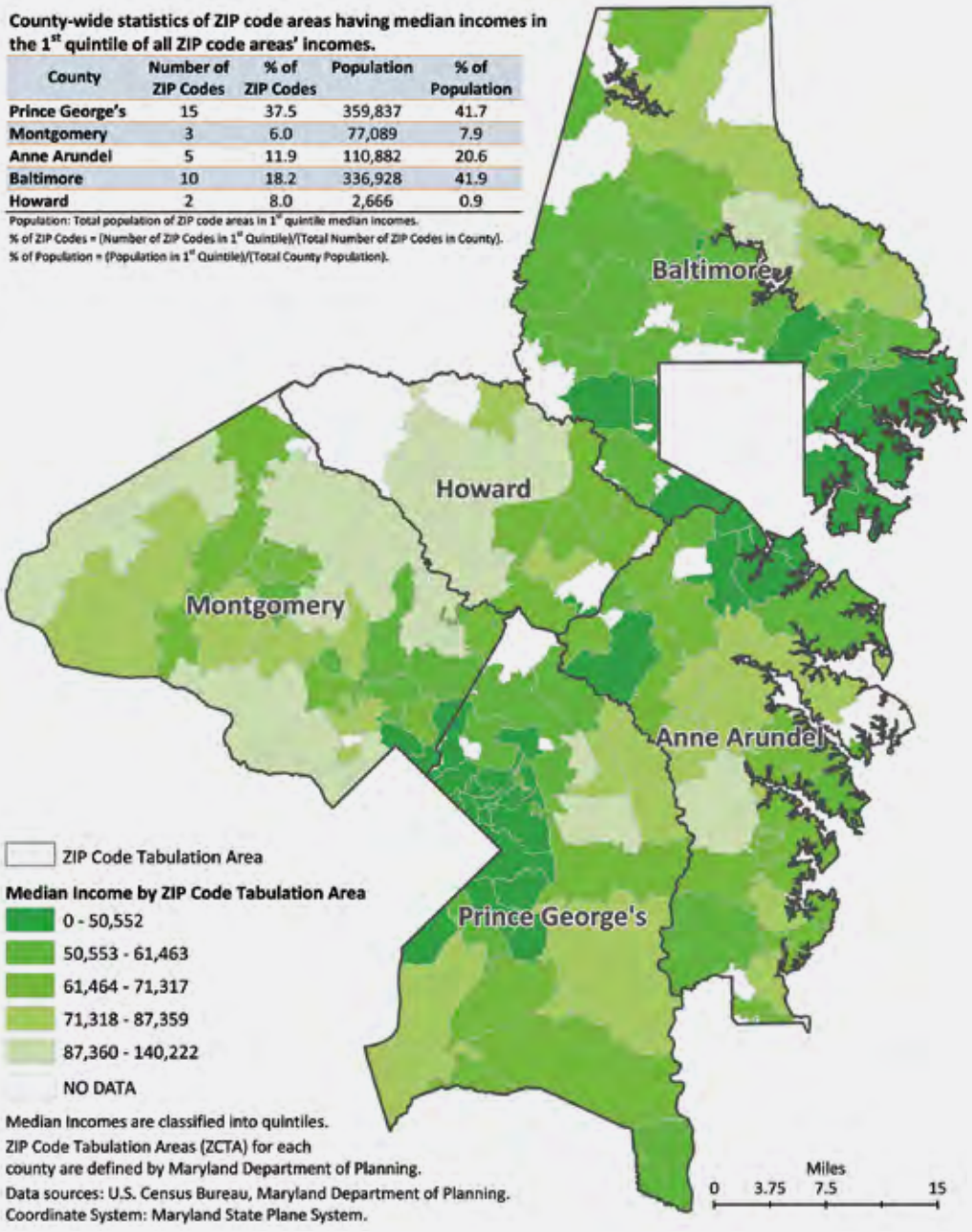


MEDIAN HOUSEHOLD INCOME

Prince George's County contains the largest number of ZIP codes (n=15) in the bottom quintile of median household income ($0–50,552), associating with 359,837 residents. Baltimore County ranked second, with 10 ZIP codes in the bottom quintile of median household income ($0–50,552), 369,837 residents were located in these areas. Howard County had only two ZIP codes in the bottom quintile of median household income, with 2,666 residents in these areas (see Figure 5).

Previous documents indicated that although approximately 4.7 percent of families and 7.4 percent of the population were below the poverty line—including 9.2 percent of those under age 18 and 7.1 percent of those age 65 or over—Prince George's County is the 70th most affluent county in the United States by median income for families, and the most affluent county in the United States with a

FIGURE 5 GIS ANALYSIS OF MEDIAN HOUSEHOLD INCOME BY JURISDICTIONS



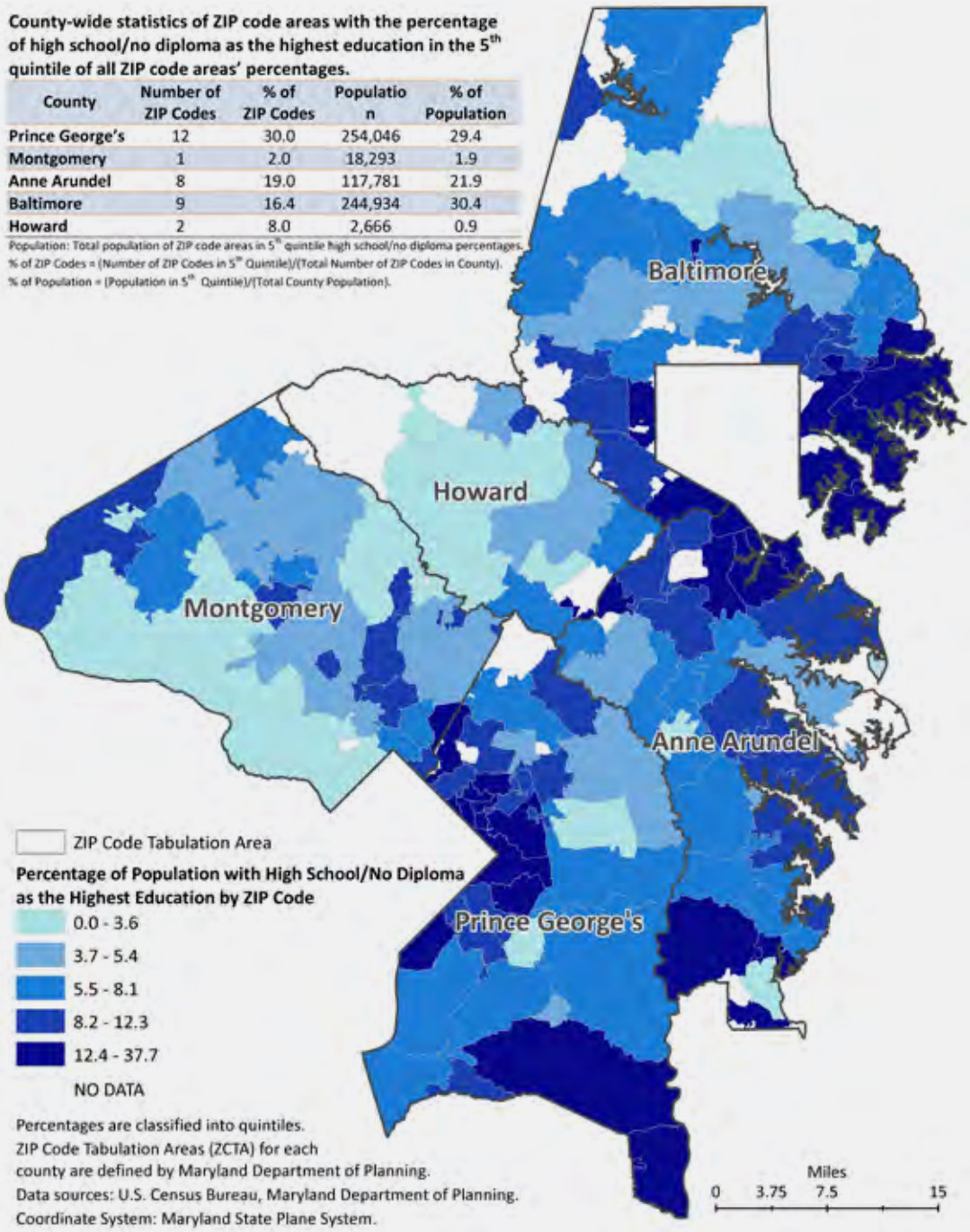
County	Number of ZIP Codes	% of ZIP Codes	Population	% of Population
Prince George's	15	37.5	359,837	41.7
Montgomery	3	6.0	77,089	7.9
Anne Arundel	5	11.9	110,882	20.6
Baltimore	10	18.2	336,928	41.9
Howard	2	8.0	2,666	0.9

majority of African-American residents. Almost 38.8 percent of all households in Prince George's County earned more than $100,000 in 2008 (United States Census Bureau, 2010).

HIGH SCHOOL ATTENDANCE, BUT NO DIPLOMA AS THE HIGHEST EDUCATIONAL LEVEL

Prince George's County contains the largest number of ZIP codes (n=12) in the top quintile of ZIP codes with high school/no diploma as the highest educational level; 254,046 residents (29.4 percent) are located in these areas. Baltimore County ranked second, with 10 ZIP codes in the top quintile, and 244,934 residents (30.4 percent) in these areas. Residents in Montgomery County and

FIGURE 6 GIS ANALYSIS OF HIGH SCHOOL DIPLOMA AS THE HIGHEST EDUCATIONAL LEVEL BY JURISDICTIONS



County	Number of ZIP Codes	% of ZIP Codes	Population	% of Population
Prince George's	12	30.0	254,046	29.4
Montgomery	1	2.0	18,293	1.9
Anne Arundel	8	19.0	117,781	21.9
Baltimore	9	16.4	244,934	30.4
Howard	2	8.0	2,666	0.9

Howard County had the best educational attainment; these counties had only one ZIP code (1.9 percent of the population, 293 residents) and two ZIP codes (0.9 percent of the population, 2,666 residents) in the top quintile, respectively. The educational level corresponded well with the median household income as reported frequently in the literature. Areas with lower median household income were associated with more residents in top-quintile ZIP codes (see Figure 6).

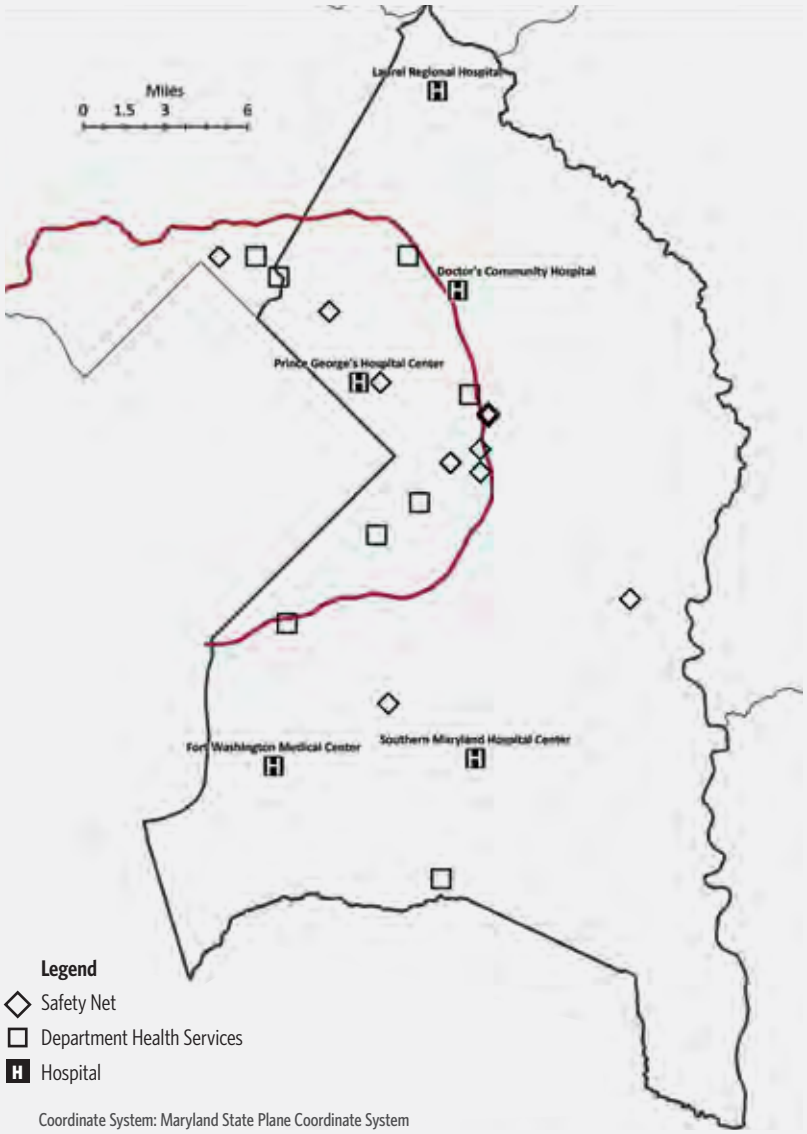
SUMMARY AND IMPLICATIONS

Our analysis indicated that Prince George's County contained the largest number of areas with African-American/black populations, lower median household income and high school but no diploma as the highest educational level. By computing the ZIP codes with quintiles of all three socio-demographic measures, it was found that Prince George's County contained the highest number of ZIP codes (seven), followed by Baltimore County with two ZIP codes and Howard County with one ZIP code. Anne Arundel and Montgomery had no ZIP codes with all three socio-demographic measures in the risk quintiles.

These social and economic disparities appear to negatively impact the access to health care and patient care workforce supply, which will be discussed later. However, in examining the social-demographic characteristics within the Prince George's County, i.e., between inner-Beltway and outer-Beltway areas, one salient point emerged. The county is comparable in terms of the population size and the rates of African-American/blacks. However, the median household income and educational level are highly diverse between inner-Beltway residents and the outer-Beltway residents. Residents living in the northern regions of the inner Beltway have the highest poverty rates and lowest educational attainment. Residents living in outer-Beltway areas are substantially more affluent and more highly educated. In fact, the GIS could not detect substantial differences between county residents outside the Beltway and residents in neighboring jurisdictions (Montgomery, Howard and Anne Arundel) in terms of the median household income and educational level.

According to a report released by the U.S. Census Bureau, 20 percent of Prince George's County's eligible population did not have any health insurance as of 2005, the highest rate in Maryland. This translates to more than 150,000 people in Prince George's County who do not have health insurance, which also is the highest number in the state. While roughly 76,000 of the uninsured Prince George's patients listed in the census report make less than $25,000 a year, the other half make more, but chose not to have health insurance due to the costs involved (Valentine, 2008).

FIGURE 7 GEOGRAPHICAL DISTRIBUTION OF COMMUNITY FACILITIES



The community facilities are described in the Overview of Public Health Resources technical report. This map (Figure 7) displays the Prince George's County Health Department programs and facilities, the safety net clinics and the hospitals in the County.

TWO CASE STUDIES OF HEALTH STATUS USING HOSPITALIZATION DISCHARGE DATA BY JURISDICTIONS

The health status of a population reflects its demographic and socio-economic composition, as well as the need for and effectiveness of its health care delivery system. We obtained a limited number of hospital discharge data from the Maryland Department of Health and Mental Hygiene (DHMH). Of the available data, we selected two of the most common conditions, myocardial infarction and asthma, to provide a selected picture of the health status of Prince George's County residents, and to compare their health with the residents in surrounding jurisdictions.

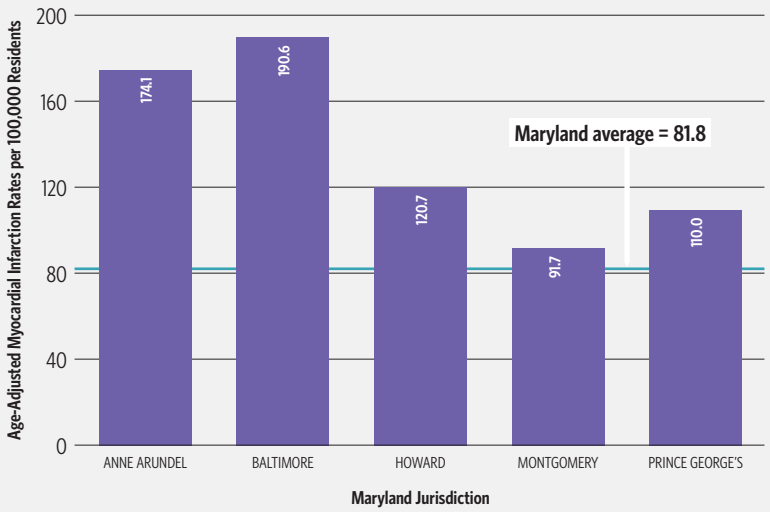
We analyzed the health status by first computing the age-adjusted rates of myocardial infarction and asthma at the ZIP code level, using the U.S. standard population from the 2000 Census. Then we used ArcGIS Desktop to map these rates in order to examine the geospatial clustering of the disease incidence. These clusters are often termed "disease hot spots." The identification of these hot spots will allow investigators to focus on these areas, identify the risk factors associated with the hot spots and implement effective health care services. This approach could be done for other conditions of interest, including hospital readmissions to help with planning a new health delivery system.

MYOCARDIAL INFARCTION

We compared age-adjusted myocardial infarction hospital discharge rates for Prince George's County with those in the neighboring Maryland jurisdictions. These rates are presented in quintiles in the geographical map by ZIP codes. In addition, we also computed the number and percent of ZIP codes in the top quintile, and the number and percent of residents in these ZIP codes for each county.

Figure 8 presents the myocardial infarction age-adjusted rates by jurisdiction and the Maryland average rate. Surprisingly, all five jurisdiction rates were higher than the Maryland state average (81.8 per 100,000 residents). The rates for these five jurisdictions ranged from 91.7 to 190.6. The rate for Prince George's County (110.0) was higher than the rate for Montgomery, but lower than the other three jurisdictions (Anne Arundel, Baltimore and Howard).

FIGURE 8 AGE-ADJUSTED MYOCARDIAL INFARCTION RATE PER 100,000 RESIDENTS BY JURISDICTION, 2009

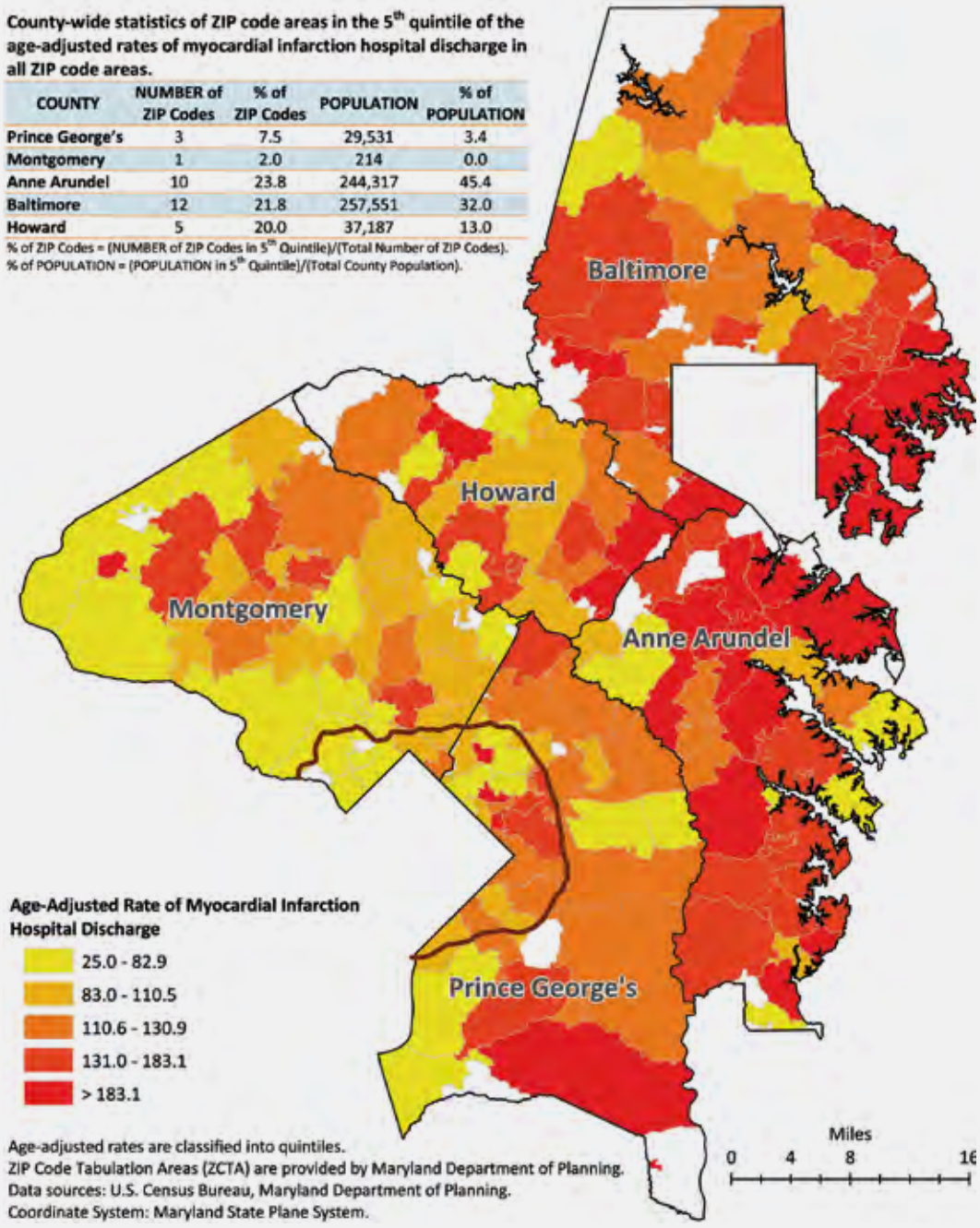


A geographical map of the age-adjusted rates per 100,000 residents was developed at the ZIP code level across five jurisdictions. The map (Figure 9) revealed that three ZIP codes in Prince George's County fell into the fifth quintile (i.e., a rate > 183.1) with 29,531 residents. This number was substantially lower than that of Anne Arundel County, where 10 ZIP codes fell into the fifth quintile with 244,317 residents (45.4 percent of the county population) and lower than that of Baltimore County, where 12 ZIP codes fell into the fifth quintile with 257,551 (32 percent of the county population).

ASTHMA

Figure 10 presents the age-adjusted rates of asthma by jurisdiction and the Maryland average rate. Surprisingly, four of the five jurisdiction rates were higher than the Maryland state average (83.8 per 100,000 residents). The rates for these five jurisdictions

FIGURE 9 GIS ANALYSIS OF MYOCARDIAL INFARCTION HOSPITAL DISCHARGE RATES BY JURISDICTIONS



ranged from 74.0 to 233.1. The rate for Prince George's County (127.4) was higher than the rate of Montgomery County (90.1) and Howard County (74), but lower than Anne Arundel County (137.2) and Baltimore County (233.1).

A geographical map of the age-adjusted rates per 100,000 residents was developed at the ZIP code level across five jurisdictions for a more detailed examination of asthma distribution. The map (Figure 11) revealed that five ZIP codes in Prince George's County fell into the fifth quintile (i.e., a rate > 170.3), with 145,851 residents. This number was substantially lower than that of Anne Arundel where seven ZIP codes fell into the fifth quintile with 207,018 residents (38.5 percent of the county population) and lower than that of Baltimore County where 16 ZIP codes fell into the fifth quintile with 425,190 (52.8 percent of the county population).

HEALTH CARE WORKFORCE SUPPLY ANALYSIS

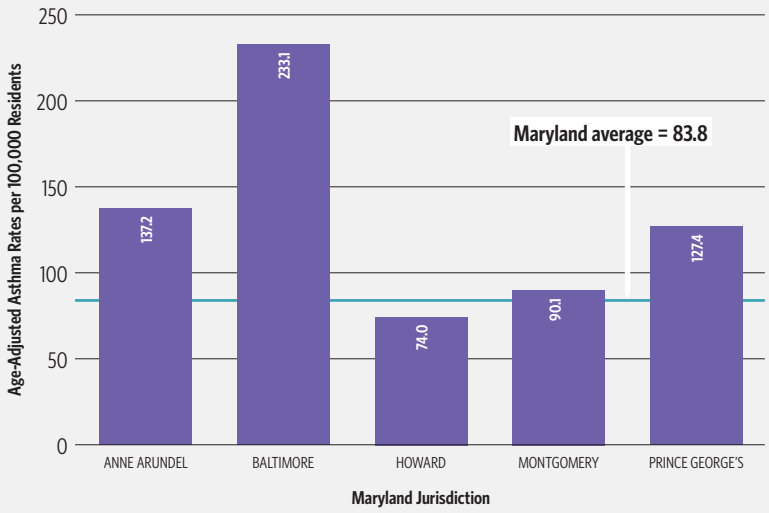
One of the objectives of this project was to use GIS mapping to assess the health care workforce and identify the shortage area geospatially. The workforce data included five categories: active licensed primary care physicians, nurse practitioners, physician assistants, dental care professionals (dentists and dental hygienists), and licensed behavioral and mental health professionals (psychologists, psychiatrists, clinical social workers, and counselors and therapists).

To gain a better understanding of the patient care workforce, three analyses were conducted:

1. Computing rates of workforce per 100,000 residents by each jurisdiction as well as the Maryland average to allow comparisons between counties and with the state;

2. Computing rates of workforce per 100,000 residents at each ZIP code level across five jurisdictions and computing the quintiles. The ZIP codes associated with the first or first and second quintiles were identified as well as the total number of residents living in these areas. This step allowed the assessment of differential levels of primary care provider need, with the lower quintiles reflecting higher need for primary care.

FIGURE 10 AGE-ADJUSTED ASTHMA RATE PER 100,000 RESIDENTS BY JURISDICTION, 2009



3. Computing rates of workforce per 100,000 residents at each Public Use Microdata Area (PUMA) within Prince George's County. PUMAs are the geographic areas defined by the U.S. Census Bureau. There are seven non-overlapping PUMAs within Prince George's County. Each PUMA contained approximately 100,000 people at the time of the 2000 Census. The seven PUMA boundaries and ZIP code boundaries are presented in Figure 12. The region of Prince George's County located inside Interstate 495,the Beltway, is divided into four PUMAs; the area located outside of the Beltway is divided into three PUMAs. The larger geographic size of PUMAs located outside the Beltway reflects their lower population density.

FIGURE 11 GIS ANALYSIS OF ASTHMA HOSPITAL DISCHARGE RATES BY JURISDICTIONS, 2009

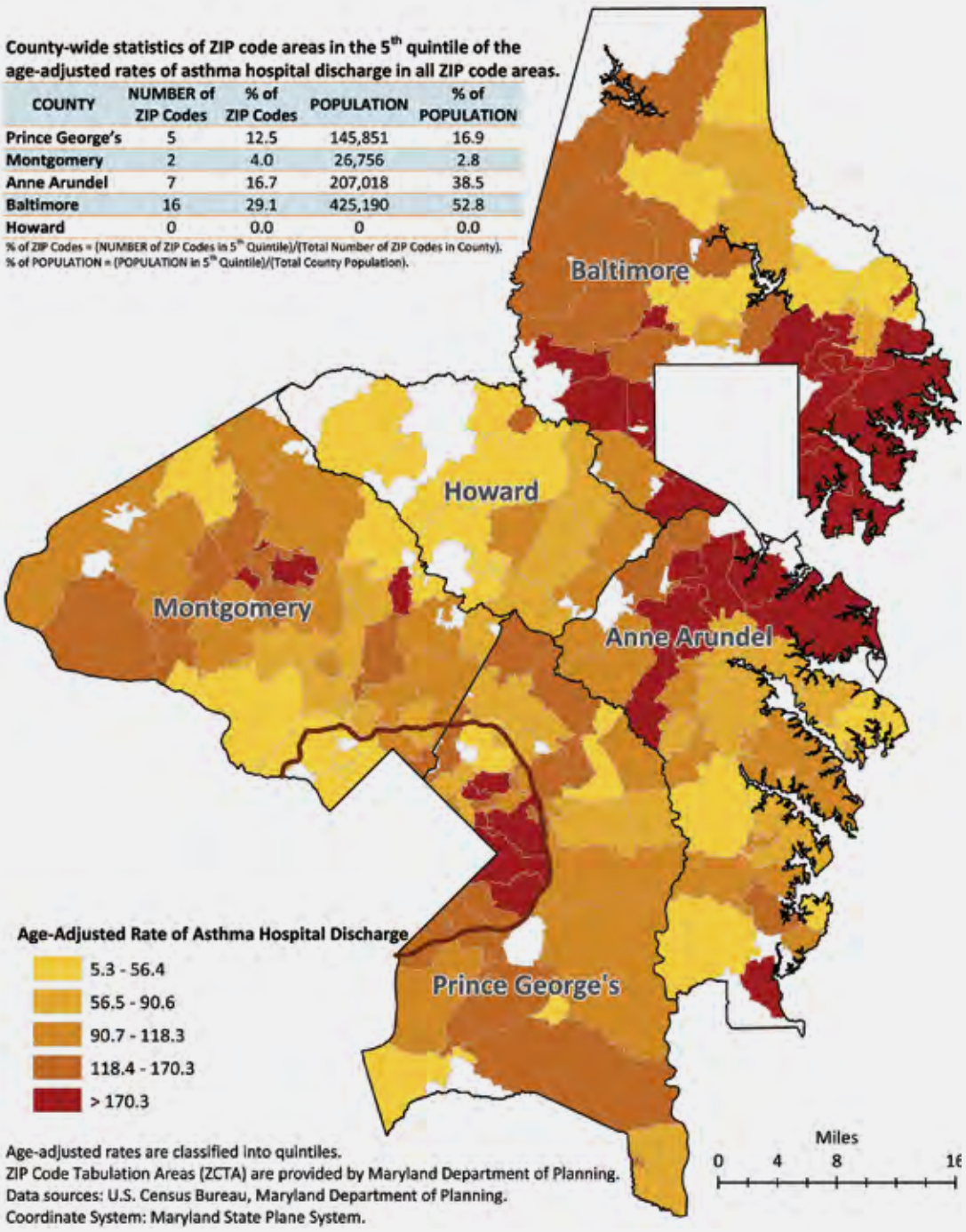
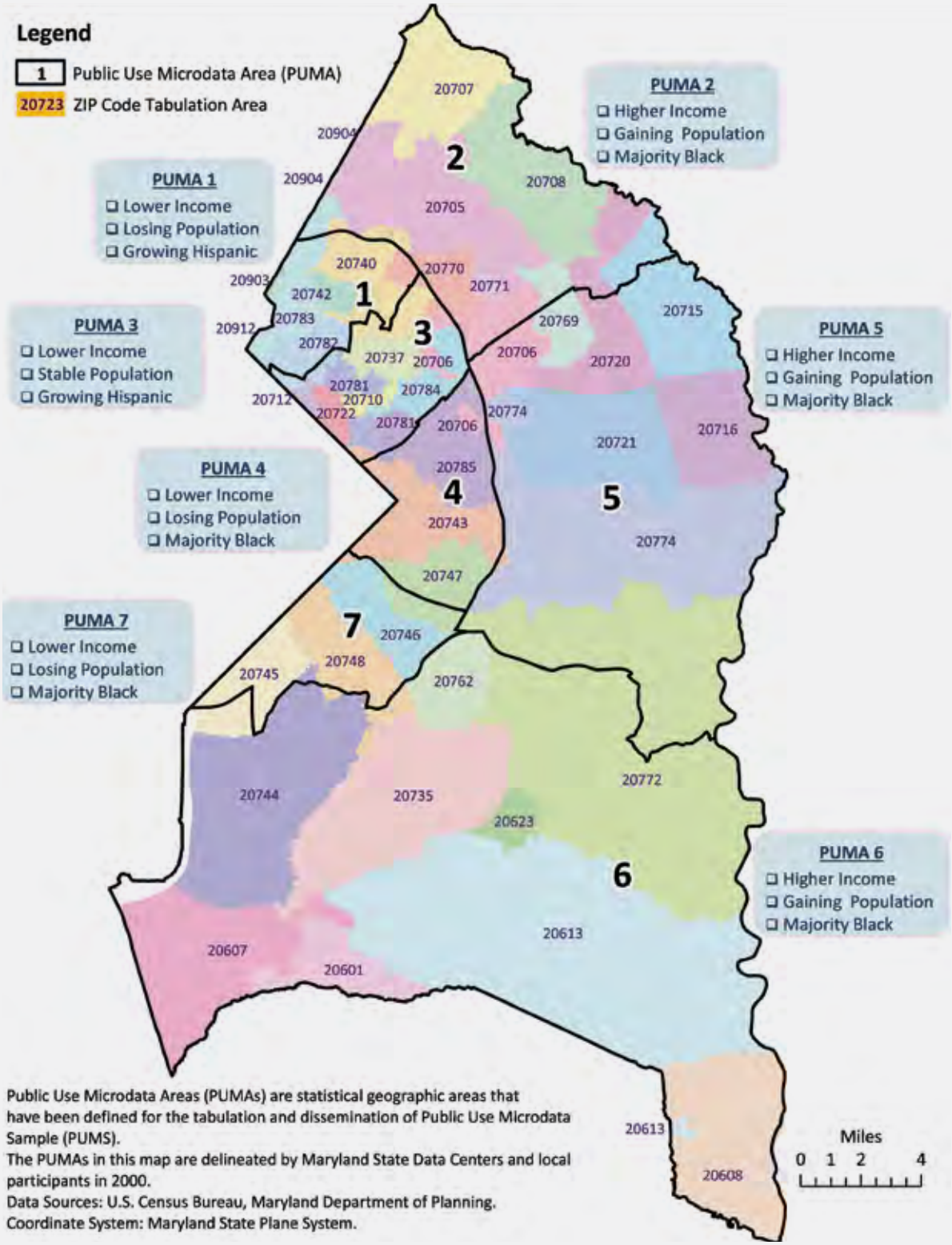


FIGURE 12 **GEOGRAPHICAL LOCATIONS OF PUBLIC USE MICRODATA AREAS (PUMA)**



Public Use Microdata Areas (PUMAs) are statistical geographic areas that have been defined for the tabulation and dissemination of Public Use Microdata Sample (PUMS).
The PUMAs in this map are delineated by Maryland State Data Centers and local participants in 2000.
Data Sources: U.S. Census Bureau, Maryland Department of Planning.
Coordinate System: Maryland State Plane System.

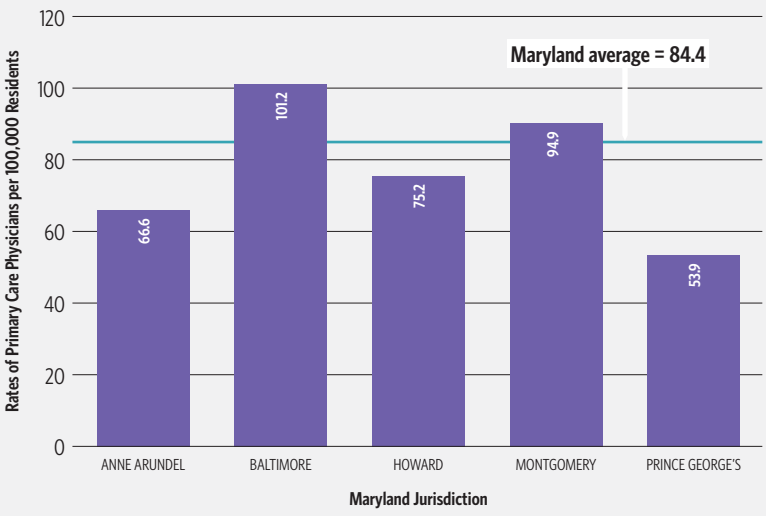
TABLE 1 THE NUMBER OF HEALTH CARE WORKFORCE BY TYPE AND BY COUNTY

Jurisdiction	Primary Care Physicians	Physician Assistant	Nurse Practitioner	Dental Care	Mental Health
Anne Arundel	353	378	347	650	894
Baltimore	909	928	622	1023	2431
Howard	221	203	277	573	1060
Montgomery	919	709	457	1578	2933
Prince George's	465	339	209	618	905

TABLE 2 THE NUMBER AND TYPE OF DENTAL CARE AND MENTAL HEALTH WORKFORCE BY COUNTY

	Dental Care		Mental Health			
Jurisdiction	Dentist	Hygienist	Social Worker	Counselor	Psychologist	Psychiatrist
Anne Arundel	339	311	422	303	148	21
Baltimore	634	389	1109	761	381	180
Howard	355	218	499	226	286	49
Montgomery	1203	375	1423	502	833	175
Prince George's	470	148	396	364	114	31

FIGURE 13 PRIMARY CARE PHYSICIAN RATE PER 100,000 RESIDENTS BY JURISDICTION, 2010



Tables 1 and 2 provide the counts for each workforce category by county and are a reference for the next sections.

PRIMARY CARE PHYSICIANS

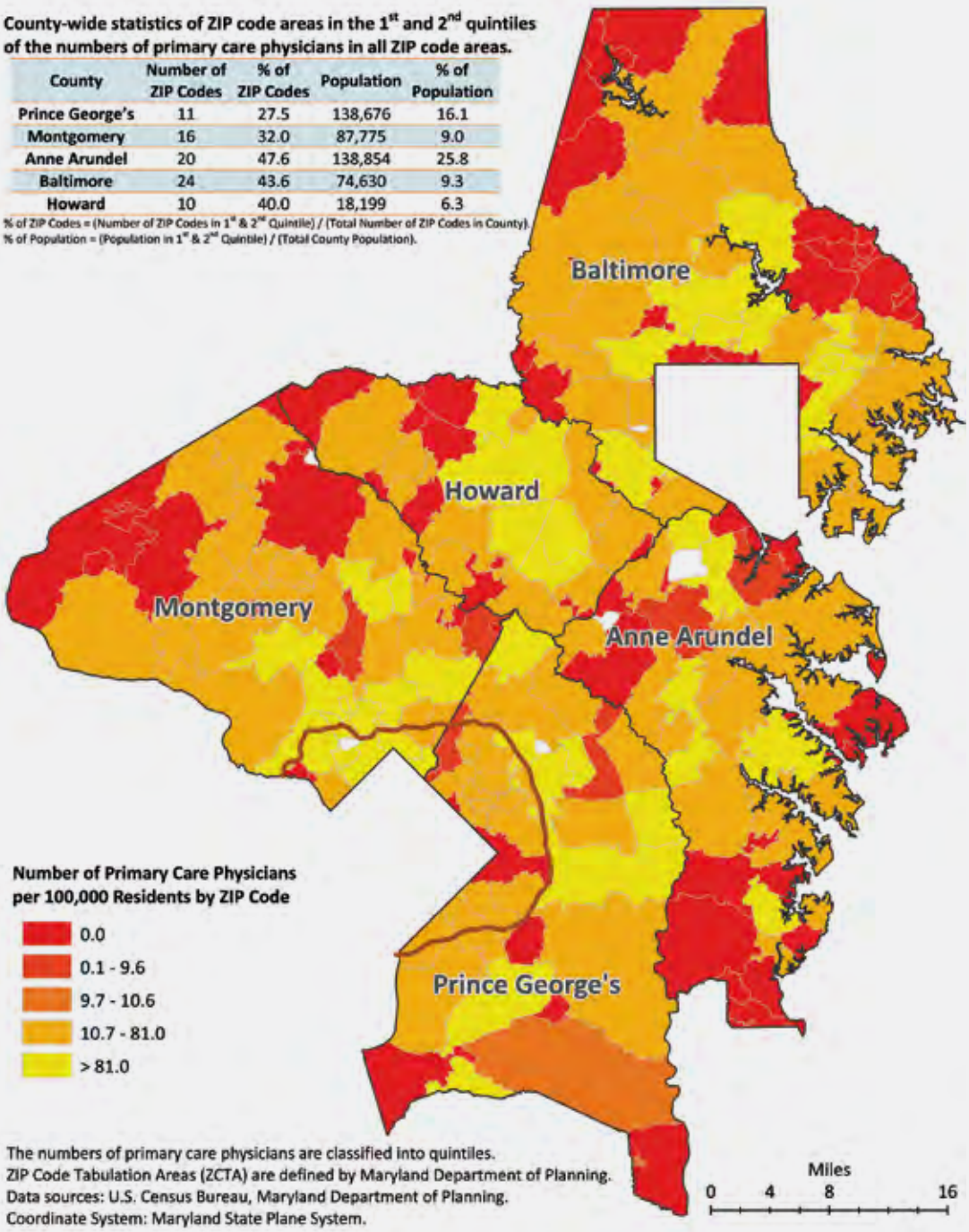
In 2010, there were approximately 4,870 active, non-federally employed primary care physicians practicing in Maryland. These included specialists in family practice, internal medicine, pediatrics and obstetrics and gynecology. Of this number, 2,867 practiced in the selected five jurisdictions and 465 in Prince George's County.

The rate of primary care physicians in Prince George's County was the lowest (53.9 per 100,000 residents) among five jurisdictions. This rate was 30 points lower than the average rate for the state of Maryland (84.4 per 100,000 residents). Anne Arundel County had the second-lowest rate among the five counties, 66.6 per 100,000 residents. The highest rate belonged to Baltimore County (101.2 per 100,000 residents), which was more than twice the rate of Prince George's County. Montgomery County had the second highest rate, with 94.9 per 100,000 residents (see Figure 13).

A geographical map of primary care physicians per 100,000 residents was examined for each ZIP code across the five counties for a more detailed examination of primary care physician distribution. The map (Figure 14) revealed that 11 ZIP codes areas in Prince George's County fell into the first and second quintile (i.e., < 9.6 primary care physicians per 100,000 residents) with 138,676 residents. This is contrasted with neighboring Montgomery County, where 16 ZIP codes were in the first and second quintiles, with only 87,775 residents.

To gain a better understanding of how 2,867 primary care physicians were distributed across the five jurisdictions, a density map was created using various advanced spatial analysis methods. The spatial density of the primary care physicians was determined by the number of physicians normalized by the size of the area. The area was defined as a function of the mean nearest area distance. Geographic areas with a density higher than a selected threshold were then circled and displayed on the map. The selected areas represent clusters of primary care physicians. Figure 15 shows that while there were several clusters in each of the jurisdictions, the clusters were smaller for Prince George's County. Identifying these clusters could help investigators examine the underlying

FIGURE 14 GIS ANALYSIS OF PRIMARY CARE PHYSICIAN RATE PER 100,000 RESIDENTS BY JURISDICTION, 2010



County	Number of ZIP Codes	% of ZIP Codes	Population	% of Population
Prince George's	11	27.5	138,676	16.1
Montgomery	16	32.0	87,775	9.0
Anne Arundel	20	47.6	138,854	25.8
Baltimore	24	43.6	74,630	9.3
Howard	10	40.0	18,199	6.3

factors associated with the clustering.

Figures 16 and 17 present the geographical locations of primary care physicians, overlaid with the age-adjusted myocardial infarction rates and the age-adjusted asthma rates, respectively. These two maps demonstrate the demand for patient care and the supply of the primary care physician workforce. It was apparent that the clustering of primary care physicians did not correspond to the higher rates of myocardial infarction and asthma. For example, the age-adjusted rates of myocardial infarction and asthma were substantially higher than the south region of Montgomery County, but the density of primary care physicians was one of the highest among five jurisdictions.

