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The Illinois Institute for Rural Affairs (IIRA) works to improve the quality of life for rural residents by partnering with public and private agencies on local development and enhancement efforts.



**Western Illinois  
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## **Patient Satisfaction with Rural Health Centers**

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### **Abstract**

This research uses microdata from a health center patient survey to explore patients' service quality perceptions and satisfaction with health centers. Results of empirical analysis show that Black patients are more skeptical of health center service quality than other ethnicities.

### **Introduction**

Community health centers emphasize primary and preventive care; they strive to take responsibility for the health status of the community that they serve<sup>2</sup>. The 'community health' model dates back to the early 20<sup>th</sup> century; in the early 1900s, the Greater Community Association at Creston, Iowa, brought together civic, religious, education, and healthcare groups to serve the healthcare needs of 100,000 residents<sup>3</sup>. The model gained popularity in 1965 by the federal Office of Economic Opportunity's "war on poverty" program<sup>4</sup>. In 2020, 1,375 federally-funded health centers served 28.6million patients<sup>5</sup>. Health centers mostly rely on revenues from Medicaid, 44%, and Section 330 funding, 18%<sup>6</sup>. What is the health status of rural health center patients? How do health center patients perceive the quality of healthcare? What proportion of health center patients are satisfied with their healthcare? What proportion of variability in satisfaction is related to patient demographics? This paper addresses these and other related questions.

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<sup>2</sup> Dievier, A., & Giovannini, T. (1998). Community health centers: promise and performance. *Medical Care Research and Review*, 55(4), 405-431.

<sup>3</sup> Kepford, A. E. (1919). The Greater Community Association at Creston, Iowa. *Modern Hospital*.

<sup>4</sup> Zarefsky, D. (2005). *President Johnson's war on poverty: Rhetoric and history*. University of Alabama Press.

<sup>5</sup> National Association of Community Health Centers; <https://www.nachc.org/research-and-data/americas-health-centers-2022-snapshot/>.

<sup>6</sup> Rosenbaum, S., Sharac, J., Shin, P., & Tolbert, J. (2019). Community health center financing: The role of medicaid and section 330 grant funding explained. *The Kaiser Family Foundation*.

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## Conceptual Framework and Propositions

### Patient Profile

Social factors initiate the onset of health problems<sup>7</sup>; for example, the social context of a person's life determines the risk of exposure and the outcome of a disease regardless of whether it is infectious, genetic, metabolic, malignant, or degenerative<sup>8</sup>.

The theory of Fundamental Causes states that individuals deploy resources to avoid health risks and adopt protective strategies; for example, a person in a higher socioeconomic status (SES) is better able to maintain a healthy lifestyle and get the best medical treatment available<sup>9</sup>.

The theory is built on four inter-related constructs: *means*: one's resources such as knowledge, power, prestige, and beneficial social connections; *spillovers*: contextual resources such as living in a neighborhood that has little or no pollution, crime, violence, traffic, etc.; these

contextual resources produce health benefits for the individual without any purposeful action by the individual. *Habitus*: norms and lifestyles of different social groups; and *institutions*: actions of institutions that treat individuals differentially according to their SES<sup>10</sup>.

When Fundamental Cause theory is reduced to its most basic proposition, it implies that resources consisting of money, knowledge, power, prestige, and social connections are vital to maintaining a health advantage; an absence or shortage of these resources causes poor health outcomes and earlier deaths.

In an earlier paper, I stated that people with 'resources' have less risk of exposure to preventable diseases and when disease occurs, they are better able to achieve positive outcomes by employing their resources. Those lacking such resources not only have greater exposure to risk and

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<sup>7</sup> Cockerham, W. C. (2016). *Medical Sociology*, 13<sup>th</sup> edition. New York: Routledge.

Holtz, T. J. et al. (2006). Health is still social: Contemporary examples in the age of genome. *PLOS Medicine*, 3-10, c19-c25.

<sup>8</sup> Infectious diseases are illness caused by bacteria, viruses, fungi, etc., for example, COVID-19. Genetic disorders are caused by mutations to one's DNA colon cancer. Type 2 diabetes is an example of a metabolic disorder; abnormal cell divisions, for example, carcinomas are malignant; and nerve diseases such as Alzheimers are degenerative.

<sup>9</sup> Link, B. G., and Phelan, J. (1995). Social conditions as fundamental causes of diseases. *Journal of Health & Social Behavior*, 36, 80-94.

