A Comparison of the Health Status and Behavioral Risk Factors Among English-Speaking Hispanics and Non-Hispanic Blacks and Whites in Missouri

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Objectives: The study objectives were to estimate the prevalence of chronic diseases and other health indicators for Hispanics in Missouri, and to compare their prevalence estimates with other racial/ethnic groups.

Design / Setting / Participants: This study, conducted in public health and academic settings, used combined data from the 2002 and 2003 Missouri Behavioral Risk Factor Surveillance System and the 2003 Missouri County-Level Study. Data were post-stratified with Hispanic ethnicity as a separate group.

Main Outcome Measures: Twenty health indicators were compared. Logistic regression was used to control for sociodemographic characteristics.

Results: Overall, 21.7% (95% confidence interval [CI] 13.4–30.0] of Hispanics, 19.8% (95% CI 14.4–25.2%) of non-Hispanic Blacks, and 12.2% (95% CI 11.2–13.1%) of non-Hispanic Whites had no insurance coverage. Hispanics were significantly less likely to report poor or fair health (12.1%, 95% CI 7.5–16.7%) than non-Hispanic Blacks (21.6%, 95% CI 17.2–26.0%), and less likely to report activity limitation (12.9%, 95% CI 8.0–17.9%) than non-Hispanic Whites (20.2%, 95% CI 19.1–21.2%). Controlling for sociodemographic characteristics, Hispanics had greater physician-diagnosed diabetes (OR=2.0, 95% CI 1.0–3.3%) and Hispanics aged ≥50 were less likely to have no sigmoidoscopy or colonoscopy in the past five years (OR=0.5, 95% CI 0.2–1.0%) compared to non-Hispanic Whites.

Conclusions: Other than lower healthcare coverage and diabetes status, the health indicators for English-speaking Hispanics were similar to, or better than, non-Hispanic Blacks and Whites. However, these data may not represent all Hispanics in Missouri since health status between English-speaking and non-English speaking Hispanics may differ significantly. (*Ethn Dis*. 2007;17:291–297)

Key Words: Hispanics, Chronic Diseases, Behavioral Risk Factors, Healthcare Coverage, Health Status, Preventive Care

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Introduction

According to the 2000 census data, 2.1% of the population in Missouri is Hispanic. Although the actual percentage is low, the Hispanic population in Missouri has experienced the highest growth among all racial/ethnic groups since 1990. From 1990 to 2000, Missouri's Hispanic population grew by a staggering 92.2% from 61,702 to 118,592. In contrast, Missouri's total population grew by 9.3% from a little more than 5.1 million in 1990 to slightly less than 5.6 million in 2000.[1]

Hispanics in Missouri are a diverse ethnic group. The majority of this group are Mexican (65.7%), followed by Puerto Rican (5.6%), Central American (4.3%), Spanish (3.1%), South American (3.0%), and Cuban (2.5%) in origin.[2] An estimated 58.4% of Missouri Hispanics aged ≥18 in Missouri speak languages other than English (mainly Spanish); 19.7% speak English "not well" or "not at all."[3]

National data show that Hispanics are disproportionately affected by chronic diseases and conditions and are less likely to practice preventive care.[4–7] Therefore, it is important for public health to monitor the health status and risk factors among this fast-growing population in Missouri. The purposes of this study are to estimate the prevalence of chronic diseases, health conditions, behavioral risk factors, and preventive care practices among Hispanic Missourians, and to compare the prevalence of these health indicators with non-Hispanic Whites and Blacks.

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Methods

Data Sources

Behavioral Risk Factor Surveillance System (BRFSS) Data

BRFSS is a Centers for Disease Control and Prevention (CDC)-sponsored, standardized state-based telephone survey carried out by health agencies in all 50 states, the District of Columbia, Puerto Rico, Guam and the US Virgin Islands.[8] It annually collects chronic disease, health conditions, behavioral risk factors, and preventive care practices information for the primary purpose of providing state-specific estimates of the prevalence of diseases and

behaviors that are associated with the leading causes of death in the United States. Each participating state independently selects a probability sample from adult residents aged ≥18 years in households with telephones for interview. The response rate was 57% in the 2002 Missouri BRFSS and 53% in the 2003 Missouri BRFSS. To overcome the obstacle of the small sample size of Hispanics in the annual Missouri BRFSS, data were combined from the annual 2002 and 2003 Missouri BRFSS and Missouri County-level Study, a BRFSS-like study with a substantially larger sample.