FIGURE 15 GEOGRAPHICAL CLUSTERING OF PRIMARY CARE PHYSICIANS BY POPULATION

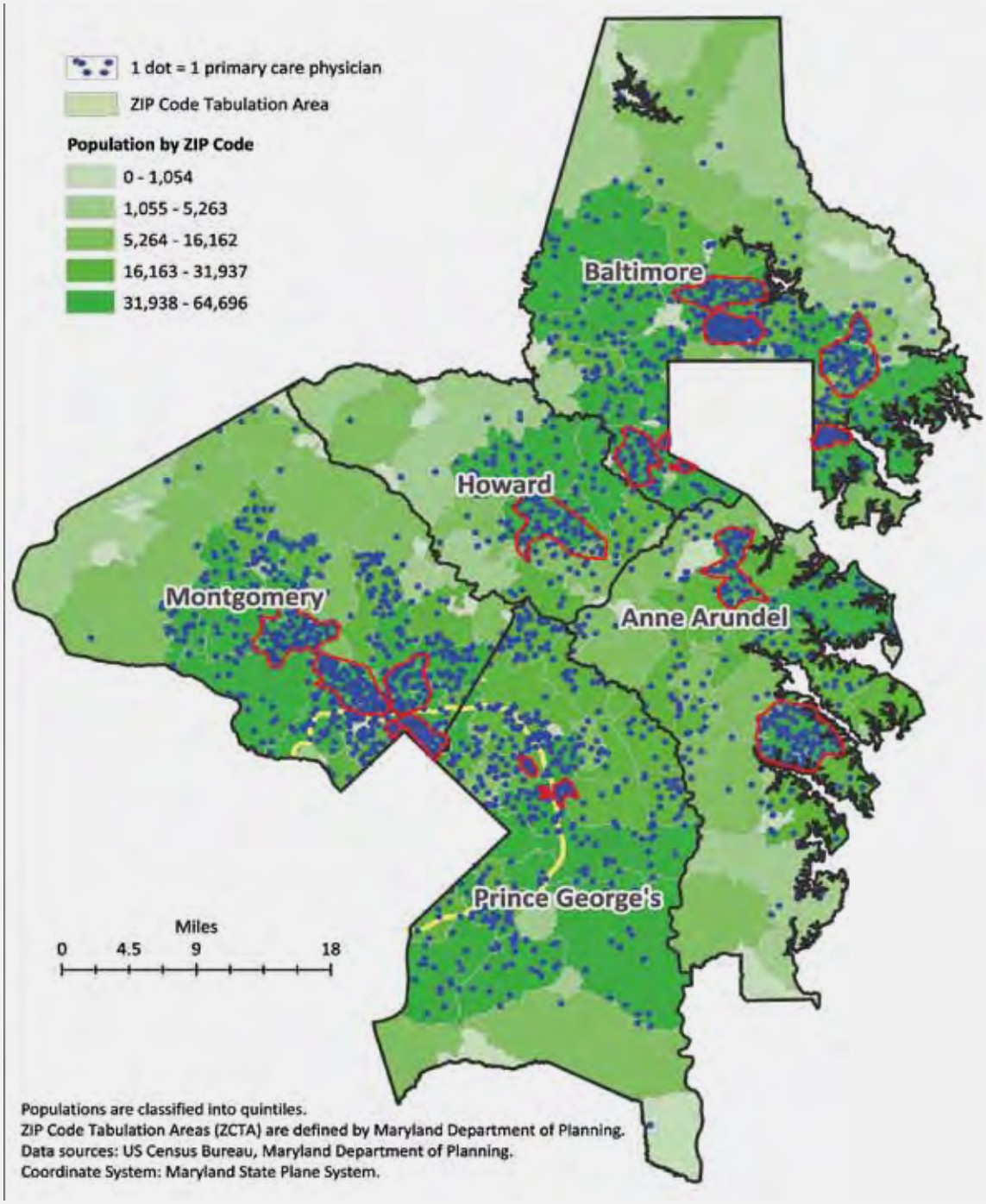


FIGURE 16 GIS ANALYSIS OF PRIMARY CARE PHYSICIAN LOCATION OVERLAYING AGE-ADJUSTED MYOCARDIAL INFARCTION RATE PER 100,000 RESIDENTS

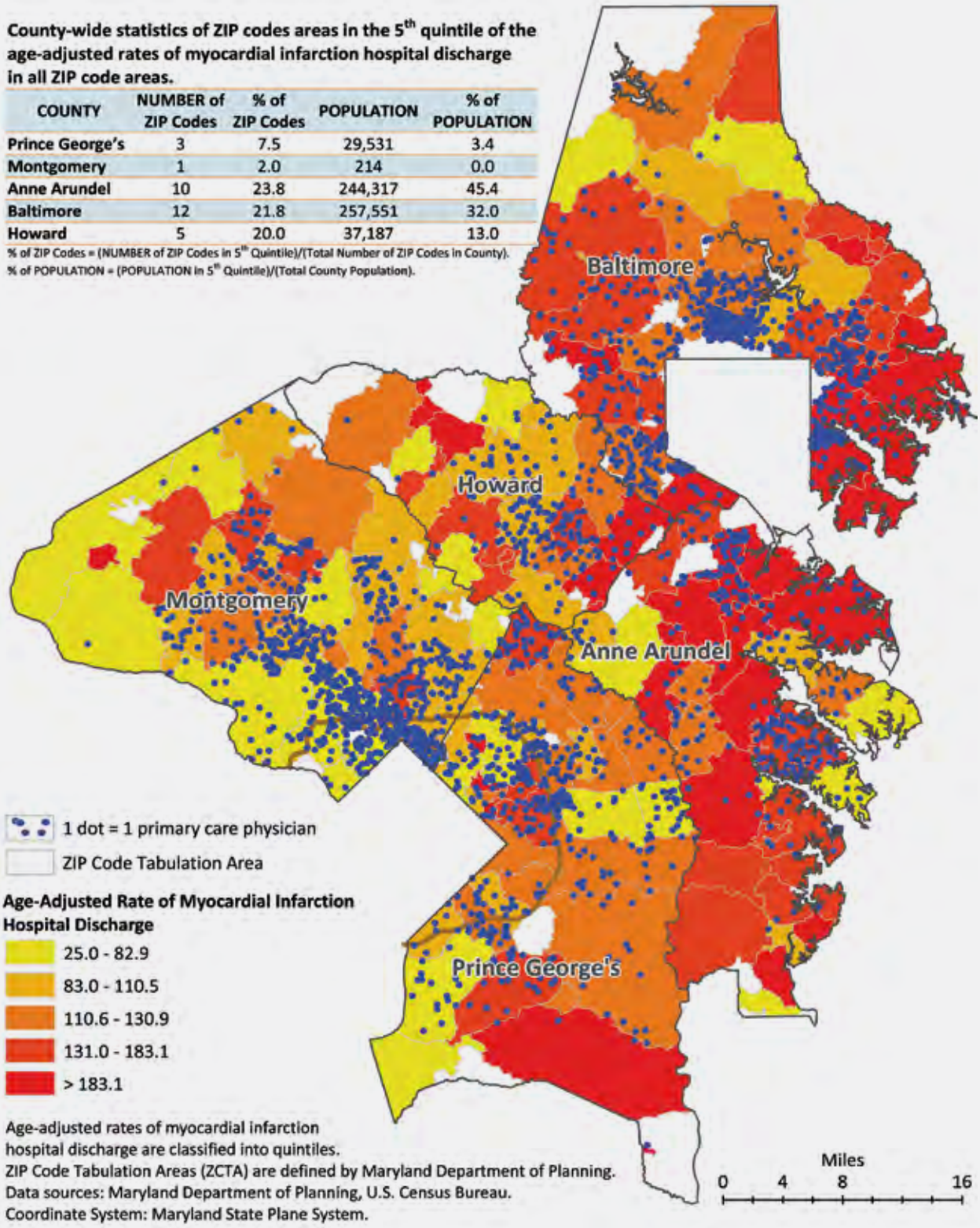
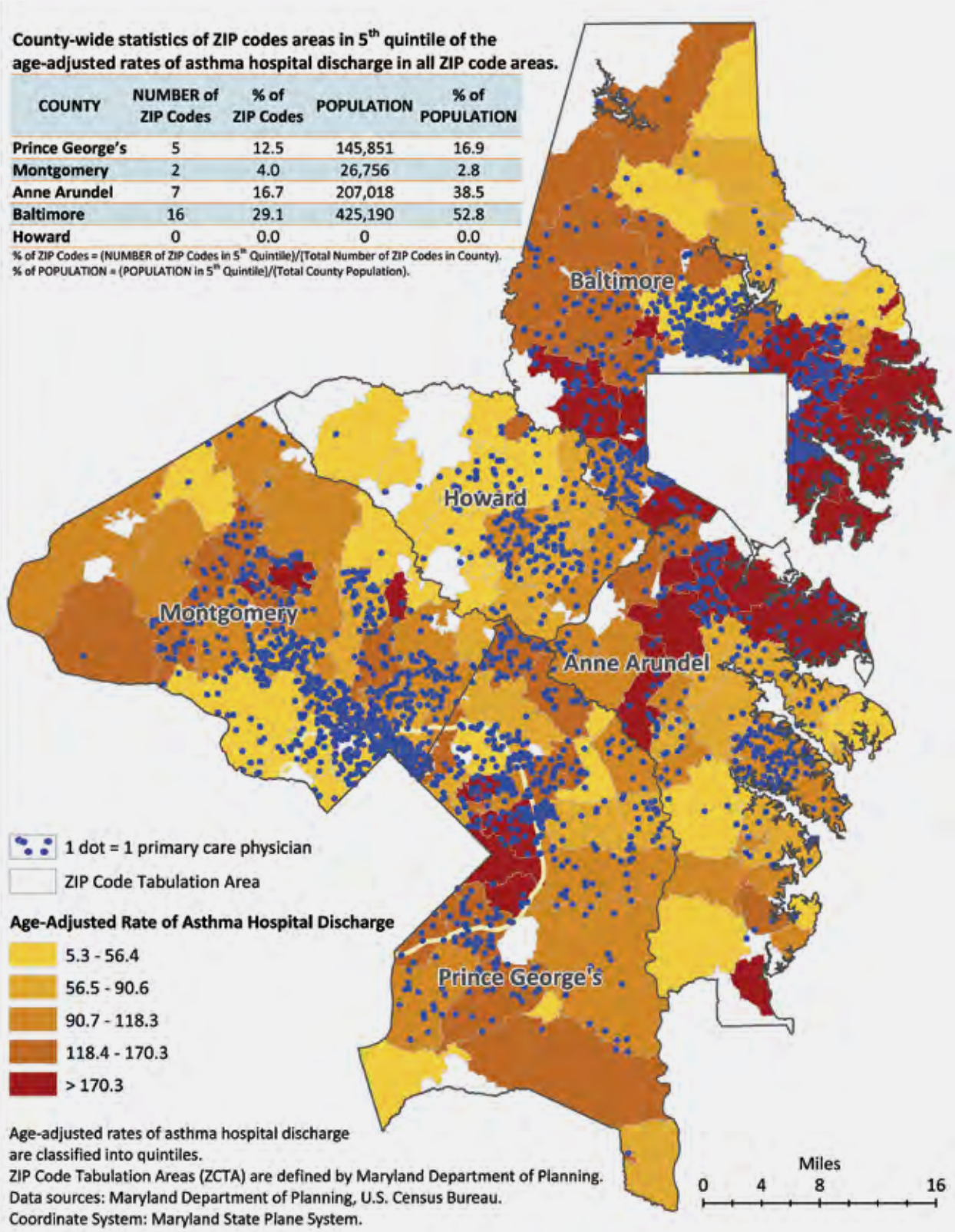
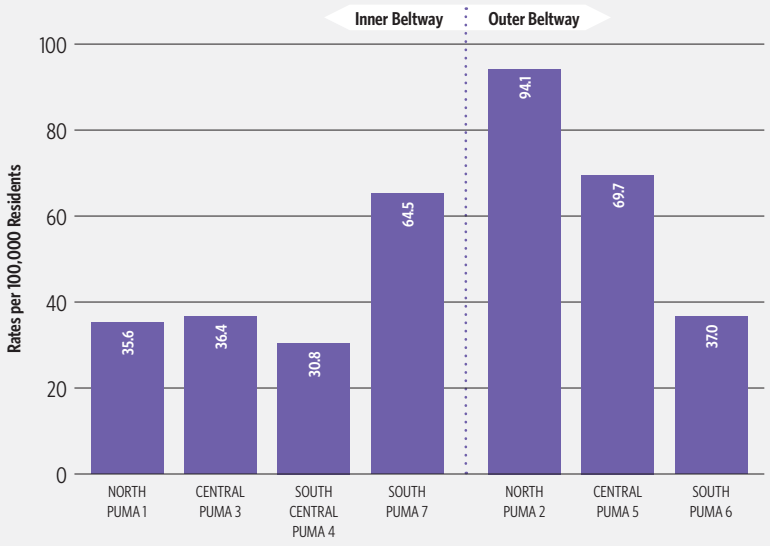


FIGURE 17 GIS ANALYSIS OF PRIMARY CARE PHYSICIAN LOCATION OVERLAYING AGE-ADJUSTED ASTHMA RATE PER 100,000 RESIDENTS



Within Prince George's County, the rates of primary care physicians per 100,000 residents were lower for three PUMAs (1, 3 and 7) in the inner Beltway than for two outer-Beltway PUMAs (2 and 5). However, one inner-Beltway PUMA (4) was substantially higher (51.9 per 100,000 residents) than other inner-Beltway PUMAs, while one outer-Beltway PUMA (6) was substantially lower (18.8 per 100,000 residents) than other outer-Beltway PUMAs (see Figure 18).

FIGURE 18 ACTIVE PRIMARY CARE PHYSICIANS PER 100,000 RESIDENTS, BY PUMA, 2010

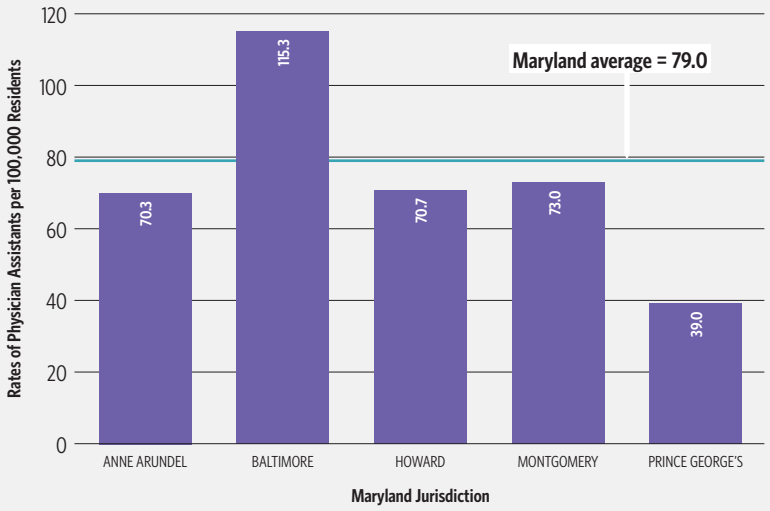


PHYSICIAN ASSISTANTS (PAS)

In 2011, there were approximately 4,560 licensed PAs practicing in Maryland. Of this number, 2,557 practiced in the five selected jurisdictions and 339 in Prince George's County.

For the county, the rate of physician assistants was the lowest (39.0 per 100,000 residents) among the five selected jurisdictions. This rate was less than half of the average rate for the state of Maryland (79.0 per 100,000 residents). The rate for Prince George's County was at least 30 rate points lower than the rates for Anne Arundel, Howard and Montgomery counties; it was approximately one-third the rate of Baltimore County (115 per 100,000 residents) (Figure 19).

FIGURE 19 RATES OF PHYSICIAN ASSISTANTS PER 100,000 RESIDENTS BY JURISDICTION, 2011



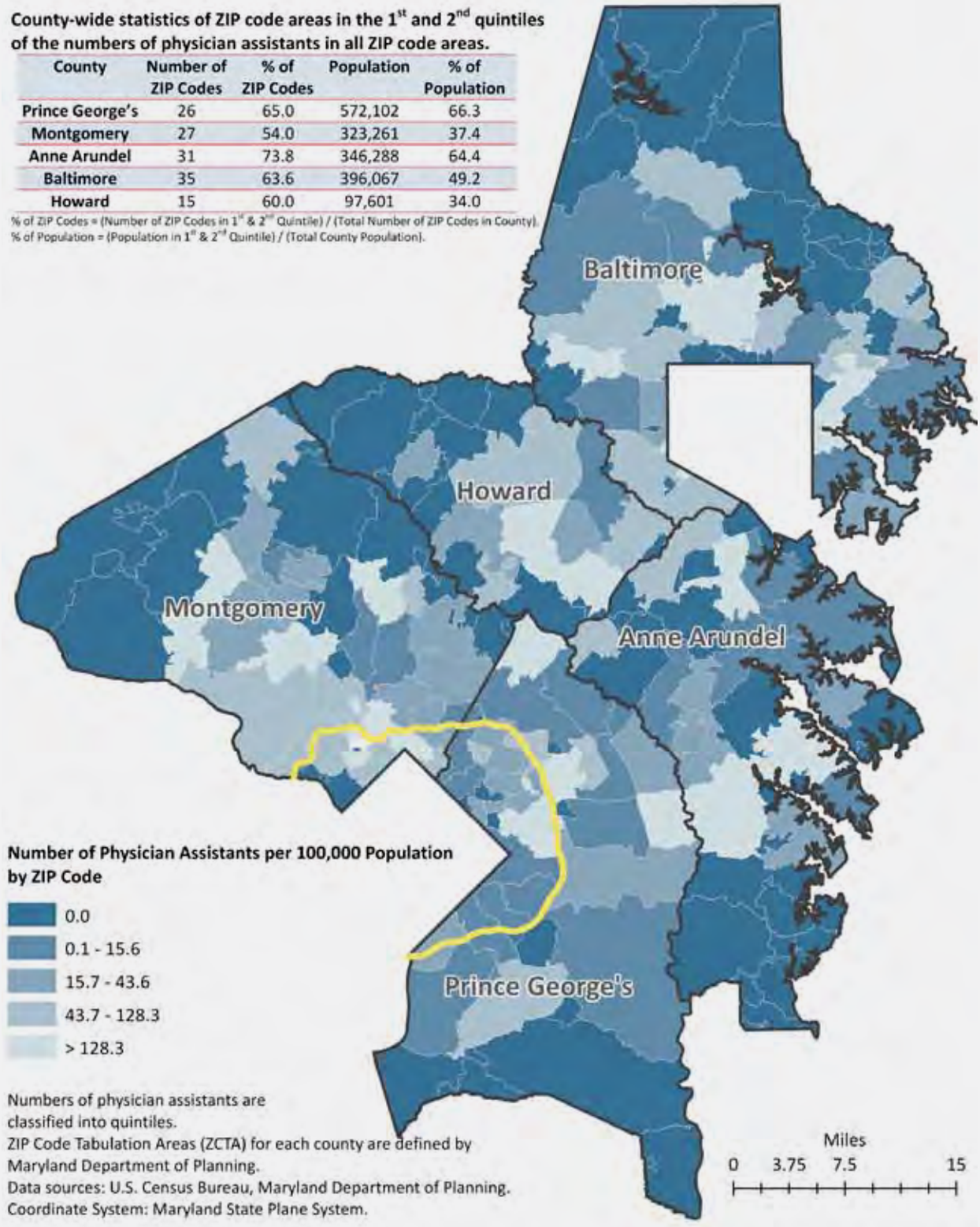
The geographical map of physician assistants per 100,000 residents was examined (Figure 20) for a more detailed analysis of physician assistant workforce distribution by ZIP code level. If we define the bottom two quintiles of the rates as the areas that had the highest need for primary care (i.e., < 15.6 physician assistants per 100,000 residents), we see that Prince George's County contained 26 ZIP codes (65 percent of all Prince George's County ZIP codes) that fell into these areas, where 572,102 (66.3 percent of all Prince George's County residents) resided. Baltimore County contained 35 ZIP codes in the shortage area, with 396,067 residents (49.2 percent of all Baltimore County residents).

FIGURE 20 GIS ANALYSIS OF PHYSICIAN ASSISTANTS PER 100,000 RESIDENTS BY JURISDICTION, 2011

County-wide statistics of ZIP code areas in the 1st and 2nd quintiles of the numbers of physician assistants in all ZIP code areas.

County	Number of ZIP Codes	% of ZIP Codes	Population	% of Population
Prince George's	26	65.0	572,102	66.3
Montgomery	27	54.0	323,261	37.4
Anne Arundel	31	73.8	346,288	64.4
Baltimore	35	63.6	396,067	49.2
Howard	15	60.0	97,601	34.0

% of ZIP Codes = (Number of ZIP Codes in 1st & 2nd Quintile) / (Total Number of ZIP Codes in County).
% of Population = (Population in 1st & 2nd Quintile) / (Total County Population).



Numbers of physician assistants are classified into quintiles.
ZIP Code Tabulation Areas (ZCTA) for each county are defined by Maryland Department of Planning.
Data sources: U.S. Census Bureau, Maryland Department of Planning.
Coordinate System: Maryland State Plane System.

Within Prince George's County, the rates of physician assistants per 100,000 residents were lower for three PUMAs in the inner Beltway (PUMAs 1, 3 and 7) than for two outer-Beltway PUMAs (2 and 5). However, one inner-Beltway PUMA (4) was substantially higher (51.9 per 100,000 residents) than other inner-Beltway PUMAs, while one outer-Beltway PUMA (6) was substantially lower (18.8 per 100,000 residents) than other outer-Beltway PUMAs (Figure 21).

FIGURE 21 LICENSED PHYSICIAN ASSISTANTS PER 100,000 RESIDENTS, BY PUMA, 2011

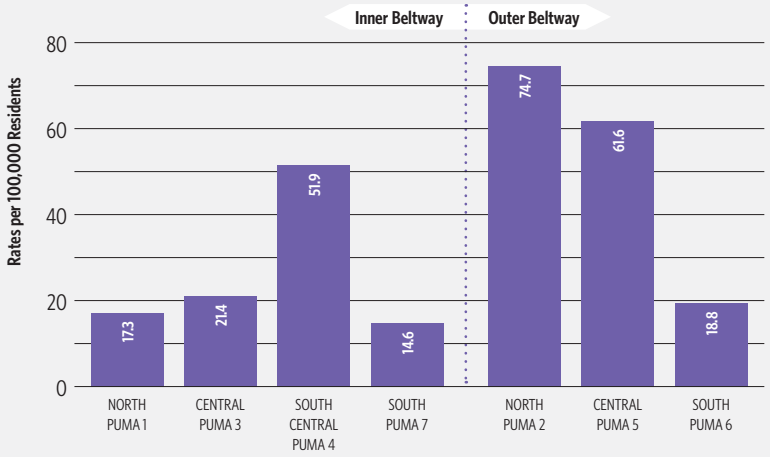
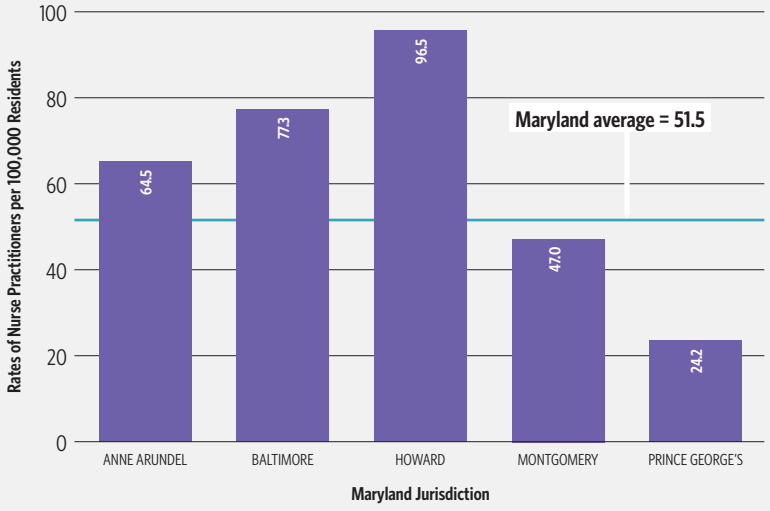


FIGURE 22 RATES OF NURSE PRACTITIONERS PER 100,000 RESIDENTS BY JURISDICTION, 2011



NURSE PRACTITIONERS

In 2011, there were approximately 3,002 licensed nurse practitioners in Maryland. Of this number, 1,930 practiced in five jurisdictions and 211 in Prince George's County.

The geographical map of nurse practitioners per 100,000 residents was examined (Figure 22) for a more detailed analysis of nurse practitioner workforce distribution by ZIP code level. If we define the bottom two quintiles of the rates as the area in need of primary care (i.e., < 23 nurse practitioners per 100,000 residents), we see that Prince George's County contained 24 ZIP codes (60.0 percent of all Prince George's County ZIP codes) that fell into this area, where 510,554 people (59.1 percent of all Prince George's County residents) resided. Baltimore County contained 20 ZIP codes in this area, with 146,227 residents (18.2 percent of all Baltimore County residents).

For Prince George's County, the rate of nurse practitioners was the lowest (24.2 per 100,000 residents) among five jurisdictions. This rate was less than half of the average rate for the state of Maryland (51.5 per 100,000 residents). The rate for Prince George's County was less than one-fourth of the rate for Howard County, which has the highest rate (96.5 per 100,000 residents) among the five selected jurisdictions (see Figure 23).

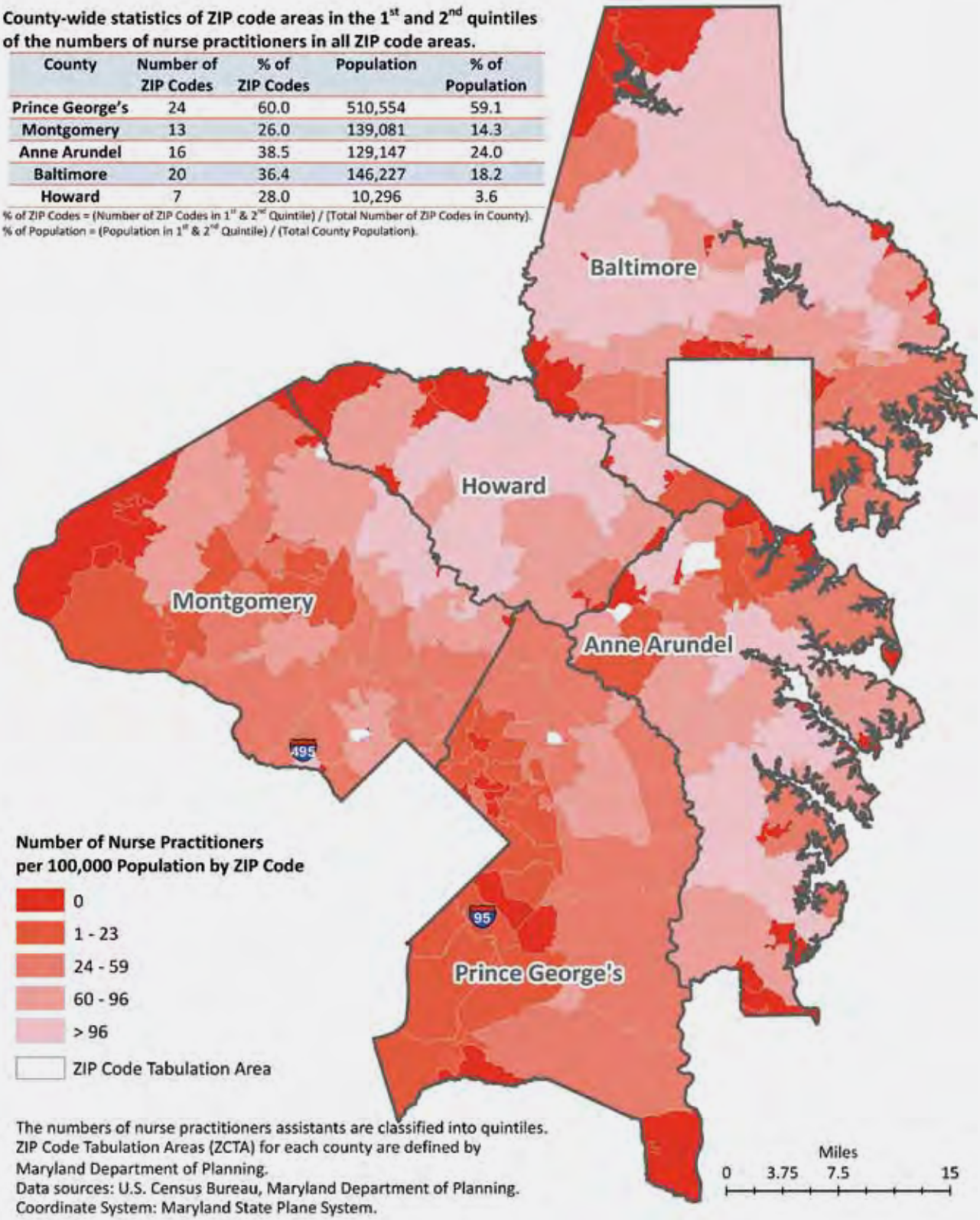
Within Prince George's County, the rates of nurse practitioners per 100,000 residents were substantially lower for inner-Beltway PUMAs (1, 3, 4 and 7) than outer-Beltway PUMAs (2, 5, and 6). For the inner-Beltway areas, the rates ranged from 4.2 to 11.6, while the outer-Beltway areas had rates from 24.3 to 49.6. Two inner-Beltway PUMAs (4 and 7) had the lowest rates, 7.9 and 4.2, respectively (Figure 24).

FIGURE 23 GIS ANALYSIS OF NURSE PRACTITIONERS PER 100,000 RESIDENTS BY JURISDICTION, 2011

County-wide statistics of ZIP code areas in the 1st and 2nd quintiles of the numbers of nurse practitioners in all ZIP code areas.

County	Number of ZIP Codes	% of ZIP Codes	Population	% of Population
Prince George's	24	60.0	510,554	59.1
Montgomery	13	26.0	139,081	14.3
Anne Arundel	16	38.5	129,147	24.0
Baltimore	20	36.4	146,227	18.2
Howard	7	28.0	10,296	3.6

% of ZIP Codes = (Number of ZIP Codes in 1st & 2nd Quintile) / (Total Number of ZIP Codes in County).
% of Population = (Population in 1st & 2nd Quintile) / (Total County Population).



The numbers of nurse practitioners assistants are classified into quintiles.
ZIP Code Tabulation Areas (ZCTA) for each county are defined by Maryland Department of Planning.
Data sources: U.S. Census Bureau, Maryland Department of Planning.
Coordinate System: Maryland State Plane System.

DENTAL CARE

In 2011, there were approximately 6,651 dental care professionals (4,121 dentists and 2,527 dental hygienists) practicing in Maryland. Of this number, 4,442 practiced in the five selected jurisdictions and 618 in Prince George's County (470 dentists, 148 hygienists).

For Prince George's County, the rate of the combined dental care professionals was the lowest (71.6 per 100,000 residents) among five jurisdictions, and the only county among five jurisdictions with the rate below the average rate for the state of Maryland (115.2 per 100,000 residents). Anne Arundel County had the second-lowest rate among the five counties (120.9 per 100,000 residents) which was almost 50 higher than the Prince George's County (Figure 25).

For a more detailed analysis of the dental care professional workforce distribution by ZIP code level, the geographical map of dental care professionals per 100,000 residents was examined (Figure 26). If we define the bottom two quintiles of the rates as the high primary care need area (i.e., ≤ 59 dental care professionals per 100,000 residents), we see that Prince George's County contained 23 ZIP codes (57.5 percent of all Prince George's County ZIP codes) that fell into this area, where 419.780 residents (48.6 percent of all Prince George's County residents) resided. Baltimore County contained 24 ZIP codes in the dental care need area, with 270,042 residents (33.6 percent of all Baltimore County residents).

FIGURE 24 LICENSED NURSE PRACTITIONERS PER 100,000 RESIDENTS, BY PUMA, 2011

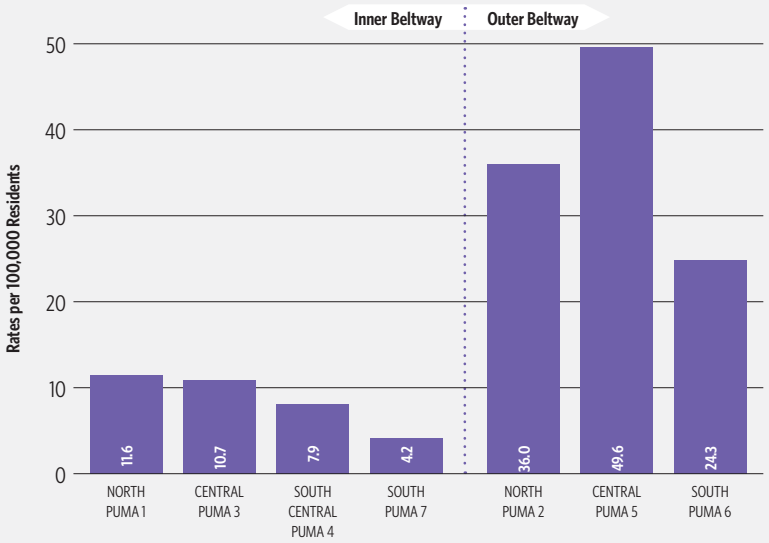


FIGURE 25 RATES OF DENTAL CARE PROFESSIONALS PER 100,000 RESIDENTS BY JURISDICTION, 2011

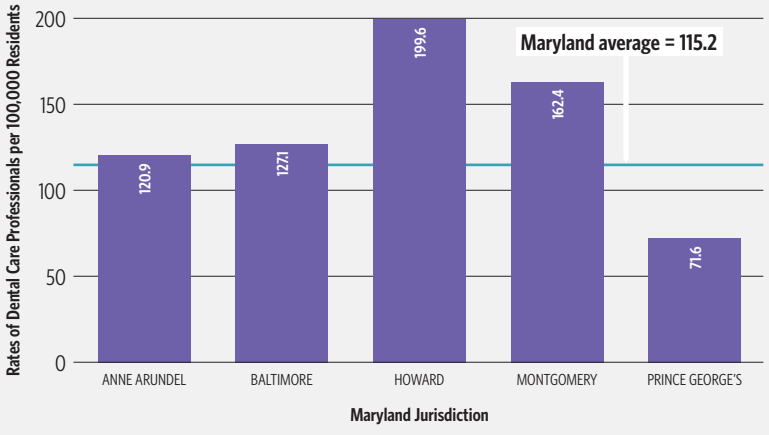
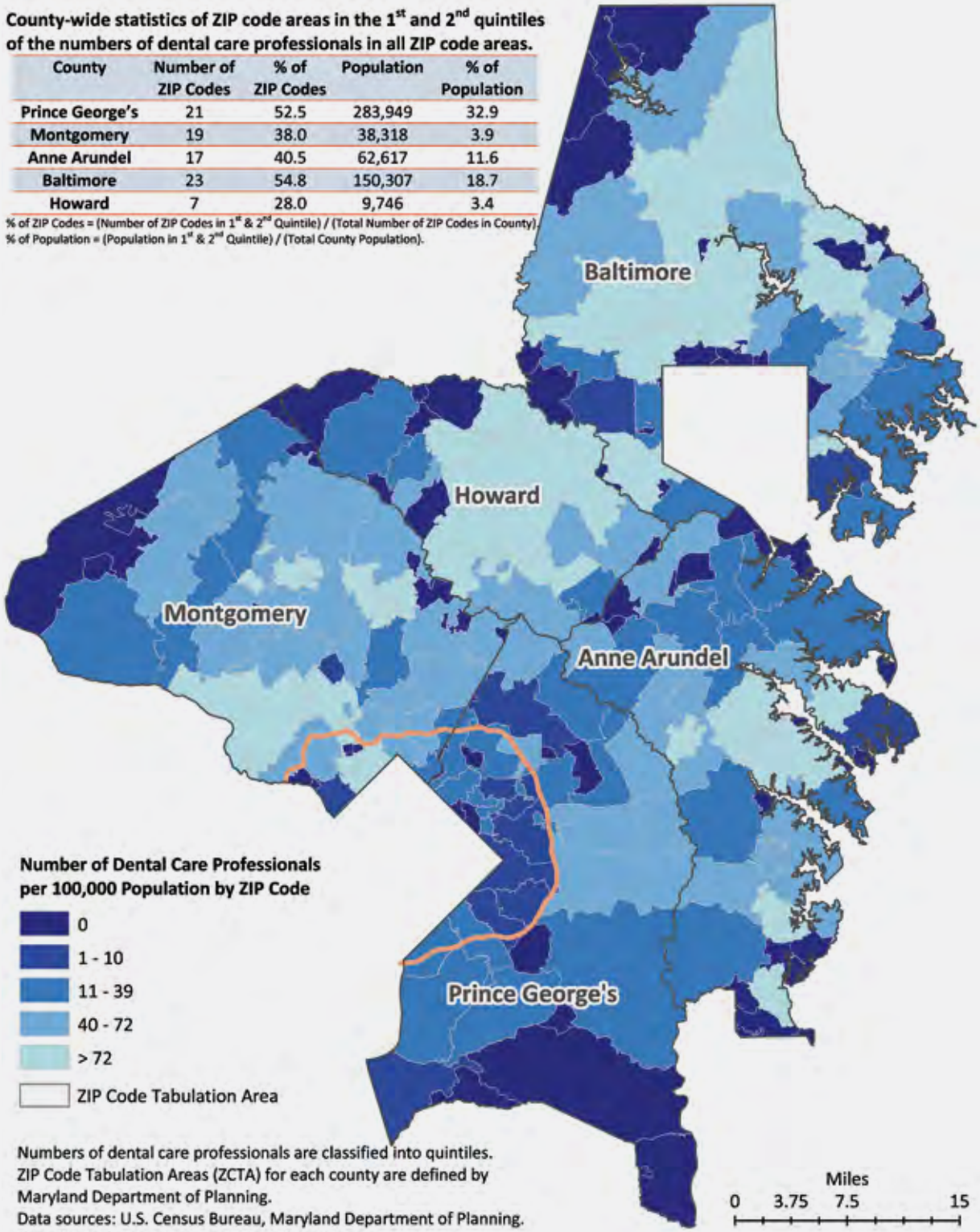


FIGURE 26 GIS ANALYSIS OF DENTAL CARE PROFESSIONALS PER 100,000 RESIDENTS BY JURISDICTION, 2011

County-wide statistics of ZIP code areas in the 1st and 2nd quintiles of the numbers of dental care professionals in all ZIP code areas.

County	Number of ZIP Codes	% of ZIP Codes	Population	% of Population
Prince George's	21	52.5	283,949	32.9
Montgomery	19	38.0	38,318	3.9
Anne Arundel	17	40.5	62,617	11.6
Baltimore	23	54.8	150,307	18.7
Howard	7	28.0	9,746	3.4

% of ZIP Codes = (Number of ZIP Codes in 1st & 2nd Quintile) / (Total Number of ZIP Codes in County).
% of Population = (Population in 1st & 2nd Quintile) / (Total County Population).



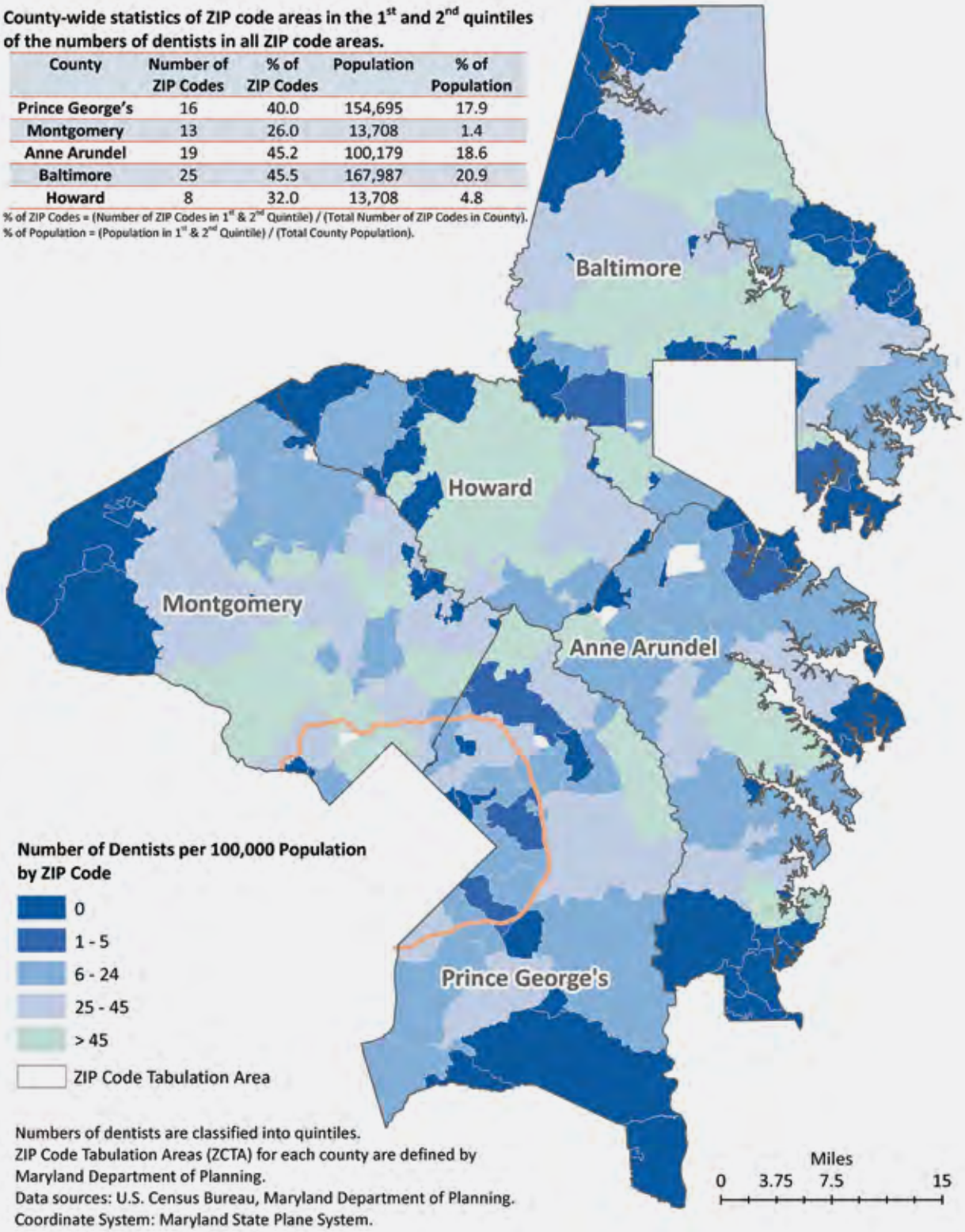
Numbers of dental care professionals are classified into quintiles.
ZIP Code Tabulation Areas (ZCTA) for each county are defined by Maryland Department of Planning.
Data sources: U.S. Census Bureau, Maryland Department of Planning.
Coordinate System: Maryland State Plane System.

FIGURE 27 GIS ANALYSIS OF DENTISTS PER 100,000 RESIDENTS BY JURISDICTION, 2011

County-wide statistics of ZIP code areas in the 1st and 2nd quintiles of the numbers of dentists in all ZIP code areas.

County	Number of ZIP Codes	% of ZIP Codes	Population	% of Population
Prince George's	16	40.0	154,695	17.9
Montgomery	13	26.0	13,708	1.4
Anne Arundel	19	45.2	100,179	18.6
Baltimore	25	45.5	167,987	20.9
Howard	8	32.0	13,708	4.8

% of ZIP Codes = (Number of ZIP Codes in 1st & 2nd Quintile) / (Total Number of ZIP Codes in County).
% of Population = (Population in 1st & 2nd Quintile) / (Total County Population).



Numbers of dentists are classified into quintiles.
ZIP Code Tabulation Areas (ZCTA) for each county are defined by Maryland Department of Planning.
Data sources: U.S. Census Bureau, Maryland Department of Planning.
Coordinate System: Maryland State Plane System.

Figures 27 and 28 present separate geographical maps of dentists and dental hygienists workforce distribution by ZIP code level per 100,000 residents.