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<sup>10</sup> The theory is related to the 'life chances' and 'life choices' concepts discussed in my earlier paper; see Athiyaman, A. (2023). Health and healthcare disparities in Illinois, Metro versus Nonmetro. *Research Brief*, 5(3), February 16. Available: [http://www.iira.org/wp-content/uploads/2023/02/RB5\\_3-Health-and-Healthcare-Disparities-in-Illinois-Metro-vs-Nonmetro.pdf](http://www.iira.org/wp-content/uploads/2023/02/RB5_3-Health-and-Healthcare-Disparities-in-Illinois-Metro-vs-Nonmetro.pdf).

more likelihood of the risk being realized but also a diminished capacity for preventing negative consequences<sup>11</sup>.

**Proposition<sub>1</sub>:** Research by NACHC suggests that a majority of health center patients are in or near poverty<sup>12</sup>. Based on this, I infer that the typical health center patient will be unhealthy.

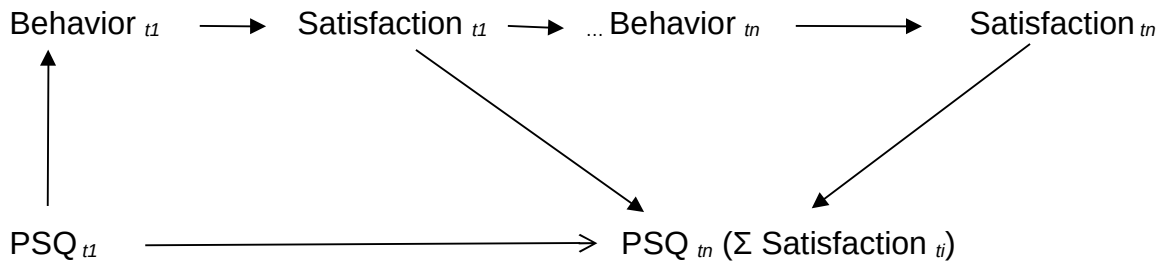
Patient Satisfaction

The behavioral law, law of effect, could be used to explain patient satisfaction with health centers<sup>13</sup>. The law predicts that a

response followed by a reinforcing event will receive an increment in its strength of occurrence. For patients of the health center, 'satisfaction' with visiting the health center is the reinforcer; it will strengthen their behavior or behavioral intentions to revisit the health center.

These episodic satisfactions will merge into an overall evaluation of the health center; I label this overall evaluation, 'perceived service quality'<sup>14</sup>. Figure 1 is a flow model of satisfaction and perceived service quality.

**Figure 1: Satisfaction and Service Quality Perceptions**



<sup>11</sup> Athiyaman, A. (2023). Health policy for rural Illinois, data for policy development. *Research Brief*, 5(4), February 25. Available: [http://www.iira.org/wp-content/uploads/2023/03/RB5\\_4-Health-Policy-for-Rural-Illinois-Data-for-Policy-Development.pdf](http://www.iira.org/wp-content/uploads/2023/03/RB5_4-Health-Policy-for-Rural-Illinois-Data-for-Policy-Development.pdf); also, see Footnote 10.

<sup>12</sup> See the reference in Footnote 5.

<sup>13</sup> Athiyaman, A. et al. (2017). Resident satisfaction with public services in nonmetro Illinois: Implications for resource allocation. *Rural Research Report*, 27(1), Fall. Available: [http://www.iira.org/wp-content/uploads/2019/11/Public\\_transport\\_satisfaction.pdf](http://www.iira.org/wp-content/uploads/2019/11/Public_transport_satisfaction.pdf).

<sup>14</sup> I conceptualized the causal relations between customer satisfaction and service quality perceptions some 25 years ago, when I was a faculty member at Charles Sturt University, Australia; see, Athiyaman, A. (1997). Linking student satisfaction and service quality perceptions: the case of university education. *European journal of marketing*, 31(7), 528-540.

A person’s socioeconomic status is often modeled as a linear combination of one’s educational level, occupation, and income<sup>15</sup>. Health center patients are predominantly poor and lack health insurance coverage<sup>16</sup>, characteristics of persons of low socioeconomic status.

A person of low socioeconomic status would have little or no expectation about ‘credence attributes’ of services such as healthcare<sup>17</sup>; this argument leads to the inference that health center patients will have little or no expectation about health services and hence would not have well-formed satisfaction judgments. Thus,

**Proposition<sub>2</sub>:** The health center is the only option for healthcare for most patients, so their overall evaluation of the facility, perceived service quality, would be positive. Furthermore, since they may not have well-formed expectations

about health center services, their satisfaction judgment would range from neutral to positive.