Missouri Count-Level Study

This study was conducted during June 2002 through June 2003 and used random-digit-dialed telephone interviews among non-institutionalized adults, aged ≥18 years in Missouri. The sample was drawn from all 114 counties and the city of St. Louis. To assure representation of African Americans, we over-sampled ZIP code areas where African Americans represent more than 40% of the population in the City of St. Louis, and more than 18% of the population in Jackson County (Kansas City), and in the six county Bootheel area (Dunklin, Pemiscot, Scott, Stoddard, Mississippi, and New Madrid Counties). Four counties with large Metropolitan Statistical Areas (MSAs) were divided into urban and rural strata. Data collection followed the standard BRFSS protocol.[9]

The final sample size of the Missouri County-Level Study was 15,059 with an overall response rate of 60.9%. The questionnaires included the core and optional questions contained in the Adult Tobacco Survey, as well as selected questions on key chronic diseases, conditions, behavioral risk factors, preventive care practices, and all demographic questions from the BRFSS. The reliability and validity of these questions have been previously tested by the CDC.[10,11]

Both the Missouri BRFSS and the County-Level Study used disproportionate stratified random sampling (DSS) and collected data through random-digit dialed telephone interview. All interviews were administered in English only.

Health indicators

Twenty health indicators were included in this study. These included:

- three general health indicators: no healthcare coverage, fair or poor health, and activity limitation;
- two behavioral risk factor indicators: physical inactivity, and current smoking status;
- six disease and condition indicators: overweight (25 kg/m^2; body mass index [BMI] < 30 kg/m^2), obesity (BMI≥30 kg/m^2), high blood pressure, high cholesterol, asthma, and diabetes;
- six indicators on cancer screening among women: never had mammogram among women aged ≥40, did not have mammogram or clinical breast exam in the past year among women aged ≥40, never had a Pap test among women aged ≥18, did not have a Pap test in last year among women aged 18 to 29, and did not have a Pap test in the last three years among women aged 30 to 69; and
- four indicators on colorectal cancer screening among men and women ≥50 years or older: never had a blood stool test, no blood stool test in last year, never had a sigmoidoscopy or colonoscopy, and no sigmoidoscopy or colonoscopy in past five years.

Detailed information on the definition of these indicators is available on the Missouri Department of Health and Senior Services website.[12]

Data analysis

Prior to data analysis, the institutional review board at the Missouri Department of Health and Senior Services reviewed the study protocol and determined it to be exempt. Data from the Missouri BRFSS and the Missouri County-Level Study were combined and re-weighted. The post-stratification accounted for the distribution of the Hispanic population. All statistical analyses were performed using STATA (SE 8.2, StataCorp, College Station, TX, USA), and the complex survey designs were accounted for in our analysis. Prevalence estimates and 95% confidence intervals (CIs) for the 20 health indicators were calculated, and logistic regression was used to adjust for age, sex, and education when the prevalence of the health indicators were compared across racial and ethnic groups. We did not adjust for household income because including household income in the model only changed the point estimates for the prevalence odds ratios (PORs) slightly while making the estimates less precise. Crude and adjusted PORs and 95% CIs were computed.

RESULTS

A total of 23,791 respondents, including 21,664 non-Hispanic Whites, 995 non-Hispanic Blacks, 434 Hispanics, and 698 other races, were included in this study. Compared to non-Hispanic Whites and Blacks, Hispanics included in the study sample tended to be younger and had a higher proportion of males. Also, compared with non-Hispanic Whites, Hispanics tended to have lower educational attainment and lower household income. Hispanics and non-Hispanic Blacks were similar in the proportion of those having less than a high school education (14.6% vs 14.1%), but non-Hispanic Blacks tended to have lower household incomes than Hispanics. (Table 1)

The weighted age and sex distributions for all three racial/ethnic groups in the survey population were similar to