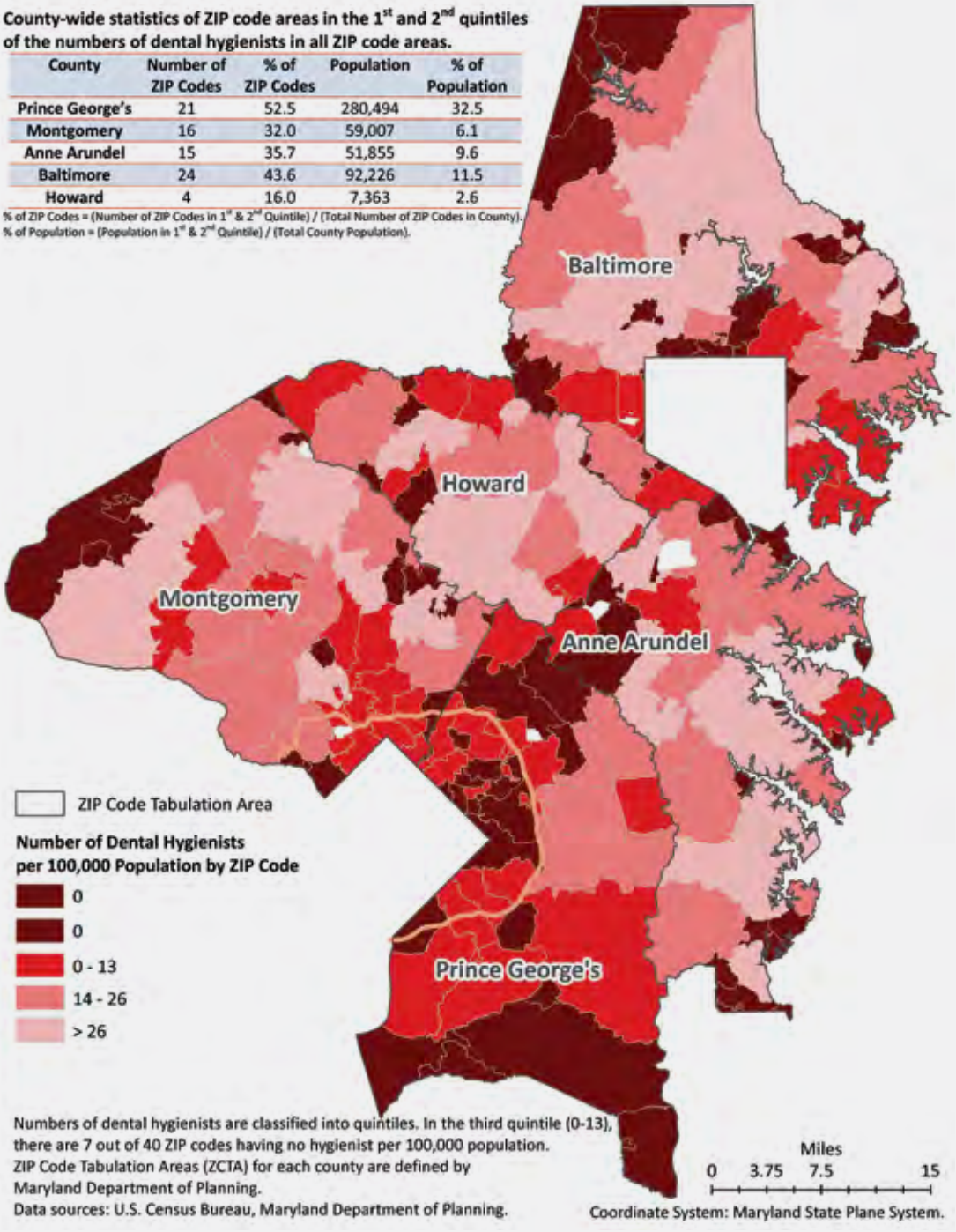
Within Prince George's County, the rates of dental care professionals per 100,000 residents were substantially lower for inner-beltway PUMAs (3, 4 and 7) than for two of the outer-beltway PUMAs (2 and 5). For the inner-beltway areas, the rates ranged from 14.9 to 54.9, while the rates for outer-beltway areas ranged from 61.6 to 82.3. Additionally, the lowest rate in the outer-beltway PUMAs (61.6) was greater than the highest rate in the inner-beltway PUMAs (54.9) (Figure 29).

FIGURE 28 GIS ANALYSIS OF DENTAL HYGIENISTS PER 100,000 RESIDENTS BY JURISDICTION, 2011

County-wide statistics of ZIP code areas in the 1st and 2nd quintiles of the numbers of dental hygienists in all ZIP code areas.

County	Number of ZIP Codes	% of ZIP Codes	Population	% of Population
Prince George's	21	52.5	280,494	32.5
Montgomery	16	32.0	59,007	6.1
Anne Arundel	15	35.7	51,855	9.6
Baltimore	24	43.6	92,226	11.5
Howard	4	16.0	7,363	2.6

% of ZIP Codes = (Number of ZIP Codes in 1st & 2nd Quintile) / (Total Number of ZIP Codes in County).
% of Population = (Population in 1st & 2nd Quintile) / (Total County Population).



Numbers of dental hygienists are classified into quintiles. In the third quintile (0-13), there are 7 out of 40 ZIP codes having no hygienist per 100,000 population.
ZIP Code Tabulation Areas (ZCTA) for each county are defined by Maryland Department of Planning.
Data sources: U.S. Census Bureau, Maryland Department of Planning.

Coordinate System: Maryland State Plane System.

MENTAL HEALTH PROFESSIONALS

In 2011, there were approximately 13,266 mental health professionals (licensed social workers (3,849), licensed psychologists (1,762), psychiatrists (456) and licensed counselors (2,156) practicing in Maryland. Of this number, 8,223 practiced in the five selected jurisdictions and 905 in Prince George's County; 396 social workers, 114 licensed psychologists, 31 psychiatrists and 364 licensed counselors.

For Prince George's County, the rates of mental health professionals were the lowest (104.8 per 100,000 residents) among five jurisdictions. This rate was less than half of the average rate for the state of Maryland (229.8 per 100,000 residents). Anne Arundel County had the second-lowest rate among the five counties, 166.3 per 100,000 residents, but this rate was 60 points higher than the rate of Prince George's County. All other jurisdictions (Baltimore, Howard and Montgomery counties) had rates that were approximately three times that of Prince George's County (Figure 30).

For a more detailed analysis of the mental health professional workforce distribution by ZIP code level, the geographical map of mental health professionals per 100,000 residents was examined (Figure 31). When we define the bottom quintile of the rates as the high primary care-need area (i.e., < 61 mental health professionals per 100,000 residents), we see that Prince George's County contained 14 ZIP codes (35 percent of all Prince George's County ZIP codes) that fell into this area, where 266,659 people (30.9 percent of all Prince George's County residents) resided. Baltimore County contained eight ZIP codes in this high primary care-need area, with 65,933 residents (8.2 percent of all Baltimore County residents).

Within Prince George's County, the rates per 100,000 residents were substantially lower for inner-Beltway PUMAs (1, 3, 4 and 7) than for the outer-Beltway PUMAs (2, 5, and 6). For the inner-Beltway areas, the rates ranged from 37.5 to 81.9, while the rates for the outer-Beltway areas ranged from 107.6 to 169.7. Additionally, the lowest rate in the outer-Beltway PUMAs (107.6) was greater than the highest rate in the inner-Beltway PUMAs (81.9) (see Figure 32).

FIGURE 29 LICENSED DENTAL CARE PROFESSIONALS PER 100,000 RESIDENTS, BY PUMA, 2011

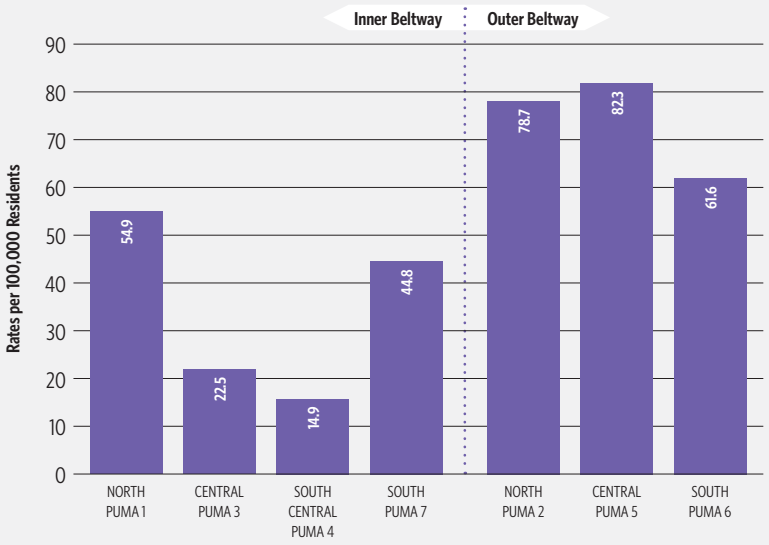
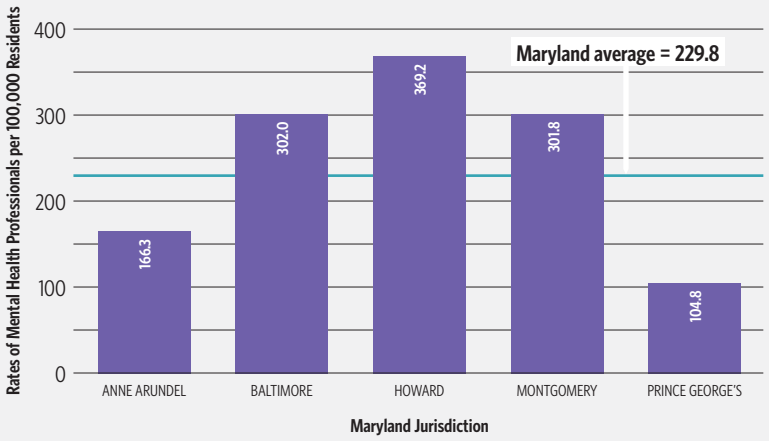


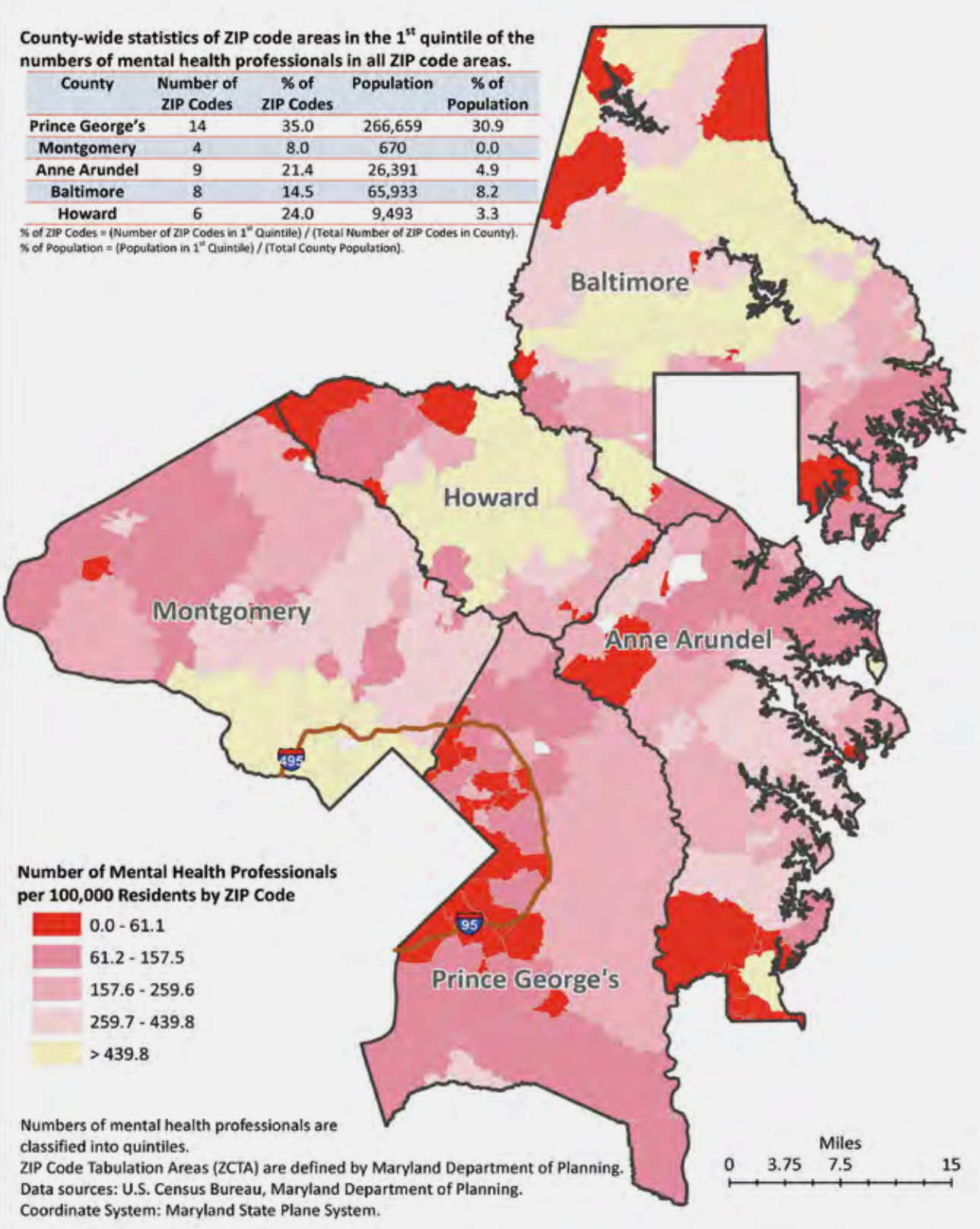
FIGURE 30 RATES OF MENTAL HEALTH PROFESSIONALS PER 100,000 RESIDENTS BY JURISDICTION, 2011



SUMMARY

This part of this investigation assessed the distribution of the health care workforce associated with primary care, including: primary care physicians, nurse practitioners, physician assistants, dental care professionals (dentists and dental hygienists), and behavioral and mental health professionals (psychologists, psychiatrists,

FIGURE 31 GIS ANALYSIS OF MENTAL HEALTH PROFESSIONALS PER 100,000 RESIDENTS BY JURISDICTION, 2011



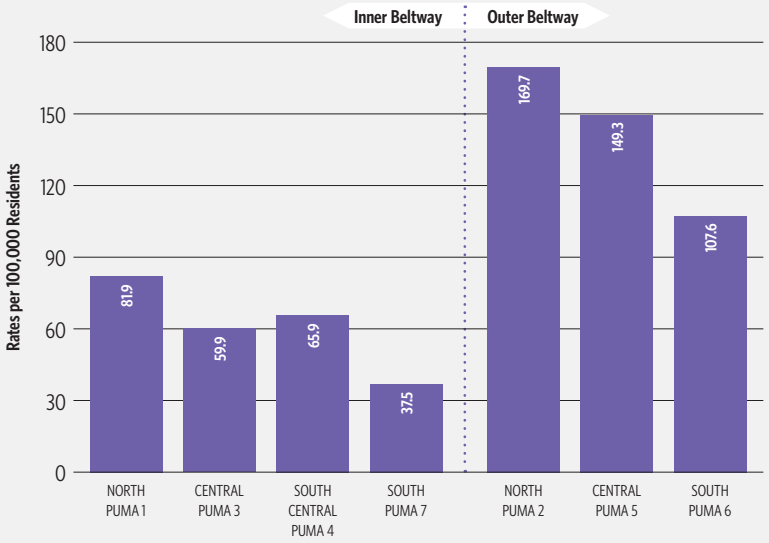
County	Number of ZIP Codes	% of ZIP Codes	Population	% of Population
Prince George's	14	35.0	266,659	30.9
Montgomery	4	8.0	670	0.0
Anne Arundel	9	21.4	26,391	4.9
Baltimore	8	14.5	65,933	8.2
Howard	6	24.0	9,493	3.3

clinical social workers, counselors and therapists). In addition, this investigation assessed the level of primary care need based on quantifying the provider-to-population rates.

Three major analyses were conducted on Prince George's County and four neighboring counties:

- Between jurisdictions
- Within ZIP codes
- Within Prince George's County Public Microdata Areas (PUMAs)

FIGURE 32 LICENSED MENTAL HEALTH PROFESSIONALS PER 100,000 RESIDENTS, BY PUMA, 2011



PRIMARY CARE PHYSICIANS

The results indicated that the primary care physician workforce for Prince George's County was substantially less than the neighboring jurisdictions. Specifically, the rate of primary care physicians for Prince George's County was below the average rate of primary care physicians per 100,000 residents in Maryland, and below any of the four neighboring jurisdictions. When considering the lowest two quintiles as the high primary care-need area, the rate of primary care physicians supply was smaller than or equal to 9.6 per 100,000; 138,677 residents (16.2 percent of the population) in Prince George's County lived in this area. The overlay geographical analysis case studies indicated that there was a disparity between the primary care physician locations and the rates of myocardial infarction and asthma hospital discharges.

Within Prince George's County, some disparities were observed. Overall, the outer-Beltway areas (PUMAs 2, 5, and 6) had higher rates than the inner-Beltway areas (PUMAs 1, 3, 4 and 7). The average rate of primary care physicians per 100,000 residents in the outer Beltway was about 20 points higher than that of the inner Beltway (66.9 vs. 40.8). It was also noted that inside the Beltway, the rate for PUMA 7 (64.5) was substantially higher than for other PUMAs inside the Beltway, which had rates in the 30s). In the outer Beltway, the rate for PUMA 6 (37.0) was substantially lower than in the other two PUMAs (94.1 and 69.7).

PHYSICIAN ASSISTANTS

The results indicated that the physician assistants' workforce for Prince George's County was substantially lower than the neighboring jurisdictions. Specifically, the rate of physician assistants for Prince George's County was just about half of the Maryland average and at least 30 points below any of the four neighboring jurisdictions. Furthermore, when considering the lowest two quintiles as the high primary care-need area, the rate of physician assistants supply was smaller than or equal to 15.6 per 100,000 residents; 572,102 individuals (66.3 percent of the population) in Prince George's County lived in this area. Overall, the outer-Beltway areas (PUMAs 2, 5 and 6) in Prince George's County had higher rates than the inner-Beltway areas (PUMAs, 1, 3, 4 and 7). However, the rate for PUMA 4 was substantially higher than other PUMAs inside the Beltway and the rate for PUMA 6, in the outer Beltway, was substantially lower than in the other two PUMAs.

NURSE PRACTITIONERS

The results indicated that the nurse practitioners' workforce for Prince George's County was substantially lower than the average for Maryland and the neighboring jurisdictions. The rate of nurse practitioners for Prince George's County was less than half of the Maryland average and at least 30 points below any of the four neighboring jurisdictions. Furthermore, when considering the lowest two quintiles as the high primary care-need area, the rate of nurse practitioners supply was smaller than or equal to 23.0 per 100,000; 510,554 residents (59.1 percent of the population) in Prince George's County lived in this area. All outer-Beltway areas (PUMAs 2, 5 and 6) in Prince George's County had much higher rates than inner-Beltway areas (PUMAs 1, 3, 4 and 7).

DENTAL CARE PROFESSIONALS

The results indicated that the dental care workforce for Prince George's

County was substantially lower than the neighboring jurisdictions. There are 470 dentists and 148 dental hygienists in Prince George's County in comparison to 1,203 dentists and 375 dental hygienists in Montgomery County.

Specifically, the rate of dental care professionals, when dentists and dental hygienists are combined, for Prince George's County was more than 40 points lower than the Maryland average, and substantially lower than Montgomery and Howard counties. Furthermore, when considering the lowest two quintiles of dental care professionals as the high primary care need Prince George's County has a more substantial proportion of its residents living in this areas, 419.780 residents (48.6 percent of all Prince George's County residents), as compared with Baltimore County with 270,042 residents (33.6 percent of all Baltimore County residents). Only 5.9 percent of Montgomery County's population falls within these same two quintiles. Overall, the outer-Beltway areas (PUMAs 2,5 and 6) in Prince George's County had higher rates than the inner-Beltway areas (PUMAs 1,3,4and 7). However, the rate for PUMA 1 is higher than for other PUMAs inside the Beltway.

MENTAL HEALTH PROFESSIONALS

The results indicated that the mental health workforce for Prince George's County was substantially lower than the neighboring jurisdictions. Specifically, the rate of mental health professionals for Prince George's County was less than half of the Maryland average and was about 200 points below any of the three neighboring jurisdictions (Baltimore, Howard and Montgomery). Furthermore, when considering the lowest quintile as the high primary care-need area, the rate of mental health professionals supply was smaller than or equal to 61.1 per 100,000 residents; 266,659 residents (30.9 percent of the population) in Prince George's County lived in this area. Overall, the outer-Beltway areas (PUMAs 2, 5 and 6) in Prince George's County had higher rates than the inner-Beltway areas (PUMAs 1, 3, 4 and 7).

ADDITIONAL CONSIDERATIONS AND OVERALL SUMMARY

These findings reinforced the previous reports conducted by RAND (Lurie, Harris, Shih, Ruder, Price, Martin, Acosta, & Blanchard (2010), by the 2010 Primary Care Needs Assessment (DHMH, 2010) and the Maryland Physician Workforce Study (MHCC Extramural Report, 2011). However, the current study expanded on previous studies by including the full range of primary care health care workforce categories, provided an analysis at the ZIP code level, and applied geospatial mapping to investigate the areas of high primary care need and the variations within PUMAs. Prince George's County has a substantially lower number and ratio of primary care physicians, physician assistants, nurse practitioners, dental care professionals and mental health professionals compared with neighboring jurisdictions. The areas that are more affected appear in the inner-Beltway PUMAs, where a large proportion of lower-income African-American/blacks and Hispanics reside, than in the outer-Beltway PUMAs (See Tables 1 and 2).

Even within Prince George's County, there were disparities across ZIP codes. The Prince George's County ZIP code areas that fell within the Beltway (inside the yellow line in Figure 31.) generally had lower rates than ZIP code areas lying outside the Beltway (see Table 3). To contribute to discussions about primary care health care workforce need, we also applied the HRSA provider-to-population ratios for Health Professions Shortage Areas at the PUMA level for primary care physicians (1:2,000), dentists (1:3,000) and mental health professionals, as measured by psychiatrists alone (1:10,000). (HRSA, 2011). Table 4 reflects the findings of this assessment.

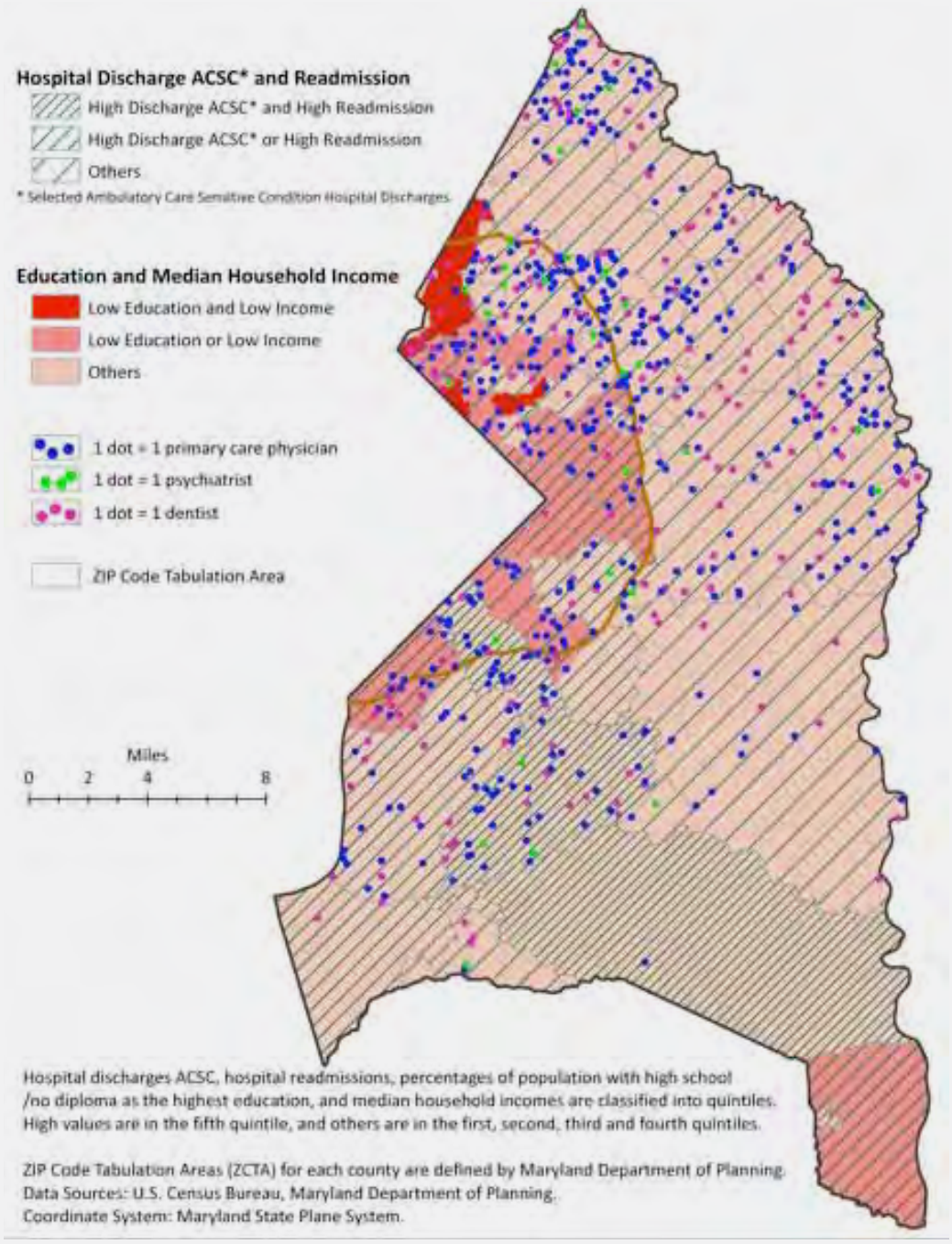
Although the study did not attempt to investigate the reasons for these disparities, the literature suggested that economic factors in the region might influence the recruitment and retention of this professional workforce. Health care workers—particularly those providing direct services—may face many issues related to safety and work benefits in their work environments. The lack of having teaching hospitals with an academic affiliation also may contribute to this challenge of recruitment and retention. These factors should be carefully studied in future assessments of the health care workforce. They should also be considered in any attempts to understand why Prince George's County had substantially lower rates of health care workers than other comparable counties in Maryland.

Figure 31 presents an integrated map of Prince George's County consisting of three areas: 1) the

ambulatory care sensitive-condition hospital discharges and readmissions; 2) demographics of education and median household income and 3) the geographical distribution of health care workforce of primary care physicians, psychiatrists and dentists.

LIMITATIONS The ZIP code-level data analysis may provide more detailed sub-county-level information, but it is not without limitations. Some ZIP codes located in the sparsely populated areas of the county have a small number of residents and are thus more likely to have no patient care professionals providing care in the area. As a result, the rate computed for such areas is zero. On the other hand, if it happens that one or a few patient care professionals do provide services in these areas, the resulting rate could be

FIGURE 33 INTEGRATED MAP OF PRINCE GEORGE'S COUNTY CONSISTS OF HOSPITAL DISCHARGES AND READMISSIONS; EDUCATION AND MEDIAN HOUSEHOLD INCOME; AND THE GEOGRAPHICAL DISTRIBUTION OF HEALTH CARE WORKFORCE



unrealistically high. These zeros and inflated rates may become "noise" for the true pattern of the rates of patient care workforce computation and for the geographical mapping.

FUTURE CONSIDERATIONS The ZIP code-level patient care workforce data analysis may be compared to the health professional shortage areas (HPSAs), medically underserved areas (MUAs) and medically underserved populations (MUPs). Currently, the HPSA data is based on the census tracts, which do not match with the ZIP code areas, making it difficult to combine the patient care workforce data with HPSAs without the alignment with the ZIP code. Future studies may also consider the socioeconomic index in relation to geographical mapping and the patient care workforce. Multiple density clustering—i.e., clusters of residents, clusters of patients and clusters of the patient care workforce—may also be considered.

PUMAs are generally useful in categorizing regions within Prince George's County. However, since each PUMA consists of more than 100,000 residents, the sub-county-level analysis of patient care workforce by PUMA may lose some necessary granularity. Breaking some or all of the PUMAs down into two to three regions might better illustrate the socio-demographic profile of the residents and the supply of the patient care workforce.

In the past, the definition of active physicians varied from study to study, making the results incomparable. Our definition of active physicians was perhaps more stringent than in other studies. Though the physician counts appeared to be smaller than that of the previous reports, our study could reflect more of the true patient care workforce. In the future, the tallying of physicians and other applied patient care workforce may be standardized so that studies on Maryland's patient care workforce can be compared across years.

TABLE 3 THE RATES OF HEALTHCARE WORKFORCE PER 100,000 POPULATION BY TYPE AND BY PUMA FOR PRINCE GEORGE'S COUNTY

Region	Primary Care	Physician Assistant	Nurse Practitioner	Dentist	Dental Hygienist	Mental Health
Inner Beltway						
PUMA1	35.6	17.3	11.6	54.9	15.4	81.9
PUMA3	36.4	21.4	10.7	22.5	2.1	59.9
PUMA4	30.8	51.9	7.9	15.9	4.4	65.9
PUMA7	64.5	14.6	4.2	44.8	4.2	37.5
Outer Beltway						
PUMA2	94.1	74.7	36.0	78.7	18.5	169.7
PUMA5	69.7	61.6	49.6	82.3	32.1	149.3
PUMA6	37.0	18.8	24.3	61.6	27.0	107.6

TABLE 4 THE NUMBER OF THREE HEALTH CARE WORKFORCE WORKERS NEEDED BY PUMA, PRINCE GEORGE'S COUNTY

Region	Current PCP count	Number of PCPs needed	Current dentist count	Number of dentists needed	Current psychiatrist count	Number of psychiatrists needed
Inner Beltway						
PUMA1	37	**15**	57	**0**	3	**7**
PUMA3	34	**13**	21	**10**	4	**5**
PUMA4	35	**22**	17	**21**	2	**9**
PUMA7	62	**0**	43	**0**	1	**9**
Outer Beltway						
PUMA2	102	**0**	85	**0**	9	**2**
PUMA5	128	**0**	151	**0**	7	**11**
PUMA6	67	**24**	96	**0**	5	**13**

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APPENDIX A

TABLE A1 PRINCE GEORGE'S COUNTY HEALTH CARE WORKFORCE PER 100,000 RESIDENTS BY ZIP CODE

ZIP CODE	Primary Care Physicians	Nurse Practitioners	Dentists	Psychiatrists
20601	346.0	1730.1	2076.1	173.0
20607	0.0	20.5	10.2	0.0
20608	0.0	0.0	0.0	0.0
20613	9.7	29.2	19.4	0.0
20623	0.0	72.9	0.0	18.2
20705	11.5	30.7	23.1	0.0
20706	85.3	31.0	43.9	2.6
20707	147.2	38.4	128.0	8.0
20708	54.8	27.4	66.5	0.0
20710	21.5	0.0	10.7	0.0
20712	0.0	0.0	44.3	0.0
20715	37.9	37.9	117.5	1.9
20716	115.5	57.7	129.9	2.4
20720	9.5	80.8	61.8	0.0
20721	40.7	59.2	103.6	1.9
20722	70.0	35.0	0.0	0.0
20735	90.3	11.3	81.9	4.2
20737	62.9	19.3	38.7	0.0
20740	76.4	10.4	76.4	3.5
20742	51.2	0.0	0.0	19.2
20743	0.0	2.6	18.1	0.0
20744	41.4	13.8	55.2	0.0
20745	38.7	7.0	84.4	0.0
20746	69.4	0.0	20.8	0.0
20747	20.0	10.0	12.5	1.2
20748	79.9	5.2	33.5	1.3
20762	0.0	0.0	0.0	0.0
20769	166.6	60.6	45.4	0.0
20770	154.9	47.7	87.4	7.9
20772	28.2	49.3	70.4	0.0
20774	86.0	46.5	74.4	2.3
20781	43.7	0.0	26.2	0.0
20782	42.5	19.6	58.9	1.6
20783	4.5	6.7	38.2	0.0
20784	20.4	13.6	17.0	1.7
20785	77.0	11.4	14.3	1.4

APPENDIX B: ADDITIONAL DOCUMENTATION METHODS FOR SECTION 1

This appendix describes our methods for additional analyses required for Section I of the Study report and includes an overview of our approach for designating and projecting primary care workforce areas of need and delineation of ZIP codes with high primary care need.

PRIMARY CARE WORKFORCE NEED BY GEOGRAPHIC AREA

This following step by step approach describes our approach to assessing primary care workforce need and resulted in the generation of Map A and the table of estimated counts for primary care providers by PUMA in Section I.

1. Initial identification of counts of primary care professionals was provided for physicians, nurse practitioners, physician assistants, dentists, dental hygienists, social workers, psychologists, and counselors and therapists. (See Technical Report on Physician Counts and Technical Report on Geographic Mapping and Primary Care Providers)

2. We used Public Use Microdata Areas (PUMAs) as the geographic footprint in County. This approach, rather than using ZIP code provider ratio data, was recommended by DHMH (Office of Primary Care). We adjusted the PUMAs to ensure that estimated populations capture County residents, given that some ZIP codes overlap geographic boundaries with other counties.

3. For projections we focus only on the Health Resources and Services Administration (HRSA) categories for primary care providers: medical (primary care physicians), dental (dentists), and mental health (core mental health providers and/or psychiatrists).

4. Specific approach for each category of health providers follows:

   4.1 Primary care physicians are defined by four specialties (general or family practice; pediatrics; internal medicine; and obstetrics and gynecology). Similar to HRSA, we have counted only non-federal physicians (of medicine and osteopathy) providing direct patient care; and do not include physicians who participate solely in teaching, research and/or administration without practice. Unlike HRSA we have not fractionated the hours per physician. Our count includes physicians who report practicing 20 hours or more a week. Each such physician is considered "a count." Unlike HRSA, we have not included interns and residents; we include all physicians who have designed Prince George's County as a primary practice location. To ensure quality of care, we only count physicians who report being Board Certified in their respective specialties. This is not mentioned in the HRSA guidance. Physicians who are counted are those who have a practice in the county. This could be a primary or secondary practice.

   4.2 Dentists include any licensed dentist in the County. Most dentists are general practitioners, so no attempt was made to separate general practitioners from specialists.

   4.3 Mental health workers were reviewed in two ways:

   a. Board certified psychiatrists, or

   b. Core Mental Health Providers, defined as Board certified psychiatrists, psychologists, clinical social workers, and therapists/counselors. We use a modification of the HRSA definition of "core mental health professionals," minus psychiatric nurse specialists, for our initial assessment. The HRSA definition from Criteria for Mental Health HPSA states: "Core mental health professionals or core professionals includes those psychiatrists, clinical psychologists, clinical social workers, psychiatric nurse specialists, and marriage and family therapists..."

   c. We did two assessments: a separate assessment for psychiatrists alone and then a second, for the aggregated core mental health professionals that include psychiatrists, clinical psychologists, clinical social workers and marriage and family therapists (as noted from HRSA above). In our state data base we have one list for therapists and counselors for the latter.

Personal Communication with staff at Office of Primary Care, DHMH regarding general approach; and for advice on how to approach mental health workers.

5. The HRSA criteria for provider to population ratios used to designate a Health Professions Shortage Area were reviewed:

   5.1 Primary Medical Care HPSA includes a:

   Ratio of at least 1:3,500, or a Ratio of greater than 1:3,000 if there are other "high needs for primary care services, or insufficient capacity of existing primary care providers."

   5.2 Dental HPSA includes a:

   Ratio of at least 1:5,000, or a Ratio of worse than 1:4,000 and with unusually high needs for dental services as shortage

   5.3 Mental Health HPSA

   The HRSA criteria for mental health providers are not clear. We got advice from DHMH to proceed with looking at both provider categories and ratio levels.

   For ratios: To determine a need we used 1: 30,000 and worse for a shortage of psychiatrists alone; and 1:10,000 and worse for the core mental health professionals.

   Ratios in item #5 were obtained from HRSA site: *bhpr.hrsa.gov/shortage/hpsas/designationcriteria/primary-carehpsaoverview.html* accessed 5/31/12

6. HRSA also mentions other ratios as "meeting the need for primary care providers" with the following ratios. **We used these ratios as indicating a "sufficient" workforce capacity and applied these to determine additional counts of these providers needed by PUMA.**

   Physicians: 1:2,000
   Dentists: 1:3,000
   Core Mental Health providers: 1:10,000

   Ratios in item #6 were obtained from HRSA site: *bhpr.hrsa.gov/shortage* accessed 5/31/12

7. Logic for identifying "Need" for primary care providers

   7.1 We considered immediate need; not a projected future need.

   7.2 We acknowledge, but do not separate specialties within the primary care physician category.

   7.3 Need is based on 2010 population census

   7.4 We do not adjust according to population practices, but acknowledge them.

   7.5 We recognize that provider counts needed may change over time depending upon provider mix, but acknowledge that this is not taken into account for this exercise.

8. We applied the aforementioned approach to create Map A in Section 1 that identifies ZIP codes with three levels of primary care physician ratios.

9. We also applied the aforementioned approach and used the ratios from item #6 to develop our estimation of need for each of the three provider categories. The resulting table is presented in Section I in response to the identification of primary care workforce need by geographic area. The additional counts needed are based on the number needed to add to the base counts in order to reach the respective recommended ratio for each PUMA. Using the seven PUMAs in the County we identified the count of each category of health provider and determined the additional count needed to reach the ratio considered to be sufficient: 1:2,000 for primary care physicians; 1:3,000 for dentists; and 1:10,000 for core mental health providers. Where the existing base counts were sufficient to meet the recommended ratio, no additional workforce counts are noted. We then added the individual PUMA specific additional counts needed to reach the total additional count needed for that sub-county level. While we did not find a shortage using "core mental health providers" we did when only psychiatrists were used. This area warrants further study.

ZIP CODES WITH HIGH PRIMARY CARE NEED

To determine geographic areas that reflect high primary care need we developed an algorithm using workforce, health care and population factors applied at the ZIP code level. These categories and respective criteria selected are ones that have been shown to be associated with primary care, such as the ratio of primary care providers to population. Hospital events, such as the proportion of discharges that were considered ambulatory care sensitive hospitalizations

and the rate of 30 day readmissions, reflect care that could have been averted and managed outside the hospital within a primary care network. Finally population characteristics, such as education and income levels, have been associated with lower levels of health and low levels of recommended health care utilization.

We provide our rationale and approach for each of these factors and for the algorithm. We stress that we view this assessment as preliminary and a complement to the assessment of primary care physician to population ratios provided in Map A. Three categories of criteria were used to estimate primary care need in the County by ZIP codes.

Better health outcomes have been demonstrated when the number of primary care physicians is sufficient to serve a given population. We applied one of the criteria that Health Resources and Services Administration (HRSA) uses to designate Health Professions Shortage Areas as described earlier. HRSA designates a geographic area with a primary care physician to population ratio of at least 1:3,500 or worse as a shortage area, while a ratio of 1:2,000 is viewed as sufficient. If this ratio is equal to or worse than the equivalent to one provider to 3,500 individuals, then we viewed this area having a primary physician shortage area. If the ratio is equal to or better than the equivalent to one provider to 2,000 individuals, then we viewed this area as having sufficient primary care physicians. Ratios that fall within these two parameters are considered at risk for a shortage of providers.

We used ZIP code level data from two hospital events for County residents: an index that captures hospital discharges for conditions that are ambulatory care sensitive, referred to as the Prevention Quality Indicator (PQI) and the 30-day readmission rate. Both of these events reflect the level of primary care capacity in the community. High rates are associated with lower primary care capacity. We used values at or above the average rate for each of these factors as indicating a primary care need. These data come from Technical Report 6. The average rate for the PQI is 20.2 and for the 30-day readmission rate is 10% (.10).

For the population characteristics we used the median income for each ZIP code population and education. Education was defined by the criteria of the proportion of individuals 25 years of age or older who attended high school but did not receive a diploma. If the ZIP code population was equal to or higher than the average for the County we considered this to reflect lower educational attainment. For income we used the median income for the County as an indicator. If the median income for the ZIP code was equal to or lower than the median income for the County we considered this to be low income.

A summary of the criteria for each of these categories follows:

Primary Care Physicians, derive provider to population PCP ratio per ZIP code and use:

- PCP worse than 1:3,500 ratio for High Need, and
- PCP worse than 1:2,000 but better than 1:3,500 for Trending to High Need,

Hospital Events:

- PQI for ZIP code is 20% or greater (20.2% is average for County Zip codes 2007-2009), and
- 30 Day Readmission for ZIP code is 10% or greater (10% is average for County Zip codes 2007-2009).

Population Characteristics:

- ZIP code percent of population 25 years and older who attended high school but did not get a diploma is 10.5% or greater than 10.5%, and
- ZIP code median family income is $58,353 or lower.

These categories and respective criteria were then applied according to the following algorithms to define need for primary care:

High Need
HIGH NEED = PCP worse than 1:3,500 PLUS one or both of PQI or Readmission PLUS one or both of education and income

Trending to HIGH NEED (approaching highest need for primary care):
Trending to HIGH NEED = PCP worse than 1:2,000 but better than 1:3,500 PLUS one or both of PQI or Readmission PLUS one or both of education/income

MEDIUM NEED (has several indicators of need in each of two of three categories, but not in all):
MEDIUM NEED = PCP worse than 1:2,000 but better than 1:3,500 PLUS one or both of PQI or Readmission OR one or both of education/income

ADEQUATE (appears to be able to meet primary care need)
ADEQUATE = None of the criteria used to determine need were met.

The following table documents Prince George's County ZIP code specific data for each of the five factors and identifies the outcome of applying the algorithm we developed to identify primary care need. This includes: High Need, Trending to High Need, Medium Need, Some Need (with presence (+)

or absence (-) of the three categories delineated), and Adequate. We used these designations to create Map B in Section I.

FINDINGS

Applying this approach, seven ZIP codes fall into the High Need category: Aquasco, Brandywine, Bladensburg, Mount Rainier, Capital Heights, District Heights and one ZIP code of Hyattsville. Three additional ZIP codes are trending toward High Need: these include two more ZIP codes in Hyattsville and one in Oxon Hill. Areas of Medium Need have been identified for 7 ZIP codes. Of the remaining ZIP codes, all but two (Beltsville and one part of Bowie) have a low ratio of primary care physicians to population, but do not meet any of the other criteria used for this assessment. For this analysis, these two areas fall within the trending to Medium Need category. However, if decisions are to be made solely on provider to population ratios, these two areas would fall in a higher need category.

LIMITATIONS

Our algorithm is a crude measure and does not give weights to the different factors. It also does not assess other measures of primary care need such as infant mortality rates or availability of safety net clinics.

ZIP CODES AND TOWN/AREAS BY PRIMARY CARE PHYSICIAN RATIO, PREVENTION QUALITY INDICATOR (PQI), 30 DAY READMISSION RATES, PROPORTION OF POPULATION WITH ONLY HIGH SCHOOL EDUCATION AND ZIP CODE MEDIAN INCOME

Zip Code	Town/Area	Primary Care Physician: 100K	Any PQI per ZIP code	Readmission Rate for 2009 for ZIP code	Proportion with HS education but no diploma in ZIP code	Median Income for ZIP code	Identification of Type of Need and Other Status
20601	Waldorf	346.0	0.25	0.00	8.6	66125	Adequate
20607	Accokeek	0.0	17.65	0.13	7.8	82060	Medium
20608	Aquasco	0.0	33.73	0.08	21.8	61354	High
20613	Brandywine	9.7	31.37	0.12	13.4	62842	High
20623	Cheltenham	0.0	15.31	0.11	4.8	78889	Medium
20705	Beltsville	11.5	14.09	0.04	6.0	60149	+--
20706	Lanham	85.3	24.19	0.10	10.2	58528	-+-
20707	Laurel	147.2	20.96	0.05	8.5	53006	-++
20708	Laurel	54.8	18.95	0.04	8.6	52129	--+
20710	Bladensburg	21.5	25.34	0.05	21.4	35112	High
20712	Mount Rainier	0.0	20.26	0.03	17.3	35889	High
20715	Bowie	37.9	14.37	0.11	4.5	76206	Medium
20716	Bowie	115.5	14.82	0.09	4.5	72641	Adequate
20720	Bowie	9.5	11.74	0.10	4.7	83728	Medium
20721	Bowie	40.7	14.32	0.09	1.7	94851	+--
20722	Brentwood	70.0	30.99	0.07	20.3	44928	-++
20735	Clinton	90.3	36.05	0.14	7.9	71317	-+-
20737	Riverdale	62.9	19.87	0.06	16.0	46427	-++
20740	College Park	76.4	9.17	0.07	8.3	50844	--+
20742	University of Maryland	51.2	0.38	0.00	-	-	NA

Zip Code	Town/Area	Primary Care Physician: 100K	Any PQI per ZIP code	Readmission Rate for 2009 for ZIP code	Proportion with HS education but no diploma in ZIP code	Median Income for ZIP code	Identification of Type of Spot and Other Status
20743	Capitol Heights	0.0	48.32	0.07	18.5	44197	High
20744	Fort Washington	41.4	27.27	0.14	7.0	74933	Medium
20745	Oxon Hill	38.7	31.14	0.14	15.0	42247	Trending to High
20746	Suitland	69.4	29.27	0.08	12.2	43566	-++
20747	District Heights	20.0	32.03	0.09	13.3	47663	High
20748	Temple Hills	79.9	32.56	0.12	11.4	51578	-++
20762	Andrews Air Force Base	0.0	0.67	0.33	2.8	44310	DROP
20769	Glenn Dale	166.6	15.60	0.08	5.0	91066	Adequate
20770	Greenbelt	154.9	14.14	0.08	5.2	46200	--+
20772	Upper Marlboro	28.2	20.48	0.09	8.1	73612	Medium
20774	Upper Marlboro	86.0	18.76	0.07	6.2	70019	Adequate
20781	Hyattsville	43.7	20.54	0.05	12.6	45883	Trending to High
20782	Hyattsville	42.5	21.24	0.04	11.9	43783	Trending to High
20783	Hyattsville	4.5	16.50	0.02	15.9	43345	Medium
20784	Hyattsville	20.4	23.23	0.08	11.7	49834	High
20785	Hyattsville	77.0	36.49	0.06	15.8	43108	-++

TECHNICAL REPORT 5

An Overview of the Public and Public Health Resources in Prince George's County

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INTRODUCTION

To contribute to the answer of the question, "What resources can be mobilized in the public health sector to complement the impact of the health care system?," we undertook a high-level overview of Prince George's County public and public health-sector resources.