## Methodology

Data are from the Health Center Patient Survey (HCPS) which was fielded during October 2014 through April 2015; microdata from the survey were released by the Health Resources and Service Administration (HRSA) in June 2022<sup>18</sup>.

The data had 7,002 records, which amounts to slightly more than 20mil weighted responses from patients; 51% of the respondents were from the metro. Respondents ethnicity differed by their home location; Whites were the majority of the survey respondents in the nonmetro whereas Hispanics and Blacks were the majority in the metro (Table 1).

**Table 1: Respondents’ Home Location and Ethnicity**

Ethnicity	Metro	Nonmetro
Whites	31%	56%
Blacks	27%	12%
Asians	5%	< 0.5%
Hispanics	37%	32%
<b>N</b> (Number of Respondents)	10,000,096	10,000,027

<sup>15</sup> Athiyaman, A. (2022). Demographics of high-income households in rural Illinois, 2021. *Research Brief*, 4(3), February. Available: [http://www.iira.org/wp-content/uploads/2022/02/demographics-high-income-households-in-rural-illinois-2022\\_V4\\_3.pdf](http://www.iira.org/wp-content/uploads/2022/02/demographics-high-income-households-in-rural-illinois-2022_V4_3.pdf).

<sup>16</sup> Same reference as footnote 5.

<sup>17</sup> Same reference as footnote 13.

<sup>18</sup> <https://bphc.hrsa.gov/data-reporting/health-center-patient-survey>.

Table 2 lists the operational definitions of the variables. Data were analyzed by computing descriptive statistics of the variables. Group comparison procedures

for means and tests of independence in contingency tables were used to test the empirical implications of the propositions.

**Table 2: Variables and their Operational Definitions**

HCPS Variable	Definition
PRS8	For last prescription: Were you satisfied with the way the medication was explained (e.g. instructions side-effects); 1 = Yes and 2 = No.
PRS9	Were you satisfied with the way your questions about the medication were answered? 1 = Yes, 2 = No, 3 = Didn't have any questions.
Urban	Regional location of the respondent; Metro = 1 and Nonmetro = 2.
Final_race	Ethnicity of the respondent. White = 1; Black = 2; Asian = 3; Hispanic = 5
HEA52	In the last 12 months, how often did clerks and receptionists at this health center treat you with courtesy and respect? ..... 1=never; 2=sometimes; 3=usually; 4=always; -1=don't know; -2=refusal.
HEA51	In the last 12 months, how often were clerks and receptionists at this health center as helpful as you thought they should be? ... 1=never; 2=sometimes; 3=usually; 4=always; -1=don't know; -2=refusal.
MEN9b_R	Using any number from 0 to 10, where 0 is poor and 10 is excellent, what number would you use to rate the treatments or counseling services at the health center? 1=bad; 2=good; -1=don't know.
PRG10a_R	On a scale of 0 to 10, where 0 means poor and 10 means excellent, how would you rate the family planning services you received at the health center? 1=bad; 2=good; -1=don't know.
INTAGE_R	Age of the respondent. 1 = 0 to 11; 2 = 12 to 17; 3 = 18 to 20; 4 = 21 to 25; 5 = 26 to 34; 6 = 35 to 44; 7 = 45 to 54; 8 = 55 to 64; 9 = 65 to 74; 10 = 75 or older.
Edit_gen	Gender of the respondent. 1 = male; 2 = female.
ANALWT	Analysis weight

**Note:** See Appendix 1 for a complete list of variables used in statistical analysis.

## Findings

### Health Status of the Respondents

When asked, “Would you say your health in general is excellent, very good, good, fair, or poor?”, one-half of the respondents replied “fair” or “poor”. Although the

average self-assessment did not differ among the ethnicities, Black respondents provided the most varied or extreme responses (Table 3).

**Table 3: Health Status of the Respondents by Ethnicity**

Ethnicity	Median	Q1	Q3	HS	95% CI	
White	Good	Good	Fair	1.5	Very Good	Poor
Black	Good	Very Good	Fair	3	Excellent	Poor
Asian	Good	Good	Fair	1.5	Very Good	Poor
Hispanic	Good	Good	Fair	1.5	Very Good	Poor

**Note:** Q<sub>i</sub> = Quartile *i*; HS = Hinge spread; value labels were: Excellent = 1; Fair Very good = 2; Good = 3; = 4; Poor = 5.