Table 1. Characteristics of the survey population, by racial/ethnic groups

	Missouri Survey Population[8,18]			*2000 Census Missouri Population*[19]		
	Weighted Percentage			Percentage		
	Non-Hispanic Whites	Non-Hispanic Blacks	Hispanics	Non-Hispanic Whites	Non-Hispanic Blacks	Hispanics
Age						
18–44	47.3	57.4	71.6	50.0	60.5	73.8
45–64	33.5	29.6	21.3	30.7	26.8	19.3
> 65	19.2	13.0	7.1	19.3	12.7	6.8
Sex						
Female	51.8	53.8	45.9	52.1	55.0	46.6
Male	48.2	46.2	54.1	47.9	45.0	53.4
Education						
Less than high school	11.1	14.1	14.6	17.5	26.1	34.3
High school or GED	35.4	36.4	35.3	33.4	30.6	26.0
Attended college or technical school	26.9	34.3	29.6	26.8	30.1	23.6
College or technical school graduate	26.6	15.3	20.6	22.3	13.2	16.1
Household Income						
Less than 15,000	9.1	22.7	13.5	15.5	28.7	20.1
15,000–24,999	18.0	25.9	24.9	14.2	17.3	16.4
25,000–34,999	16.6	17.2	13.7	14.3	14.7	15.7
35,000–49,999	18.6	13.3	21.0	17.8	15.4	17.8
More than 50,000	37.4	20.9	26.9	38.2	23.9	30.0

the 2000 census Missouri population. However, the proportion of Hispanics with less than a high school education in the survey population was substantially lower than that in the census data (14.6% vs 34.5%). This difference between the survey and census population is larger among Hispanics than among non-Hispanic Whites and Blacks. The levels of difference in the distributions of household income between the survey population and census data were similar across all three racial/ethnic groups.

An estimated 13.3% of all Missourians had no healthcare coverage during 2002–2003. The prevalence was significantly higher among Hispanics and non-Hispanic Blacks compared to non-Hispanic Whites. Hispanics were also less likely to report poor or fair health than non-Hispanic Blacks, and less likely to report activity limitation than non-Hispanic Whites.

A larger proportion of Hispanic women aged 18 to 29 received Pap test within one year with Hispanic women four times less likely not to have had a Pap test in the last year than non-Hispanic Whites. In comparison, non-Hispanic Blacks were more likely to have had no leisure-time physical activity, more likely to be obese, less likely not to have had a Pap test in last three years among women aged 30 to 69, and less likely not to have had a mammogram or clinical breast exam (CBE) in the past year among women ≥40, compared to non-Hispanic Whites. All other health indicators did not differ significantly among the three racial/ethnic groups. (Tables 2 and 3)

After controlling for sociodemographic characteristics, Hispanics were less likely than non-Hispanic Blacks to report fair or poor health status [OR=0.6, 95% CI 0.3–1.0]; and more likely than non-Hispanic Whites to have physician-diagnosed diabetes (OR=2.0, 95% CI 1.0–3.3). Additionally, Hispanics ≥50 were less likely than non-Hispanic Whites to have no sigmoidoscopy or colonoscopy in the past five years (OR=0.5, 95% CI 0.2–1.0).

DISCUSSION

The Hispanic population is the fastest-growing ethnic population in Missouri. National data suggest that the health status of this population is of concern. Therefore, it is important to monitor the health status of Hispanics in Missouri for planning timely and appropriate interventions to improve health status and reduce health disparities. However, there is insufficient information about the prevalence of behavioral risk factors, chronic diseases, health conditions, and preventive care practices among Hispanics in Missouri because of the small sample sizes in the annual BRFSS. This study estimates the prevalence of health indicators among Hispanics in Missouri.

Consistent with findings from other studies, we found a significantly higher proportion of Hispanics with no healthcare coverage. Also, after adjusting for sociodemographic characteristics, Hispanics were more likely to have diabetes than non-Hispanic

Table 2. Diseases, conditions, and risk factors by racial/ethnic Groups, Missouri, 2002–2003[8,18]