We interpreted this question to reflect both existing and potential public health-sector resources that could be mobilized to complement the impact of the health care system. The design of a new health care system requires we extend and link with existing resources that provide support to population health. It also offers the opportunity to review the basic functions of public health in light of a new system design. Support for population health depends on the expertise and services that underpin these basic functions: assessment, policy development and assurance. This support also includes the full scope of services, from clinical comprehensive or specialty health care services, screening and referral programs to health education and counseling services. Ideally the decision as to which resources in the public health sector to mobilize and how they can be mobilized should be considered at the initial stages of the design of a new health care system. This would permit integrated system planning dedicated to identifying programmatic foci of a new system and to activities that contribute to improvement in the priority health outcomes. It also would permit a review of the capacity of basic public health functions to support an enhanced and modified new system. The result would be the mobilization of a tailored set of resources to complement the system's effectiveness and reach.

We also have interpreted this question to include population health improvement as a focus of the impact. The opportunities and challenges related to partnerships and linkages among public health and medicine have received renewed interest. The focus on population health is a centerpiece of public health practice and programs. The recent health care reform initiatives and legislation have reinforced the need to address population health, not just the health of individuals who seek care. Stine and Chokshi (2012) highlight the opportunity for these partnerships to address population health in an era of economic austerity and use the resulting partnerships to provide more efficient and cost-effective services and care. These authors highlight Maryland's State Health Improvement Process as one example of an "effective collaboration between health systems and public health departments." This state resource and the County's Health Improvement Plan provide the foundational processes and documents for collaboration support and accountability. The definition of integrating primary care and public health is well-stated in the IOM Report, "Primary Care and Public Health: Exploring Integration to Improve Population Health (IOM, 2012)": "The linkage of programs and activities to promote overall efficiency and effectiveness and achieve gains in population health." This report also provides a framework that defines the spectrum of degrees of integration. Ultimately, awareness of existing and needed public health-sector resources in the context of the overall health care system redesign should facilitate effective partnerships.

METHODS

Within the parameters of this study, we took a preliminary step in capturing a high-level "snapshot", as of early 2012, of traditional public health-sector programs, programs that service vulnerable populations and programs that support the public's ability to maintain their health and quality of life in Prince George's County. This technical report is designed to give a "flavor" of the scope of resources, primarily those that are situated within the public sector and are of importance to population health throughout the lifespan. They are designed to be used as a

basis for determining which categories should be pursued for an in-depth assessment of capacity and ability to be mobilized. A more specific look at the behavioral and mental health programs available in the County and a brief summary of the dental programs is provided. Subsequent steps would require targeted discussions with and among entities in the County. This would need to be followed by detailed assessments of selected resources in order to delineate capacity and ability to be mobilized. We believe this assessment will best be done in tandem with the programs identified for the new system.

We used the following approach to identify and categorize the resources:

- We focused on resources that are available to individuals who are most at risk for prevalent health conditions as well as resources that are available to all County residents that do not require additional eligibility. In addition, emphasis was placed on resources that support health promotion, disease prevention and early diagnosis and care, rather than tertiary care.
- A detailed search was conducted, primarily Internet-based, to identify and determine the scope of services for all entities providing the delineated range of health and health-related services.
- Members of the advisory committee were asked to provide suggestions for inclusion. These suggestions were incorporated into the appropriate categories and reports.
- All identified entities and their specific addresses are identified by street address and select entities are mapped and included in Technical Report #3 to permit review by geographic area and type. In addition, the geographic locations of the safety net clinics were used as part of the econometric model found in Technical Report #6.

FINDINGS

The County includes a broad array of programs that provide services to specific populations and contribute to the general wellness and quality of life of all County residents. These programs and resources are included:

- Prince George's County Health Department Services
- Safety net programs
- Hospital community health benefit activities
- Behavioral and mental health facilities and programs
- Prince George's County School programs/services
- Nursing homes and long-term care facilities
- Department of Parks and Recreation
- University of Maryland Extension

We recognize that the academic and community-related programs in the County provided by Bowie State University, Prince George's County Community College and the University of Maryland, College Park campus are an asset.

PRINCE GEORGE'S COUNTY HEALTH DEPARTMENT

The mission of Prince George's County Health Department (PGCHD) is "to protect the public's health, assure availability of and access to quality health care services and promote individual and community responsibility for the prevention of disease, injury and disability." (PGCHD, 2012) PGCHD serves as the County's public health sector centerpiece and provides a broad range of programs and services to County residents.

The programs offered by the PGCHD are housed in 11 locations dispersed throughout the County. Table 1 and Table 2 identify the programs, by name, according to the primary population or condition being addressed. These programs reflect the identified needs of the County and the commitment made to support maternal and child health, address substance use and mental health, and infectious diseases. The majority of the programs and services provide general screening and referral, health education and counseling services, and about one-third provide clinical care.

In addition to the PGCHD programs, there are four School-Based Wellness Centers under the auspices of the department. These centers provide comprehensive social and health services and are located in four of the County's public high schools: Bladensburg High School, Fairmont

Heights High School, Northwestern High School and Oxon Hill High School. The goal is to "make students available for learning by promoting health, preventing disease, and reducing behavioral risks." (PGCHD, 2011). Services include physical examination, laboratory testing, mental health counseling, treatment of common illnesses, gynecological care, on-site screening/treatment of sexually transmitted infections, dental care and immunizations.

The Prince George's County Health Improvement Plan 2011 to 2014 sets the agenda for the "Blueprint for a Healthier County." (PGCHD, 2011) This plan and the PGCHD programs provide the basis for identifying resources that can be mobilized to support a new health care system.

Our study of 13 comparable health care systems reveals that public health departments and federally qualified community health centers were mentioned most often by the 13 interviewed health care systems as potential public health resources that can be mobilized to complement the health care system's impact on health outcomes. It is interesting that many of the health systems mentioned public health departments as complementary sources of funding, despite the funding cuts currently underway by federal, state and local governments to public health programs. This means that health systems still expect public health departments to fulfill their public health missions despite the funding cuts. Interviews with the systems provided additional evidence of the value of these community health centers.

The different health systems have many creative ideas when it comes to mobilizing public health resources that may be useful for Prince George's County to take into consideration when designing their new health system. Some of these are already part of the state-supported initiatives, such as funding that comes from a state tobacco tax and the receipt of the Community Transformation Grants from the Centers for Disease Control and Prevention (Maryland Department of Health and Mental Hygiene now holds). Other initiatives included: a state health department-sponsored Chronic Care Initiative that requires insurers to participate; an integrated, collaborative system or community coalition with community

TABLE 1 PRINCE GEORGE'S COUNTY HEALTH DEPARTMENT PROGRAMS BY POPULATION

Population	Program
Infants	Healthy Start Program
	Infant at Risk Program
	Infants and Toddlers Program
Children/Teens	Care for Kids Program
	Dental Health Program
	Healthy Teens and Young Adult Center
	Healthy Teens Center
	Immunization Program
	Oasis Youth Services
	Operation Safe Kids
	Youth and Community Services Program
Women—Maternity	Dental Health Services
	Regional Access Centers
	Tapestry Program
Women—General	Breast and Cervical Cancer Program
	Healthy Women/Healthy Lives
	Maternal Health and Family Planning
Family	Food Protection Program
	Healthline
	Medical Assistance for Families
	Women, Infants and Children
Adults	Cancer Prevention, Education, Screening and Treatment Program (CPEST)
	Medical Assistance Transportation (MAT)
	The Cheverly Adult Services Program
Seniors	Adult Evaluation and Review Services
	Division of Adult and Geriatric Health

health centers; partnering with school systems and employers; and local news media health awareness campaigns.

SAFETY NET PROGRAMS

Safety net programs provide a critical role in the health care delivery system, providing primary care health services to vulnerable and uninsured or underinsured populations. These programs involve federal designation and include designation of medically underserved areas and populations (MUA/MUP) and designation of health professional shortage areas (HPSAs). Such designations identify areas of high need and allow communities to request providers through the National Health Service Corps (NHSC) and establishment of certification of facilities such as federally qualified health centers (FQHCs) or FQHC "look-alike" centers. In addition, state governors can designate areas using state criteria and data approved by the federal government. The latter are primarily used by rural health clinics. Table 3 identifies the programs for the safety nets that are provided by Prince George's County hospitals. Table 4 provides the names and locations of the traditional safety net clinics in the County.

TABLE 2 PRINCE GEORGE'S COUNTY HEALTH DEPARTMENT PROGRAMS BY CONDITION/TOPIC

Condition/Topic	Program
STI/HIV/Disease Control	Epidemiology
	HIV/AIDS Program (HAP)
	Sexually Transmitted Disease (STD) Control Program
	Suburban Maryland Ryan White Part A Administrative Agency
	Tuberculosis Control Program
Substance Abuse/ Mental Health	Alcohol and Other Drugs Prevention Program
	Assessment and Case Management Services
	Division of Addictions and Mental Health
	Southern Region Addictions
	Substance Abuse Services
	Tobacco Cessation Program
	Tobacco Use Prevention, Cessation and Enforcement
Environment/ Emergency Preparedness	Communicable and Vector Borne Disease Control
	Division of Environmental Health
	Environmental Engineering Program
	Plan Review/Institutions Program
	Public Health Emergency Preparedness (PHEP)

Prince George's County has been shown to have a low capacity for providing safety-net care apart from hospital and emergency room care (Lurie et al. 2009). This is in part due to shortages in primary care physicians in poor areas of the County (Lurie et al. 2008). Until 2012, the County had six MUA/MUPs, and was the only County in the state with multiple MUPs (MDHMH, 2010). In early 2012 two more areas were designated.

The County has only one FQHC (Greater Baden Medical Services) that has multiple locations. In addition, two other FQHCs located outside the County, Mary's Center (based in the District of Columbia) and Community Clinic, Inc. (based in Montgomery County) have established clinical sites within the County. Table 4 provides the locations of these centers and clinics. In addition, the ministries in the County and a few non-profits provide services to uninsured and underinsured individuals.

The health care systems we interviewed highlighted the importance of federally qualified health centers (FQHCs) in providing primary care to underserved populations. The Affordable Care Act (ACA) contains provisions to expand FQHCs. Given the magnitude of the uninsured population in the County, it is clear resources must be invested into expanding community health centers.

OUTPATIENT AND COMMUNITY PROGRAMS OFFERED BY HOSPITALS TO THE PUBLIC: A LOOK AT COMMUNITY BENEFIT REPORTS

As a result of the limited safety net, the burden of the uninsured and underinsured extends to the hospitals in the County, particularly Prince George's County Hospital. Programs for the community and that contribute to the

public's health are also provided by the five hospitals in the County. Of these, Dimensions Healthcare oversees two hospitals (Laurel Hospital and Prince George's Hospital) and the Bowie Health Clinic. The latter provides 24-hour, urgent-care services. The services noted by hospitals include health promotion and education programs tailored to health risk reduction, patient support groups, health screenings, immunization programs and community outreach and education materials.

Community benefit reports are provided by each hospital in the state and provide a glimpse into the investment and types of programs offered by hospitals. Reports from each Maryland hospital are collected by the Health Services Cost Review Commission (HSCRC). This process was initiated by the Maryland General Assembly in 2001(Chapter 178 of the 2001 Laws of Maryland, and codified under Health-General Article %19–303 of the Maryland Annotated Code) and the FY 2010 reports reflect the seventh year of this practice.

Community benefit is defined by the Maryland law as "an activity that is intended to address community needs and priorities primarily through disease prevention and improvement of health status, including: health services provided to vulnerable or underserved populations; financial or in-kind support of public health programs; donations of funds, property, or other resources that contribute to a community priority; health care cost containment activities; and health education screening and prevention services." (HSCRC, 2011).

The same report states that community benefits should meet the following criteria: "Ultimately improve the health status and well being of specific populations in the organization's service area who are known to have difficulty accessing care and/or who have chronic needs; generate a low or

TABLE 3 PROGRAMS FOR THE SAFETY NET PROVIDED BY PRINCE GEORGE'S COUNTY HOSPITALS

Hospital	Description of Services
Prince George's Hospital Center	Community support and outreach
	Partial hospitalization and intensive outpatient programs
	Emergency psychiatric services
	Inpatient behavioral health treatment
	Staff is comprised of psychiatrists, counselors, dietitians, pharmacists and social workers.
Doctors Hospital	Offers the "Look Good ... Feel Better" program—a free program designed to help women undergoing cancer treatment adapt to temporary side effects of some cancer therapies.
	Offers a range of services including support groups for various illnesses.
Laurel Regional Hospital	Childbirth education classes
	P.A.C.E. (People with Arthritis Can Exercise)
	Smoking cessation program (four-week program)
	Support groups—Alcoholics Anonymous, Al-Anon, Nar-Anon
	Bi-Polar support group
	Narcotics Anonymous
	Parkinson support group
	Rehabilitation sharing group—strokes and long-time illness
Southern Maryland Hospital Center	Health screenings (i.e. blood pressure, diabetes, cholesterol and triglycerides) and assessments (i.e. cardiac risk)
	Educational materials are available as well as referrals for a variety of specialized areas. Vaccines for pneumonia and the seasonal influenza are also offered.
	Cardiology services—performs EKG/stress tests/Holter Monitors/ echocardiograms (inpatient and outpatient)
	Car seat safety
	Breastfeeding classes
Fort Washington Medical Center	NBC 4 Your Health event—annual health fair; FWMC medical professionals will be on hand to provide assessments and screenings.
	Community health fairs
	Free screenings
	Diabetes management seminar

TABLE 4 TRADITIONAL SAFETY NET CLINICS IN PRINCE GEORGE'S COUNTY

FQHC	Clinic
Greater Baden Medical Services, Inc.* Five locations:	Glenarden 3028 Brightseat Rd., Glenarden, MD 20706
	Capital Heights 1458 Addison Rd., Capital Heights, MD 20743
	Oxon Hill WIC 6188 Oxon Hill Rd, Oxon Hill, MD 20745
	Suitland WIC 5001 Silver Hill Rd, 2nd Floor, Suitland, MD 20746
	Brandywine 7450 Albert Rd., 2nd Floor, Brandywine, MD 20613
Mary's Center	8908 Riggs Rd., Hyattsville, MD, 20782
Community Clinic, Inc Two Locations:	9001 Edmonston Road, Suite 40, Greenbelt, MD 20770
Pregnancy Aid Center	4780 Erie Street, College Park, MD, 20742

*Greater Baden Medical Services is the only County-based FQHC in Prince George's County.

TABLE 5 HPSA SUMMARY MEDICALLY UNDERSERVED AREAS IN PRINCE GEORGE'S COUNTY BY NAME, TYPE (MEDICALLY UNDERSERVED AREA (MUA); MEDICALLY UNDERSERVED POPULATION (MUP)), DESIGNATION AND UPDATE DATES

Name	MUA	MUP	Governor MUP	Designated Date	Update Date
District Heights/Capital Heights Service Area	✓			12/30/1992	2/1/1994
Low-Income: Brandywine Service Area			✓	12/20/1992	2/1/1994
Prince George Service Area	✓			5/11/1994	—
Low-Income: Glenarden Service Area		✓		9/11/2002	—
Low-Income: Berwyn Heights		✓		9/11/2002	—
Low-Income: Takoma/Langley			✓	9/11/2003	—
Collington Neighborhood	✓			1/5/2012	—
Accokeek Neighborhood	✓			1/12/2012	—

negative margin; are not provided for marketing purposes; and/or the service or programs would likely be discontinued if the decision were made on a purely financial basis."

The ACA calls for every hospital to conduct a "community health needs assessment at least once every three years in order to maintain its tax-exempt status and avoid an annual penalty of up to $50,000." (USDHHS, 2012). Currently, the guidelines for reporting community benefits for hospitals are being revised to incorporate aspects of the ACA. Table 6 is a summary of FY 2010 Prince George's County hospital community benefit reports and Table 7 summarizes the programs that are provided by these hospitals.

Consideration should be given to partnerships among the hospitals and the County health department to support a shared County-wide assessment and a common planning process in order to support coordination and reinforcement of evidence-based programs aligned with community needs. This approach would be cost-effective, promote use of evidence-based interventions and truly begin to address population health. In addition, given the fact that a large proportion of residents frequent hospitals in the surrounding jurisdictions, consideration also should be given to extending an aspect of that partnership to those hospitals as well.

BEHAVIORAL AND MENTAL HEALTH SERVICES

Behavioral and mental health programs are available in all hospitals and through the private sector health care providers. The latter capacity is presented as part of the paper "Identification of Geographic Areas of Need for Primary Care." The rates of licensed provider categories for psychiatrists, clinical social workers, therapists/

counselors and psychologists are presented by County ZIP code and PUMA and compared to the overall rates in surrounding jurisdictions.

The County's Department of Family Services, Mental Health and Disabilities Division provides leadership for the "development and institution of a diverse, comprehensive and accessible array of high quality public mental health services" (PGCDFS, 2011). These services embrace the contributions that citizens with disabilities bring to the Prince George's County community. Additionally, the division oversees all public mental health services and monitors the related programs and mental health professionals in this system.

The County's safety net facilities include behavioral and/or mental health services. Also identified are several non-governmental entities (NGOs) that are free-standing and provide services that vary widely in their scope. Because of the interest in identifying the scope of behavioral and mental health services, we provide specific contact information and an inventory of facilities derived from the County as well as our review. Table 8 provides the names and contact information for the identified facilities. In addition to the facilities listed in the latter table, clinical services are provided by Greater Baden Medical Services, Inc. and Mary's Center provides mental health services.

A thorough review of the behavioral and mental health capacity of the County beyond the identification of facilities and providers is recommended. The review will need to take into account the multidisciplinary nature of the provider groups involved in the provision of behavioral and mental health services, the diversity of the leadership and accountability of the programs and facilities planning and providing services and outreach programs, the mental health needs of the community, and the proposed enhanced mental health training of primary care providers (State of Maryland and Governor's Workforce Investment Board, 2011). Ultimately, the challenge is to develop a detailed plan for integration of behavioral and mental health and primary care.

PRINCE GEORGE'S COUNTY DENTAL HEALTH SERVICES AND PROGRAMS

The County was the home of Deamonte Driver, a 12-year-old boy who died in 2007 due to a dental infection that was not managed. The factors contributing to his tragic death are complex, but the solution would have been simple since we know how to prevent tooth decay. Maryland responded swiftly in response to Deamonte's death and took immediate legislative and

TABLE 6 SUMMARY OF FY 2010 PRINCE GEORGE'S COUNTY HOSPITAL COMMUNITY BENEFIT REPORTS

Hospital	Employees	Total Staff Hours in CB Operations	Total Hospital Operating Expense	Total Community Benefit	Total CB as % of Total Operating Expense	FY2010 Amount in Rates for Charity Care, DME and NSPI	Total Net CB minus charity care, DME, NSPI in Rates	Total Net CB (minus charity care, DME, NSPI in Rates) as % of Operating Expense	CB Reported Charity Care	Reported Contact with Local Health Department	Score Card
Doctors	1298	80	$183,636,478	$3,916,189	2.13%	$798,832	$3,117,357	1.70%	$923,563	no	90.00%
Fort Washington	446*	0	$43,015,368	$946,512	2.20%	$307,393	$639,119	1.49%	$634,221	yes	60.00%
Laurel Regional	519	61	$92,314,100	$15,171,974	16.44%	$3,202,533	$11,969,441	12.97%	$5,741,000	no	70.00%
Prince George's	1478	61	$245,390,100	$41,939,862	17.09%	$14,995,029	$26,944,833	10.98%	$17,794,506	Yes	100.00%
Southern Maryland	1636	0	$215,067,531	$16,909,732	7.86%	$2,161,874	$14,747,858	6.86%	$1,764,265	Yes	80.00%
Total County	5,377	202	$779,423,577	$78,884,269	10.12%	$214,656,61	$57,418,608	34.00%	$26,857,555	n/a	n/a
Average County	1075**	40.4	$155,844,715.40	$15,776,853.80	9.14%	$4,293,132.20	$11,483,721.60	6.80%	$5,371,511	n/a	n/a
Total State	80,544	38,577	$12,647,785,380	$1,051,051,746	8.31%	$437,489,304	$613,562,442	4.85%	$347,434,061		
Average State	2,014	839			7.71%			5.22%		Yes+91.30% No+8.70%	96.39%

*The hospital did not provide the number of employees in its FY 2010 CB report, therefore the number reported is from the FY 2009 report.

**rounded to the nearest whole number

programmatic action. A special issue of the *Journal of Public Health Dentistry* (Horowitz & Kleinman, 2012; Vargas, Casper, Altema-Johnson, Kolasny, 2012, Thuku, Carulli, Costello & Goodman, 2012) documents the state's efforts in addressing oral health of the population and includes recommendations and lessons from other states and national perspectives. Five years later there still is a major need for resources to provide evidence-based preventive and health promotion services and programs to the dentally uninsured and underinsured in this County (this is usually three times greater than the percent of medically uninsured). The County health department and efforts of professional organizations and practicing dental professionals provide select programs.

The Prince George's County Health Department, Dental Health Program operates one facility in the Cheverly Health Center, located centrally in the County. The clinic houses five operatories and staff includes Program Chief Dr. Debony Hughes, one PTE dental hygienist, one PTE general dentist, one PTE pediatric dentist and two dental assistants. Funding from the Maryland Department of Health and Mental Hygiene has provided programmatic fees for the pediatric residents from Howard University College of Dentistry to rotate through the clinic one day per week. The Dental Health Program provides education and comprehensive dental treatment to all children 0 to 18 years of age and pregnant women. The program accepts children and pregnant women enrolled in the Maryland Healthy Smiles Program and the uninsured on a sliding scale fee. The program also receives Ryan White funding to provide dental care to those residents living with HIV/AIDS. Educational programs are presented in the Prince George's County Public School System, during National Children's Dental Health Month and throughout the school year, emphasizing the relationship of good oral health to overall good health.

Collaborations are in place with several organizations to reach beyond the walls of our clinic to engage communities and vulnerable populations in our mission to improve oral health. The Deamonte Driver Dental Van Project and the Howard University College of Dentistry are two of these organizations whose presence has provided delivery and dissemination of dental services and education to the most needed populations of the County.

TABLE 7 SUMMARY OF FY 2010 PRINCE GEORGE'S COUNTY HOSPITALS HEALTH PROGRAMS

Hospital/ Medical Center	Initiated/Maintained Health Programs	
Southern Maryland Hospital (SMH)	Cerebrovascular and chronic conditions programs	Cardiac and Wellness Expo
		Diabetes Expo
	Adult and childhood obesity programs	Weight Management Support Group
		Fit n' Fun Weight Management Program
	Prostate cancer programs	Prostate Screening Event
	Stroke and mental health programs	Monthly support groups
	Spiritual health programs	Chaplaincy services
Fort Washington Medical Center (FWMC)	Diabetes Management Program Series	
	General health education presentations	Heart Health
		Hypertension
		Lifestyle behavior
		Respiratory ailments (asthma, COPD, bronchitis)
	Community awareness and engagement events	
	Health screenings	
Prince George's Hospital Center (PGHC)	Community Health Task Force	
	Partnerships with the National Institutes of Health	National Library of Medicine focused on community sustainability
		Health delivery
Laurel Regional Hospital (LRH)	Community health education	
	Health screenings	
	Eye examinations	
	Diabetes and pain management consultation	

TABLE 8 **PRINCE GEORGE'S COUNTY FACILITIES PROVIDING BEHAVIORAL AND MENTAL HEALTH SERVICES**

Name of Center	Location	Contact Information
Affordable Behavioral Consultants, Inc.	1400 Mercantile Lane, Suite 206 Largo, MD 20774	Christine Williams, CEO (301) 386-7722 (301) 386-7789 FAX
Adam's House	5001 Silver Hill Road Suitland, MD 20746	(301) 817-1900
Adult Evaluation and Review Services (AERS)	1701 McCormick Drive, Suite 200 Largo, MD 20774	(301) 324-2980
Affiliated Sante Group (Lanham location)	4372 Lottsford Vista Road Lanham, MD 20706	Fred Chanteau 1-888-867-2683 EXT 311 (301) 429-2180 FAX
Alek's House, Inc.	4200 Forbes Boulevard, Suite 122 Lanham, MD 20706	Syndney Bryson (301) 429-6100 (301) 429-1333 FAX
Alek's House, Inc. (District Heights location)	7930 Cryden Way, Suite 100 District Heights, MD 20746	(301) 420-7772
All that Matters	5108 Belgreen Street Suitland, MD 20746	Sandra Pyant (301) 516-7084
All That's Therapeutic, Inc.	6192 Oxon Hill Road, Suite 311 Oxon Hill, MD 20745	Dawn Chism, Executive Director (301) 567-0400 (301) 567-7900 FAX
Arm's Reach, LLC	7700 Old Branch Ave., Suite B-104 Clinton, MD 20735	Miquel Davis, Director (301) 877-7748 or (301) 877-7055
Arundel Lodge	337 Brightseat Road, Suite 106 Landover, MD 20785	Mike Drummond (301) 499-6870
Care Connections	9602 Martin Luther King Jr. Highway Lanham, MD 20706	Howard Eisenburg, Executive Director (301) 596-1255
Castles of Love Assisted Living, LLC	15554 Peach Walker Drive Bowie, MD 20716	Charlotte H. Branch, CEO (301) 249-4594 (301) 218-0266 FAX
Center For Therapeutic Concepts, Inc.	1300 Mercantile Lane, Suite 204 Upper Marlboro, MD 20774	Regina Stanley, CEO (301) 386-2991 (301) 386-1994 FAX
Community Counseling & Mentoring Services, Inc.	1400 Mercantile Lane, Suite 232 Largo, MD 20774	Anthony Carvana, Executive Director (301) 583-0001 (301) 583-3403 FAX
Community Crisis Services, Inc.	4316 Farragut Street Hyattsville MD 20781	Timothy Jansen, Director (301) 864-7095
Contemporary Family Services, Inc.	6525 Belcrest Road, Suite G-40 Hyattsville, MD 20782	John Monroe Jr., Director (301) 779-8345 (301) 779-8417 FAX
Crawford Consulting and Mental Health Services, Inc.	6490 Landover Road Cheverly, MD 20785	Patrick Crawford, Director (301) 341-5111 (301) 341-5211 FAX
Detention Center mccjtp (Maryland Community Criminal Justice Treatment Program)	13400 Dille Drive Upper Marlboro, MD 20772	Stephan Simmons, Program Services Division Chief (301) 952-4800
District Court (Mental Health Court)	14735 Main Street Upper Marlboro, MD 20772	Patrice Lewis, Presiding Judge (301) 952-2721
Division of Adult and Geriatric Health	1701 McCormick Drive, Suite 200 Largo, Maryland 20774	(301) 883-3526
Division of Addictions and Mental Health	1701 McCormick Drive, Suite 230 Largo, MD 20774	(301) 883-3514
	Outpatient Services:	Southern Region (301) 856-9400
		Northern Region (301) 583-5920
Essential Therapeutic Perspectives, Inc.	8100 Professional Place, Suite 202 Landover, MD 20785	Virginia Arnegard, Director (301) 577-4440 (301) 577-4123 FAX
Family Behavioral Services, LLC	6475 New Hampshire Avenue, Suite 650 Hyattsville, MD 20783	Nadege Fevry, Director (301) 270-3200 (301) 270-4600 FAX
Family Service Foundation	5301 76th Avenue Landover Hills, MD 20784	Rob Claxton EXT. 201, CEO (301) 459-2121 (301) 459-0675 FAX
Guide Program, Inc.	8643 Cherry Lane Laurel, MD 20707	Scott Birdsong, CEO (301) 549-3602 (301) 549-3605 FAX
Healthy Teens Center	7824 Central Avenue Landover, MD 20785	(301) 324-5141
Independent Psychiatric Services	7801 Old Branch Ave., Suite 212 Clinton, MD 20735	Grace Inyang, m.d., Director (301) 856-8516 (301) 856-8515 FAX
Institute For Family Centered Services	4351 Garden City Drive Landover, MD 20785	Robin McCrea, Acting Director (301) 386-9490
Institute For Life Enrichment	4700 Berwyn House Road, Suite 101A College Park, MD 20740	Dr. James Savage Jr., Director (301) 474-3750 (301) 474-4046 FAX
Joshya Sussal, m.d., pa	7474 Greenway Center Drive, Suite 730 Greenbelt, MD 20770	(301) 982-3437 (301) 982-9452 FAX
links, Inc.	8715 Greenbelt Road, Suite 301 Greenbelt, MD 20770	(301) 731-0383

Maryland Family Resource, Inc.	903 Brightseat Road Landover, MD 20785	Leonard Bivins, Executive Director, EXT 109 (301) 333-2980 (301) 333-8161 FAX
Melwood*	5606 Dower House Road Upper Marlboro, MD 20772	(301) 599-8000 (301) 599-0180 FAX
Mental Health Resources Plus	6192 Oxon Hill Road, Suite 412 Oxon Hill, MD, 20745	(301) 749-2003
Metropolitan Mental Health Clinic, Inc.	96 Harry S. Truman Drive, Suite 250 Upper Marlboro, MD 20774	Makeitha AbdulBarr, Director (301) 324-0600 (301) 324-5009 FAX
NAMI Prince George's County	6513 Queens Chapel Road University Park, MD 20782	James Jones, Director (301) 429-0970
New Pathway's Therapeutic Services	4200 Forbes Boulevard, Suite #202 Lanham, MD 20706	Elaine Wilson, Clinical Director (301) 577-7390 Phone (301) 577-7392 FAX
Norfield Acres-Adventures	5400 Norfield Road Capital Heights, MD 20743-4135	Eleanor Bonner, Director (301) 735- 0596
Oasis Youth Services Bureau	13900 Laurel Lakes Avenue, Suite 225 Laurel, MD 20707	(301) 498-4500
On Our Own of Prince George's County, Inc.	6513 Queens Chapel Road University Park, MD 20782	Daphne Klein, Director (301) 699-8939 (301) 699-5378 FAX
Operation Safe Kids	1701 McCormick Drive, Suite 230 Largo, MD 20774	(301) 324-4288
People Encouraging People	337 Brightseat Road Landover, MD 20785	Sean Lare, Director (301) 429-8950 (301) 429-8959 FAX
Progressive Life Center—Prince George's County	8800 Jericho City Drive Landover, MD 20785	Evette Clark, Director (301) 909-6824 (301) 909-6825 FAX
Psychotherapeutic Rehabilitation Services (prs)	337 Brightseat Road, Suite 106 Landover, MD 20785	D. Cherrey Jones, PMHCNS-BC, MBA, CEO (301) 499-6870
QCI Behavioral Health	9475 Lottsford Road, Suite 250 Largo, MD 20774	Millie Richmond, CEO (301) 636-6504 (301) 636-6509 FAX
Regenerations	5900 Princess Garden Parkway, Suite 670 Lanham, MD 20706	Steve Howden (301) 259-5782
Rehabilitation Systems, Inc.	10210 Greenbelt Road, Suite 950 Greenbelt, MD 20706	Donna Coe, Executive Director (301) 794-9444 (301) 794-7444 FAX
Rims Center For Enrichment & Development	1895 Brightseat Road Landover, MD 20785	Yolanda Coleman, CEO (301) 773-8201 or 8202 (301) 773-8203 FAX
Southern Region Addictions	9314 Piscataway Road Clinton, MD 20735	(301) 856-9400
Substance Abuse Services	501 Hampton Park Blvd. Capitol Heights MD 20743	(301) 324-2872
Tateioms, LLC	14435 Cherry Lane Court, Suite 206 Laurel, MD 20707	Regina Sharber, Director (301) 362-0090
The ARC of Prince George's County*	1401 McCormick Drive Largo, MD 20774	Jack M. Ramsey, Executive Director (301) 925-7050 (301) 925-4387 FAX
The Cheverly Adult Services Program	3003 Hospital Drive, Ground Floor Cheverly, MD 20785	(301) 583-5920
Tobacco Cessation Program	1801 McCormick Drive, Suite 250 Largo, MD 20774	(301) 883-3516
Vesta Inc.—Forestville	3900 Forestville Road Forestville, MD 20747	Maxine Curtis, Regional Director (301) 736-2636 (301) 736-2405 FAX
Vesta Inc.—Lanham	9301 Annapolis Rd. Lanham, MD 20706	Carol Nasr-Carle, Regional Director (301) 459-9840 (301) 459-9110 FAX
Volunteers of America Chesapeake	4611 Assembly Drive, Suite D Lanham, MD 20706	Tomeka Bolden, rrp, Senior Program Director (301) 306-0904
Winn Team, LLC	6511 Princess Garden Parkway, Suite 121 Lanham, MD 20706	Al Laws, CEO (443) 756-9047
Youth and Community Services Program (4 Locations)	Central Region—Cheverly Health Center 3003 Hospital Drive, Ground Floor Cheverly, MD 20785	(301) 583-7752
	Northern Region—Langley Park Youth and Family Services Center 1401 E. University Boulevard, Suite 201 Hyattsville, MD 20783	(301) 434-4895
	Laurel Youth and Family Services Center 13992 Baltimore Avenue, Suite 203 Laurel, MD 20707	(301) 498-4500
	Southern Region—D. Leonard Dyer Regional Health Center 9314 Piscataway Road, First Floor Clinton, MD 20735	(301) 817-3130

*Agency received funding from Prince George's County (Department of Family Services

PRINCE GEORGE'S COUNTY PUBLIC SCHOOLS

Public schools traditionally have contributed to the health education of children and youth, provided or contracted for basic health functions identified by the health department and school systems, and have provided needed health care services for children while they are in school. In addition, schools provide eligible children with free lunch programs, and school principals and teachers have partnered with a broad range of sectors, including health care, to offer programs beyond the routine curriculum. The school system provides a natural link between families and teachers, between communities and the public education sector. Finally, school buildings offer the community another site for community-based events.

The Prince George's County Public Schools system (PGCPS) is administered at the County level and is overseen by the Maryland State Department of Education. The system includes 107 elementary schools, 24 middle schools and 24 high schools. The Board of Education of Prince George's County's mission is "to advance the achievement of its diverse student body through community engagement, sound policy governance, accountability, and fiscal responsibility." (Prince George's County Board of Education, 2010a).

The PGCPS invests in the capacity and professional development of its health-related staff. As an example, in the 2009–10 school year, the PGCPS system conducted 16 hours of professional staff development with 225 school nurses and other allied health professionals on critical areas of medical need, inclusive of but not limited to, diabetes, case management, delegation and blood-borne pathogens. In addition, the County hired and conducted orientation for 35 professional school-registered nurses, trained 38 non-licensed individuals who were certified as medication technicians, and provided training for 78 participants who completed the renewal class as medication technicians (Prince George's County Board of Education, 2010b).

The PGCPS partners with County academic programs and supports the development of the health care workforce pipeline. The schools served as a clinical practicum sites for 155 nursing students from Prince George's Community College and 20 nursing students from Bowie State University.

Many county schools have a registered nurse assigned to them and a few have additional providers such as psychologists, speech pathologists and occupational therapists. Figures 1, 2, 3 and 4 provide a profile of the distribution of these providers by level of school: elementary, middle school and high school. The elementary schools have the greatest diversity of providers. As noted earlier, there are four School-based Wellness Centers (SBWCs) located in four high schools.

Since schools have nurse health

FIGURE 1 PRINCE GEORGE'S COUNTY SYSTEM—ELEMENTARY SCHOOL SERVICES

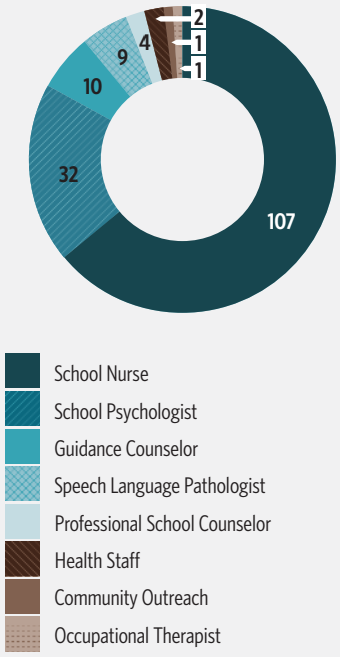
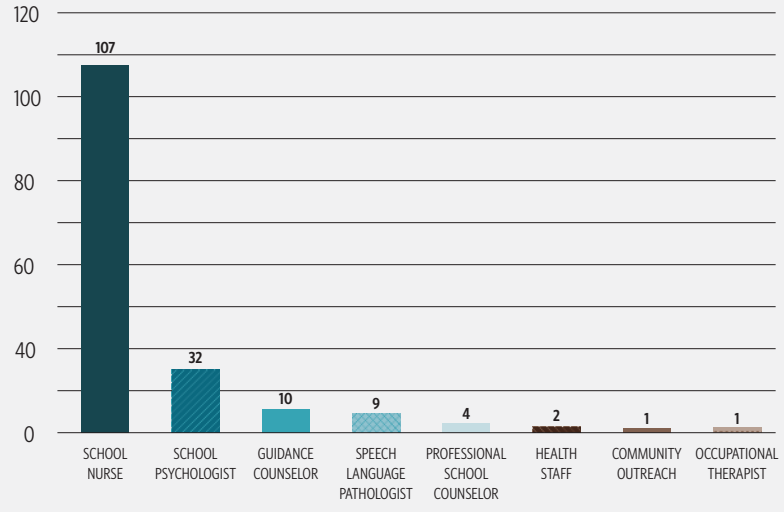


FIGURE 2 PRINCE GEORGE'S COUNTY SYSTEM—ELEMENTARY SCHOOL SERVICES



offices, they offer the opportunity to expand to become community/school-based health centers in the future as additional federal resources become available. All schools are part of the American Heart Association-Dell Foundation-Clinton Foundation Alliance for a Healthier Generation. The schools also provide Medicaid services to IEP and IFSP eligibles. For example, Frances Fuchs Early Childhood Center has more than 500 preschool age-children with special needs enrolled and receiving a variety of services. Also, it is worth noting that Dimensions Healthcare originally had the contract with PGCPS to operate SBWCs, now managed by the health department.

FIGURE 3 PRINCE GEORGE'S COUNTY SYSTEM—MIDDLE SCHOOL SERVICES

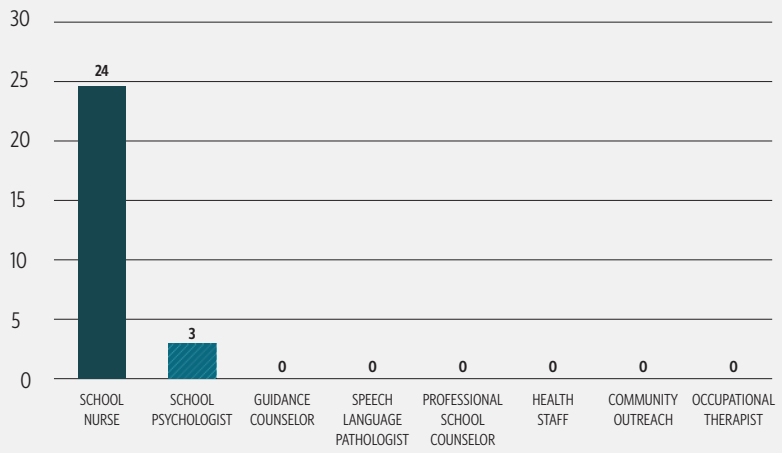
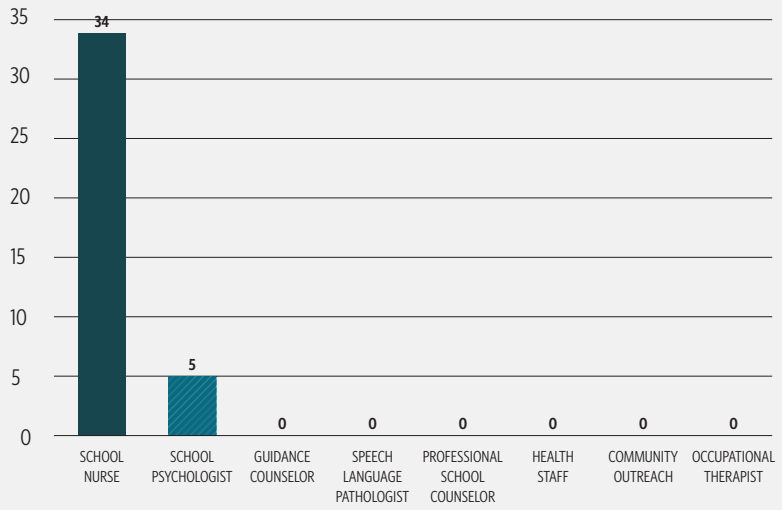


FIGURE 4 PRINCE GEORGE'S COUNTY SYSTEM—HIGH SCHOOL SERVICES



NURSING HOMES AND HOME HEALTH CENTERS

Nursing homes and home health centers provide institutional and home-based services for the elderly and for special needs populations. There are 20 nursing home facilities in the County (Table 9). They cover a wide spectrum of services that include respite and rehabilitative services and may include outpatient rehabilitative services. For example, Gladys Spellman Speciality Hospital is located at Laurel Regional and focuses primarily on very sick patients. Southern Maryland Hospital has a subacute care center that offers a number of services. The Prince George's County Senior Care Program provides services for seniors who may be at risk for nursing home placement. Older adults can access publicly funded services, or if they are not available, the staff will make arrangements with private vendors. Services can include personal care, chore, adult daycare, financial help for medications, medical supplies, respite care, home-delivered meals, emergency response system, transportation and others.

Home health centers provide nursing services, home health aides, and one or more other services such as physical therapy, occupational therapy and social services. Most often, the health care staff may provide care based on the needs of clients and families. Home health centers participate in the Medicare program and many health insurance programs include a home health benefit. A physician referral is often required and a medical reason is regularly needed for these services to be reimbursed by Medicare or insurance. Home health care is suitable whenever a person prefers to stay at home, but needs ongoing care that cannot simply be provided by family and friends. Table 10 includes 14 entities that provide a varying range of home health services. Most include

skilled nursing care and many provide additional specialty services such as diabetic management, cardiac and oncologic care management, physical and occupational therapy and nutrition management. There are opportunities for the County to look at options with federal monies to support innovative programs for special need populations, such as cash and counseling and money follows the person.

PRINCE GEORGE'S COUNTY PARKS AND RECREATION

Prince George's County has more than 26,000 acres of Maryland-National Capital Park and Planning Commission (M-NCPPC) parkland. Approximately one-third has been developed to provide active and passive recreation opportunities. There are approximately 46 miles of paved hiker/biker/equestrian trails that run throughout M-NCPPC's park system. Additionally, fitness trails, hiking trails, walking loop trails and nature trails are also located in neighborhood and community parks.

There are several community centers that are part of the County's parks and recreation programs. They provide a rich array of health improvement programs. These include fitness centers, classes, nutrition, cooking, and a variety of programs geared to seniors, adolescents, child care, etc. These centers provide a substantial opportunity to incorporate health promotion as well as clinical services. Many of these centers are incorporated in schools or are adjacent to schools that add additional health promotion and wellness opportunities for school-based wellness and community health centers.