Further analysis of the health status of the respondents revealed that:

- (i) The prevalence of obesity is higher among Asians in the nonmetro (Table 4a);
- (ii) A majority of Blacks in the nonmetro suffer from hypertension and one in four suffer from asthma (Tables 4b and 4c); and
- (iii) More than two-out-of-ten Whites and Blacks in the nonmetro have diabetes (Table 4d).

**Table 4a: Obesity by Race**

Race	% Obese
White	24
Black	28
Asian	49
Hispanic	19
<b>N (Nonmetro)</b>	<b>10,000,026</b>

**Table 4b: Hypertension by Race**

Race	% with Hypertension
White	47
Black	51
Asian	4
Hispanic	19
<b>N (Nonmetro)</b>	<b>9,783,084</b>

**Note:** All  $\chi^2$  significant at  $p < .05$  level.

**Table 4c: Asthma by Race**

Race	% Obese
White	23
Black	25
Asian	10
Hispanic	20
<b>N</b> (Nonmetro)	10,000,027

**Table 4d: Diabetes by Race**

Race	% with Hypertension
White	24
Black	22
Asian	8
Hispanic	13
<b>N</b> (Nonmetro)	10,000,026

**Note:** All  $\chi^2$  significant at  $p < .05$  level.

### Perceived Service Quality (PSQ)

The construct was operationalized using a linear combination of three indicators:

- In the last 12 months, how often did clerks and receptionists at this health center treat you with courtesy and respect?
- In the last 12 months, how often were clerks and receptionists at this health center as helpful as you thought they should be?
- Using any number from 0 to 10, where 0 is poor and 10 is excellent, what number would you use to rate the treatments or counseling services at the health center?

The first two items had two levels each: 1 = never / sometimes; 2 = usually / always; the third item had a score of 1 for “bad” and 2 for “good”<sup>19</sup>. The linear combination

<sup>19</sup> HRSA has recoded the original 11-point measure.

had a minimum score of 3 and a maximum of 6.

To assess the reliability of the linear combination, Cronbach alpha was computed; the closer the statistic is to 1, the higher is the scale’s reliability. As a rule of thumb, an alpha of 0.7 is required for a scale to be used in data analysis.

The average intercorrelations among the three items was 0.75; the reliability coefficient was 0.9<sup>20</sup>,

$$r_{kk} = \frac{k \bar{r}_{ij}}{1 + (k - 1) \bar{r}_{ij}} = \frac{3 \times .75}{1 + (2) \cdot .75} = 0.9.$$

The average PSQ scores for the regions, for both the metro and the nonmetro, was 5.75; perceptions of service quality did not differ between the regions (difference between means = .00262,  $t = -.06$ ,  $p > .9$ ).

Table 5 shows the crosstabulation of PSQ with ethnicity; in general, Blacks are more skeptical of health center service quality than other ethnicities. Almost all of the White respondents, 98%, in both the metro and the nonmetro provide positive, overall ratings.

<sup>20</sup> Furr, R. M. (2021). *Psychometrics: an introduction*. SAGE publications.

**Table 5: PSQ Assessments by Ethnicity, Metro and Nonmetro**

PSQ	Metro				Nonmetro			
	White	Black	Asian	Hispanic	White	Black	Asian	Hispanic
Bad	0	0	0	0	0	0	0	0
Neutral	2%	15%		1%	2%	32%		7%
Good	98%	85%	100%	99%	98%	68%	NA	93%
N	578,157	240,936	19,659	197,949	902,321	66,786	NA	190,321

**Note:** All  $\chi^2$  significant at  $p < .05$  level.

### Satisfaction

The construct, satisfaction, was measured as a composite of two variables:

- 1) PRS8: For last prescription:  
Were you satisfied with the way the medication was explained (e.g. instructions side-effects); 1 = Yes and 2 = No;
- 2) PRS9: Were you satisfied with the way your questions about the medication were answered? 1 = Yes, 2 = No.

To further explore the association of respondents' satisfaction responses with demographics, an analysis of variance model was calibrated. The 'model' included the main effects of geography (metro / nonmetro), race, gender, education, and insurance status (Medicare, Medicaid, or SCHIP); the interaction between race and geography was also estimated.