Indicators	Race/Ethnicity	Prevalence (%)	95% CI†	Adjusted POR‡	95% CI
General					
No health coverage	NH White	12.2	11.2–13.1	0.7	0.4–1.2
	NH Black	19.8	14.4–25.2*	1.0	0.5–1.9
	Hispanic	21.7	13.4–30.0*	Reference	Reference
	Overall**	13.3	12.3–14.3		
Health status (fair or poor)	NH White	16.8	15.9–17.8	1.1	0.7–1.8
	NH Black	21.6	17.2–26.0	1.7	1.0–2.9
	Hispanic	12.1	7.5–16.7*	Reference	Reference
	Overall**	17.4	16.4–18.3		
Activity limitation	NH White	20.2	19.1–21.2	1.4	0.9–2.1
	NH Black	17.9	13.8–21.9	1.2	0.7–2.1
	Hispanic	12.9	8.0–17.9*	Reference	Reference
	Overall**	19.9	18.9–20.9		
Behavioral risk factors					
Physical inactivity	NH White	24.4	23.3–25.5	1.1	0.7–1.7
	NH Black	32.8	27.6–37.9*	1.5	0.9–2.5
	Hispanic	22.6	15.0–30.3	Reference	Reference
	Overall**	25.2	24.1–26.3		
Current smoker	NH White	26.3	25.0–27.5	1.4	0.9–2.5
	NH Black	30.4	24.9–36.0	1.5	0.9–2.3
	Hispanic	25.0	16.4–33.5	Reference	Reference
	Overall**	26.9	25.7–28.1		
Disease and conditions					
Overweight (BMI ≥25–29.9)§	NH White	36.5	35.2–37.9	1.1	0.7–1.6
	NH Black	37.0	31.3–42.7	1.2	0.8–1.9
	Hispanic	32.3	23.6–41.1	Reference	Reference
	Overall**	36.4	35.1–37.7		
Obese (BMI ≥ 30)§	NH White	22.3	21.2–23.4	1.0	0.9–2.0
	NH Black	29.2	24.0–34.3*	1.4	0.7–1.3
	Hispanic	24.6	16.6–32.6	Reference	Reference
	Overall**	23.0	21.9–24.1		
High blood pressure	NH White	28.4	26.9–29.9	0.9	0.6–1.4
	NH Black	31.1	25.0–37.3	1.2	0.7–2.0
	Hispanic	21.6	11.9–31.4	Reference	Reference
	Overall**	28.5	27.0–29.9		
High cholesterol	NH White	40.1	38.1–42.2	1.1	0.4–2.7
	NH Black	31.1	23.5–38.7	0.8	0.3–2.0
	Hispanic	34.2	16.5–51.9	Reference	Reference
	Overall**	38.9	37.0–40.9		
Asthma	NH White	11.7	10.8–12.5	0.9	0.5–1.4
	NH Black	12.7	9.1–16.3	0.9	0.5–1.6
	Hispanic	14.5	8.6–20.5	Reference	Reference
	Overall**	11.9	11.0–12.7		
Diabetes	NH White	7.1	6.4–7.7	0.5	0.3–1.0
	NH Black	9.5	6.9–12.1	0.9	0.4–1.8
	Hispanic	8.0	3.3–12.7	Reference	Reference
	Overall**	7.3	6.7–7.9		

* Statistically significant different from NH White, P<.05.
** Includes Non-Hispanic (NH) other race.
† Confidence interval (CI).
‡ Adjusted for age, sex, and education.
§ Body mass index (BMI).

Table 3. Cancer Screening Practices by Racial/Ethnic Groups, Missouri, 2002–2003[8,18]

Indicators	Race/ethnicity	Prevalence (%)	95% CI†	Adjusted POR‡	95% CI
Cancer screening among women					
Never had a mammogram (>40)	NH White	12.4	11.1–13.7	1.2	0.3–2.4
	NH Black	10.7	5.3–16.0	0.9	0.5–2.8
	Hispanic	13.0	3.6–22.4	Reference	Reference
	Overall**	12.3	11.1–13.6		
No mammogram or CBE§ in past year (>40)	NH White	50.4	48.4–52.4	1.0	0.5–2.0
	NH Black	37.5	29.5–45.5*	0.6	0.3–1.2
	Hispanic	51.4	36.1–66.8	Reference	Reference
	Overall**	49.4	47.5–51.3		
Never had a pap test	NH White	5.0	3.9–6.1	1.7	0.6–8.0
	NH Black	4.3	1.2–7.5	2.3	0.4–7.4
	Hispanic	2.7	0–5.7	Reference	Reference
	Overall**	5.1	4.0–6.1		
No pap test in last year (18–29)	NH White	25.2	20.7–29.8	4.1	0.8–34.2
	NH Black	21.3	9.5–33.1	5.2	0.6–30.4
	Hispanic	6.2	0–16.9*	Reference	Reference
	Overall**	24.6	20.5–28.7		
No pap test in last three years (30–69)	NH White	12.6	11.1–14.1	1.8	0.6–4.9
	NH Black	6.3	1.9–10.6*	0.7	0.2–2.3
	Hispanic	6.4	0.4–12.3	Reference	Reference
	Overall**	11.8	10.4–13.2		
Cancer screening among men and women ≥50 years					
Never had a blood stool test	NH White	55.5	53.1–57.9	1.3	0.6–2.8
	NH Black	51.2	40.5–62.0	1.0	0.4–2.3
	Hispanic	51.0	33.1–68.9	Reference	Reference
	Overall**	55.3	53.0–57.6		
No blood stool test in last year	NH White	79.1	77.0–81.1	0.9	0.3–2.4
	NH Black	69.5	59.8–79.2	0.5	0.2–1.5
	Hispanic	81.6	67.3–95.9	Reference	Reference
	Overall**	78.4	76.5–80.4		
Never had a sigmoidoscopy or colonoscopy	NH White	54.3	51.9–56.7	1.6	0.8–3.3
	NH Black	53.5	42.7–64.4	1.4	0.6–3.2
	Hispanic	43.9	26.7–61.1	Reference	Reference
	Overall**	54.2	51.9–56.5		
No sigmoidoscopy or colonoscopy in past five years	NH White	62.7	60.3–65.0	2.1	1.0–4.4
	NH Black	59.7	49.1–70.3	1.7	0.7–3.9
	Hispanic	45.8	28.4–63.2	Reference	Reference
	Overall**	62.3	60.0–64.6		