Parks and other recreational facilities provide access to residents throughout the northern, central and southern parts of the County. Each area is staffed by a maintenance crew that cares for the parks and facilities, an inclusion specialist who assists citizens with special needs and a coordinator who works with the community centers to provide programs for teens and preteens.

Prince George's County Parks and Recreation sites are divided into three areas: Northern (Laurel, Beltsville, Berwyn Heights, College Park, Riverdale Park, Langley Park, Greenbelt, New Carrollton, Landover Hills, Cheverly, Bladensburg, Cottage City and Hyattsville); Central (Bowie, Mitchellville, District Heights, Landover, Seat Pleasant, Capitol Heights, Fairmont Heights, Forestville and Glenarden); and Southern (Marlow Heights, Forest

TABLE 9 PRINCE GEORGE'S COUNTY NURSING HOMES FACILITIES

Name of Institution	Location	No. of Beds
Bradford Oaks Center	7520 Surratts Road, Clinton MD, 20735	180
Cherry Lane Nursing Center	9001 Cherry Lane, Laurel, MD 20708	155
Clinton Nursing and Rehabilitation	9211 Stuart Lane, Clinton, MD 20735	267
Collington Episcopal Life Care	10450 Lottsford Rd, #210, Bowie, MD 20721	44
Cresecent Cities Center	4409 East West Highway, Riverdale, MD, 20737	140
Forestville Health & Rehabilitation Center	7420 Marlboro Pike, Forestville, MD 20747	160
Fort Washington Health and Rehabilitation	12021 Livingston Road, Fort Washington, MD 20744	150
Future Care Pineview	9106 Pine View Lane, Clinton, MD 20735	192
Gladys Spellman Specialty Hospital at Laurel Regional Hospital	7300 Van Dusen, Laurel, MD 20707	61
Heartland Health Care Center -Adelphi	1801 Metzerott Road, Adelphi, MD 20783	218
Heartland Health Care Center- Hyattsville	6500 Riggs Road, Hyattsville, MD 20783	160
HillHaven Nursing Center	3200 Powder Mill Rd., Adelphi, MD 20783	66
Larkin Chase Care and Rehabilitation Center	15005 Health Center Drive, Bowie, MD 20716	120
Magnolia Center Nursing Home	8200 Good Luck Road, Lanham, MD 20706	104
ManorCare Health Services - Largo	600 Largo Road, Glenarden, MD 20774	130
Patuxent River Health and Rehabilitation	14200 Laurel Park Drive, Laurel, MD, 20707	177
Sacred Heart Home INC.	5805 Queens Chapel Road, Hyattsville, MD 20782	100
St. Thomas More Medical Complex	4922 LaSalle Road, Hyattsville, MD 20782	250
Subacute Care Center Southern Maryland	7503 Surratts Road, Clinton, MD 20735	24
Villa Rosa Nursing Home, Inc	3800 Lottsford Vista Road, Mitchellville, MD 20721	101

Heights, Oxon Hill, Accokeek, Baden/Brandywine, Ft. Washington, Clinton, Temple Hills, Upper Marlboro and Morningside) (PGCPRD, 2012).

MARYLAND EXTENSION

University of Maryland Extension-Prince George's County (UME) has been a leader and partner in implementing programs throughout the County that address obesity; food insecurity; low levels of fitness; unhealthy diets for youth, families and senior citizens; best practices in conservation and nutrient management; and signature programs in outdoor education. The programs include:

Nutrition and Finance Education programs target underserved and high-risk families, especially those with young children:

- **Food Stamp Nutrition Education (FSNE) program** (SNAP-ED at the federal level) has four nutrition educators, two assigned to the County health department and two at the Center for Educational Partnership (CEP) in Riverdale.

- **Expanded Foods and Education Program** (EFNEP) includes seven local nutrition educators housed at the CEP and working throughout the County. Both programs offer classes and hands-on experiences through public and private agencies and community centers. In the schools, educators offer teacher training to integrate nutrition, fitness and other healthy living concepts into ongoing public school academic curriculum and serve on advisory committees and task forces.

- **Healthy Cents and Stretching Your Food Dollar** are programs that combine nutrition and financial education for youth and adult audiences. Participants include school youth, teen moms, women in shelters and senior citizens.

4-H Youth Development works with schools, community centers and volunteers to offer healthy living programs including Health Rocks, a substance abuse prevention program; Up for the Challenge, a healthy living and nutrition program and outdoor education; and camping at the Patuxent River 4-H Center. 4-H also offers major STEM programs in the areas of robotics, engineering and physical science, which help youth to connect their personal lives with their surroundings.

Agriculture includes the Master Gardener Volunteer program, Agriculture Marketing and Nutrient Management advising. Major programs include Grow It, Eat It, Preserve It; Sheridan Street Community garden; Farmers' Market support; educational programs for the general public through libraries, schools and churches; Bay Wise Certification; and development of best practices for landowners in the areas of conservation and nutrient runoff. Extension also supports economic development in the urban and rural areas of the community as it pertains to food and farms.

Extension collaborates with many organizations including M-NCPPC (Healthy Heights, Extreme Teens and Community Centers), Prince George's County Public Schools (Alliance for a Healthier Generation, individual schools at all levels), Head Start, Judy Hoyer Centers, County Memorial Library System, municipal governments and County government departments. UME also supports school and community gardens and offer advice to homeowners, farmers and businesses as requested.

HIGHER EDUCATION ACADEMIC RESOURCES IN THE COUNTY

The County has a number of higher education academic resources that contribute to health and wellness capacity. In addition, health professions students from University of Maryland, Baltimore have also rotated through sites in the County. These programs include health provider and public health workforce training, continuing education as well as research and service programs.

The health care systems we interviewed had two innovative programs that included academic partners and could serve as models. One program involved a partnership between the academic health care system and a community-based clinic to establish a medical home with case managers for the under- and uninsured. This program was successful in achieving cost savings and improvements in quality of care. Another system formed a community-wide "Nurse Advice Line" in collaboration with the public health department, managed-care organizations and the university, and operated in both rural and urban areas. This Nurse Advice Line helped the state health department identify illnesses statewide and resulted in decreased emergency department visits, increased medical homes and better coordination of patient care.

TABLE 10 PRINCE GEORGE'S COUNTY HOME HEALTH CENTERS

Name of Institution, Contact Information	Description of Services
Americare In-Home Nursing 10905 Fort Washington Road, Suite 300 Fort Washington, MD 20744	• Orthopedic rehabilitation • Cardiac Care Program™ • Diabetic management • Pain management • Wound care management • Joint replacement program • Fall prevention program • Oncology care program • Observation and assessment • Chronic disease management
Southern Maryland Hospital 10403 Hospital Drive, Suite G-9 Clinton, MD 20735	• Home health aide • Occupational therapist • Registered nurse • Social worker • Speech therapist **Specialty Areas:** • Certified wound ostomy nurse on staff • Nutritionist on staff • Wound-care certified • Orthopedics • Diabetes education • Cardiac-related diagnosis • Wound ostomy, continence
Medstar Health, Vna, Inc. 4061 Powder Mill Road, Suite 500 Beltsville, MD 20705	• Physical therapy • Occupational therapy • Speech therapy • Home health aide • Nursing care
Professional Healthcare Resources, Inc. 4429 Forbes Boulevard Lanham, MD 20706	• Clinical assessment and monitoring • Wound care • Intravenous therapy • Psychiatric nursing • Diabetic care and services • Cardiac care services • Comprehensive patient and caregiver education • Physical or occupational therapy • Nutritional counseling
Revival Homecare Agency 4810 Saint Barnabas Road Temple Hills, MD 20748	• Home health aid • Medical social • Medicare • Nursing care • Occupational therapy • Physical therapy • Speech pathology
Adventist Home Care Services 12041 Bournefield Way, Suite B Silver Spring, MD 20904	**Adult nursing for:** • Diabetes mellitus • Coronary artery disease (CAD) • Congestive heart failure (CHF) • Chronic Obstructive Pulmonary Disease (COPD) • Decubitus care • Post-surgical wound care • Ostomy care • Feeding tubes • Indwelling urinary catheters **Diabetes Management:** • Assessment of patient's condition • Instruction of patients and families on monitoring blood glucose levels • Dietary counseling and meal planning • Medication teaching • Awareness of drug interaction • Treatment of feet and other skin issues • Circulatory needs • Meal planning • Assessment for need of adaptive equipment and occupational therapy **Coordination of community services:** • Medication management, ostomy care, cardiac nursing, maternal and child care, wound care, pediatric nursing, lactation support, phototherapy
Amedisys Home Health Care 12510 Prosperity Drive, Suite 350, Silver Spring, MD 20904	• Home-based skilled nursing • Rehabilitation • Chronic disease management
Amedisys Home Health Care—Largo Location 1401 Mercantile Lane, Suite 351 Largo, MD 20774	• Home-based skilled nursing • Rehabilitation • Chronic disease management
First Health Care Network 1408 Golf Course Drive Bowie, MD 20721	• Non-medical home care • Personal care services • Homemaker services • Respite care services • Hospice care services

Maryland Healthcare Services

4810 Saint Barnabas Road
Temple Hills, MD 20748

Deal with the following illnesses:

- Congestive heart failure
- Unstable angina
- Unstable blood pressure
- Osteoarthritis
- Osteoporosis
- Rheumatoid arthritis
- Pneumonia
- Anemia
- Chronic Obstructive Pulmonary Disease (COPD)
- Stroke
- Bowel disorders
- Diverticulitis
- Fractures
- Post-operative surgery
- Parkinson's Disease
- Multiple Sclerosis
- Urinary retention
- Uncontrollable blood sugar—diabetes

Home Call of Prince George's County

1408 Golf Course Drive
Bowie, MD 20721

- Nursing care
- Physical therapy
- Occupational therapy
- Speech pathology
- Medical social and home health aide services

Specialty Care Services

4810 Saint Barnabas Road
Temple Hills, MD 20748

- Wound care management
- Diabetic management and care
- Cardiac/respiratory care
- Post-operative care
- Nutrition therapy
- Safety measures and universal precautions
- Medication management
- Tube feeding
- Injections

Angels of Mercy Home Health Care Services LLC

99 Commerce Place, Suite 100
Largo, MD 20772

- Elderly care or geriatric care
- Personal care services
- Nursing procedures (vital signs monitoring, wound care, IV Therapy, etc.)
- Assistance with daily living activities
- Home-bound status
- Bedside care (temporary, intermittent or long-term care

Family and Nursing Care

8555 16th Street, Suite 101
Silver Spring, MD 20910

- Alzheimer's Disease
- Parkinson's Disease
- Cancer
- Hospice dare
- Dementia
- Diabetes
- Heart disease
- Stroke
- Depression

Provide skilled nursing for:

- Medication management
- Diabetes management
- Tube feeding
- Wound care
- Injections
- Ostomy care

Also provide activities of daily living, companionship, mobility assistance and other support services

Homewatch Caregivers

6475 New Hampshire Avenue,
Suite 304
Hyattsville, MD 20783

- Dementia care
- Elder care for chronic conditions such as (diabetes, Parkinson's, stroke, ALS or Lou Gehrig's disease, heart disease and lung disease)
- Elderly care such as travel assistance, hospital discharge care

SUMMARY

This snapshot review reveals that the County has many assets that are directed to health and wellness of its residents. These are imbedded in public health sector programs as well as in public sector programs that support education, social services and recreation. Upon cursory review, the public health sector programs in the County appear to be aligned with lifestage and special population needs and with health conditions identified in the County Health Improvement Plan.

However, this snapshot also reinforces what other reports have emphasized: The County safety net clinics are severely limited in size and number and are not resourced to meet the current needs of the community. Two new federal designated medically underserved areas were added to the County this year. To achieve success of any health care system, there must be an investment to fulfill and manage the County's safety net needs. This is the most critical and the first factor to remedy. The hospital community benefit reports reveal the burden of charitable care provided by Prince George's County Hospital that extends the safety net.

We used secondary data to identify the existence and range of services provided by these programs. The existing capacity of these facilities and programs to meet the disease prevention and disease management demands of populations in need was not directly reviewed. Prior to considering the mobilization of specific public health resources, a critical review of current program and clinical care structure, process and outcomes is needed in light of the plans for the design of a new health care system and in the context of the priority health outcomes to be improved. The capacity for delivering the basic public health functions of assessment, policy development and assurance must be given priority in this review. These functions must be in place to serve the public health sector and to serve as a hub for the coordination and interaction of health and health care programs within the overall system. This type of review should be tailored to determine which, whether and how existing programs can be expanded or modified to address the health outcome priorities and complement the impact of the health care system, especially in the context of the state health care reform innovations and mandates. Ultimately this review would provide the basis for determining the actual fiscal, workforce, Health Information Technology (HIT) and programmatic investments needed to reach a level capacity to meet the current health needs of uninsured and underinsured County residents.

The continuation of existing partnerships and the forging of new ones would be beneficial. Emerging multi-sectoral coalitions, like the County's Health Care Coalition, offer opportunities to communicate across organizational borders and enrich health and wellness for County residents through proactive coordination of services and activities. Technical Report #2 noted that partnerships were viewed as an approach for tackling wellness and prevention goals such as the County government, schools and wellness programs working together to prevent obesity and tobacco use. The stakeholders from this report also mentioned collaboration opportunities by co-sponsoring events with community-based organizations, employers in the County and religious organizations.

Novel approaches, such as those implemented by other systems, should guide the integration of public health sector and health-system programs for population health (See Technical Report: Interviews with Professionals in Model Health Care Systems).

We appreciate the input from leadership and staff from the County Executive's Offices and from the Prince George's County Health Department. In addition, we would like to acknowledge the meetings and input from the leadership and staff of the Maryland Extension programs and Prince George's County Parks and Recreation Services.

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TECHNICAL REPORT 6

Current (2007–2009) Experiences and Future Projections of Prince George's County Residents' Hospital Encounters

Karoline Mortensen Ph.D.

INTRODUCTION

As part of the Public Health Impact Study of Prince George's County, a series of studies were conducted to contribute to the understanding of hospital, health care and community population elements of a health care system that may contribute to the improvement of selected health outcomes. These studies provide both descriptive and analytic findings of the hospital use of Prince George's County residents and of the hospitals they frequent. They were designed to complement the work of groups, beyond that of the School of Public Health, who are contributing to the design phase of the regional health care system and primarily focused on select hospital encounters of County residents.

The econometric model informing this section was designed to primarily provide answers to the question, "What elements of a health care system (hospital and community) can affect key health outcomes and by how much?" Secondarily, the model provides insights of relevance to all of the questions posed by the advisory committee. The model was designed to integrate data from multiple sources to reflect effects of different aspects of the health care system on hospital discharges. The model provides a look at the macro level of the health care system and also allows flexibility to explore how health system and other factors affect discharges for each major disease or condition differently.

A critical component of access to health care is the receipt of timely and effective primary care to prevent disease, manage chronic illness and treat acute illness at an early stage to avoid hospitalization (Delia, 2003; Ansari, Laditka, and Laditka, 2006). The supply of primary care physicians, nurse practitioners and safety net clinics are known components of access. Primary care physician supply is associated with improved health outcomes (Macinko, Starfield & Shi, 2007). Areas with higher concentrations of physician supply have been found to have fewer ambulatory care, sensitive discharges than areas with lower supply (Laditka, Laditka, and Probst, 2005), but this relationship does not always hold true (Krakauer, Jacoby, Millman & Lukomnik, 1996; Epstein, 2001).

The demographic and health characteristics of Prince George's County residents, access and capacity of the County's health care system, and patterns of hospital and emergency department use have been reported in extensive detail (Lurie, Harris, Shih, Ruder, Price, Martin et al., 2009). The results from this econometric model are critical for taking the next steps to analyze the associations between these local characteristics and inpatient discharges for key health outcomes. The econometric model estimates the statistically significant relationships that are essential to understand in order to improve the County's health care system. It is not enough to know the ratios per 1,000 residents of primary care physicians, nurse practitioners, physician assistants and safety net clinics in the County; it is imperative to understand how these health system factors are related to discharges for key health outcomes. Once we begin to understand the inner workings of these relationships, stakeholders in Prince George's County are able to focus on the factors that have the most significant impact. The outline of this section is as follows: This section first describes the data used in the analysis, then details the empirical methodology and concludes with an analysis of discharge data.

DATA

A number of databases and data sources were used to define elements of the community, the hospital health care system and of the community health care system. The primary data source was data for fiscal years 2007, 2008 and 2009 acquired from the Health Services Cost Review Commission (HSCRC) and the District of Columbia Hospital Association (DCHA) containing discharge data for Prince George's County residents. Discharges were from 59 hospitals located in Prince George's County, Montgomery County, Baltimore County, Anne Arundel County, the District of Columbia and a variety of other hospitals in the state of Maryland.

The data included the following fields: indicator for Maryland or D.C. hospital, year, ZIP code, city, sex, age, race, hospital, where admitted from, visit type, discharge status, International Classification of Diseases version 9 (ICD-9) primary diagnosis, ICD-9 secondary diagnosis, primary payer, total charges, hospital division, All Patient Refined Diagnosis code (APR), APR description, Diagnosis-Related Group (DRG) and DRG description. There were no unique patient identifiers in the data set.

A variety of data sources were used to collect information on ZIP codes, Maryland health care workforce, hospital characteristics and readmissions for each ZIP code. ZIP code population data for 2000 and 2010 were collected from the Bureau of Census Population Data (U.S. Census Bureau, 2012). These data were used to assess population growth within each ZIP code in Prince George's County and to project population growth into 2022 for the hospital discharge 10-year projections.

Maryland Health Workforce Data described in the geographic mapping section of this report were used for this analysis. We include a measure of the ratio of board-certified primary care physicians, a ratio of nurse practitioners and a ratio of physician assistants at the ZIP code level per 1,000 residents. Data on the 59 hospitals' total discharges (not limited to discharges of only Prince George's County residents) for fiscal year 2010 was collected from the American Hospital Directory website (www.ahd.com). One of the major limitations of the HSCRC and DCHA discharge data is that it did not include unique identifiers, so readmission rates for individuals in the data could not be calculated. Readmission rates at the ZIP code level were supplied by the Maryland Health Care Commission staff from their analysis of HSCRC discharge abstract data for fiscal years 2008 and 2009 (personal communication, Jeff Johnson).

SAMPLE SIZE The initial data set of 297,117 discharges included approximately 100,000 discharges for each fiscal year, with D.C. hospitals reporting roughly one quarter of discharges for Prince George's County residents (Table 1).

Data was missing for a number of each of the fields. ZIP code data were coded as zero, 77777 or 99999 for 171 observations, so those observations were dropped as they could not be mapped to additional data on Prince George's County residents (Appendix). ZIP codes that were for counties outside of Prince George's County (primarily representing D.C. and Montgomery County) were also dropped, reducing the sample by an additional 3,191 discharges. Discharges that had a ZIP code assigned to a post office rather than a residential area were reassigned the ZIP code value for the geographic area surrounding the post office. The hospital name was missing for 1,725 discharges, so those observations were dropped as well. In order to maximize information from the data, different sample sizes were used for different analyses. Tables at the discharge level of analysis that did not require information on gender, primary diagnosis code and payer information used a large sample that included observations missing those data (n=292,030). For the regression models, discharges missing a primary diagnosis code (1,988) and payer information (5,623) were excluded. The resulting dataset for the regression models had a sample size of 284,402 discharges.

TABLE 1

DISCHARGE DATA PER FISCAL YEAR, MARYLAND AND D.C.

Fiscal Year	Maryland	D.C.	Total
2007	71,201	27,541	98,742
2008	73,004	25,262	98,266
2009	74,402	25,707	100,109
Total			**297,117**

Source: 2007, 2008 and 2009 inpatient discharge data from HSCRC and DCHA

METHODS

A commonly used indicator of access to primary care and its overall effectiveness is the number of ambulatory care-sensitive admissions within a given population (Ansari, Laditka, & Laditka 2006). The Agency for Healthcare Research and Quality (AHRQ) has developed measures of health care quality that make use of readily available hospital inpatient administrative data. Prevention Quality Indicators (PQIs) identify ambulatory care-sensitive hospital admissions in geographic areas that evidence suggests may have been avoided through access to high-quality outpatient care (Agency for Healthcare Research and Quality, 2012a). Access to good outpatient care and early intervention can potentially prevent these ambulatory care-sensitive conditions.

AHRQ states that these indicators provide insight into the community health care system and services outside the hospital setting (Agency for Healthcare Research and Quality, 2012b). The ambulatory care-sensitive discharges can be used as a screening tool to help flag potential health care quality problem areas that need further research and investigation. Ambulatory care-sensitive discharges measured by PQIs provide a check on primary care access or outpatient services in a community by using patient data found in a hospital discharge abstract (Agency for Healthcare Research and Quality, 2012b). These data help public health agencies, state data organizations and health care systems improve health care quality in their communities. This analysis used the March 2012 technical specifications.

AHRQ provides an algorithm to identify these ambulatory care-sensitive PQIs at the County level, using County-level discharges of each of the identified conditions in the numerator, and County population as the denominator. AHRQ clearly specifies that the denominator is based on the County of patient residence, not the County of the hospital. We modify their calculation to include ZIP code-level discharge counts for each of the relevant indicators in the numerator, and ZIP code-level population counts from the 2010 U.S. Census in the denominator. The purpose of the PQI, or ambulatory care-sensitive discharge, analysis is to show geographic variation in discharges that could have been prevented with better access to outpatient care. Our analysis focuses on those indicators reflecting chronic disease that are most aligned with the key health outcomes of interest for the public health impact assessment.

The ambulatory care-sensitive conditions that we examine in the analysis represent key health outcomes that are chronic conditions—those most amenable to an improved health care delivery system. These include the diabetes short-term complications admission rate, diabetes long-term complications admission rate, the chronic obstructive pulmonary disease (COPD) or asthma in older adults admission rate, asthma in younger adults admission rate, hypertension admission rate, heart failure admission rate, angina without procedure admissions rate, uncontrolled diabetes admission rate, and an indicator for a discharge with any of these admission types. The PQI ambulatory care-sensitive discharge measure excludes transfers from a hospital (transfers from a skilled nursing facility are not identified in the data).

The public health impact assessment is primarily concerned about factors that affect discharges for specific diagnoses, including cardiovascular disease, diabetes and asthma, that could be avoided altogether if treated in a more appropriate outpatient setting. ICD-9 codes were used to identify these diagnoses from the primary diagnosis code in the discharge data and to generate the PQI ratios.

VARIABLES

Key variables in the model include ambulatory care-sensitive hospitalizations per 1,000 residents, readmissions within 30 days, health care workforce capacity (physicians, physician assistants, nurse practitioners and safety net clinics), and patient and population characteristics. The analyses include sex, age, race/ethnicity and proportion of the population at or below the federal poverty level (FPL) at the ZIP code level (Epstein, 2001; Delia, 2003). Data for Prince George's County are from the U.S. Census for 2010 (U.S. Census Bureau, 2012). We classify race/ethnicity at the ZIP code level in categories that include non-Hispanic white and minority. Minority includes Hispanic, black and other, where other includes American Indian and Alaska Native, Asian, Native Hawaiian and Pacific Islander, some other race and two or more races. White is the reference category in the analyses. Due to

TABLE 2 AMBULATORY SENSITIVE CONDITIONS DEFINITIONS AND SAMPLE MEANS

Prevention Quality Indicator (PQI)	Description	ICD-9 Codes for Numerator	Age	Percent of Prince George's County Resident Discharges	Count PQI Prince George's County Residents
1	Diabetes short-term complications admission rate	25010 25011 25012 25013 25020 25021 25022 25023 25030 25031 25032 25033	18+	0.5	1,355
3	Diabetes long-term complications admission rate	25040 25041 25042 25043 25050 25051 25052 25053 25060 25061 25062 25063 25070 25071 25072 25073 25080 25081 25082 25083 25090 25091 25092 25093	18+	0.9	2,474
5	COPD or asthma in older adults admission rate	**COPD:** 4660 490 4910 4911 49120 49121 4918 4919 4920 4928 494 4940 4941 496 **Asthma:** 49300 49301 49302 49310 49311 49312 49320 49321 49322 49381 49382 49390 49391 49392	40+	1.4	4,069
7	Hypertension admission rate	4010 4019 40200 40210 40290 40300 40310 40390 40400 40410 40490	18+	0.6	1,816
8	Heart failure admission rate	39891 4280 4281 42820 42821 42822 42823 42830 42831 42832 42833 42840 42841 42842 42843 4289	18+	2.8	8,097
13	Angina without procedure admission rate	4111 41181 41189 4130 4131 4139	18+	0.4	1,143
14	Uncontrolled diabetes admission rate	25002 25003	18+	0.2	527
15	Asthma in younger adults admission rate	**Asthma:** 49300 49301 49302 49310 49311 49312 49320 49321 49322 49381 49382 49390 49391 49392 **Cystic fibrosis and anomalies of the respiratory system:** 27700 27701 27702 27703 27709 51661 51662 51663 51664 51669 74721 7483 7484 7485 74860 74861 74869 7488 7489 7503 7593 7707	18–40	0.2	492

Sample size excludes those with missing data on hospital locations, sex, primary diagnosis and primary payer. N=284,402

All PQIs are ratios per 1,000 residents of the numerators described above divided by the ZIP code population.

Asthma in younger adults admission rate includes age 40, as does asthma in older adults, resulting in an overlap of discharges

Procedure codes were not included in the discharge data, so PQIs requiring procedure codes (hypertension, heart failure and angina) do not exclude by procedure code, which may overstate PQI.

missing 2010 Census data on ZIP codes 20601, 20607, 20608 and 20613, data from 2000 are used instead. Poverty is included as the proportion of the population at or below the federal poverty level, as measured by the 2000 U.S. Census (2010 data were not available at the ZIP code level as of April, 2012). In preliminary analyses using age categories, also from U.S. Census data, of under age 18, age 18 to 44 (reference category), 45 to 64, and 65 and older, only the over 65 category was significant. To keep the model parsimonious, we include age over 65, with under age 65 as the referent category. Sex is measured by the proportion of females in each ZIP code; males are the reference category.

Ambulatory-sensitive conditions were defined using several of the AHRQ PQIs, and were analyzed individually in the econometric models as the outcome variable. The ICD-9 codes

used to define each PQI are described in Table 2. The PQIs we measured that indicate ambulatory sensitive visits for chronic conditions include diabetes short-term complications admissions rate, diabetes long-term complications admissions rate, COPD or asthma in older adults admission rate, hypertension admissions rate, heart failure admissions rate, angina without procedure admissions rate, uncontrolled diabetes admissions rate, asthma in younger adults admissions rate, and an indicator for any of the above ambulatory care-sensitive conditions admissions rate. The count for each type of discharge was divided by the ZIP code population and presented as a rate per 1,000 residents. Procedure data were not available in the discharge data set, so the conditions that exclude cases with a cardiac procedure code (hypertension, heart failure and angina) may be over-estimated. Discharges with an indicator that they were transfers from other hospitals were excluded.

These conditions and the respective hospital encounters provide a picture of the management of care and discharges within hospitals as well as the capacity of the relationship between hospitals and community-based primary care. We did not include all conditions defined as ambulatory care-sensitive, rather we selected a subset that aligned with several key health outcomes.

ANALYSIS

Using the aforementioned data sources including discharges, characteristics of the hospitals and local health system factors, data were merged in at both the hospital and patient ZIP code levels. We used this merged data file to model the dynamic effects of "what if" scenarios for each of the conditions, such as the potential impacts of changes in elements such as health care workforce supply on discharges, as well as project the impact of these changes out into the future.

We applied the model using a macro-level approach in order to address the relationship between the various outcomes at the ZIP code level, and overall system and population characteristics. We used the lens of specific conditions for a more specific assessment of any discharge for an ambulatory care-sensitive condition, as well as each identified ambulatory care-sensitive condition in turn and for the 30-day readmissions rate.

Ordinary Least Squares linear probability models were estimated to analyze the relationship between community, hospital and ZIP code-level factors and discharges for specific diagnoses. The macro-level approach analyzes ZIP code-level data on PQI discharges. Data from 2007, 2008 and 2009 are aggregated to increase sample size for the ratios (Epstein, 2001). The models are constrained by the sample size at the ZIP code level, since there are only 36 ZIP codes in Prince George's County. Therefore robust regression models were also estimated. Robust regression is an alternative to least squares regression when data may be contaminated by outliers or influential observations.

PATTERNS OF HOSPITAL USE BY PRINCE GEORGE'S COUNTY RESIDENTS

To get a more detailed view of resident hospital experiences and their impact on hospitals in the County and the surrounding area, we pursued answers to several questions. Where do Prince George's County residents go for hospital inpatient care? For those residents using County hospitals, what proportion of all hospital discharges and inpatient days did residents represent? This information allows planners to view the impact of resident patterns of use, and raises questions about who comprises the remaining patients that use the County hospitals and estimate what proportion of hospital discharges for other jurisdictions County residents represent. The answers to the latter questions would provide useful information for planning a regional center of excellence as well as for forging formal regional partnerships among hospitals.

Aggregate discharge data for 2007, 2008 and 2009 are displayed in Table 3 to provide the distribution of discharges of Prince George's County residents across hospitals in Prince George's County, D.C., Montgomery County, Anne Arundel County, Baltimore County and numerous other hospitals in the state of Maryland. Only 45.5 percent of discharges for Prince George's County residents are

TABLE 3 INPATIENT DISCHARGES FOR PRINCE GEORGE'S COUNTY RESIDENTS (2007-2009)

HOSPITAL NAME	COUNT	%
Prince George's Hospitals	**132,929**	**45.5**
Doctors Community Hospital	31,273	10.7
Fort Washington Hospital	6,736	2.3
Laurel Regional Medical Center	13,125	4.5
Prince George's Hospital Center	41,043	14.1
Southern Maryland Hospital	40,752	14.0
Montgomery County Hospitals	**55,592**	**19.0**
Adventist Rehab Hospital	731	0.3
Holy Cross Hospital	27,528	9.4
Montgomery General Hospital	850	0.3
Shady Grove Adventist Hospital	1,508	0.5
Suburban Hospital	1,601	0.5
Washington Adventist Hospital	23,374	8.0
District of Columbia Hospitals	**76,683**	**26.3**
Children's National Medical Center	11,626	4.0
George Washington University Hospital	6,566	2.2
Georgetown University Hospital	7,367	2.5
Greater Southeast Community	1,595	0.5
Howard University Hospital	3,014	1.0
Providence Hospital	12,431	4.3
Sibley Memorial Hospital	2,552	0.9
VA Medical Center	1,863	0.6
Washington Hospital Center	29,669	10.2

HOSPITAL NAME	COUNT	%
Baltimore County Hospitals	**10,714**	**3.7**
Bon Secours Hospital	55	0.0
Franklin Square Hospital	68	0.0
Good Samaritan Hospital	194	0.1
Greater Baltimore Medical Center	242	0.1
Harbor Hospital Center	191	0.1
Johns Hopkins Bayview	612	0.2
Johns Hopkins Hospital	3,509	1.2
Johns Hopkins Oncology	588	0.2
Kernan Hospital	208	0.1
Maryland General Hospital	164	0.1
Mercy Medical Center	267	0.1
Northwest Hospital Center	47	0.0
Saint Joseph Hospital	130	0.0
Sinai Hospital	380	0.1
St. Agnes Healthcare	450	0.2
University of Maryland Hospital	1941	0.7
University of Maryland Cancer Center	443	0.2
University of Maryland Shock Trauma	864	0.3
Union Memorial Hospital	361	0.1
Anne Arundel County Hospitals	**10,704**	**3.7**
Anne Arundel Medical Center	10,222	3.5
Baltimore Washington Medical Center	482	0.2

HOSPITAL NAME	COUNT	%
Other Maryland Hospitals	**5,408**	**1.9**
Atlantic General Hospital	48	0.0
Braddock Hospital (Western Maryland Regional)	4	0.0
Calvert Memorial Hospital	700	0.2
Carroll County General Hospital	38	0.0
Chester River Hospital	8	0.0
Civista Medical Center	1,962	0.7
Dorchester General Hospital	9	0.0
Frederick Memorial Hospital	66	0.0
Garrett County Memorial Hospital	8	0.0
Harford Memorial Hospital	21	0.0
Howard County General Hospital	2,026	0.7
Memorial Hospital at Easton	27	0.0
Memorial of Cumberland	9	0.0
Peninsula Regional Medical Center	83	0.0
St. Mary's Hospital	343	0.1
Union of Cecil Hospital	5	0.0
Upper Chesapeake Medical Center	17	0.0
Washington County Hospital	34	0.0
TOTAL DISCHARGES Prince George's County Residents	**292,030**	**100.0**

Source: 2007, 2008 and 2009 inpatient discharge data from HSCRC and DCHA

from Prince George's County hospitals. Dimensions Healthcare hospitals were on the low and high ends of the spectrum, with Laurel Regional accounting for 4.5 percent of discharges of Prince George's County residents and Prince George's Hospital Center accounting for 14.1 percent, the highest of any of the County's hospitals.

The majority of County residents are discharged from hospitals in the region outside of the County. D.C. hospitals represent 26.3 percent of County resident discharges, with Washington Hospital Center accounting for 10.2 percent of County residents' discharges. Providence Hospital accounted for 4.3 percent of discharges, Children's National Medical Center for 4.0 percent and the remaining hospitals for 2.5 percent or less. Montgomery County hospitals account for 19.0 percent of County residents' discharges; Holy Cross Hospital represents 9.5 percent of total discharges and Washington Adventist Hospital accounts for 8 percent. The

remaining hospitals each represent less than 1 percent of discharges. Hospitals in Baltimore account for 3.7 percent of discharges for Prince George's County residents, Anne Arundel hospitals for 3.7 percent and hospitals in the other counties of Maryland account for the remaining 1.9 percent of County discharges. There were no dominant hospitals in the Baltimore area, whereas in Anne Arundel County, Anne Arundel Medical Center represented the bulk of the discharges with 3.5 percent. The remaining hospitals in the Maryland area, such as Civista Medical Center (0.7 percent) and Howard County General Hospital (0.7 percent) represented a very small fraction of the Prince George's County resident discharges.

There is significant variation in payer type across jurisdictions (Table 4), with discharges from Prince George's County hospitals reflecting the payer mix representative of safety net hospitals. Approximately two-thirds of discharges from Prince George's County hospitals are reimbursed by Medicare (34.6 percent), Medicaid (16.9 percent) or self-pay/uninsured (7.3 percent), with only an average of one-third of the discharges reimbursed by private payers (32.3 percent). Discharges from hospitals in D.C., Montgomery County, Baltimore County, Anne Arundel County and other jurisdictions in Maryland had a larger proportion of discharges from private payment sources, and lesser proportions reimbursed by Medicaid, Medicare and self payment. Montgomery County hospitals average payer mix was 53.3 percent of discharges reimbursed by private insurance, 16.9 percent by Medicaid, 23.0 percent by Medicare, 6.1 percent paid out of pocket by the uninsured and 0.7 percent were categorized as other payer. D.C. area hospitals average was 49.1 percent by private payer, 21.2 percent by Medicaid, 23.3 percent by Medicare, 6.1 percent by the uninsured and 0.7 percent by other sources. Average payer mix for Baltimore County and the other grouped Maryland hospitals closely mirrored that of D.C. Anne Arundel County hospitals had a significantly higher share of private pay discharges than any of the other jurisdictions, with 62.3 percent of them reimbursed by private payers.

There was also significant variation within jurisdictions. In Prince George's County, Fort Washington Hospital had the highest proportion of reimbursement by private payers at 41.2 percent, whereas Prince George's Hospital Center had the lowest proportion at 24.0 percent. Prince George's Hospital Center had 47.1 percent of discharges reimbursed by Medicaid, relative to only 3.8 percent at Fort Washington Hospital. All hospitals had a significant share of discharges reimbursed by Medicare, ranging from 20.7 percent at Prince George's Hospital Center to 44.7 percent at Doctors Community Hospital. The uninsured accounted for a high of 10.6 percent of discharges at Fort Washington Hospital and a low of 6.3 percent at Laurel Regional Medical Center.

Prince George's County hospitals serve out-of-County patients as well as its own residents; the extent to which those patients account for their total discharges varies by hospital. Hospital-reported fiscal year 2010 total discharges were used with fiscal year 2009 discharges for Prince George's County from the HSCRC data for County residents to estimate the percent of each hospital's discharges that are for County residents (These are estimates since the discharge data base sample size is reduced due

TABLE 4 ESTIMATED PERCENT OF PRINCE GEORGE'S COUNTY HOSPITAL DISCHARGES THAT ARE FOR PRINCE GEORGE'S COUNTY RESIDENTS

Hospital		2009 actual	2010 actual*	Prince George's residents/total^
Doctors Community Hospital	# discharges	10,598	12,357	85.8%
	# inpatient days	43,691	51,708	84.5%
Fort Washington Medical Center	# discharges	2,243	3,078	72.9%
	# inpatient days	8,502	10,924	77.8%
Laurel Regional Hospital	# discharges	4,330	6,929	62.5%
	# inpatient days	17,778	27,426	64.8%
Prince George's Hospital Center	# discharges	13,815	15,789	87.5%
	# inpatient days	60,875	101,520	60.0%
Southern Maryland Hospital	# discharges	13,825	18,660	74.1%
	# inpatient days	51,059	72,877	70.1%

Source: 2007, 2008 and 2009 inpatient discharge data from HSCRC and DCHA

Includes data on all discharges even those missing data on primary payer, etc.

* Data from American Hospital Directory for fiscal year 2010 ending June 30, 2010. Includes discharges from ALL ZIP codes, not just Prince Georges' County

^ Ratio takes 2009 Prince George's County residents discharges per hospital/2010 AHD data for total discharges for each hospital to get the estimate for the ratio of how many discharges are Prince George's County residents.

to observations with missing data, although the majority of those discharges were for D.C. hospitals). These calculations are presented in Table 4. Prince George's County residents account for an estimated 85 percent of discharges from Doctors Community Hospital. County residents represent about 73 percent of discharges from Fort Washington Medical Center, 63 percent from Laurel Regional Hospital, 88 percent of Prince George's Hospital Center, and 74 percent of Southern Maryland Hospital. There is significant variation in hospital capacity in the County. In terms of discharges, Southern Maryland Hospital (13,825), Prince George's Hospital Center (13,815) and Doctors Community Hospital (10,598) had significantly more discharges than Laurel Regional Hospital (4,330) and Fort Washington Medical Center (2,243) in 2009. This variation is expected since bed size varies considerably for these hospitals. Prince George's Hospital Center has 329 beds, Southern Maryland Hospital has 265 beds, Doctors Community Hospital has 190 beds, Laurel Regional Hospital has 95 beds and Fort Washington Medical Center has 37 beds (www.ahd.com).

WHAT IS THE PAYMENT PROFILE OF THE HOSPITAL USE FOR COUNTY RESIDENTS?

The payer data tabulated in Table 5 reveal the payer mix for County resident hospital discharges by jurisdiction. Looking at the three major jurisdictions where residents go for hospital care

TABLE 5 INPATIENT DISCHARGES BY PAYER SOURCE AND HOSPITAL (2007, 2008, 2009) VALUES REPORTED AS PERCENTAGES

Hospital Name	Private	Medicaid	Medicare	Uninsured	Other
Prince George's Hospitals	32.3	25.0	34.6	7.3	0.8
Doctors Community Hospital	36.4	11.8	44.7	6.4	0.7
Fort Washington Hospital	41.2	3.8	44.1	10.6	0.3
Laurel Regional Medical Center	31.6	27.4	34.0	6.3	0.6
Prince George's Hospital Center	24.0	47.1	20.7	7.9	0.4
Southern Maryland Hospital	36.4	15.6	39.6	7.1	1.3
Montgomery County Hospitals	53.3	16.9	23.0	6.1	0.7
Adventist Rehab Hospital	30.7	6.4	54.8	6.3	1.8
Holy Cross Hospital	67.0	17.3	11.9	2.9	0.9
Montgomery General Hospital	56.6	15.2	16.6	11.4	0.2
Shady Grove Adventist Hospital	69.4	13.1	11.7	3.8	2.0
Suburban Hospital	54.3	6.1	26.6	9.0	3.9
Washington Adventist Hospital	36.3	17.8	36.1	9.6	0.2
District of Columbia Hospitals	49.1	21.2	23.2	2.3	4.1
Children's National Medical Center	44.1	52.5	0.7	2.7	0.0
George Washington University Hospital	61.8	3.0	28.8	4.4	2.0
Georgetown University Hospital	61.9	5.3	30.1	0.4	2.3
Greater Southeast Community	44.8	6.1	31.3	16.7	1.1
Howard University Hospital	63.1	3.0	21.1	11.6	1.3
Providence Hospital	19.2	58.3	18.9	0.1	3.5
Sibley Memorial Hospital	70.9	0.5	20.5	2.2	5.7
VA Medical Center	0.0	0.0	0.0	0.0	100.0
Washington Hospital Center	57.0	7.8	32.5	1.8	0.8
Baltimore County Hospitals	49.9	18.8	22.6	4.9	3.9
Bon Secours Hospital	7.3	14.5	16.4	41.8	20.0
Franklin Square Hospital	52.9	23.5	10.3	8.8	4.4
Good Samaritan Hospital	48.5	12.9	33.5	4.1	1.0

TABLE 5 **INPATIENT DISCHARGES BY PAYER SOURCE AND HOSPITAL (2007, 2008, 2009)** (CONTINUED) VALUES REPORTED AS PERCENTAGES

Hospital Name	Private	Medicaid	Medicare	Uninsured	Other
Greater Baltimore Medical Center	65.3	9.9	19.4	2.1	3.3
Harbor Hospital Center	46.6	26.7	17.3	8.9	0.5
Johns Hopkins Bayview	36.6	20.4	23.4	5.4	14.2
Johns Hopkins Hospital	54.4	18.5	25.7	0.3	1.1
Johns Hopkins Oncology	62.9	15.3	21.3	0.0	0.5
Kernan Hospital	50.5	16.3	25.5	2.9	4.8
Maryland General Hospital	20.1	54.3	14.6	7.9	3.0
Mercy Medical Center	58.1	17.6	19.5	1.9	3.0
Northwest Hospital Center	44.7	27.7	17.0	8.5	2.1
Saint Joseph Hospital	56.2	6.2	29.2	0.8	7.7
Sinai Hospital	56.3	20.3	17.9	2.4	3.2
St. Agnes Healthcare	62.9	14.2	16.0	6.0	0.9
University of Maryland Hospital	41.4	21.0	27.5	8.1	2.1
University of Maryland Cancer Center	42.8	24.9	18.8	7.8	5.7
University of Maryland Shock Trauma	47.8	16.4	10.9	14.4	10.5
Union Memorial Hospital	47.4	8.0	18.3	10.8	15.5
Anne Arundel County Hospitals	62.3	7.1	26.4	2.8	1.4
Anne Arundel Medical Center	63.4	7.1	25.9	2.5	1.2
Baltimore Washington Medical Center	39.5	6.7	36.8	9.4	7.5
Other Maryland Hospitals	46.3	17.3	27.3	6.5	2.6
Atlantic General Hospital	37.5	4.2	45.8	8.3	4.2
Braddock Hospital (Western Maryland Regional)	50.0	0.0	50.0	0.0	0.0
Calvert Memorial Hospital	41.0	17.1	31.7	6.7	3.4
Carroll County General Hospital	39.5	21.1	23.7	10.5	5.3
Chester River Hospital	25.0	0.0	25.0	25.0	25.0
Civista Medical Center	40.1	23.8	29.0	6.1	1.1
Dorchester General Hospital	22.2	44.4	33.3	0.0	0.0
Frederick Memorial Hospital	31.8	16.7	33.3	9.1	9.1
Garrett County Memorial Hospital	87.5	0.0	12.5	0.0	0.0
Harford Memorial Hospital	47.6	14.3	9.5	19.0	9.5
Howard County General Hospital	58.5	12.4	19.6	5.9	3.5
Memorial Hospital at Easton	37.0	14.8	48.1	0.0	0.0
Memorial of Cumberland	66.7	0.0	22.2	0.0	11.1
Peninsula Regional Medical Center	45.8	16.9	32.5	3.6	1.2
St. Mary's Hospital	27.4	11.4	50.4	9.3	1.5
Union of Cecil Hospital	40.0	20.0	40.0	0.0	0.0
Upper Chesapeake Medical Center	41.2	11.8	5.9	17.6	23.5
Washington County Hospital	35.3	23.5	20.6	20.6	0.0

All discharges Prince George's County residents

Source: 2007, 2008 and 2009 inpatient discharge data from HSCRC and DCHA

Sample size is 286,407; excludes the 5,683 discharges with missing data on payer

(Prince George's County, Montgomery County and D.C.), it is clear that residents who have private insurance are utilizing hospitals outside the County, while residents who have Medicaid, Medicare or who are uninsured predominate in the County hospitals. The findings for specific hospitals within Prince George's County reflect the undue burden of Medicaid patients on Dimensions Healthcare hospitals compared with other County hospitals. The data also reflect findings from previous studies that residents who have the capacity to pay for care are using services outside the County (Lurie, Harris, Shih, Ruder, Price, Martin et al., 2009).