Table 6 shows differences in satisfaction judgments among the races. A majority of respondents from all races are satisfied with the way their medication was explained and questions answered. However, 4% of Blacks in the metro, an equal proportion of Asians in the nonmetro, and 6% of Hispanics in the nonmetro are dissatisfied (Table 6).



**Table 6: Respondents' Satisfaction Judgments by Ethnicity, Metro and Nonmetro**

Satisfied ...	Metro				Nonmetro			
	White	Black	Asian	Hispanic	White	Black	Asian	Hispanic
Yes	91%	95%	99%	98%	98%	100%	96%	94%
Neutral	8%	1%	1%	1%	<2%		0%	0%
No	1%	4%		1%	<1%		4%	6%
N	438,461	330,371	65,639	471,481	1,471,408	120,594	3,176	637,944

Note: All  $\chi^2$  significant at  $p < .05$  level.

Table 7 shows the partitioning of variation of the dependent variable; the statistically significant  $F$  statistic suggests that the predictors explain the variance of the response variable. The grand mean of the response variable is 2.06.

The partial sum of squares, Type III SS, reveal that the main effects of education, gender, and the interaction between race

and geography explain a significant proportion of the variance in satisfaction; the significant interaction suggests that the effect of geography depends on race. Specifically, if the respondent is Black and lives in the nonmetro, then her satisfaction assessments of health center(s) is much lower than respondents from other ethnicities (Figure 2).

**Table 7: ANOVA: Satisfaction and Demographics**

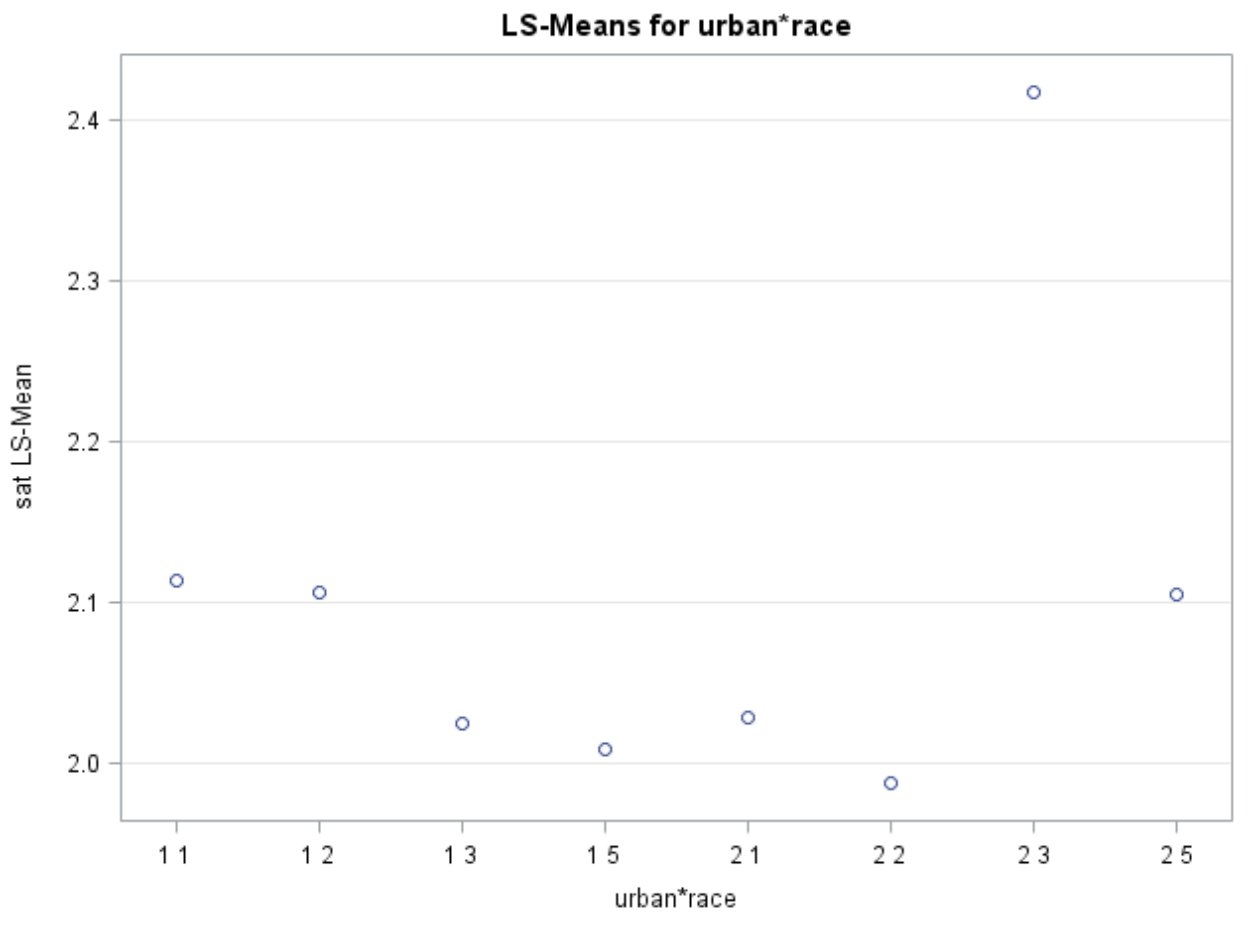
Source	DF	SS	MS	F	p
Model	13	11031	848	3.76	<.0001
Error	1290	290729	225		
Corrected Total	1303	301759			