* Statistically significant different from NH White, P<.05.
** Includes mon-Hispanic (NH) other race.
† Confidence interval (CI).
‡ Adjusted for age and education for cancer screening indicators among women; adjusted age, sex, and education for cancer screening indicators among men and women ≥50 years.
§ Clinical breast exam (CBE).

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Whites.[4–6,13] Other than these two indicators, all other health indicators among Hispanics were similar to, or better than, non-Hispanic Blacks and Whites. In fact, Hispanics were more likely, than one or both of the other racial/ethnic groups, to perceive better overall health status; less activity limitations; and Hispanic women 18–29 were more likely to have received a Pap test within one year.

Several limitations should be considered when interpreting the findings of this study. The Missouri BRFSS and the county-level study both collected self-reported data through telephone

interviews. The prevalence of certain risk factors, such as smoking and obesity, has been shown to be underestimated by using self-reported data.[14,15] Whether the levels of underestimation vary across racial and ethnic groups has not been fully investigated. The telephone coverage rate in the United States is approximately 95%, which is lower in populations with a lower social economic status.[16] It is not known whether the telephone coverage is different across racial and ethnic groups after controlling for social economic status. The response rates of the three surveys ranged from 53% to 60%. Those who responded were likely to be different from those who refused to participate. It is also unknown whether response rates were different among the three racial and ethnic groups included in this study. Therefore, the impact of self-reporting, low telephone coverage, and non-response on the comparison of the health status among the three racial and ethnic groups is unknown. Additionally, it is possible that some respondents included in this study participated in more than one survey. Including subjects who participated in more than one survey in the analysis may influence the standard error estimates, not the point estimates of the prevalence and PORs. Because the surveys were anonymous, we were unable to identify the individuals who participated in both surveys. However, we expect the number of duplicates to be small compared to the sample size, and the overall impact of the duplication on the standard error estimates to be negligible.

Another limitation of this study is that the interviews in Missouri's annual BRFSS and the Missouri County-Level Study were only administered in English. Therefore, Hispanic respondents to the surveys were only those who spoke English well. More than half of Hispanics aged ≥18 in Missouri speak languages other than English (mainly Spanish), and a fifth speak English "not well" or "not at all."[3] Studies at the national level and state level (eg, North Carolina and Texas) showed that the health indicators among English-speaking Hispanics are significantly better than those among Spanish-speaking Hispanics.[7,13,17] Therefore, the data in this study only represent the health status of English-speaking Hispanics, not the overall Hispanic population in Missouri.

At the national level, the CDC BRFSS branch is striving to collect reliable and valid data for the Hispanic population. Several pilot projects have been conducted to test innovative approaches to improve data collection among the Hispanic population, including mailed surveys and using Spanish as the first line language in areas with high proportions of Hispanics. Currently, there are still many states conducting BRFSS surveys in English only. The potential bias introduced to national estimates by this practice needs to be evaluated.

In Missouri, to monitor the health status and risk factors among this fast-growing population and tailor interventions based on this information, we will work with CDC and other partners in the development of new approaches and methods for data collection and translation.

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