In order to assess what hospital/health care and community population elements of the health care system can affect health outcomes, such as those identified as having high impact if improved, we focused on the proportion of hospital encounters that fall within the ambulatory care-sensitive condition category. In this manner we explored the association of selected elements with hospital discharges.

PATTERNS OF HOSPITAL USE BY PRINCE GEORGE'S COUNTY RESIDENTS FOR SELECTED AMBULATORY CARE-SENSITIVE CONDITIONS

Prince George's County resident discharges for each ambulatory care-sensitive PQI measure were detailed in Table 2. Diabetes-short term complications admissions were 0.5 percent, or 1,355 discharges, and diabetes long-term complications admissions were 0.9 percent (2,474 of discharges). COPD or asthma in older adults was the primary diagnosis for 4,069 discharges or 1.4 percent of County resident's discharges. Hypertension was the primary diagnosis for 0.6 percent of discharges (1,816), heart failure for 2.8 percent (8,097), angina for 0.4 percent (1,143), uncontrolled diabetes for 0.2 percent (527) and asthma in younger adults for 0.2 percent or 492 discharges. Any ambulatory care-sensitive condition indicated by one of the above PQIs was also included as a variable; this indicator accounted for 7.0 percent (19,973) of discharges. By looking at this subset ambulatory care-sensitive conditions and learning about associations with community population and health care elements, we can begin to estimate the capacity of the health care system to make a difference in the County's health status and health outcomes.

The community population and hospital characteristics elements we selected are ones that have been highlighted in the literature as contributing to improved health outcomes. These are listed in Table 6.

We looked at these elements and associations at the ZIP code level and at the level of the Public Use Microdata Areas (PUMAs). This level of detail was undertaken to contribute to decision making for the regional health care system.

The distribution of these discharges at the ZIP code level is detailed in Table 7. Some ZIP codes with few discharges have PQI indicator rates of zero. ZIP code 20601, for example, only had 50 total discharges over the three-year period, so PQI admissions rates are zero for most indicators. There is significant variation in PQI admissions rates across ZIP codes. The rates show that heart failure, diabetes and asthma are quite prevalent in the community and are important to address.

The definitions, means and standard errors of the dependent variables included in the econometric model are described in Table 8. The mean PQI ratio aggregated across all the ZIP codes was 21.2 (standard deviation of 10.6). This can be interpreted as on average 21 discharges per 1,000 total population of Prince George's County residents were for any of these ambulatory care-sensitive conditions related to a chronic condition. The readmission rates aggregated at the ZIP code level (available only for fiscal year 2008 and 2009 data) were also used as a dependent variable; readmissions averaged 10 percent for hospitalized Prince George's County residents.

Descriptive statistics for the explanatory variables are also included in Table 8. Age, sex and proportion of the ZIP code population that is minority were controlled for in the analyses, following Epstein (2001). The aggregate age

TABLE 6 COMMUNITY AND HEALTH SYSTEM CHARACTERISTICS

Community Population Elements
Age
Sex
Race/Ethnicity
Poverty Level
Health Care Elements
Primary Care Physician to Population Ratio
Nurse Practitioner to Population Ratio
Physician Assistant to Population Ratio
Presence of Safety Net Clinic

TABLE 7 ZIP CODE-LEVEL DATA FOR OUTCOME VARIABLES

ZIP Code	Short-term Diabetes	Long-term Diabetes	COPD & Asthma	Hypertension	Heart Failure	Angina	Uncontrolled Diabetes	Asthma Younger Adults
20601	0.00	0.04	0.17	0.00	0.00	0.00	0.00	0.04
20607	1.33	1.12	3.37	1.94	7.24	1.84	0.20	0.61
20608	0.00	7.62	7.62	1.09	8.71	5.44	0.00	1.09
20613	2.45	2.19	9.87	3.29	11.30	1.60	0.17	0.17
20623	1.46	0.73	1.82	0.73	7.65	2.55	0.36	0.00
20705	1.18	1.76	2.71	1.07	5.73	0.73	0.50	0.42
20706	1.55	3.54	5.38	1.96	9.43	1.01	0.67	0.62
20707	1.52	2.16	4.50	1.36	9.42	1.14	0.51	0.32
20708	1.64	1.76	3.95	1.37	7.87	1.33	0.55	0.39
20710	2.36	2.25	5.69	2.36	9.13	0.97	1.07	1.50
20712	1.88	2.55	2.33	1.44	9.41	1.44	0.55	0.55
20715	0.49	1.21	4.36	1.02	5.88	1.02	0.11	0.23
20716	0.82	3.51	2.21	1.49	5.63	0.67	0.34	0.10
20720	0.81	1.14	2.71	0.76	5.33	0.62	0.24	0.29
20721	0.85	1.81	2.04	1.55	6.51	0.70	0.22	0.52
20722	0.88	3.15	9.28	1.93	12.61	1.58	0.70	0.70
20735	2.23	4.94	7.71	3.08	14.34	2.09	0.90	0.76
20737	1.74	2.47	3.96	2.18	6.96	1.21	0.58	0.82
20740	0.73	1.42	2.26	0.38	3.44	0.63	0.07	0.17
20742	0.13	0.00	0.00	0.00	0.13	0.13	0.00	0.00
20743	2.46	6.71	9.45	4.53	20.35	2.05	1.11	1.73
20744	1.99	3.27	4.55	2.25	12.20	1.75	0.75	0.47
20745	2.50	3.97	5.20	2.85	13.78	1.51	0.74	0.60
20746	1.56	3.19	6.35	3.16	11.65	2.01	0.59	0.73
20747	2.15	3.55	6.77	2.57	13.08	1.50	1.10	1.25
20748	1.88	3.51	7.24	3.04	12.84	2.29	0.90	0.90
20762	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00
20769	0.61	1.21	3.33	0.45	6.97	1.82	0.45	0.76
20770	1.11	2.18	3.73	1.03	3.97	1.19	0.52	0.24
20772	1.55	2.21	3.94	1.97	8.35	1.48	0.70	0.21
20774	1.60	2.49	3.84	2.00	6.63	1.16	0.63	0.28
20781	0.87	2.45	4.63	2.36	7.87	1.22	0.87	0.17
20782	1.15	2.59	3.73	2.49	8.64	1.47	0.56	0.49
20783	1.26	2.45	2.94	1.62	6.59	0.88	0.36	0.34
20784	1.77	3.09	4.41	2.31	9.20	1.02	0.65	0.71
20785	2.85	4.85	6.73	4.17	14.15	1.94	1.00	1.08

Source: 2007, 2008 and 2009 discharge data from HSCRC and DCHA, rates per 1,000 County residents

Total sample size= 292,013

TABLE 8 DEFINITIONS AND MEANS OF MODEL VARIABLES

Variable		Description	Mean	Standard Deviation
Dependent Variables				
Prevention Quality Indicator (PQI) Proportion		Proportion of discharges (2007-2009) that were ambulatory care-sensitive hospitalizations	0.070	0.256
PQI ratio		Ratio of discharges that are ambulatory care-sensitive to ZIP code population per 1,000 residents	21.168	10.558
Readmission rate		ZIP code-level readmissions rate 2008, 2009	0.101	0.054
Demographic variables				
Age distribution	0-17	Proportion of ZIP code population age 0-17	0.239	0.053
	18-44	Proportion of ZIP code population age 18-44	0.415	0.125
	45-64	Proportion of ZIP code population age 45-64	0.256	0.072
	65+	Proportion of ZIP code population age 65 and older	0.089	0.034
Poverty		Proportion of ZIP code population at or below federal poverty level	0.078	0.041
Female		Proportion of ZIP code population female	0.515	0.025
Minority		Proportion of ZIP code population that is non-white, including: black, Hispanic, Asian, American Indian, Native Hawaiian and Pacific Islander, some other race and two or more races	0.798	0.171
Health Workforce Characteristics				
Licensed physicians		Ratio of licensed physicians in the ZIP code	1.130	1.214
Board-certified physicians		Ratio of board-certified physicians in the ZIP	0.924	1.035
Primary care physicians		Ratio of primary care physicians in the ZIP	0.489	0.457
Adult primary care physicians		Ratio of primary care physicians not including pediatricians in the ZIP code	0.401	0.386
Nurse practitioners		Ratio of nurse practitioners in the ZIP code	0.241	0.228
Physician assistants		Ratio of physician assistants in the ZIP code	0.408	0.552
Safety net clinic		Dichotomous indicator of safety net clinic in ZIP code	0.222	0.421

Notes: All of the ratios are calculated as per 1,000 County residents.

distribution was categorized by under age 18 (proportion = 0.239), 18 to 44 (proportion = 0.415), 45 to 64 (proportion = 0.256) and the proportion 65 and older (.089); the distribution of these proportions varied across ZIP codes. Results from preliminary analyses showed that only the proportion of the population over 65 was statistically significant, so we used an indicator of over 65 compared to under 65. On average, 52 percent of the population was female. The race distribution of the population was indicated by a variable reflecting the proportion of the population in each ZIP code that was classified as minority. Whites were the referent group, and minority included black, Hispanic, Asian, American Indian, Native Hawaiian and Pacific Islander, some other race and two or more races. Roughly 80 percent of Prince George's County residents were minorities. On average, 7 percent of the residents were at or below federal poverty level; this ranges from 2 percent in some ZIP codes to a maximum of 18 percent.

Health workforce characteristics measured at the ZIP code level were included as explanatory variables. The ratio of primary care physicians per 1,000 County residents (0.401) was a key explanatory variable. The ratio of

TABLE 9 ZIP CODE-LEVEL DATA FOR KEY OUTCOME VARIABLES

ZIP Code	Any PQI	Readmission Rate 2008	Readmission Rate 2009	ZIP Code	Any PQI	Readmission Rate 2008	Readmission Rate 2009
20601	0.25	0.14	0.00	20740	9.17	0.07	0.07
20607	17.65	0.13	0.13	20742	0.38	0.04	0.00
20608	33.73	0.11	0.08	20743	48.32	0.07	0.07
20613	31.37	0.10	0.12	20744	27.27	0.17	0.14
20623	15.31	0.09	0.11	20745	31.14	0.15	0.14
20705	14.09	0.03	0.04	20746	29.27	0.11	0.08
20706	24.19	0.11	0.10	20747	32.03	0.11	0.09
20707	20.96	0.04	0.05	20748	32.56	0.11	0.12
20708	18.95	0.05	0.04	20762	0.67	0.07	0.33
20710	25.34	0.07	0.05	20769	15.60	0.12	0.08
20712	20.26	0.05	0.03	20770	14.14	0.09	0.08
20715	14.37	0.12	0.11	20772	20.48	0.11	0.09
20716	14.82	0.10	0.09	20774	18.76	0.08	0.07
20720	11.74	0.09	0.10	20781	20.54	0.06	0.05
20721	14.32	0.12	0.09	20782	21.24	0.03	0.04
20722	30.99	0.11	0.07	20783	16.50	0.03	0.02
20735	36.05	0.17	0.14	20784	23.23	0.09	0.08
20737	19.87	0.06	0.06	20785	36.49	0.08	0.06

Source: 2007, 2008 and 2009 discharge data from HSCRC and DCHA. Readmission rate data are ZIP code-level data received from HSCRC and DCHA.
Total sample size= 292,013

nurse practitioners per 1,000 population (mean of 0.241) and physician assistants (mean of 0.343) were also included as a key explanatory variable reflecting work force supply. Presence of a safety net clinic in the ZIP code was included as a dichotomous indicator variable. The proportion of ZIP codes with a safety net clinic was 0.22.

ZIP code-level details on each of these outcome variables (any PQI and readmission rates) are tabulated in Table 9.

WHAT WE LEARNED ABOUT ASSOCIATIONS USING HOSPITAL DISCHARGES

We examined associations of community population and health care elements with each ambulatory care-sensitive condition hospital encounter. The results from the ordinary least squares regressions and robust regressions are presented in Appendices B through J, including the estimated coefficients, standard errors, t-statistics, *P* values and elasticities. The elasticity is calculated for ease of interpretation. It represents the percentage change in the mean rate of the dependent variable (ambulatory care-sensitive PQI) resulting from a 10 percent increase in the mean of each independent variable. For example, the elasticity for the minority variable is calculated as the mean of the minority variable (.798) divided by the mean of the outcome variable (any PQI, 21.168). This dividend is multiplied by the β coefficient for minority (β=29.6) and then by 10 to determine the effect of a 10 percent increase in the means (ε= 29.2 * (.798/21.2)* 10 = 11.01). A 10 percent increase in the proportion of the population that is non-white was

TABLE 10 AGGREGATE RESULTS: SIGNIFICANCE OF ASSOCIATIONS FOR SELECTED AMBULATORY CARE-SENSITIVE VISITS

Variable	Short-term Diabetes	Long-term Diabetes	COPD/ Asthma	Hyper-tension	Heart Failure	Angina	Uncontrolled Diabetes	Asthma Young Adults	Any Ambulatory Care
Age, Race, and Sex Distribution									
Female							+		
Age 65+		+	+		+	+		+	+
Minority	+	+		+	+		+	+	+
Poverty									
Supply Characteristics									
Safety net clinic									
Primary care physician ratio									
Nurse practitioner ratio		-		-			-	-	-
Physician assistant ratio									

Notes: The direction of the relationship is indicated by a +/= sign if the relationship is significant at the $p<.05$ level.

TABLE 11 INTERPRETATION OF ELASTICITY FOR ANY AMBULATORY CARE-SENSITIVE DISCHARGE MODEL

Element/Variable	Elasticity	Implication	Improvement (+) Decline (-)
Population 65+	6.4	A 10 percent increase in the population 65+ is associated an increase in the ambulatory care-sensitive hospital discharge ratio of 6.4 percent.	-
Race/Ethnicity	11.0	A 10 percent increase in the proportion of the population that is non-white is associated with an increase in the ambulatory sensitive hospital discharge ratio of 11.0 percent.	-
Nurse practitioner to population ratio	-1.60	A 10 percent increase in the ratio of nurse practitioners to population is associated with a decrease in the ambulatory care-sensitive hospital discharge ratio of 1.6 percent.	+

associated with an 11 percent increase in the rate of ambulatory care-sensitive discharges. The robust regression coefficients are compatible for the ordinary least squares regression coefficients for the variables that are statistically significant in the model.

Specific details on the estimates from the individual PQI admissions ratios are presented in an aggregate format in Table 10, an example of interpretation is included in Table 11, and all of the coefficients and elasticities are presented in more detail in the in Appendices B through J. These include the results for short-term diabetes, long-term diabetes, COPD and asthma, hypertension, heart failure, angina, uncontrolled diabetes and asthma in younger adults. The consistent findings across these models are that age and gender distribution across the ZIP codes are not persistently significantly associated with the ambulatory sensitive discharges, although proportion of population over 65 is positively associated with these discharges in some models. The proportion of the population that is minority is positively associated with ambulatory care-sensitive discharges in most of the models; increasing the proportion of the population that is non-white associated with higher ratios of ambulatory care-sensitive discharges.

Perhaps surprising, the primary care physician ratio per 1,000 residents and physician assistant ratio are not significant in any of these models. This

TABLE 12 LINEAR REGRESSION MODEL RESULTS READMISSIONS (PERCENTAGE)

Variable	Coefficient	Standard Error	t-statistic	*P* Value
Age, Race, and Sex Distribution				
Female	0.17	0.43	0.40	0.69
Age 65+	-0.28	0.26	-1.09	0.29
Minority	-0.02	0.06	-0.38	0.71
Poverty	-1.02	0.26	-3.86	0.01
Supply Characteristics				
Safety net clinic	0.02	0.02	1.17	0.25
Primary care physician ratio	0.00	0.02	0.20	0.85
Nurse practitioner ratio	-0.11	0.05	-2.46	0.02
Physician assistant ratio	-0.01	0.02	-0.34	0.74
Constant	0.15	0.20	0.76	0.45

Number of observations (ZIP codes): 36

R2 = 0.4373, Adjusted R2 = 0.2706

*Readmissions is the percent of discharges that resulted in a readmission within 30 days for each ZIP code.

ROBUST REGRESSION RESULTS

Variable	Coefficient	Standard Error	t-statistic	*P* Value
Age, Race, and Sex Distribution				
Female	0.25	0.37	0.67	0.51
Age 65+	0.27	0.25	1.08	0.29
Minority	0.02	0.05	0.31	0.76
Poverty	-0.49	0.25	-1.92	0.07
Supply Characteristics				
Safety net clinic	0.01	0.02	0.78	0.44
Primary care physician ratio	0.01	0.02	0.38	0.71
Nurse practitioner ratio	-0.03	0.04	-0.65	0.52
Physician assistant ratio	-0.01	0.02	-0.46	0.65
Constant	-0.03	0.17	-0.18	0.86

Number of observations (ZIP codes): 35

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

finding is consistent with findings using discharge data for all of the state of Virginia (Epstein, 2001). However, the ratio of nurse practitioners per 1,000 residents is statistically significantly associated with fewer ambulatory care-sensitive discharges per 1,000 residents, highlighting the importance of physician extenders in mitigating discharges for conditions that could be avoided with access to primary care in the community.

WHAT WE LEARNED ABOUT ASSOCIATIONS USING 30-DAY HOSPITAL READMISSIONS

In order to get an additional measure of all ambulatory care-sensitive conditions we looked at 30-day readmissions for County residents (Table 12). Hospital readmissions are an important measure of quality of health care highlighted in the Patient Protection and Affordable Care Act of 2010. Up to 50 percent of readmissions have been found to be preventable (Benbassat & Taragin 2000) and they may reflect quality of care in the hospital and in the community.

These readmissions were aggregated as a proportion of admissions for each ZIP code. Similar to the other models, the only health care workforce supply variable that was significantly associated with lower readmissions is the nurse practitioner ratio variable. However, this relationship was not significant in the robust regression models, so it should be interpreted with caution.

GENERAL PROJECTIONS FOR HOSPITAL DISCHARGES FOR 2017 AND 2022

Projections for Prince George's County residents' use of Prince George's County hospitals for 2017 and 2022

and a more general model for total discharges for all County residents were estimated. All five hospitals in Prince George's County are privately owned. Four of the five are non-profit; the only for-profit hospital is Southern Maryland Hospital. Analyses conducted for other localities interested in projecting hospital demand were used to model projections (Stewart, Tate, Finlayson, et al., 2002; Moscovitch, 2005; Minnesota Department of Health, 2006). These are simple, unadjusted projections that only account for population growth. Our methods closely follow those used in Minnesota to predict the impact of a new hospital in Cass County (Minnesota Department of Health, 2006). Several key assumptions were made for the hospital discharge projections, similar to those in the Minnesota analysis. The first assumption was that hospitalizations by age groups would be the same as they were in 2009. To predict future changes in hospitalization rates, we removed the two lowest and two highest ZIP code growth rates, modeling slower or faster growth rates in the ZIP codes that account for 75 percent of each hospital's discharges. We assumed that past growth rates (population change between 2000 and 2010) would hold true for the period 2012–2022. We assumed that the group of ZIP codes that account for 75 percent of each hospital's discharges would remain the same. We also assume that utilization behaviors and technology improvements have the same effect in the future as they had on past discharges. The data supplied by HSCRC and DCHA were only for Prince George's County residents.

There was no clear pattern in discharges for Prince George's County residents using Prince George's County hospitals over the 2007 to 2009 fiscal year period. Fiscal year 2008 discharges were somewhat lower than for the 2007 fiscal year period, except for Laurel Regional Hospital and Southern Maryland Hospital, which were slightly higher. In contrast, some hospitals saw fiscal year 2009 discharges increase compared to the previous fiscal year (Doctors Community Hospital, Fort Washington Medical Center and Prince George's Hospital Center), but fiscal year 2009 discharges were lower than fiscal year 2007 discharges for Fort Washington Medical Center, Laurel Regional Hospital and Prince George's Hospital Center. Since no clear trends in growth were identified, the projections were based off of the fiscal year 2009 data.

Projection results for inpatient growth for Prince George's County hospitals are shown in Table 13. As described in the methods section, population growth rates between 2000 and 2010 U.S. Census were calculated for the ZIP codes that account for 75 percent of each hospital's discharges. We calculated the average growth rate for these ZIP codes for the actual projection. We then re-estimated an upper bound for the average ZIP code growth by removing the two ZIP codes with the lowest growth rates, and the lower bound by removing the two ZIP codes with the highest growth rates. These projections are presented in the lower/upper bound row. Projections were calculated for both total discharges as well as for the total number of inpatient days.

There was significant variation in both the population of these ZIP codes as well as in their growth rates. Some ZIP codes experienced population decreases over the 10-year period, whereas other ZIP codes with small population totals experienced growth rates as high as 43 percent. The growth in ZIP codes accounting for 75 percent of Doctors Community Hospital's (190 beds) discharges ranged between -7 percent and 43 percent. The average growth rate used for the projection was 11.3 percent, with a lower bound of 6.1 percent and an upper bound of 15.2 percent. Fort Washington Hospital (37 beds) had 45 percent of its discharges coming from one ZIP code, 20744. Three ZIP codes (20744, 20745, and 20748) accounted for 75 percent of its discharges. The average population growth in these ZIP codes was 1.7 percent. Since there were only three ZIP codes in the 75 percent of discharges, we estimated the lower bound using the lowest ZIP code growth rate (-3 percent) and the upper bound using the ZIP with the highest growth rate (5 percent). One ZIP code (20707) accounted for 30 percent of the discharges from Laurel Regional Hospital. This ZIP code had a 23 percent population growth rate between 2000 and 2010. Three ZIP codes accounted for 65 percent of visits and seven ZIP codes accounted for 75 percent of discharges. The average ZIP code-population growth rate was 9.1 percent, the lower bound was estimated at 4.4 percent and the upper bound at 13.8 percent. Prince George's Hospital Center had two ZIP codes each account for 15 percent of discharges (20743, 20785) and both of those ZIP codes had negative population growth. Overall, 12 ZIP codes accounted for 75 percent of their discharges. The average population growth for these ZIP codes was 5.6 percent, the lower bound was estimated at 2 percent and the upper bound at 7.8 percent. One ZIP code (20735) accounted for 21.6 percent of Southern Maryland Hospital's discharges, and six ZIP codes accounted for 75 percent of their discharges. The average population growth rate was 4.6 percent, the lower bound was at less than 1 percent and the upper bound at 7.8 percent.

The projected increases in discharges are relatively modest (Table 13). Discharges from Doctors Community Hospital are projected to be 11,194 in 2017 and 11,790 in 2022. The estimated range for the 2022 projections includes a lower bound of 11,245

TABLE 13 PROJECTIONS FOR 2017 AND 2022 DISCHARGES FOR PRINCE GEORGE'S COUNTY HOSPITALS

Hospital		2017 projected	2022 projected
Doctors Community Hospital	# discharges	11,194	11,790
	(lower, upper bound)	(10,921, 11,403)	(11,245, 12,209)
	# inpatient days	46,149	48,606
	(lower, upper bound)	(45,024, 47,012)	(46,357, 50,332)
Fort Washington Medical Center	# discharges	2,262	2,280
	(lower, upper bound)	(2,209, 2,299)	(2,175, 2,355)
	# inpatient days	8,573	8,644
	(lower, upper bound)	(8,375, 8,715)	(8,247, 8,927)
Laurel Regional Hospital	# discharges	4,528	4,726
	(lower, upper bound)	(4,425, 4,629)	(4,520, 4,928)
	# inpatient days	18,591	19,403
	(lower, upper bound)	(18,169, 19,005)	(18,560, 20,231)
Prince George's Hospital Center	# discharges	14,206	14,598
	(lower, upper bound)	(13,953, 14,354)	(14,091, 14,893)
	# inpatient days	62,600	64,325
	(lower, upper bound)	(61,484, 63,249)	(62,093, 65,623)
Southern Maryland Hospital	# discharges	14,148	14,470
	(lower, upper bound)	(13,877, 14,361)	(13,929, 14,896)
	# inpatient days	52,250	53,442
	(lower, upper bound)	(51,251, 53,038)	(51,442, 55,016)

2017 and 2022 projections use 2009 data

Includes data on all discharges even those missing data on primary payer, etc.

and an upper bound of 12,209. The number of inpatient days is projected to be 48,606 in 2022. Discharges from Fort Washington Medical Center are projected to be 2,262 in 2017 (range 2,209–2,299) and 2,280 in 2022 (range 2,175–2,355). Inpatient days are projected to total 8,573 (range 8,375–8,715) in 2017 and 8,644 (range 8,247–8927) in 2022. These numbers are relatively low relative to the 2007 and 2008 discharges, since they are based off of 2009 figures, which were lower than the two previous years. Laurel Regional Hospital discharges are projected to be 4,528 in 2017 (range 4,425–4,629) and 4,726 in 2022 (range 4,520–4,928). Total inpatient days in 2017 are projected to be 18,591 (range 18,169–19,005) and 19,403 in 2022 (range 18,560–20,231). Prince George's Hospital Center discharges are projected to be 14,206 in 2017 (range 13,953–14,354) and 14,598 in 2022 (range 14,091–14,893). Inpatient days are estimated to be 62,600 in 2017 (range 61,484–63,249) and in 2022, 64,325 (range 62,093–65,623). Southern Maryland Hospital discharges are projected to be 14,148 in 2017 (range 13,877–14,361) and 14,470 in 2022 (range 13,929–14,896). Total inpatient days in 2017 are projected to be 52,250 (range 51,251–53,038), and 53,442 in 2022 (range 51,442–55,015).

For comparison with national statistics, we took the average discharge ratio per 1,000 Prince George's County residents for 2007, 2008 and 2009. The average annual discharge ratio for Prince George's County was 101.8 per 1,000 residents. This is slightly lower than the national average of 116.9 per 1,000 population in 2006, 117.9 per 1,000 population in 2008 and 118.1 in 2009 (CDC 2008, CDC 2009). (The discharge data used in this analysis do not include data on the non-civilian population, which may explain some of the undercount.)

The coefficients from the regression model of total discharges by ZIP code per 1,000 County residents are reported in Table 14. This allows us to understand the associations of community and health care system characteristics associated with total discharge ratios, and gives us a projection we can use in modeling future discharge ratios. The predicted discharge ratio from the model is 101.9 discharges per 1,000 County residents. This ratio can be increased or reduced based on beliefs about changes in the health care system and community in the future.

For overall discharge ratios, the proportion of the population over 65, the proportion of the population that is minority, and the proportion of the population living at or below federal poverty level are all associated with more hospital discharges per 1,000 residents in the ZIP code. None of the health care workforce supply variables

were significant in this model. This finding suggests that presence of a safety net clinic, and supply of primary care physicians, nurse practitioners and physician assistants are not significantly associated with discharges for Prince George's County residents. The outcome measured is all discharges, including injury and other acute conditions, which may mask the types of visits that truly would be impacted by local workforce supply.

Given the econometric model findings and the articulated intention of the planned regional medical center with an ambulatory primary care network, further estimates could be introduced to modify these projections. The following estimates could support additional health improvements.

1. Changes in health care workforce supply. The goal of the Governor's Workforce Investment Board is to "increase workforce capacity by 10-25 percent over the next 10 years." Given our econometric model findings this could reflect a decline in hospital use with the right mix of primary care workers and demonstrate an improvement in health outcomes for the County.

2. The Maryland Health Benefit Exchange plans to be launched in 2014 and will extend insurance coverage to the uninsured and underinsured. Given the payer profile mix of County residents, this could be another factor that would contribute to improved health outcomes. The Maryland State Health Improvement Process estimates 17.2 percent of County residents do not have insurance.

TABLE 14 LINEAR REGRESSION MODEL RESULTS DISCHARGE RATIO PER 1,000 RESIDENTS

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	-309.82	550.98	-0.56	0.58	-5.05
Age 65+	1864.30	327.61	5.69	0.01	5.25
Minority	323.57	72.92	4.44	0.01	8.18
Poverty	742.05	337.11	2.20	0.04	1.83
Supply Characteristics					
Safety net clinic	-10.57	25.95	-0.41	0.69	-0.07
Primary care physician ratio	3.08	30.96	0.10	0.92	0.05
Nurse practitioner ratio	-19.88	58.03	-0.34	0.74	-0.15
Physician assistant ratio	30.53	28.09	1.09	0.29	0.39
Constant	-19.31	253.54	-0.08	0.94	

Number of observations (ZIP codes): 36

R2 = 0.7707, Adjusted R2 = 0.7028

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

ROBUST REGRESSION RESULTS

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	142.99	550.98	0.30	0.69	2.33
Age 65+	1804.10	283.72	6.36	0.01	5.09
Minority	228.28	63.15	3.61	0.01	5.78
Poverty	881.64	291.95	3.02	0.01	2.18
Supply Characteristics					
Safety net clinic	-12.07	22.48	-0.54	0.60	-0.08
Primary care physician ratio	-10.77	26.81	-0.40	0.69	0.17
Nurse practitioner ratio	-5.20	50.26	-0.10	0.92	-0.04
Physician assistant ratio	24.17	24.33	0.99	0.33	0.31
Constant	-168.04	219.57	-0.77	0.45	

Number of observations (ZIP codes): 36

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable

3. The Maryland State Health Improvement Process and the Prince George's County Health Improvement Plan emphasize target improvements in all measures aimed at 2014. Most of these measures for chronic conditions reflect a 5 percent improvement. The efforts planned to achieve these improvements also could contribute to further improvements in health.

PROJECTING FUTURE DEMAND

Demand for inpatient care is sensitive to a variety of factors, including access to primary care, the economy, socio-demographic characteristics, health insurance coverage and technology. In Prince George's County, reputation, perception of quality of care and geographic proximity matter as well. All of these factors will play a role in determining inpatient demand in the future. Incorporating data and information from the KPMG market analysis, we can make assumptions about future demand for inpatient care in Prince George's County. These assumptions also factor in the expected future increases in primary care workforce, spread of insurance via the benefit exchanges and successful outcomes from the state and County health improvement plans. Taken together with declining trends for inpatient utilization over the last several decades, it seems reasonable to expect a 1 percent per year decline in inpatient discharges per 1,000 residents. For Prince George's County, this means that in the next decade, the discharge ratio is expected to decrease to below 100 discharges per 1,000 residents.

PUBLIC USE MICRODATA AREA (PUMA) RESULTS

Public Use Microdata Areas (PUMAs) can be used to identify broader geographic variation in outcomes at a level that aggregates across ZIP codes. Descriptive statistics at the PUMA level are presented in Table 15. These descriptive statistics are unadjusted, meaning they are only taking ZIP code population into account. They do not account for the distribution of age, minorities, sex or income in the PUMAs (see results in the following table for these adjusted models).

There are several striking findings when the data are tabulated at this level. PUMAs 1 and 5, and in many cases 2, are consistently lower than the average across these measures. Specifically, the lowest ratios are for: short-term diabetes in PUMAs 1 and 5, long-term diabetes in PUMAs 2 and 5, COPD/asthma in PUMAs 1 and 5, hypertension in PUMAs 2 and 5, heart failure in PUMAs 1 and 5, angina in PUMAs 1 and 5, uncontrolled diabetes in PUMAs 1 and 5, asthma in younger adults in PUMAs 1 and 2 (and also relatively low in 5) and any PQI in PUMAs 1 and 5. Total discharge ratios and 30-day readmissions are lowest in PUMAs 1 and 2. Essentially, PUMA 5 has lower ratios than the other PUMAs across all of the PQIs. The PUMAs with the highest ratios of ambulatory care-sensitive discharges include PUMA 7 for every measure, and PUMA 4 for every measure except uncontrolled diabetes and 30-day readmissions.

Moving beyond descriptive statistics, analysis including PUMA designation as an independent variable was conducted to isolate differences in types of discharges. These models controlled for the demographic and local health care workforce variables included in the previous models. The PUMA analyses are reported in Table 16. Presenting the results in one table rather than numerous tables allows us to see which PUMAs have higher rates of ambulatory care-sensitive discharges, readmissions and total discharges.

All of the results are relative to PUMA 5, a PUMA chosen because of its central location outside of the Beltway. PUMA 5 population is higher-income, gaining population and majority black. PUMA 1, a lower-income, losing population and growing Hispanic area, is not significantly different from PUMA 5 on any of the outcome measures once demographic and health workforce characteristics are included in the model. PUMA 2, a higher-income, gaining population, majority black area, is similar in discharges to PUMA 5 but does have statistically significantly lower 30-day readmissions than PUMA 5. PUMA 3, which is lower-income, stable population, growing Hispanic, differs significantly on several measures from PUMA 5. PUMA 3 has a higher rate of discharges for COPD/asthma in older adults, heart failure and any ambulatory

care-sensitive discharge. PUMA 4, a lower-income, losing population and majority black area, has a higher discharge ratio for COPD/asthma, hypertension, heart failure, asthma in younger adults and any ambulatory care-sensitive discharge relative to PUMA 5. PUMA 6, a higher-income, gaining population, majority black area, has a higher ratio of COPD/asthma, heart failure, angina and any ambulatory care-sensitive discharge than PUMA 5. PUMA 7, a lower-income, losing population and majority black area, has higher ratios of heart failure and any ambulatory care-sensitive discharge than PUMA 5.

There are limitations to using hospital discharge data for statistical analyses (Schoenman, Sutton, Elixhauser & Love, 2007). The data provided by HSCRC and DHA had several limitations. Some observations had missing data and in some cases those observations had to be excluded (for example, those discharges missing the hospital name). The data did not include a unique identifier, so readmissions could not be directly identified in the data. The data set received did not have procedure codes, which are useful in determining the discharges to use for some of the PQIs. More than 70,000 discharges did not have data on the All Patient Refined Diagnosis Related Groups (APR-DRGs), a system of classifying hospital discharges. APR-DRGs are grouped using ICD-9 codes as well as other discharge level data. This was not a major limitation, as using ICD-9 codes and AHRQ's PQIs are commonly adopted strategies in the literature. In fact, an advantage to using PQIs is that they take the population size into consideration. However, PQIs are traditionally measured at the County level. This within-County analysis adopted the same methodology and applied it to the ZIP code level rather than the County level. The ZIP code-level of analysis is also a limitation, as there

TABLE 15 PUMA LEVEL OUTCOME RATIOS PER 1,000 RESIDENTS

Outcome Measure	PUMA 1	PUMA 2	PUMA 3	PUMA 4	PUMA 5	PUMA 6	PUMA 7
Short-term Diabetes	1.04	1.37	1.38	2.49	0.96	1.22	1.98
Long-term Diabetes	2.15	1.96	2.28	5.02	2.13	2.46	3.56
COPD/Asthma	2.98	3.72	4.33	7.65	3.41	4.34	6.26
Hypertension	1.50	1.21	1.80	3.76	1.32	1.59	3.01
Heart Failure	6.22	6.75	7.90	15.86	6.62	7.79	12.76
Angina	0.99	1.10	1.08	1.83	1.00	1.86	1.94
Uncontrolled Diabetes	0.33	0.52	0.63	1.07	0.38	0.37	0.74
Asthma Younger Adults	0.33	0.34	0.64	1.36	0.40	0.37	0.73
Any PQI	15.64	17.03	20.09	38.94	16.26	20.31	30.99
30-day Readmissions	0.05	0.06	0.07	0.09	0.11	0.15	0.13
Total Discharge Ratio (aggregate 2007, 2008 and 2009 data)	**280.64**	**310.37**	**312.57**	**431.48**	**286.89**	**259.74**	**362.67**

Source: HSCRC and DCHA discharge data for 2007, 2008 and 2009

TABLE 16 LINEAR REGRESSION RESULTS: PUMA ASSOCIATIONS

Outcome Measure	PUMA 1	PUMA 2	PUMA 3	PUMA 4	PUMA 6	PUMA 7
Short-term Diabetes						
Long-term Diabetes						
COPD/Asthma			+	+	+	
Hypertension				+		
Heart Failure			+	+	+	+
Angina					+	
Uncontrolled Diabetes						
Asthma Younger Adults				+		
Any PQI			+	+	+	+
Total Discharge Ratio						
30-day Readmissions		-				

Source: Relationships from models estimating the association between Public Use Microdata Areas (PUMAs) and ratios of ambulatory care-sensitive discharges, readmissions and total discharges. The relationships are relative to PUMA 5. Since the estimated coefficients themselves do not have meaningful interpretations, the tables include an indicator of the sign of the coefficient if the relationship is statistically significant at the p=0.05 level.

are only 36 ZIP codes in Prince George's County. The regression models were parsimonious to maximize degrees of freedom.

The health care workforce findings in this study need careful follow-up. The data used for this study include licensed primary care practitioners and their reported practice locations and do not reflect their actual practice configurations and capacity.

DISCUSSION

This model provided a ZIP code-level analysis describing the relationship between local health system factors and Prince George's County residents' inpatient utilization. The majority of Prince George's residents seek hospital care outside of the County borders, including D.C. and Montgomery County hospitals. The payer mix for these discharges varies significantly across hospitals. Discharges from the D.C. and Montgomery County hospitals are much more likely to have private insurance as the primary payer, whereas Prince George's County hospitals have the highest proportion of visits paid for by public sources of coverage including Medicaid and Medicare. There were no consistent differences in trends in utilization between 2007 and 2009.

Ambulatory care-sensitive discharges, measured using AHRQ's Prevention Quality Indicators (PQIs), were analyzed for each ZIP code in Prince George's County. The ZIP code-level factors relating to these discharges were modeled using ordinary least squares and robust regression. The results consistently show that the ratio of nurse practitioners to 1,000 residents in a ZIP code is negatively associated with discharges for ambulatory care-sensitive admissions and the proportion of the population that is minority is associated with increases in these admissions. Physicians, physician assistants and presence of a safety net clinic in the ZIP code were not related to the ambulatory care-sensitive admissions in the model. These findings also hold in the readmissions model. Although this finding has been confirmed in some of the previous literature, it is an important dynamic to investigate within Prince George's County.

Several recommendations arise from this analysis. First, review of the patient characteristics and related factors for all County hospital discharges and readmissions, as well as emergency department use is encouraged, not just for Prince George's County residents. This will allow a more comprehensive assessment of the current demand on the health care system in Prince George's County and as a regional resource since the hospitals also provide care to non-County residents. Second, a group should be convened to critically review these findings in the context of other such studies in the region and to use the model to test other elements of the system. Third, a more specific assessment of the practice characteristics of the primary care workforce should be conducted, with an emphasis on nurse practitioners, in order to understand the specifics and implication of the reported association. It is important to further explore the relationship between nurse practitioners and admissions, including the existing practice models within the hospitals and the community. Adding a nurse practitioner to an inpatient surgery team has been found to improve overall resource use as well as reduce unnecessary emergency department visits by 50 percent (Robles, Slogoff, Ladwig-Scott, et al., 2011). The current analysis does not measure where or how nurse practitioners are practicing. Fourth, we encourage investment in an information system that can monitor the interaction and contributions of the elements of the system and report on outcome levels in real time. Fifth, we recommend consideration of site visits to select health systems that have successfully altered to improve health outcomes to obtain additional information and insights.

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APPENDIX A

SAMPLE SIZE

Starting Sample Size: 297,117, Analysis sample size: 284,402

Exclusion Criteria	# Observations Dropped
ZIP code 0, 77777 or 99999	171
ZIP code not in Prince George's County	2,522
Hospital location missing	1,725
Sex missing	17
Primary payer missing	5,623
Primary diagnosis data missing	1,988

ZIP codes identified from Prince George's County 2010 Maryland Department of Planning: http://www.mdp.state.md.us/MSDC/ZIPcode_map/2010/prinzc10.pdf

Post office ZIP codes are mapped to the overlapping residential ZIP code.