Source	DF	Type III SS	MS	F	p
Urban	1	47.66	47.66	0.21	.64
Race	3	232.30	77.43	0.34	.79
<b>Education</b>	2	1304.68	652.34	2.89	.05
INS4	1	607.21	607.21	2.69	.10
INS8	1	.78	0.78	0.00	.95
INS5	1	755.17	755.17	3.35	.06
<b>Gender</b>	1	2394.31	2394.31	10.62	.0011
<b>Urban * Race</b>	3	5340.00	1780.0	7.9	.0001

Note: All highlighted variables significant at  $p \leq .05$  level.

**Figure 2: Least Squares Means**



**Note:** Urban has two levels: 1 = Metro and 2 = Nonmetro; Race has 4 levels: 1 = White, 2 = Black, 3 = Asian, and 5 = Hispanic; see Table 2.

### Summary and Conclusion

This paper explores patient satisfaction and service quality perceptions about health centers. Data are from the Health Center Patient Survey (HCPS) which was fielded during October 2014 through April 2015; microdata from the survey were released by the Health Resources and Service Administration (HRSA) in June 2022.

Data were analyzed to gain insights into the following questions:

- (i) What is the health status of rural health center patients?  
The prevalence of obesity is higher among Asians; a majority of Blacks suffer from hypertension and one in four suffer from asthma, and more than two-out-of-ten Whites have diabetes.
- (ii) How do health center patients perceive the quality of healthcare?  
Blacks are more skeptical of service quality than other

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ethnicities. Almost all of the White respondents, 98%, in both the metro and the nonmetro provide positive evaluations.

(iii) What proportion of health center patients are satisfied with their healthcare?

A majority of respondents, more than 90%, from all races are satisfied with the health centers.

(iv) What proportion of variability in satisfaction is related to patient demographics?

Less than 10%; if the respondent is Black and lives in the nonmetro, then her satisfaction assessments of health center(s) is much lower than respondents from other ethnicities.

This research indicates that patients are satisfied with the services of the health centers; empirical analysis suggests that health centers can be relied upon to ensure that the health needs of the poor are met.

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## Appendix 1: List of Variables used in Statistical Analysis

HCPS Variable	Definition
PRS8	For last prescription: Were you satisfied with the way the medication was explained (e.g. instructions side-effects); 1 = Yes and 2 = No.
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HEA51	In the last 12 months, how often were clerks and receptionists at this health center as helpful as you thought they should be? ... 1=never; 2=sometimes; 3=usually; 4=always; -1=don't know; -2=refusal.
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PRG10a_R	On a scale of 0 to 10, where 0 means poor and 10 means excellent, how would you rate the family planning services you received at the health center? 1=bad; 2=good; -1=don't know.
INTAGE_R	Age of the respondent. 1 = 0 to 11; 2 = 12 to 17; 3 = 18 to 20; 4 = 21 to 25; 5 = 26 to 34; 6 = 35 to 44; 7 = 45 to 54; 8 = 55 to 64; 9 = 65 to 74; 10 = 75 or older.
Edit_gen	Gender of the respondent. 1 = male; 2 = female.
ANALWT	Analysis weight
Education	1 = Less than high school; 2 = High school; 3 = More than high school.
INS4	Current health insurance coverage provided by Medicare? 1 = Yes; 2 = No
INS5	Current health insurance coverage provided by state Medicaid or SCHIP? 1 = Yes; 2 = No
INS8	Current health insurance coverage – other (TRICARE, CHAMPUS): 1 = Yes; 2 = No

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