APPENDIX B

LINEAR REGRESSION MODEL RESULTS ANY AMBULATORY CARE-SENSITIVE DISCHARGE PER 1,000 RESIDENTS

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	38.84	56.75	0.68	0.50	9.45
Age 65+	152.49	33.74	4.52	0.01	6.41
Minority	29.21	7.51	3.89	0.01	11.01
Poverty	25.09	34.72	0.72	0.48	0.93
Supply Characteristics					
Safety net clinic	1.34	2.67	0.50	0.62	0.14
Primary care physician ratio	-1.85	3.19	-0.58	0.57	-0.43
Nurse practitioner ratio	-14.08	5.98	-2.35	0.03	-1.60
Physician assistant ratio	3.28	2.89	1.13	0.27	0.63
Constant	-34.74	26.11	-1.33	0.20	

Number of observations (ZIP codes): 36

R2 = 0.7489, Adjusted R2 = 0.6745

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

ROBUST REGRESSION RESULTS

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	45.01	59.70	0.75	0.46	10.95
Age 65+	143.85	35.50	4.05	0.01	6.05
Minority	27.60	7.90	3.49	0.01	10.40
Poverty	23.87	36.53	0.65	0.52	0.88
Supply Characteristics					
Safety net clinic	0.23	2.81	0.08	0.94	0.02
Primary care physician ratio	-1.82	3.35	-0.54	0.59	-0.42
Nurse practitioner ratio	-14.31	6.29	-2.27	0.03	-1.63
Physician assistant ratio	3.26	3.04	1.07	0.29	0.63
Constant	-35.54	27.47	-1.29	0.21	

APPENDIX C

LINEAR REGRESSION MODEL RESULTS SHORT-TERM DIABETES

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	7.63	4.52	1.69	0.10	23.17
Age 65+	-0.28	2.69	-0.10	0.92	-0.15
Minority	2.76	0.60	4.62	0.01	12.98
Poverty	1.26	2.77	0.46	0.65	0.58
Supply Characteristics					
Safety net clinic	0.21	0.21	0.99	0.33	0.27
Primary care physician ratio	-0.34	0.25	-1.33	0.20	-0.98
Nurse practitioner ratio	-0.77	0.48	-1.62	0.12	-1.09
Physician assistant ratio	0.39	0.23	1.69	0.10	0.93
Constant	-4.66	2.08	-2.24	0.03	

Number of observations (ZIP codes): 36

R2 = 0.6905, Adjusted R2 = 0.5989

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

ROBUST REGRESSION RESULTS

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	8.08	4.13	1.96	0.06	24.53
Age 65+	-1.42	2.46	-0.58	0.57	-0.75
Minority	3.01	0.55	5.51	0.01	14.16
Poverty	2.10	2.53	0.83	0.41	0.97
Supply Characteristics					
Safety net clinic	-0.04	0.19	-0.21	0.84	-0.05
Primary care physician ratio	-0.24	0.23	-1.05	0.30	-0.68
Nurse practitioner ratio	-0.86	0.44	-1.98	0.06	-1.22
Physician assistant ratio	0.41	0.21	1.95	0.06	0.99
Constant	-5.06	1.90	-2.66	0.01	

Number of observations (ZIP codes): 36

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

APPENDIX D

LINEAR REGRESSION MODEL RESULTS LONG-TERM DIABETES

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	-0.61	9.78	-0.06	0.95	-2.01
Age 65+	30.16	5.81	5.19	0.01	12.81
Minority	3.01	1.29	2.33	0.03	10.72
Poverty	3.91	5.98	0.65	0.52	
Supply Characteristics					
Safety net clinic	0.13	0.46	0.28	0.78	0.16
Primary care physician ratio	-0.36	0.55	-0.66	0.52	0.53
Nurse practitioner ratio	-2.36	1.03	-2.29	0.03	-1.88
Physician assistant ratio	0.89	0.50	1.78	0.09	1.41
Constant	-2.07	4.50	-0.46	0.65	

Number of observations (ZIP codes): 36

R2 = 0.6942, Adjusted R2 = 0.6036

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

ROBUST REGRESSION RESULTS

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	8.42	5.70	1.48	0.15	16.80
Age 65+	9.62	4.35	2.21	0.04	3.32
Minority	3.80	0.77	4.96	0.01	11.75
Poverty	6.60	3.39	1.94	0.06	1.99
Supply Characteristics					
Safety net clinic	0.07	0.26	0.26	0.80	0.06
Primary care physician ratio	-0.12	0.31	-0.39	0.70	-0.23
Nurse practitioner ratio	-1.49	0.59	-2.55	0.02	-1.39
Physician assistant ratio	0.70	0.28	2.47	0.02	1.10
Constant	-6.22	2.63	-2.36	0.03	

Number of observations (ZIP codes): 35

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

APPENDIX E

LINEAR REGRESSION MODEL RESULTS COPD & ASTHMA

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	8.42	17.69	0.48	0.64	9.83
Age 65+	39.96	10.52	3.80	0.01	8.06
Minority	3.55	2.34	1.52	0.14	6.42
Poverty	8.59	10.82	0.79	0.43	1.52
Supply Characteristics					
Safety net clinic	0.66	0.83	0.79	0.43	0.33
Primary care physician ratio	0.21	0.99	0.21	0.84	0.23
Nurse practitioner ratio	-2.36	1.86	-1.27	0.22	-1.28
Physician assistant ratio	0.14	0.90	0.15	0.88	0.13
Constant	-6.69	8.14	-0.82	0.42	

Number of observations (ZIP codes): 36

R2 = 0.5696, Adjusted R2 = 0.4420

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

ROBUST REGRESSION RESULTS

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	16.45	14.20	1.16	0.26	19.21
Age 65+	32.49	8.45	3.85	0.01	6.55
Minority	3.73	1.88	1.98	0.06	6.75
Poverty	5.30	8.69	0.61	0.55	0.94
Supply Characteristics					
Safety net clinic	-0.08	0.67	-0.12	0.91	-0.04
Primary care physician ratio	0.35	0.80	0.43	0.67	0.39
Nurse practitioner ratio	-3.61	1.50	-2.41	0.02	-1.97
Physician assistant ratio	0.35	0.72	0.48	0.64	0.32
Constant	-10.00	6.54	-1.53	0.14	

Number of observations (ZIP codes): 36

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

APPENDIX F

LINEAR REGRESSION MODEL RESULTS HYPERTENSION

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	9.79	6.17	1.59	0.12	27.55
Age 65+	6.92	3.67	1.89	0.07	3.37
Minority	3.46	0.82	4.25	0.01	15.08
Poverty	2.17	3.77	0.57	0.57	0.92
Supply Characteristics					
Safety net clinic	0.26	0.29	0.91	0.37	0.31
Primary care physician ratio	-0.32	0.35	-0.92	0.37	-0.85
Nurse practitioner ratio	-1.74	0.65	-2.67	0.01	-2.29
Physician assistant ratio	0.38	0.31	1.20	0.24	0.85
Constant	-6.37	2.84	-2.25	0.03	

Number of observations (ZIP codes): 36

R2 = 0.7278, Adjusted R2 = 0.6471

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

ROBUST REGRESSION RESULTS

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	9.46	5.69	1.66	0.11	26.62
Age 65+	4.69	3.38	1.39	0.18	2.28
Minority	3.81	0.75	5.06	0.01	16.61
Poverty	3.30	3.48	0.95	0.35	1.41
Supply Characteristics					
Safety net clinic	-0.20	0.27	-0.73	0.47	-0.24
Primary care physician ratio	-0.13	0.32	-0.41	0.68	-0.35
Nurse practitioner ratio	-1.87	0.60	-3.12	0.01	-2.46
Physician assistant ratio	0.37	0.29	1.29	0.21	0.82
Constant	-6.39	2.62	-2.44	0.02	

Number of observations (ZIP codes): 36

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

APPENDIX G

LINEAR REGRESSION MODEL RESULTS HEART FAILURE

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	19.40	24.33	0.80	0.43	11.87
Age 65+	45.48	14.47	3.14	0.01	4.81
Minority	14.07	3.22	4.37	0.01	13.33
Poverty	5.19	14.89	0.35	0.73	0.48
Supply Characteristics					
Safety net clinic	0.67	1.15	0.59	0.56	0.18
Primary care physician ratio	-1.18	1.37	-0.86	0.40	-0.69
Nurse practitioner ratio	-5.09	2.56	-1.99	0.06	-1.46
Physician assistant ratio	1.66	1.24	1.34	0.19	0.80
Constant	-16.15	11.20	-1.44	0.16	

Number of observations (ZIP codes): 36

R2 = 0.7154, Adjusted R2 = 0.6311

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

ROBUST REGRESSION RESULTS

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	29.71	21.45	1.38	0.18	18.17
Age 65+	35.58	12.76	2.79	0.01	3.76
Minority	12.42	2.84	4.37	0.01	11.77
Poverty	4.69	13.13	0.36	0.72	0.43
Supply Characteristics					
Safety net clinic	-1.39	1.01	-1.38	0.18	-0.36
Primary care physician ratio	-0.26	1.21	-0.21	0.83	-1.15
Nurse practitioner ratio	-5.76	2.26	-2.55	0.02	-1.64
Physician assistant ratio	1.40	1.09	1.28	0.21	0.68
Constant	-19.21	9.87	-1.95	0.06	

Number of observations (ZIP codes): 36

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

APPENDIX H

LINEAR REGRESSION MODEL RESULTS ANGINA

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	-7.66	7.09	-1.08	0.29	-28.57
Age 65+	19.62	4.22	4.65	0.01	12.65
Minority	0.80	0.94	0.85	0.40	4.63
Poverty	0.10	4.34	0.02	0.98	0.06
Supply Characteristics					
Safety net clinic	-0.23	0.33	-0.68	0.50	-0.37
Primary care physician ratio	0.14	0.40	0.35	0.73	0.50
Nurse practitioner ratio	-0.53	0.75	-0.71	0.48	-0.92
Physician assistant ratio	-0.20	0.36	-0.54	0.59	-0.59
Constant	3.12	3.26	0.95	0.35	

Number of observations (ZIP codes): 36

R2 = 0.4894, Adjusted R2 = 0.3381

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

ROBUST REGRESSION RESULTS

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	1.02	4.46	0.23	0.82	3.81
Age 65+	8.30	3.40	2.44	0.02	5.35
Minority	1.42	0.60	2.37	0.03	8.21
Poverty	0.17	2.65	0.07	0.95	0.10
Supply Characteristics					
Safety net clinic	-0.08	0.21	-0.39	0.70	-0.13
Primary care physician ratio	0.55	0.24	2.24	0.03	1.95
Nurse practitioner ratio	-1.00	0.46	-2.18	0.04	-1.74
Physician assistant ratio	-0.26	0.22	-1.16	0.26	-0.77
Constant	-1.10	2.06	-0.54	0.60	

Number of observations (ZIP codes): 35

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

APPENDIX I

LINEAR REGRESSION MODEL RESULTS UNCONTROLLED DIABETES

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	3.31	1.63	2.03	0.05	32.47
Age 65+	0.00	0.97	0.00	0.99	0.00
Minority	1.22	0.22	5.63	0.01	18.54
Poverty	1.84	1.00	1.84	0.08	2.73
Supply Characteristics					
Safety net clinic	-0.12	0.08	-1.56	0.13	-0.51
Primary care physician ratio	0.08	0.09	2.03	0.39	0.75
Nurse practitioner ratio	-0.38	0.17	-2.21	0.04	-1.74
Physician assistant ratio	0.03	0.08	0.41	0.68	0.23
Constant	-2.22	0.75	-2.95	0.01	

Number of observations (ZIP codes): 36

R2 = 0.6063, Adjusted R2 = 0.4897

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

ROBUST REGRESSION RESULTS

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	3.68	2.15	0.74	0.46	36.10
Age 65+	-0.17	1.27	-0.14	0.89	-0.29
Minority	1.24	0.28	4.38	0.01	18.85
Poverty	1.27	1.31	0.97	0.34	1.89
Supply Characteristics					
Safety net clinic	-0.12	0.10	-1.16	0.26	-0.51
Primary care physician ratio	0.09	0.12	0.74	0.46	0.84
Nurse practitioner ratio	-0.38	0.23	-1.69	0.10	-1.74
Physician assistant ratio	0.03	0.11	0.23	0.82	0.23
Constant	-2.37	0.98	-2.40	0.02	

Number of observations (ZIP codes): 36

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

APPENDIX J

LINEAR REGRESSION MODEL RESULTS ASTHMA YOUNGER ADULTS

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	2.56	2.82	0.91	0.37	20.31
Age 65+	4.00	1.68	2.39	0.02	5.49
Minority	0.98	0.37	2.62	0.01	12.05
Poverty	2.43	1.73	1.41	0.17	2.92
Supply Characteristics					
Safety net clinic	-0.16	0.13	-1.24	0.23	-0.55
Primary care physician ratio	-0.08	0.16	-0.49	0.63	-0.60
Nurse practitioner ratio	-0.62	0.30	-2.10	0.05	-2.30
Physician assistant ratio	0.08	0.14	0.58	0.57	0.50
Constant	-1.91	1.30	-1.47	0.15	

Number of observations (ZIP codes): 36

R2 = 0.6063, Adjusted R2 = 0.4897

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

ROBUST REGRESSION RESULTS

Variable	Coefficient	Standard Error	t-statistic	*P* Value	Elasticity*
Age, Race, and Sex Distribution					
Female	1.21	2.72	0.45	0.66	9.60
Age 65+	3.39	1.61	2.10	0.04	4.65
Minority	0.91	0.36	2.52	0.02	11.19
Poverty	2.16	1.66	1.30	0.21	2.60
Supply Characteristics					
Safety net clinic	-0.25	0.13	-1.95	0.06	-0.86
Primary care physician ratio	0.00	0.15	0.00	1.00	0.00
Nurse practitioner ratio	-0.59	0.29	-2.06	0.05	-2.19
Physician assistant ratio	0.06	0.14	0.47	0.65	0.37
Constant	-1.14	1.25	-0.91	0.37	

Number of observations (ZIP codes): 36

*Elasticity is the percentage change in the dependent variable associated with a 10 percent increase in the independent variable.

APPENDIX K

TABLE K1 PRINCE GEORGE'S COUNTY DISCHARGE AND POPULATION CHARACTERISTICS AT THE ZIP CODE LEVEL

ZIP	Name	PUMA	2000 Census Population	2010 Census Population	Total Discharges per ZIP 2007–2009*	Total Discharges per ZIP 2007–2009 complete data only+	2010 Proportion Non-white	2010 Proportion Female	Licensed Physician Ratio^	Board Physician Ratio^
20601	Waldorf	6	22279	24156	50	50	0.59	0.52	0.08	0.08
20607	Accokeek	6	7069	9802	2600	2542	0.78	0.51	0.00	0.00
20608	Aquasco	6	1015	919	407	402	0.52	0.49	0.00	0.00
20613	Brandywine	6	8266	11860	4240	4181	0.66	0.51	0.17	0.08
20623	Cheltenham	6	2702	2744	646	629	0.87	0.51	0.36	0.36
20705	Beltsville	2	22802	26188	7548	7415	0.77	0.51	0.34	0.23
20706	Lanham	5	37642	38692	14382	14118	0.91	0.53	2.33	1.91
20707	Laurel	2	25637	31538	10642	10540	0.70	0.52	3.46	3.11
20708	Laurel	2	25062	25546	8368	8273	0.81	0.53	0.86	0.74
20710	Bladensburg	3	7782	9313	3593	3465	0.95	0.53	0.54	0.21
20712	Mount Rainier	3	9067	9031	3119	2937	0.88	0.50	0.00	0.00
20715	Bowie	5	25226	26382	8098	8019	0.43	0.52	1.14	1.02
20716	Bowie	5	19595	20787	6182	6070	0.73	0.54	2.41	2.02
20720	Bowie	5	14713	21031	5277	5190	0.80	0.53	0.14	0.10
20721	Bowie	5	22412	27016	7014	6899	0.94	0.54	0.56	0.48
20722	Brentwood	3	5400	5711	2240	2152	0.87	0.50	1.05	0.88
20735	Clinton	6	32887	35421	15039	14768	0.90	0.53	4.29	3.36
20737	Riverdale	3	19938	20684	7812	7578	0.88	0.48	1.74	1.31
20740	College Park	1	31041	28780	5765	5636	0.47	0.47	1.36	1.08
20742	University of Maryland	3	N/A	7808	152	149	0.37	0.47	1.15	0.90
20743	Capitol Heights	4	41549	38621	19065	18420	0.98	0.54	0.08	0.00
20744	Fort Washington	6	48198	50722	16600	16173	0.92	0.53	0.91	0.79
20745	Oxon Hill	7	27692	28451	10335	9898	0.95	0.53	1.27	0.77
20746	Suitland	7	28530	28838	11037	10633	0.96	0.55	1.18	0.97
20747	District Heights	4	39920	40054	15812	15316	0.97	0.55	0.25	0.22

TABLE K1 PRINCE GEORGE'S COUNTY DISCHARGE AND POPULATION CHARACTERISTICS AT THE ZIP CODE LEVEL (CONTINUED)

ZIP	Name	PUMA	2000 Census Population	2010 Census Population	Total Discharges per ZIP 2007–2009*	Total Discharges per ZIP 2007–2009 complete data only+	2010 Proportion Non-white	2010 Proportion Female	Licensed Physician Ratio^	Board Physician Ratio^
20748	Temple Hills	7	40035	38792	14847	14407	0.95	0.54	1.08	0.95
20762	Andrews Air Force Base	6	7925	2973	74	73	0.44	0.47	0.00	0.00
20769	Glenn Dale	5	4942	6604	1783	1758	0.77	0.50	2.42	2.12
20770	Greenbelt	2	21186	25173	7687	7559	0.76	0.54	4.97	4.33
20772	Upper Marlboro	6	35414	42625	12931	12648	0.86	0.52	0.54	0.45
20774	Upper Marlboro	5	32942	43013	12308	12002	0.96	0.55	2.09	1.84
20781	Hyattsville	3	11217	11440	4158	4029	0.76	0.48	0.52	0.44
20782	Hyattsville	1	28764	30560	10562	10096	0.85	0.51	0.79	0.56
20783	Hyattsville	1	43380	44487	14643	14045	0.92	0.45	0.16	0.07
20784	Hyattsville	3	27092	29449	11363	11080	0.92	0.51	0.34	0.31
20785	Hyattsville	4	39086	35052	15634	15252	0.94	0.54	2.11	1.57

*Data include discharges missing payer and primary diagnosis

+Observations with missing information are dropped

^The workforce data are ratios of the count of workforce supply in the ZIP code per ZIP code population per 1,000 residents.

TABLE K2 PRINCE GEORGE'S COUNTY DISCHARGE AND POPULATION CHARACTERISTICS AT THE ZIP CODE LEVEL

ZIP	Name	PUMA	Primary Care Physician Ratio^	Adult Primary Care Physician Ratio^	Nurse Practitioner Ratio	Safety Net Clinic	Proportion Under Age 18	Proportion Age 18–44	Proportion Age 45–64	Proportion Age 65+	At or below Poverty Level	Physician Assistant Ratio
20601	Waldorf	6	0.04	0.04	0.21	0	0.27	0.37	0.28	0.08	0.05	0.08
20607	Accokeek	6	0.00	0.00	0.20	0	0.25	0.33	0.33	0.09	0.04	0.00
20608	Aquasco	6	0.00	0.00	0.00	0	0.20	0.27	0.34	0.19	0.07	0.00
20613	Brandywine	6	0.08	0.00	0.25	1	0.24	0.34	0.31	0.12	0.06	0.00
20623	Cheltenham	6	0.00	0.00	0.73	0	0.28	0.34	0.32	0.06	0.02	0.00
20705	Beltsville	2	0.11	0.11	0.31	0	0.24	0.39	0.26	0.10	0.07	0.15
20706	Lanham	5	0.85	0.75	0.31	1	0.27	0.38	0.26	0.10	0.08	1.52
20707	Laurel	2	1.46	1.20	0.38	0	0.22	0.42	0.26	0.10	0.06	1.93
20708	Laurel	2	0.55	0.20	0.27	0	0.26	0.45	0.22	0.07	0.06	0.08
20710	Bladensburg	3	0.21	0.21	0.00	0	0.27	0.44	0.20	0.09	0.12	0.21

TABLE K2 PRINCE GEORGE'S COUNTY DISCHARGE AND POPULATION CHARACTERISTICS AT THE ZIP CODE LEVEL (CONTINUED)

ZIP	Name	PUMA	Primary Care Physician Ratio^	Adult Primary Care Physician Ratio^	Nurse Practitioner Ratio	Safety Net Clinic	Proportion Under Age 18	Proportion Age 18–44	Proportion Age 45–64	Proportion Age 65+	At or below Poverty Level	Physician Assistant Ratio
20712	Mount Rainier	3	0.00	0.00	0.00	0	0.23	0.46	0.24	0.07	0.13	0.00
20715	Bowie	5	0.38	0.34	0.38	0	0.22	0.35	0.29	0.15	0.02	0.34
20716	Bowie	5	1.15	1.01	0.58	0	0.25	0.38	0.27	0.10	0.02	1.35
20720	Bowie	5	0.10	0.10	0.81	0	0.26	0.34	0.33	0.07	0.03	0.10
20721	Bowie	5	0.41	0.33	0.59	0	0.25	0.30	0.34	0.11	0.02	0.11
20722	Brentwood	3	0.70	0.53	0.35	0	0.25	0.40	0.26	0.09	0.11	0.35
20735	Clinton	6	0.90	0.82	0.11	0	0.23	0.33	0.32	0.11	0.03	0.62
20737	Riverdale	3	0.63	0.48	0.19	0	0.29	0.46	0.19	0.06	0.11	0.24
20740	College Park	1	0.76	0.73	0.07	1	0.12	0.65	0.16	0.08	0.18	0.42
20742	University of Maryland	3	0.51	0.38	0.00	0	0.00	1.00	0.00	0.00	0.07	0.64
20743	Capitol Heights	4	0.00	0.00	0.03	1	0.26	0.37	0.25	0.12	0.12	0.08
20744	Fort Washington	6	0.41	0.39	0.14	0	0.23	0.32	0.31	0.13	0.03	0.08
20745	Oxon Hill	7	0.39	0.39	0.07	1	0.24	0.39	0.27	0.09	0.10	0.32
20746	Suitland	7	0.69	0.69	0.00	1	0.25	0.41	0.24	0.09	0.09	0.07
20747	District Heights	4	0.20	0.20	0.10	0	0.26	0.40	0.26	0.08	0.09	0.05
20748	Temple Hills	7	0.80	0.54	0.05	0	0.22	0.37	0.29	0.12	0.07	0.08
20762	Andrews Air Force Base	6	0.00	0.00	0.00	0	0.35	0.58	0.06	0.00	0.02	0.00
20769	Glenn Dale	5	1.67	1.36	0.61	0	0.26	0.31	0.34	0.09	0.03	0.76
20770	Greenbelt	2	1.55	1.31	0.48	1	0.23	0.44	0.25	0.07	0.10	0.56
20772	Upper Marlboro	6	0.28	0.16	0.49	0	0.25	0.37	0.29	0.09	0.03	0.14
20774	Upper Marlboro	5	0.86	0.70	0.46	0	0.23	0.36	0.30	0.11	0.03	0.16
20781	Hyattsville	3	0.44	0.35	0.00	0	0.25	0.44	0.25	0.07	0.15	0.00
20782	Hyattsville	1	0.43	0.26	0.20	0	0.22	0.45	0.23	0.09	0.10	0.10
20783	Hyattsville	1	0.04	0.04	0.07	1	0.22	0.51	0.19	0.08	0.12	0.07
20784	Hyattsville	3	0.20	0.20	0.14	0	0.27	0.41	0.24	0.07	0.08	0.20
20785	Hyattsville	4	0.77	0.57	0.11	0	0.27	0.40	0.24	0.09	0.15	1.54

^ The workforce data are ratios of the count of workforce supply in the ZIP code per ZIP code population per 1,000 residents.

TECHNICAL REPORT 7

An Assessment of Comparable Model Health Care Systems: Interviews with Key Professionals

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INTRODUCTION

The literature consistently shows that accessibility to primary care services improves population health, lowers health care spending and is associated with a more equitable distribution of health within communities (Starfield, Shi, & Macinko, 2005). An adequate supply of primary care physicians has been shown to optimize health outcomes (Goodson, 2010). However, studies show that the U.S. has a severe maldistribution of primary care physicians (Goodell, Dower, & O'Neill, 2011). Communities that have reduced access to primary care— typically comprising a high proportion of uninsured, low-income and minority individuals—has a correspondingly high proportion of death and disease rates than communities that have better access to primary care (Bodenheimer & Pham, 2010).

Under the Patient Protection and Affordable Care Act of 2010 (ACA), 32 million more Americans will obtain health insurance, thereby increasing the number of individuals who will seek primary care services and require more primary care physicians to meet their health care needs (Brook & Young, 2010). However, the U.S. lacks a sufficient number of primary care physicians to serve the health care needs of Americans, with many urban and rural communities currently underserved. Yet, these areas tend to have the greatest need for health care services (Goodell, Dower, & O'Neill, 2011). As a result of the projected shortage of primary care physicians, millions of individuals will be unable to readily obtain the health care services they need (Kirsch, Henderson, & Dill, 2012). Other factors, such as an aging population and the growth of the U.S. population will further increase the need for primary care over the next 15 years (Bodenheimer, Chen, & Bennett, 2009). In 2020, it is projected that the U.S. will have shortages of 45,500 primary care physicians and 46,100 medical specialists (Kirch, Henderson, & Dill, 2011).

The ACA reforms address the primary care supply issues through several policy mechanisms, including implementation of physician payment reform, primary care workforce expansion legislation and practice innovations. In addition, the ACA takes steps to resolve the maldistribution of primary care physicians by authorizing (though not guaranteeing) funds for tuition assistance to make it possible for poorer students to enter medical school, as these students are more likely to practice primary care in underserved communities (Dorsey, Nicholson, & Frist, 2011). Since the enactment of the ACA, the federal government has introduced financial incentives designed to improve the current primary care practice model and strengthen primary care services.

In October 2011, the Department of Health and Human Services (HHS) announced the Federally Qualified Health Center (FQHC) Advanced Primary Care Practice demonstration, which will financially support community health centers for providing quality care and provide technical assistance throughout the demonstration period, Nov. 1, 2011, and Oct. 31, 2014 (The Centers for Medicare and Medicaid Services, 2011). Another ACA initiative, led by the Health Resources Service Administration (HRSA), the Health Center Quality Improvement and Patient Centered Medical Home Supplement Funding demonstration, supplies more than 900 community health centers providing primary care services throughout the U.S. with resources to better coordinate and deliver care to patients. (HHS).

It is clear that states must take steps to improve their health systems and increase primary care access under the ACA; it is particularly critical that states address the maldistribution of primary care providers (Kirsch, Henderson, & Dill, 2012). In response to the predicted

physician workforce shortage, the state of Maryland has developed a plan to prepare the state's workforce for the full implementation of health reform. This plan contains strategies to address the impending physician shortage in an effort to mitigate the negative impact on residents' health. To address the lack of supply of primary care practitioners in service shortage areas, Maryland will take steps to ensure optimum use of innovative state and federal opportunities for primary care workforce development by 2012 (The State of Maryland & The Governor's Workforce Investment Board, November 2011).

Ensuring access to primary care services is a key factor in avoiding initial hospitalizations and post-discharge readmissions, since these providers serve as gatekeepers into the health care system, and can provide continuity of care after a patient is discharged from the hospital (Starfield, Shi, & Macinko, 2005) (Minott, 2008). A recent study found a substantial association between regional rates of overall hospital admissions and rates of readmissions (Epstein, Ashish, & Orav, 2011). These findings underscore the need for primary care providers to be available to patients when health problems arise, so that avoidable hospitalizations are prevented (Starfield, Shi, & Macinko, 2005). Based on a review of the literature, reducing hospital readmissions will require system redesign, including re-engineered discharge planning and post-discharge coordination of care. Studies have shown that transitional care management plays a key role in preventing avoidable hospital readmissions (Oh, 2011). Effective care transition requires accountability among all participants, and facilitates a smooth handoff between the hospital and post-discharge providers, as well as other individuals and organizations that may be responsible for following up with patient care post-discharge (Minott, 2008). Changes in the culture of health care will be necessary. For example, physicians and other professionals must embrace a patient-centered, collaborative, integrated approach over professional autonomy.

In summary, the literature has mainly focused on strengthening primary care and reducing hospital readmissions. Thus our study attempted to fill some of the gaps in this literature by conducting an overview of comparative health care system models to identify informative characteristics to help guide the design of an effective, efficient and financially viable medical system able to improve health care delivery for all income levels in Prince George's County. Our team identified a group of existing models of regional health systems within Maryland (Montgomery County) and other states (e.g. Arizona, Colorado, Michigan, New Mexico, North Carolina, Oklahoma, Pennsylvania, Utah, Vermont and Wisconsin,) that can inform and demonstrate components of the proposed Regional Medical System in Prince George's County.

METHODS

RESEARCH QUESTIONS, INTERVIEW PARTICIPANTS AND DATA COLLECTION

SELECTION CRITERIA

After IRB submission and approval, we conducted telephone interviews with officials from 13 health care systems. The systems were selected based on a review of relevant literature and websites, and included innovative health care systems (e.g. hospitals, community health centers and other health care facilities) that provide high-quality, accessible and cost-effective primary, chronic and specialty health care services. We also identified one system that does not meet these criteria (Arizona) for comparison purposes.

DEVELOPMENT OF THE INTERVIEW GUIDE

The primary study questions guided the development of the interview questions. Interviews addressed the following issues: (1) key health outcomes amenable to improvement, (2) elements in the health care system that affect these outcomes, (3) geographic distribution of health care resources and areas of greatest need for primary care, (4) utilization of the health care system by paying and non-paying patients, (5) type of public health sector resources mobilized to complement the health care system, (6) financing mechanisms utilized by the health care system and (7) changes in the health care system implemented in the past year, including any innovations. See Appendix A for the complete interview guide.

IDENTIFICATION OF KEY INFORMANTS AND DATA COLLECTION

To identify appropriate informants for each health care system, a project team member contacted individuals in administrative roles in the 13 identified systems via phone or email, invited them to participate in the study and scheduled an interview. Potential participants received a brief summary of the research to request their participation and if they agreed, they received an

informed consent form and the interview questions in advance. There were no monetary incentives for participants. Two faculty researchers experienced in interview techniques from the Department of Health Services Administration conducted one-hour telephone interviews February through March 2012. All interviews were audiotape recorded and transcribed. During the interview, participants were asked open-ended questions (Appendix A) that pertain to the health care systems they oversee. Participants were informed that their identities would remain confidential.

DATA ANALYSIS

The methods described by Miles and Huberman (1994) and Morgan and Krueger (1998) guided the qualitative analysis for this study. First, the researchers developed brief descriptive case studies of each health care system. Next, the comments captured for each of the project study research questions were transcribed and structured the analysis of the in-depth qualitative interviews. Three project analysts read the entire transcripts and the interviewers' notes. Using the study research questions to structure the analysis, they developed table shells that mirror the interview questions. To answer each study question, they reviewed the transcripts and identified key themes related to each question. To establish consistent definitions of themes and sub-themes among analysts, they analyzed the first interview as a team. When they reached agreement on definitions, they analyzed the remaining interviews independently. To illustrate the themes and identify descriptive quotes, they sorted and categorized the interview statements.

The analysts conducted this process using word processing to highlight, color code and re-arrange interview statements by research questions, themes and sub-themes. After they assembled each category, they wrote a descriptive summary for each section, comparing similarities and differences. They also selected notable quotes to illustrate each section.

Each table includes data for all 13 health care systems, thus the researchers were able to answer each research question across health care systems. The analysts reduced the extensive qualitative data into synthesized tables with themes and sub-themes that answer each research question.

TABLE 1 WHAT ARE THE KEY HEALTH OUTCOMES MOST AMENABLE TO IMPROVEMENT BY A NEW HEALTH CARE SYSTEM?

THE FOLLOWING IS A LIST OF THE HEALTH OUTCOMES WITH THE NUMBER OF HEALTH SYSTEMS FOCUSING ON EACH OUTCOME:

Diabetes Keeping blood sugar low (under 7)	12
Mental illness Identify mental illness in primary care (team that trains primary care providers on identifying mental illness or behavioral health problems)	7
High blood pressure	6
Asthma Uncontrolled asthma is a cause of many emergency room visits	5
Cancer care Breast, cervical, colorectal; especially chronic cancers-slow growing (e.g. prostate cancer)	5
Congestive heart failure	5
Coronary artery disease/cholesterol	5
Increase number of insured people/access to care. Work with Extension Service health workers to train health navigators, who help people enroll in Medicaid and other insurance	3
Programs for children Childhood immunizations, childhood development screening and dental care for children	3
Increase immunization rates by focusing on school-based programs in indigent areas, train community college health workers to give immunizations	2
Chronic kidney disease	1
Decrease tobacco use	1
HIV care	1
Homeless population	1
Increase high school graduation and create pipelines to health professions training. Address multiple priorities as increased education levels and decreased unemployment (via health care jobs) will lead to better health outcomes.	1
Oral health	1
Osteoporosis	1

PRELIMINARY FINDINGS

Our preliminary findings are organized according to each primary study question.

KEY HEALTH OUTCOMES MOST AMENABLE TO IMPROVEMENT BY A NEW HEALTH CARE SYSTEM

Table 1 includes key health outcomes addressed by the 13 model health care systems interviewed. While Prince George's County has identified their own priorities (Prince George's County Health Improvement Plan, 2011–2014), lessons from these systems can be instructive. The 13 systems reported 17 health outcomes most amenable to improvement, and most are chronic conditions. Seven of these outcomes were mentioned five times or more: diabetes care, mental illness/behavioral health conditions identified in a primary care setting (with training/consultation from behavioral health specialists), hypertension, asthma, cancer care, coronary artery disease/cholesterol management and congestive heart failure. Three other health outcomes were mentioned more than one time: children's programs (immunizations, child development screening and pediatric dental care), increased access to care/insurance and increased immunization rates. Individual health care systems identified the following seven items: HIV care, osteoporosis, chronic kidney disease, oral health, care for the homeless, decreased tobacco use and increased high school graduation rates and developing a pipeline to health professions education.

One health care system explained that a key element in determining health outcomes most amenable to change is community support for addressing specific health care problems. It looks at the state's standing in the country on health indictors and selects areas that have clear metrics to measure success and have community support to address the problem. For that reason, its priorities look different from many other systems. For example, this system focuses on high school graduation rates and creating a pipeline to health professions education. It

TABLE 2 WHAT RESOURCES CAN BE MOBILIZED IN THE PUBLIC HEALTH SECTOR TO COMPLEMENT THE IMPACT OF THE HEALTH CARE SYSTEM? THE MOST COMMON PUBLIC HEALTH RESOURCES MENTIONED BY THE SYSTEMS WERE PUBLIC HEALTH DEPARTMENTS AND FEDERALLY QUALIFIED HEALTH CENTERS. HOWEVER, THERE WERE MANY OTHER SUGGESTIONS AS OUTLINED BELOW. POTENTIAL PUBLIC HEALTH RESOURCES:

Community health centers (federally qualified health centers)	9
Public health department (although public health programs are being cut by federal, state and local governments)	9
Community-based providers (e.g., community mental health centers)	1
Community-wide Nurse Advice Line in partnership with the public health department, managed care organizations and a university. Works in rural and urban areas. Receives 15,000 calls/month, leads to decreased ER visits, increased medical homes, and coordinated care (patient records are faxed to the medical home the next day). Health Department monitors Nurse Advice Line to identify illness statewide.	1
Community Transformation Grants funded by the Centers for Disease Control and Prevention	1
County funds and a collaborative relationship between community providers and hospitals support the County-wide program. County funds support care; however, the program relies on pro bono primary and specialty care from community providers as well as free clinic space from hospitals and community	1
Data sharing among all types of providers (using electronic medical records)	1
Federal government (since states have deficits)	1
Health-related foundations (e.g. cardiovascular disease prevention, HIV prevention, etc.)	1
Integrated, collaborative system, public health and community coalition results in greater improvements in health outcomes than can be achieved by a health system acting alone.	1
Local news media (e.g. bilingual campaigns for prenatal care and immunizations)	1
Need for integration of community resources by one agency	1
Owned or funded clinics	1
Partnering with school systems and employers	1
Proceeds from the state tobacco tax	1
Specific community resources (new free clinic, resources for specific population e.g. heart disease or children)	1
State government (One state government required insurers to participate in a Chronic Care Initiative administered by the state health department.)	1

selected this priority as it achieves several outcomes of importance to the community: increased education levels, improved health outcomes (resulting from improved education), increased recruitment of minority students for health professions and decreased unemployment as health care is a growing job sector.

MOBILIZING PUBLIC HEALTH RESOURCES TO COMPLEMENT THE HEALTH CARE SYSTEM'S IMPACT

The health care system respondents mentioned public health departments and federally qualified health centers most often when asked about mobilizing public health resources to complement their systems' impact. However, as reflected in Table 2, they had many other suggestions, including a state health department-sponsored Chronic Care Initiative that requires insurers to participate; an integrated, collaborative system or community coalition with community health centers; community transformation grants from the Centers for Disease Control and Prevention; and funding from a state tobacco tax.

One interesting program involved a partnership between the academic health care system and a community-based health care services clinic initially funded by the system, which established a medical home with case managers for the under- and uninsured. Demonstrated successes in cost reduction, savings and quality improvement led to hospital leadership support. Another innovative health care system developed a community-wide "Nurse Advice Line" in partnership with the public health department, managed care organizations and a university. It operates in rural and urban areas and receives 15,000 calls per month. This program has led to decreased emergency department visits, increased medical homes and coordinated care (patient records are faxed to the medical home the next day). The state health department monitors the Nurse Advice Line to identify illness statewide.

GEOGRAPHIC DISTRIBUTION OF HEALTH CARE RESOURCES AND AREAS OF GREATEST NEED FOR PRIMARY CARE

Table 3 reports systems' strengths and weaknesses in geographic distribution of resources. In general, systems showed a consensus acknowledging that rural areas were in greatest need for primary care. One system located in a very urban state mentioned that they did not have problems with geographic distribution of health care resources as 90 percent of the population in the state lives in Metropolitan Statistical Areas (MSAs). Its services are equally distributed over the geography of the state. However, it is important to note that community resources can be difficult to access in crime-ridden urban areas. Examples of strengths in geographic distribution of resources include: a program that sends providers to a neighboring hospital (i.e. providers go to patients instead of patients traveling to providers), federally qualified community health centers (FQHC) in underserved areas and having far-reaching acute care hospitals as well as urgent care centers. One comprehensive system covers a broad geographic region of one state and includes all aspects of the health care system (insurance coverage, acute care hospitals, health care centers, physicians employed by the system). All parts of the health care system interact with neighboring systems (e.g. system physicians practice in non-system community hospitals, system nurse practitioners work in nursing homes). They organize around a regional hub that has primary care and specialty resources to decrease patient driving distances. Their approach is cooperative vs. competitive with other systems—they help smaller community hospitals stay afloat.

Examples of weaknesses in geographic distribution of resources include: shortages of child psychiatrists (especially in rural states), undocumented immigrants with limited services options who may need to use emergency departments (low-income clinics and FQHCs can help) and homeless people who have no home to which they are discharged. One system with worker shortages in rural areas has a two-part approach to this problem: 1) train workers in their own communities so they have roots and stay there (vs. train outsiders who leave) and 2) improve the pipeline for minority health care professionals by improving the poor educational backgrounds for this population, thereby changing who enters health professional schools.

ELEMENTS OF A HEALTH CARE SYSTEM (HOSPITAL AND COMMUNITY) THAT CAN AFFECT OUTCOMES

As indicated in Table 4, respondents have a wide variety of approaches to improve health outcomes. Among the many approaches, the following examples illustrate ideas repeated in more than one system:

- Integrating a behavioral health specialist into the primary health care team to train primary care doctors and expand their capacity to diagnose mental illness. Seven systems are implementing this approach.

- Focusing on fewer readmissions within 30 days of a hospitalization. The financial disincentive in the ACA has encouraged health care systems to shift their thinking about their responsibilities for discharge and follow-up procedures. As hospitals will be financially penalized for readmissions, rather than financially rewarded, they are developing systems (often involving information technology) to be sure that patients receive comprehensive follow-up services. One system assigns a case manager to all patients over 65 years old when they leave the hospital.

- Establishing tight working relationships with hospitals, nursing homes and home health agencies to improve discharge coordination

TABLE 3 WHAT IS THE GEOGRAPHIC DISTRIBUTION OF HEALTH CARE RESOURCES AND WHERE ARE THE AREAS OF GREATEST NEED FOR PRIMARY CARE?

Having a big academic medical center in the area with lots of affiliate providers

Rewarding people in primary care through state initiatives such as one state's Chronic Care Initiative

Sending providers once a week to a neighboring hospital (i.e., sending the providers to the patients instead of the other way round)

Having affiliated ambulatory care centers

The County program has 25 service locations with diverse provider types (e.g. hospital, FQHC), and focuses on four areas with greatest need.

Federally qualified community health centers located in underserved areas to provide primary care

Having a broad service area and placing primary care throughout the region, having physical locations and facilities strategically located

Implementing open access or advanced access to primary care (i.e., patient can call any time of day and night and schedule an appointment for same or next day). In addition, building a navigation platform that includes a 24/7 nurse triage system

Having an adequate number of far-outreaching acute care hospitals and urgent care centers

Having a broad geographic region covered by all aspects of the health care system (insurance coverage, acute care hospitals, health care centers, physicians employed by the system). All parts of the health care system interact with neighboring systems (e.g. system physicians practice in non-system community hospitals, system nurse practitioners work in nursing homes). They organize around a regional hub that has primary care and specialty resources to decrease patient driving distances. The approach is cooperative vs. competitive with other systems, help smaller community hospitals stay afloat.

STRENGTHS IN GEOGRAPHIC DISTRIBUTION OF RESOURCES:

Geographic concentration: "We don't have any ... facilities across the country, or even across the western part of the United States, we're tightly focused so that we have docs and hospitals within easy range. So that we're able to develop a communicating network so that we know what's going on in the patient's life. We don't want them in somebody else's facility where we don't know what happened to them. We think that breaks the continuity of care. So we try to be as geographically concentrated as we can as opposed to spread out."

Avoiding duplication of services: by focusing the care in physician centers and clinics and avoiding freestanding surgery centers and the like

Having a fairly extensive air transport system to reach remote communities, including trained people in stabilization of very ill patients

Having a big academic medical center in the area with lots of affiliate providers

Rewarding people in primary care through state initiatives such as one state's Chronic Care Initiative

Sending providers once a week to a neighboring hospital (i.e., sending the providers to the patients instead of the other way round)

Federally qualified community health centers located in underserved areas to provide primary care

Having a broad service area and placing primary care throughout the region, having physical locations and facilities strategically located

Having a County program with 25 service locations including diverse provider types (e.g. hospital, FQHC), and focuses on four areas with greatest need

Having affiliated ambulatory care centers

Implementing open access or advanced access to primary care (i.e., patient can call any time of day and night and schedule an appointment for same or next day). In addition, building a navigation platform that includes a 24/7 nurse triage system

Having a broad geographic region covered by all aspects of the health care system (insurance coverage, acute care hospitals, health care centers, physicians employed by the system). All parts of the health care system interact with neighboring systems (e.g. system physicians practice in non-system community hospitals, system nurse practitioners work in nursing homes). It's organized around a regional hub that has primary care and specialty resources to decrease patient driving distances. The approach is cooperative vs. competitive with other systems, help smaller community hospitals stay afloat.

and prevent readmissions. One comprehensive system places nurse practitioners in nursing homes full time to monitor patients and prevent hospitalizations, offer care in the nursing homes rather than hospitals when possible, and provide needed post-hospitalization follow-up care.

- Shifting the hospital mentality to keep people healthy and avoid unnecessary care. This requires changing hospital leaders' mindsets to understand that the goal is "to do the best for patients rather than increase profits." This practice requires information technology to help practitioners provide services based on "best practices" with prompts to remind all providers about important procedures.

- Developing a team-based, multi-disciplinary, multi-specialty approach to treatment based on bundled payment for services. Each team is responsible for patient outcomes, conducts tasks to meet established metrics and receives financial incentives for patient outcomes. Information technology prompts team members to meet the required metrics.

TABLE 4 WHAT ELEMENTS OF A HEALTH CARE SYSTEM (HOSPITAL AND COMMUNITY) CAN AFFECT THESE OUTCOMES AND BY HOW MUCH (MODEL)?

THE DIFFERENT SYSTEMS HAD VARIOUS APPROACHES TO IMPROVE HEALTH OUTCOMES:

Tracking prescriptions (filled/not filled) to monitor compliance with medications for patients with chronic diseases. Each provides M.D.s with these data, who then contact and follow up with the patients.

Integrating a mental health specialist into the primary health care team in order to train primary care doctors in diagnosing mental illnesses. Seven systems have done that. The idea is to take some of the mental health services out of the traditional setting and place them into primary care.

Parity in coverage of mental health services

"[W]e have **all the range of psychiatric services from acute inpatient to partial hospitalization programs** and again, we work very closely with the community mental health center located in our County that does a lot of the outpatient work, so we provide call coverage for psychiatric services for them. They come to our emergency department when someone shows up here with a mental health issue and we jointly evaluate the patients to see if they need inpatient, can they go to one of their programs, so we work very closely as part of I'd say the continuum of care in mental health."

Access to care for the insured and uninsured:

- Development of a health care services extension infrastructure that can deliver health care resources to areas in need to improve health of the residents
- Identify where to focus health care improvement efforts and resources to improve population health
- Creation of medical home through partnership with a community health care services clinic that reduced admissions, readmissions and ER utilization:
- Case managers identify patients and follow up with them to ensure they are accessing post-treatment services, taking medications, have transportation, etc. have decreased "no show" rate to follow-up appointments for people discharged from ER, etc.
- "[W]e've been able to dramatically reduce the uninsured margin to the hospital, what I heard last to [increase the margin] by $5 million because again these are patients who traditionally use the emergency department as their primary access point of resource."

Intensive focus on prevention: Providers focus on intensive prevention versus general wellness when possible (e.g. address obesity, exercise, good nutrition, etc. to prevent diabetes). When it isn't possible, they focus on preventing further complications of a disease (e.g. diabetes).

Electronic record prompting leads to best practices and fewer re-admissions, decreased costs and fewer deaths.

Policy changes based on data/evidence based practices: The hospital reviews regularly data on health outcomes and the literature to develop policy changes.

Coordination of care when a patient leaves the hospital using electronic records that inform the primary care M.D. that her/his patient is leaving the hospital. This results in better patient outcomes and lower readmissions.

Shift in hospital mentality: Keep people healthy and avoid unnecessary care. Requires changing the mindset of hospital leaders and providers to understand that the goal is to do the best for patients rather than increase profits. It also requires developing payment systems that maintain incomes while avoiding unnecessary care.

"[A]s a not-for-profit company, **our shareholders are the people that we care for.** And so, for us to do an unnecessary CAT scan or an unnecessary surgery or to give them an expensive medication that's not going to benefit them is essentially abandoning our fiduciary responsibility to our shareholders. I don't know if you've heard other people describe it that way, but it's kind of central to us trying to think differently about things 'cause if we're looking at maximizing the bottom line that ain't gonna do it."

Improvements in IT systems (having prompts in electronic records to help providers ask the right questions, developing IT systems that include "decision support information" to help providers conduct best practices)

Establishing tight working relationships with nursing homes and home health agencies to improve discharge coordination and prevent readmissions

Improvements in outcomes due to **pushing the primary care network outside its traditional setting** into employer and school settings

Building a planned care platform that responds to any condition and is not condition-specific (90 percent of the platform is the same for any condition)

Redesigning care delivery around connected personal experience to reduce readmissions and save costs

"We're really trying to **redesign care around the entire continuum** and we're looking at how we build accountability for the patient experience across the continuum building our budget and financing models, or quality models to really tell us how well we deliver care not in incremental visits, but in episodes."

One hospital's **real focus on primary care**, including turning their primary care practices into patient-centered medical homes, resulted in having the highest office visits per capita in its area, but the lowest hospitalization rates.

Improvement of patient transitions from hospital to home through case management where planning for patient's discharge starts once they're admitted to the hospital

Implementing registries for chronic diseases: Allows community health centers to track and improve their data on chronic disease and has resulted in improvements in cancer prevention and immunizations.

Using the lean system for process improvement that was developed by Toyota improves health outcomes

Having a task force statewide to help in community-wide sharing of data and implementation of electronic medical records

In the specific case of diabetes, **having diabetes coordinators who follow up with patients** resulted in improved diabetes outcomes

Triaging patients in the emergency department and observation status (having many patients that are observation patients rather than inpatient admissions) reduces costs, but extended observation leads to patient dissatisfaction and adverse outcomes.

Focus on high-service users by addressing mainly social problems leading to high levels of use (i.e. access to food, housing and transportation). Extension service trains community health workers to identify frequent users, bring them to case managers and address preventable conditions/high ER use.

The university medical center structure **views community health as a high priority**, and it is under the chancellor's office (not marginalized). A health economist works in the Office of Community Health and all medical students are required to earn a 17-hour certificate of public health taught by public health M.D.s.

"Access to dental health services is a tough problem to address as it's expensive. We are trying to **create mid-level dental health professionals to increase access**."

Develop a team-based, multi-disciplinary, multi-specialty approach to treatment and bundled care for nine diseases with practice metrics. Each team is responsible for patient outcomes, team members have discipline/role specific tasks, IT systems help team members conduct tasks to meet metrics, patient data are available to all team members, and the team receives financial incentives when all metrics are met. For example, different team members are responsible for wellness/prevention steps (e.g. immunizations, blood pressure and cholesterol control, smoking cessation, etc.). Patients receive automated birthday greetings with reminders about appointments/tests that need to be scheduled, and then transferred to a scheduler.

Use "predictive modeling" to anticipate how many hospital patients will need follow-up visits, and create space for visits (rather than schedule as emergencies).

Assign a case manager to anyone 65 years or older who is hospitalized, follow up for a month to monitor progress and schedule appointments

Employ full-time nurse practitioners in nursing homes to manage chronic care and provide treatment at the nursing home vs. hospital. Has reduced ER visits and re-admissions

"We're not a Kaiser model, a closed system. So **two-thirds of our patients are insured by other insurers**."

A County-based program has tracking/reporting limitations, and plans to do more outcome measurement in the future. **Process measures show increased access to care for specific population groups** as they have bilingual/bicultural providers (Hispanic, Chinese, Muslim).

Special programs focus patient transition from hospital to home or shelter for the homeless and ER diversion.

Reimbursement approaches have been important to working with providers. They **moved from a capitation to a fixed-fee payment** as that makes budgeting easier.

The program **relies on a strong provider network and an active advisory board** to represent different segments of the community (hospitals, community clinics, medical society, the public at large, etc.).

Coordinated programs that **provide practice coaching** so they can become effective medical homes and learn quality improvement techniques. These programs work in concert with a statewide community care network that funds and provides case management services (so individual practices do not need to establish this infrastructure). They also work in concert with area health education centers (AHECs) to focus on practice re-design. All three programs support one another. Case management has helped manage utilization and education.

Case management services are part of the payment structure. The network began with Medicaid, expanded to the dually eligible population, Medicare and other funders. The network pays case managers to be in primary care practices, especially if a large Medicaid population.

KEY ISSUES TO MAXIMIZE UPTAKE AND ACHIEVE THE POTENTIAL OF A HEALTH CARE SYSTEM FOR PUBLIC HEALTH

As indicated in Table 5, respondents have a wide variety of approaches to maximize uptake and achieve the potential of a health care system for public health. The following examples illustrate variations in the health care systems' thinking, values and philosophies.

- "... our goal is never to maximize utilization, we're trying to keep people from utilizing our services; we increasingly are being successful at getting our docs to think that the utilization of the health care system is a failure. ... it's not a success; we'd like people to be at home and healthy rather than sick and in the hospital. ... We're trying to make sure we're caring for our share ... of the paying population, but we're trying not to think about it as utilization. We're not trying to provide services to them, we're trying to get them under our umbrella and then keep them healthy."

- "(sighs) development of high-quality services, convenience, availability, and that's all very difficult, very challenging to develop when you are also trying to meet the demand for care among those who don't have insurance. ... we had some success in attracting patients who have insurance other than Medicaid, ... it's certainly a challenge to attract patients who have insurance that's a better payer than Medicaid ..."

- "Public perception that the health system offers an excellent facility, services and clinical product. ... must be viewed as a "world-class health facility," ... not ... a facility that primarily serves the uninsured, because the public associates such providers with having poor quality services."

- "... by developing a real efficient system of providing that care for those that aren't paying, you're sort of losing less and doing the right thing, which makes you feel good, but it's really about finding a way to care for the patients that are unable to pay in the same kind of system that you use for those that do pay .... and care for them with dignity and all the other good stuff."

- "Due to health care reform, the system is trying to increase their capacity for change and drive quality improvement. With the pressure to control costs and the pace of health care reform, people are scared that their program might get cut. So a big emphasis on demonstrating value right now. We've had the luxury to focus on the quality part of the value equation, but I think people are really focusing on the cost part of the value equation now."

DISCUSSION

KEY HEALTH OUTCOMES AMENABLE TO IMPROVEMENT

All 13 model health care systems mentioned chronic diseases in their list of health outcomes most amenable to improvement. Thus, this discussion section will focus on chronic diseases, comparing our findings to Prince George's County's health priorities while highlighting the two chronic diseases most frequently mentioned as priority health outcomes: diabetes and mental health. We also chose to highlight one health care system that had a distinct approach to prioritizing improvable outcomes.

Upon examination of Prince George County's Health Improvement Plan for 2011–2014, we found some commonalities in terms of their health priorities (County outcome objectives) and those of the systems we interviewed. These commonalities were particularly salient in the area of chronic disease prevention. Prince George's outcome objectives include, among others: reducing death rates from heart disease; reducing the overall cancer death rate; reducing hypertension-related emergency room (ER) visits; reducing diabetes related ER visits; reducing tobacco use by adults; reducing the number of ER visits related to behavioral health conditions; reducing new HIV infections among adults and adolescents; and reducing hospital ER visits from asthma. Heart disease, cancer, hypertension, diabetes, asthma and behavioral health are health outcomes that were mentioned by five or more of the health care systems we interviewed. In addition, two outcome objectives of Prince George's County focus on increasing the proportion of persons with health insurance and reducing the proportion of individuals who are unable to obtain, or delay obtaining, necessary medical care, dental care, or prescription medications. These objectives are in line with three of the interviewed health systems whose focus is to increase the number of

TABLE 5 WHAT ARE THE KEY ISSUES TO MAXIMIZE UPTAKE AND ACHIEVE THE POTENTIAL OF A HEALTH CARE SYSTEM FOR PUBLIC HEALTH? THE SYSTEMS HAD DIFFERING VIEWS ON HOW TO MAXIMIZE UPTAKE.

Reduction of emergency room visits and keeping the population healthy One system was a not-for-profit organization with a health care insurance component that covered one quarter of the population in the state. However, it mostly provided care to patients outside its insurance plan. The managed care plan focuses on overall patient care, ensuring continuity of care and offers other insurance plans better deals if they agree to use only its facilities and physicians with whom this managed care plan collaborates with.

This system focused its efforts on reducing emergency room use and physicians are instructed to welcome people without regard to ability to pay. They do not want the patient to view the ER as their source for primary care. Employed physicians are usually more welcoming of non-paying patients than non-employed or affiliated physicians.

They do not try to maximize utilization by paying patients, as they don't consider it utilization.

"Our goal is never to maximize utilization. We're trying to keep people from utilizing our services; we increasingly are being successful at getting our docs to think that the utilization of the health care system is a failure. It's not a success. We'd like people to be at home and healthy rather than sick and in the hospital. We're trying to make sure we're caring for our share, if you want to call it that, of the paying population, but we're trying not to think about it as utilization. We're not trying to provide services to them, we're trying to get them under our umbrella and then keep them healthy."

Creating a connected personal experience and moving primary care to the employer setting

"I think what we've done is we've tried to place primary care at the employer setting, create access through the system, create what we call a connected personal experience, connect the continuum for individuals who are here for a medical or surgical condition. We're trying to maximize our commercial business, really respond to needs and what people want in that experience and then look at where we place services so they're convenient for people."

Advertising MRI services, exploring global payments "This is an interesting question because the typical response for many years is, 'We need more patients because we need more revenues so we want to somehow make services more available, or get fancier equipment to draw people in and kind of the more competitive way of delivering health care.' That has happened in Vermont in the past. We will advertise maybe our MRI services. If you don't want to wait at that hospital come to us and we'll do it faster, which gets to this increasing utilization to bring in new revenues ... So we're doing a lot of exploring of things like how do you form an accountable care organization? Or how do you as a system start accepting global payments for your population that you normally wouldn't be seeing? So some of these more cutting edge ideas of shifting away from fee-for-service to more of a population-based payment strategy."

Maximize use by paying patients: high quality, convenience, availability "Development of high-quality services, convenience, availability, that's all very challenging to develop when you are also trying to meet the demand for care among those who don't have insurance. So we worked on those issues and had some success in attracting patients who have insurance other than Medicaid, but Medicaid is a payer that's challenging to live on 'cause their reimbursement rates are so low. So it's certainly a challenge to attract patients who have insurance that's a better payer than Medicaid."

Public perception that the health system offers an excellent facility, services and clinical product. The system must be viewed as a "world-class health facility," which means that is must not be viewed as a facility that primarily serves the uninsured, because the public associates such providers with having poor quality services.

Specific strategies: **excellence in trauma care and hope for the ACA to kick in**

Maximize use by paying patients by doing public information campaigns and advertising, health fairs, community education

Need to **increase the system's linguistic/cultural sensitivity** to meet the needs of ethnic communities (e.g. need more providers from the ethnic communities).

Provide incentives to provide specialty care in local areas to keep people local (e.g. extensive use of telehealth services)

Looking to the future when the ACA is implemented, accessibility problems will increase due to more insured people. **Linking community health centers with academic medical centers will make the community centers more attractive for paying patients.**

Automated system that reminds team members about the care that's needed and proving that leads to better results

"... **by developing a really efficient system of providing that care for those that aren't paying** you're sort of losing less and doing the right thing, which makes you feel good, but it's really about finding a way to care for the patients that are unable to pay in the same kind of system that you use for those that do pay .... and care for them with dignity and all the other good stuff."

While the County-based program targets the uninsured population, and only meets a fraction of current demand, the **increased number of insured people from health care reform will create more competition for unpaid care.** The program is screening eligibility now so as many people as possible will obtain insurance/Medicaid. That will leave only the uninsured (including many undocumented immigrants) in the program.

The state provides the hospital millions of dollars to provide "charity care" and they are always trying to woo more insured patients. They have a highly reputable heart care program that brings in a lot of money, and that cross subsidizes a lot of charity care.

Current and future efforts **focus on managing cost and eliminating overutilization, a big emphasis on integration of mental health and primary care.** Due to health care reform, the system is trying to increase its capacity for change and drive quality improvement. With the pressure to control costs and the pace of health care reform, people are scared that their program might get cut, so a big emphasis on demonstrating value right now. We've had the luxury to focus on the quality part of the value equation but I think people are really focusing on the cost part of the value equation now.

insured people and access to care.

Chronic diseases constitute an important focus of health care reform under the Patient Protection and Affordable Care Act (ACA) of 2010. It is estimated that 7 million of the non-elderly uninsured in the U.S. have at least one chronic disease (Hoffman & Schwartz, 2008). The ACA has many components dedicated to prevention of chronic disease including the establishment of a National Prevention, Health Promotion and Public Health Council (ACA, 2010; Section 4001). Moreover, it provides incentives for states that offer Medicaid coverage for all U.S. Preventative Services Task Force grade A and B recommended services (e.g. smoking cessation treatment, screening for diabetes, hypertension, dyslipidemia, obesity and cancer) and for the recommended immunizations by the Advisory Committee for Immunization Practices (ACIP) without cost sharing (ACA, 2010; Section 4106). Similarly, the ACA requires coverage of evidence-based preventive services without cost sharing by private insurance companies (Sections 1001 and 1302), and in Medicare (Sections 4104 and 4105) as well. In addition, this law establishes a National Diabetes Prevention Program (ACA, 2010; Section 10501[g]), which is of great importance as 12 of the health systems interviewed identified diabetes as a priority health outcome. The Maryland State Health Improvement Process (SHIP) and County health plan provide detailed outcome measures and 2014 targets for chronic conditions.

Mental health was an important priority for seven of the interviewed health systems. SHIP highlights behavioral health among its outcome measures, as does the County. Although mental health did not constitute a special focus of health care reform, it definitely benefits from its provisions. The ACA prohibits insurance companies from denying insurance to people with preexisting conditions; thus, people with preexisting chronic conditions including mental illness, will be protected from discrimination by insurance companies (ACA, 2010; Section 1101). In addition, Medicaid expansions under the ACA will extend insurance to 3.7 million people with severe mental illnesses (Garfield, 2011). Along the same line, regulated insurance exchanges in each state are required to cover mental health in their base-level benefit packages (ACA, 2011; Section 1302). Demonstration projects under reform such as medical homes (Sections 2703 and 3502), improved chronic care management (Sections 2703) and better integration of services will also improve mental health care (ACA, 2010). Maryland has already initiated patient-centered medical home pilots.

One of the health systems interviewed had a non-traditional way of prioritizing health outcomes, which entailed examining national health priorities and setting goals around increasing the state's standing nationwide and prioritizing goals that elicit community support. Thus, this system focused on health equity and healthy communities with the specific goals of increasing the number of the insured, increasing immunizations among indigent populations and increasing high school graduation rates. These are important considerations that health systems planning to improve quality and performance can draw lessons from.

MOBILIZING PUBLIC HEALTH RESOURCES

Public health departments and federally qualified community health centers were mentioned most often by the systems as potential public health resources that can be mobilized to complement the health care system's impact on health outcomes. It is interesting that many of the health systems mentioned public health departments as complementary sources of funding despite the funding cuts currently underway by federal, state and local governments to public health programs. This means that health systems still expect public health departments to fulfill their public health missions despite the funding cuts. The ACA authorizes generous funding for federally qualified community health centers (The Centers for Medicare and Medicaid Services, 2011). This is relevant to Prince George's County, given the limited safety net capacity. These centers provide important primary care services for many people with chronic illnesses and are usually located in underserved areas such as rural settings (Adashi, Geiger, & Fine, 2010). The interviews with the systems provided additional evidence of the value of these community health centers.

The different health systems had many creative ideas when it comes to mobilizing public health resources that may be useful for Prince George's County to take into consideration when designing their new health system. Among these are two innovative ones. One program involved a partnership between the academic health care system and a community-based clinic to establish a medical home with case managers for the under- and uninsured. This program was successful in achieving cost savings and improvements in quality of care. Another system formed a community-wide "Nurse Advice Line" in collaboration with the public health department, managed care organizations and a university and operated in both rural and urban areas. This Nurse Advice Line helped the state health department identify illnesses statewide and resulted in decreased emergency department visits, increased medical homes and better coordination of patient care.

GEOGRAPHIC DISTRIBUTION OF HEALTH CARE RESOURCES INCLUDING PRIMARY CARE PROFESSIONALS

The national shortage in primary care was echoed in the interview responses of the health systems. While the ACA addresses these shortages through several mechanisms including implementation of physician payment reform, primary care workforce expansion legislation, and by authorizing tuition assistance for medical school among others (ACA, 2010), it is not certain that these measures will be sufficient to accommodate the 32 million Americans who will gain insurance coverage under reform. The stated goal of the Governor's Workforce Investment Board November 2011 report, "Preparing Maryland's Workforce for Health Reform: Health Care 2020," called for increasing "primary care workforce capacity by 10–25 percent over the next 10 years." This workforce includes primary care physicians plus advanced nurse practitioners and physician assistants. The health systems interviewed highlighted that primary care shortages were mostly in rural areas and in some states crime-ridden urban areas.

Some systems had innovative practices to address geographic maldistribution of health care resources. One system addressed shortages in rural areas through training workers in their own communities as opposed to outsiders who don't have roots there and through improving the "pipeline" for minority health care professionals by focusing on increasing educational levels for minorities and increasing their enrollment in health professional schools. Another system covered a broad geographic region of one state and included all aspects of the health care system (insurance coverage, acute care hospitals, health care centers, physicians employed by the system). All parts of this health care system interacted with other health systems in a cooperative way organizing around a regional hub that has primary care and specialty resources, which decreased patient driving distances. These are creative ideas to address maldistribution of resources that may be useful for Prince George's County to take into consideration when designing their new health system.

ELEMENTS OF A HEALTH CARE SYSTEM THAT CAN AFFECT OUTCOMES

Seven systems mentioned mental health as one of the priority health outcomes and a common strategy to address this issue was to integrate behavioral health specialists into primary care teams to train primary care doctors in diagnosing mental illnesses. Thus, the new trend is to move certain mental health services from their traditional psychiatric settings and place them in primary care settings. Moreover, one system emphasized parity in insurance coverage of mental health including the whole range of psychiatric services and their close collaboration with the community mental health center in order to achieve a continuum of care in mental health. The ACA explicitly states that mental health parity applies to qualified health plans in the health benefit exchanges that will be established by states as well as in Medicaid benchmark plans (ACA 2010; Sections 1311 and 2001). Similarly, the Maryland Health Benefit Exchange Act of 2012 (HB 443) requires qualified health plans to meet the mental health requirements of the Mental Health Parity and Addiction Equity Act.

One important focus of the systems was on achieving fewer readmissions within 30 days of a hospitalization due to fear of being penalized under the ACA for avoidable readmissions. Hospitals will experience financial penalties such as reductions in Medicare payments for excess preventable readmission rates (ACA, 2010; Sections 3025 and 10309). Maryland has been acting on these types of activities for a while through the Maryland Health Services Cost Review Commission. Some strategies designed by the interviewed systems to reduce readmissions included assigning case managers that follow up patients after discharge; incorporating information technology into comprehensive follow-up services; and establishing tight working relationships with hospitals, nursing homes and home health agencies to improve discharge coordination. All these strategies seem to be inspired by the Hospital Readmissions Reduction Program provided under reform (ACA, 2010; Section 3025).

Another important system element affecting health outcomes entailed shifting the hospital mentality from profit-making to keeping people healthy and avoiding unnecessary care. This included a great focus by providers on prevention, tracking prescriptions to monitor compliance with medications for patients with chronic diseases, electronic records prompting for best practices and changing the mindset of providers from making profits to doing what is best for patients.

Increased access to care was another important system element to improving outcomes. This can be achieved through creation of medical homes, identifying the best use of resources to improve population health, implementing open access or advanced access to primary care (patient can schedule same or next day appointments) and having federally qualified health centers covering underserved areas. As previously mentioned, Maryland has launched a pilot program. However, a few states mentioned that they are mainly waiting for the ACA to kick in order to increase access to their under- and uninsured populations.

A number of systems also mentioned incorporating information technology in their systems as a means to achieve quality, efficient care. This included incorporating prompts in electronic records to help providers ask the right questions and rely less on memory in treating their patients. Another practice is developing information technology systems that include "decision support information" to help providers conduct evidence-based medicine. Information technology can also be used in tracking prescriptions to monitor compliance with medications and to support discharge planning by following up with patients upon hospital discharge.

As one examines the system elements mentioned in the interviews, it becomes clear that at least some of these systems will make use of the ACA provision that encourages Medicaid programs to implement health homes by providing a federal funding match of 90 percent in the first two years (ACA 2010; Section 2703). This provision allows states to compensate health home providers with designated patients for services that cover care management, essential referrals, provision of individual and family support, and for utilization of health information technology to ensure the monitoring and coordination of all the providers involved in the care of the designated patients.

KEY ISSUES TO MAXIMIZE UPTAKE

The health systems interviewed had different ideas on how to maximize uptake and achieve the potential of a health care system for public health. One system focused its efforts on reducing emergency room visits and keeping the population healthy and refused the concept of increasing paying patients as they viewed their goal to not maximize utilization, but instead to decrease utilization by keeping people healthy. Another system focused on creating what it called a "Connected Personal Experience" and redesigned care around the entire continuum as well as moving primary care to employer and school settings. A different system mentioned advertising its fancy equipment, such as MRIs, because they needed more revenue. However, respondents also mentioned exploring global payments in order to shift away from fee-for-service to more of a population-based payment strategy. Yet another system mentioned that to maximize use by paying patients it worked hard on developing high-quality services that are convenient and available. However, they emphasized that these strategies are very challenging to develop when trying to meet the demand for care by the uninsured and by Medicaid patients where reimbursement rates are low. Thus, there appear to be differences in the values driving the systems' answers to ways of maximizing uptake. Some systems focus on strategies to increase the utilization of services by paying patients, while others focus on decreasing unnecessary utilization and on providing a continuum of preventive and treatment services that keep people healthy and prevent avoidable medical complications.

HIGHLIGHTS OF FOUR SYSTEMS

While all 13 health care systems offer valuable lessons that can inform the development of a new system in Prince George's County, four systems include innovative designs that address critical needs: increased access to care, high-quality services addressing pressing community health outcomes, multi-disciplinary provider teams that offer coordinated care, as well as efficiency and sustainability of provider organizations. (See Appendix B for a summary of each system and an explanation of its relevance to the County.) The innovative components of these systems are highlighted below.

- One health care system, serving a rural, multi-cultural population, focuses on health outcomes that have community support. It looks at the state's standing in the country on health indictors, and selects areas that have clear metrics to measure success and community support to address the problem. For that reason, their priorities look different from many other systems. As an example, this system focuses on high school graduation rates as improved education levels lead to improved health outcomes and other community priorities (increased employment as more people would have skills for health care jobs). To meet the needs of a rural, ethnic population, this system works closely with community health workers from the Extension Service. They coordinate with this well-established system and provide health education and other preventive services. This innovative system also developed a community-wide "Nurse Advice Line" in partnership with the public health department, managed care organizations and a university. It operates in rural and urban areas, and receives 15,000 calls per month.

The Nurse Advice Line has led to decreased emergency department visits, increased medical homes and coordinated care (patient records are faxed to the medical home the next day). The state health department monitors the Nurse Advice Line to identify illness statewide.

- A second system, that serves a mainly urban population, includes multiple components, including hospitals, insurers, employed physicians and other providers. While it is a "tight system" with one board of directors, it also works with other insurers and providers. Its focus on keeping patients healthy and out of the hospital requires a mindset that differs from traditional hospitals. When asked how they increase the number of insured patients, the interview respondent described a philosophy that requires providers to view hospitalization as a failure. The system has developed information technology that helps providers implement best practices by prompting them to ask key questions, schedule preventive services, make follow-up appointments at the time of hospital discharge, etc. In place of increased revenue from admissions, physicians receive incentives for keeping patients healthy. They focus on cost savings by preventing unnecessary re-admissions. For example, they have "embedded" nurse practitioners in nursing homes so they can offer comprehensive follow-up care for elderly patients when they return from a hospitalization.

- A third system serves a large portion of one state that includes both rural and urban areas. Like the previously described system, this one also includes hospitals, insurers, employed physicians and other providers. However, they work closely with other hospitals, providers and insurers that are outside their system. They also have developed extensive information technology that helps providers follow "best practices" in hospital treatment and follow up care. They have developed a team-based, multi-disciplinary, multi-specialty approach to treatment based on bundled payment for services. Each team is responsible for patient outcomes, conducts tasks to meet established metrics and receives financial incentives for patient outcomes. Information technology prompts team members to meet their required metrics.

- The fourth health care system focuses on increasing access to services for the uninsured population in one large County. It includes a large ethnic and immigrant population, similar to Prince George's County, and could inform the development of one component of a new health care system. This County-funded system works with a coalition of hospitals and outpatient providers, including many pro bono services, to serve their target population. In preparation for health care reform implementation, this system has increased its efforts to enroll clients in Medicaid and other programs. In addition, they anticipate increased access problems for people without insurance when the insured population greatly expands. They fear that the health care system's need to serve more insured patients will impact its ability to focus on those without insurance coverage. When health care reform is implemented, many of the remaining uninsured population will be undocumented immigrants in this service area as well as Prince George's County.

- All four systems that are highlighted have expanded their capacity to serve a behavioral health population. Three have incorporated a behavioral health specialist into their primary care services.

LIMITATIONS Our ability to speak with more than one informant per health care system was limited by time. Due to tight time constraints, the researchers did not use a qualitative data analysis program that requires line-by-line coding.

SUMMARY

This study has offered a glimpse into 13 innovative systems, with a more in-depth focus on four systems. It is clear that planners of the new health care delivery system could learn additional lessons from further study of these systems. We look forward to future learning from these innovative health care programs.

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APPENDIX A **PUBLIC HEALTH IMPACT STUDY OF PRINCE GEORGE'S COUNTY**

Interview Questions for Professionals in Model Health Care Systems

OPENING QUESTION

How long has your system been in its current form in terms of organizational structure, financing, target population and services provided?

QUESTION 1

What are the key health outcomes in your service area most amenable to improvement by a new health care system?

- Has the system been able to improve health outcomes for patients with chronic diseases? Please specify which diseases.
- Describe the improvements in treatment/outcomes for specific population groups.
- Does the system have data and other material to share with us?

QUESTION 2

What elements of your health care system (hospital and community) can affect these outcomes and by how much?

- How did you achieve these improvements?
  - Which elements in the system were involved in obtaining these results and were these elements specific to each disease?
  - How did the system design assist or impede the process?
- Describe the benefits that were realized, including cost savings in regard to the following:
  - Hospital admissions
  - Readmissions
  - ED usage
- Please describe any efforts designed to improve patient transitions from hospital to home and to decrease hospital readmissions.

QUESTION 3

What is the geographic distribution of health care resources in your service area, and where are the areas of greatest need for primary care?

- How does the location of the system and geographic distribution of services optimize its impact on patient and community health? Please specify in regard to hospitals and ambulatory care centers.
- Where is the greatest need in your community for primary care providers and services? Geographic distribution? Describe this system in terms of affordability, availability and access to care.

QUESTION 4

Is your health care system well utilized by both paying and non-paying patients? By what proportion?

- What issues are key to maximizing utilization by paying patients?

If not, what are the challenges you face to maximizing utilization, and what is your system doing to increase utilization?

QUESTION 5

What resources can you mobilize in the public health sector to complement the impact of your health care system (e.g., public health and community-based organizations, community and safety net programs)?

- What other external (e.g. community-based, etc.) resources can you mobilize to facilitate your system's impact on public/community health?

QUESTION 6

What financing mechanisms does your health care system use (e.g. please specify any Medicaid waivers, managed care, etc.)?
Please provide contact information for the financial officer with whom we might speak.

QUESTION 7

a. **What changes in your system have you made in the last year?**

b. **What changes do you expect to make in the next year to keep people healthy and to keep your system sustainable?**

c. **Have you incorporated mental health into your system? If so, please explain.**

d. **What type of innovations have you implemented in your system (e.g. innovations in financing, service delivery, discharge coordination to prevent re-admissions)?**
Are there innovations that you are considering, but have not implemented yet?

The following descriptions provide additional information about four systems that are of particular relevance to the new health care delivery system design.

SYSTEM 1

SYSTEM CHARACTERISTICS

One model health care system is a primary care program within an academic health sciences center that serves a rural, multi-cultural population, and focuses on health outcomes that have community support. It looks at the state's standing in the country on health indictors and selects areas that have clear metrics to measure success and community support to address the problem. For that reason, its priorities look different from many other systems. As an example, this system focuses on high school graduation rates as improved education levels lead to improved health outcomes and other community priorities (increased employment as more people would have skills for health care jobs).

INNOVATIVE PRACTICES

To meet the needs of a rural, ethnic population, this system works closely with community health workers from the Extension Service to address the social determinants of disease within each community. It coordinates with this well-established system and provides health education and other preventive services. Health extension agents are located in rural communities across the state and are supported by regional coordinators and the Office of the Vice President for Community Health at the Health Sciences Center. The role of agents is to work with different sectors of the community in identifying high-priority health needs and linking those needs with university resources in education, clinical service and research. Community needs, interventions and outcomes are monitored by County health report cards. The Health Sciences Center is a large and varied resource, the breadth and accessibility of which are mostly unknown to communities. Community health needs vary, and agents are able to tap into an array of existing health center resources to address those needs. Agents serve a broader purpose beyond immediate, strictly medical needs by addressing underlying social determinants of disease, such as school retention, food insecurity and local economic development. Developing local capacity to address local needs has become an overriding concern. Community-based health extension agents can effectively bridge those needs with academic health center resources and extend those resources to address the underlying social determinants of disease.

This innovative system also developed a community-wide "Nurse Advice Line" in partnership with the public health department, managed care organizations and university. It operates in rural and urban areas and receives 15,000 calls per month. The Nurse Advice Line has led to decreased emergency department visits, increased medical homes and coordinated care (patient records are faxed to the medical home the next day). The state health department monitors the Nurse Advice Line to identify illness statewide.

IMPORTANCE FOR PRINCE GEORGE'S COUNTY

The ethnically diverse population served by the model system is akin to the diverse population of Prince George's County, and the School of Public Health (SPH) has faculty members with extensive experience working with the Extension Service system in Maryland. Many University of Maryland School of Public Health faculty members are well-versed in conducting community-based needs assessments and identifying key community priorities, as performed by this model system. Many lessons from this system can inform the development of a new health care system in Prince George's County.

SYSTEM 2

SYSTEM CHARACTERISTICS

This system is a not-for-profit organization with multiple components, including 23 hospitals, more than 165 clinics, around 1,000 employed physicians and other providers. Its multi-specialty medical group operates physician clinics, pharmacies, hospital units and urgent care clinics. Moreover, the system owns six community clinics and supports 13 community clinics, all serving and low-income, homeless and uninsured patients. While it is a "tight system" with one board of directors, it also works with other insurers and providers. It has a health care insurance component that covers about 650,000 individuals, which represents approximately one-quarter of the population in the state. This organization mainly serves an urban area where around 90 percent of the population lives in Metropolitan Statistical Areas (MSAs). Its clinical programs include cardiovascular, oncology, women and newborns, primary care, intensive medicine, surgical services, pediatric specialties, and behavioral health. This system's biggest problem in terms of geographic distribution of resources is the large undocumented immigrant population, which they mainly serve through low-income clinics and federally qualified

health centers. Nine percent of the patients this organization serves are non-paying patients, but this organization treats all its patients as if they are covered under its health insurance plan. The physicians employed by this organization are more likely to be welcoming of this non-paying population than non-employed or affiliated physicians. This organization's focus on keeping patients healthy and out of the hospital requires a mindset that differs from traditional hospitals.

FINANCING STRUCTURE

In terms of financing mechanisms, 23 percent of their patients are covered under Medicare, 11 percent under Medicaid, 51 percent are privately insured, 9 percent are uninsured and 6 percent are covered through other means. The organization's health insurance plan is a managed care plan in the sense it is focused on managing overall patient care with the aim of improving health outcomes. In addition, it collaborates with several national health insurance plans to manage the care this organization provides to the insured population. For example, it focuses on coordinating patient care and ensuring continuity of care, and offers other insurance plans a "better deal" if they agree to use only its facilities and physicians with whom it collaborates. This organization believes this approach increases the quality of care delivered to the patient and also reduces costs due to decreased adverse events. Its philosophy is that unnecessary care is not a source of revenue; rather, it is a source of damage to both the patient and to those who are paying the patient's health care bill. Thus, it is now developing payment mechanisms for both its employee-physicians and affiliated physicians that will reward them for avoiding unnecessary procedures and treatment, and increasing the health of their patients in order to reduce the need for such services. According to the senior vice president of this organization, as a non-profit hospital, their "shareholders" are patients. Its goal is to do the best for their patients, not increase profits.

INNOVATIVE PRACTICES

The system has developed information technology systems including "decision support information" that helps providers implement "best practices" by prompting them to ask key questions, schedule preventive services, make follow up appointments at the time of hospital discharge, etc. In place of increased revenue from admissions, physicians receive incentives in their payment systems for keeping patients healthy. They focus on cost savings by preventing unnecessary re-admissions. For example, nurse practitioners are "embedded" in nursing homes so they can offer comprehensive follow-up care for elderly patients when they return from a hospitalization. They also work with home agencies so that physicians follow patients from hospital to home health care.

Using insurance records, the system tracks prescriptions (filled/not filled) for patients with chronic diseases to monitor compliance with medications. The focus is especially on diabetes, asthma, mental illness, cognitive heart failure and chronic cancers (e.g. prostate). By using metrics/goals for each disease, they track improved health outcomes, cost savings, and decreased emergency department visits and hospitalizations. Moreover, providers focus on intensive prevention and general wellness when possible (e.g. address obesity, exercise and good nutrition to prevent diabetes). When that isn't possible, they focus on preventing further complications of a disease. For mental illness, they have adopted a mental health specialist integrated into the primary health care team. The mental health specialist is part of the initial visits and trains primary care providers to become more mental health competent.

Finally, the organization regularly implements policy changes based on data and evidence-based practices. In conclusion, this organization's main goal is to get its patients healthy and to keep them healthy.

IMPORTANCE FOR PRINCE GEORGE'S COUNTY

While this system is much larger than one County, it offers many lessons for Prince George's County. Its focus on health promotion and disease prevention as a standard of practice addresses both quality and cost issues. The system leaders' philosophy is that the best patient care keeps people healthy and out of hospitals. They achieve this goal with innovative approaches such as adherence to disease prevention protocols and metrics for chronic diseases, technology designed to help practitioners meet these metrics, comprehensive follow-up care after a hospitalization, and case management for all elderly patients who leave the hospital. Their team approach to care, with bundled payments and financial rewards for effective team care, has also helped achieve this goal. This system also treats a large immigrant population, as does the County.

SYSTEM 3

SYSTEM CHARACTERISTICS

System 3 serves a large portion of one state that includes both rural and urban areas. It serves more than 2.6 million residents in 42 counties as a not-for-profit, fully integrated health services organization. The physician-led system includes a multi-disciplinary physician group practice with system-wide aligned goals, clinical programs, an information technology platform, a robust research program and an insurance provider. This system includes three hospitals, 38 community centers with

800 employed physicians (primary care and specialists) and other providers. The system works closely with other hospitals, providers, and insurers that are outside their system.

SYSTEM FINANCING

The system insures 250,000 people. Patient insurance includes the following sources: Medicare (39 percent), Medicaid (12 percent), private insurance (44 percent) and other sources (3 percent), with only 2 percent uninsured.

INNOVATIVE PRACTICES

The system has also developed extensive information technology that helps providers follow "best practices" in hospital treatment and follow up care. It developed a team-based, multi-disciplinary, multi-specialty approach to treatment based on bundled payment for services. Each team is responsible for patient outcomes, conducts tasks to meet established metrics and receives financial incentives for patient outcomes. Information technology prompts team members to meet their required metrics.

IMPORTANCE FOR PRINCE GEORGE'S COUNTY

With a focus on primary care, information technology, team-based care, health services research and insurance coverage from a variety of sources, including Medicaid, this system offers multiple lessons that can inform the development of a new Prince George's County system.

SYSTEM 4

SYSTEM CHARACTERISTICS

System 4 was created in 2005 and provides low- or no-cost primary care services to medically uninsured, low-income adult residents of an urban County. In addition to "brick and mortar" health clinics, the program also has mobile clinics that travel throughout areas of the County. All clinics are staffed by medical professionals and are independently operated by non-government entities.

The program aims to ensure that all residents of the County are able to obtain good health care services, regardless of their health care insurance status or income. There are 28 health clinics available throughout the County in multiple communities. Clinics provide basic, essential health care services, such as office visits with medical professionals, medications/prescriptions, wellness check-ups, screenings, chronic disease management (i.e. diabetes and high blood pressure), as well as referrals for specialty care and dental services.

The program also offers a wide range of assistance to adults experiencing homelessness. There are more than 75 sites located throughout the County. A variety of critical services are offered. Each site offers specific types of assistance, including shelter, housing, food, emergency assistance, pharmacy assistance, transportation to medical appointments, STD screening, reproductive and mental health, financial assistance, clothing, supplies for infants (i.e. diapers and formula) and other social services.

SYSTEM FINANCING

The County provides partial funding to support a network of non-profit health clinics. The program relies on pro bono care from providers and donated clinic space. Each of these facilities has a distinctive history and culture, as well as their own additional funding sources.

IMPORTANCE FOR PRINCE GEORGE'S COUNTY

While this County program serves the uninsured, it is preparing for major changes when many more people become insured through the Affordable Care Act. Program staff are concerned that it will become will be even more difficult for the uninsured population to obtain care when providers are busier with a larger, insured population. They believe that the remaining uninsured population will comprise many undocumented people who will have limited access to care. This program's preparation can inform Prince George's County as it has a large immigrant population.

TECHNICAL REPORTS

Appendices

Data Source	Time Period	Description of Source	Description of Use
American Hospital Directory *Ahd.com*	FY 2010	The American Hospital Directory is an online resource for data on hospital characteristics.	Used to determine the total discharges for each Prince George's County hospital in fiscal year 2010
Maryland Health Services Cost Review Commission (HSCRC)	FY 2007, 2008, 2009	HSCRC collects a variety of hospital information including hospital discharge and hospital readmissions data	Used discharge and readmissions data as the outcome variables in the econometric analysis
DHMH Board of Dental Examiners	2011	Lists licensed dentists and dental hygienists, their primary practice address and specialty status for dentists	Used to assess the count and ratio of dentists, dental hygienists and dental care providers
DHMH Board of Nursing	2011	Lists licensed nurse practitioners, their specialty and their primary practice address.	Used to calculate the counts and ratio of nurse practitioners
DHMH Board of Physicians	2011	Lists licensed physicians, primary certification, primary and secondary office location and responses to physician relicensure survey. The Board of Physicians also provided data for licensed physician assistants and their primary practice address.	Used to calculate counts of physicians and physician assistants and derive provider-to-population ratios for physicians, data were used to identify specialists and categories of specialists, and select practice characteristics.
DHMH Board of Professional Counselors and Therapists	2011	Lists licensed counselors and therapists and their primary practice address	Used to assess the count and ratio of core mental health workers, which included social workers, psychologists, counselors and psychiatrists jurisdictions
DHMH Board of Psychology	2011	Lists licensed psychologists and their primary practice address	Used to assess the count and ratio of mental health workers, which included social workers, psychologists, counselors and psychiatrists
DHMH Board of Social Work Examiners	2011	Lists licensed social workers and their primary practice address	Used to assess the count and ratio of mental health workers, which included social workers, psychologists, counselors and psychiatrists
US Census Bureau	2000, 2010	The U.S. Census collects a broad range of information available once every 10 years from the decennial census; estimates are produced between censuses.	Data on ZIP code-level characteristics were used as explanatory variables for workforce counts, ratios and population characteristics (County, ZIP code and PUMA).
U.S. Census Bureau's Annual Estimates of the Population	2007	The Annual Estimates of the Population provides information such as the number of residents in specific jurisdictions	Used to analyze the data on population size for Prince George's County for trend comparisons

Three categories of data were used by the Public Health Impact Study investigators: 1) hospital data used for Technical Reports 4 and 6; 2) health care provider data used for Technical Reports 3, 4 and 6; and 3) population demographic data used for Technical Reports 1, 3, 4 and 6. The data sources are organized in these three categories.

HOSPITAL DATA SOURCES

For Maryland-specific data we used data that originated from the Maryland Health Services Cost Review Commission, but were provided by the Department of Health and Mental Hygiene and the University of Maryland Medical System only for purposes of this study. Similarly, data that originated from the District of Columbia were provided to us by the University of Maryland Medical System for this study.

HEALTH CARE PROVIDER SOURCES

All data on the eight categories of provider groups were obtained directly from the Department of Health and Mental Hygiene's respective boards that oversee licensure and relicensure.

POPULATION DEMOGRAPHICS SOURCES

We used the U.S. Census data for our population demographic and size information.

APPENDIX B **STUDY LIMITATIONS**

In reviewing the results of our study, the following limitations should be kept in mind:

TECHNICAL REPORT 1: RANDOM HOUSEHOLD HEALTH SURVEY

The limitations of time and resources constrained the length of the survey and resulted in limiting the questions about health behaviors. In addition, the questions related to race and ethnicity did not provide sufficient sub-group data within racial categories and thus analyses within racial categories were not possible.

TECHNICAL REPORT 2: INTERVIEWS WITH KEY STAKEHOLDERS

While our results present findings from stakeholders in a range of categories, not all identified stakeholders were able to participate in the study. This may have left a gap in the overall assessment of input from stakeholders.

TECHNICAL REPORT 3: PHYSICIAN COUNTS AND CATEGORIZATION AND CHARACTERISTICS OF PHYSICIANS IN THE STATE OF MARYLAND AND PRINCE GEORGE'S COUNTY

Our approach to physician counts varies from other studies. We focused on identifying those physicians who are licensed, providing patient care at least 20 hours per week and who have completed their specialty boards. This approach is designed to address current high-quality, patient care capacity in the County. It is most aligned with the MHCC Hogan Report and differences are described. We also describe these differences when our findings are compared with other reports and provide a very detailed description of our methods to facilitate discussions about the physician workforce. Our approach is internally consistent and should not affect our comparisons with other jurisdictions. Since our counts were developed to be used for geographic analyses at the level of ZIP codes, we did not include a number of physicians who declared the County as their jurisdiction, but whose ZIP code was outside the County. This included a total of 48 physicians of which 18 are primary care physicians.

TECHNICAL REPORT 4: IDENTIFICATION OF GEOGRAPHIC AREAS OF NEED FOR PRIMARY CARE

Our geographic analyses used both ZIP code-level data and data at the level of seven Public Use Microdata Areas (PUMAs) to provide sub-county level information. Use of ZIP codes for provider-to-population ratios can generate results that are skewed due to the variation in the size of the population within a given ZIP code and the number of providers in that same code. We projected need for primary care providers using counts derived from PUMA parameters. Because we used PUMAs, which consist of about 100,000 residents each, we may have lost some more detailed and accurate data than would have been available had we used census tracks. Since there is no match between ZIP codes and census tracks, time did not permit the extensive coding needed to use census tracts. Our identification of primary care need "hot spots" gives equal weight to three categories of factors (primary care physicians, hospital encounters and population characteristics), each of which come from different sources of data.

TECHNICAL REPORT 5: OVERVIEW OF PUBLIC AND PUBLIC HEALTH RESOURCES

We used predominately secondary data to identify the range of programs and resources in the County. We did not conduct a direct review of these activities. A critical review of these activities is needed to determine their actual capacity.

TECHNICAL REPORT 6: CURRENT EXPERIENCES (2007–2009) AND FUTURE PROJECTIONS OF PRINCE GEORGE'S COUNTY RESIDENTS' HOSPITAL ENCOUNTERS

The data used for these analyses were specific to County residents' hospital encounters and do not include emergency department use. The projections of future hospital discharges are based on 2009 discharges and population growth rates between 2000 and 2010 census data at the level of ZIP codes, and do not take into account any increases in providers or any variations in their practices. These analyses do not include non-county residents who use and are discharged by county hospitals.

TECHNICAL REPORT 7: ASSESSMENT OF COMPARABLE MODEL HEALTH CARE SYSTEMS

Time limited our interviews with one informant per health care system.

HEALTH OUTCOME MEASURES AND PROJECTIONS

The data presented for the baseline and projected rate of emergency department (ED) visits per 100,000 is limited to use of EDs in Maryland, and does not include the District of Columbia hospitals. Approximately 25 percent of County residents use the latter hospitals for their care.

DATA ON PRIMARY CARE WORKFORCE

We used relicensure data for all eight workforce categories. We did not delineate hours of patient care per week or specialty status, except for the physician category.

PROJECTION OF THE PRIMARY CARE WORKFORCE NEED

We only used provider-to-population ratios to project the number of providers needed by PUMA. The ratios used to determine sufficient needs are ones HRSA has referenced when documenting provider need. We realize provider-to-population ratios are not the only indicator of need for care and future assessments would benefit from assessing population health status, travel distances to clinics and other variables. We also did not consider subspecialty provider to population ratios in our projections.

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SCHOOL OF
PUBLIC HEALTH