

# Environmental Hazards, Chronic Diseases and Barriers to Health Care Access



## in Spanish Speaking Persons in Baltimore, Maryland

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### Abstract

**Background:** The Maryland Behavioral Risk Factor Surveillance System (BRFSS) excludes residents without a land line telephone. This project was designed to determine if Spanish speaking persons tested in a community setting and interviewed in person using either the same or similar formatted BRFSS questions and similar survey administration methods differed from Hispanics who participated in the Maryland BRFSS telephone survey. **Methods:** The survey was orally administered in Spanish in a not-for-profit community service center in Baltimore, in a face-to-face setting. There were 261 participants who were tested between June 2010 and July 2011. **Results:** Two thirds of the participants (68.6%) did not have a land line or a cellular telephone. Self-reported arthritis prevalence (12.9%) was significantly higher, diabetes marginally significantly higher (12.6%,  $p=0.07$ ) and lifetime asthma prevalence was significantly lower (3.5%) in this survey than among Hispanics in the 2009 Maryland BRFSS (11.2%, 4.0%, 12.6%, respectively). There was no significant difference in hypertension prevalence (16.0% in this survey vs. 13.0%). Pesticides were used in homes 3.4 days (95% CI=2.5-4.3) or in yards 2.5 days (95% CI=1.7-3.3) during the preceding 12 months. Insurance coverage was significantly lower in this survey (7.7%) than for Hispanics in the 2009 Maryland BRFSS (61.2%). Also, 39.9% of the participants could not see a doctor because of lack of financial resources or inability to speak English. **Conclusions:** The Maryland BRFSS may underestimate the presence of chronic diseases and barriers to health care access in Spanish only speakers who are not included in the Maryland BRFSS.

### Introduction

The Environmental Public Health Tracking (EPHT) initiative now utilizes retrospectively obtained measures for a variety of environmental hazards and chronic diseases and other health outcomes<sup>1-4</sup>. EPHT data can be used to document how environmental hazards are spatially and temporally associated with diverse health outcomes<sup>5</sup>. Based on currently available Maryland Tracking Network (MTN) public portal data, between 2000 and 2006 for asthma, acute Myocardial Infarction, births and deaths, the average increase was 125.3% for Hispanics and 0.8% for non-Hispanics<sup>6-7</sup>. The Behavioral Risk Factor Surveillance System (BRFSS) is another source of EPHT-relevant information as well as results about barriers to health care access<sup>8</sup>. The BRFSS is administered by telephone each year in all of the states in the USA<sup>9</sup>. The BRFSS questionnaire is also administered by States in English, Spanish and many other languages<sup>10-11</sup>. This poster will describe how the BRFSS instrument and methodology was used in a community setting to evaluate EPHT-like measures that included selected risk factors and chronic diseases, including asthma, contact with pesticides in the home and yard and barriers to health care access in Spanish only speakers who live in Baltimore City or Baltimore County.

### Survey Administration

The Environmental Health Spanish Survey (EHSS) includes 40 anonymous questions about demographics, environmental hazards, chronic diseases and other health outcomes, as well as barriers to health care access<sup>8</sup>. The EHSS includes 33 original BRFSS questions and seven non-BRFSS questions written by the authors and translated into Spanish spoken in the Americas<sup>8</sup>. Qualification criteria included: 1) Speak only in Spanish or a preference to only communicate in Spanish. 2) Current residence is Baltimore City or Baltimore County, Maryland. 3) Lived in the US not more than ten years. All recruitment and testing was done only in Spanish—but always in a culturally sensitive manner—and using a one-on-one testing format. The environmental hazard questions focused on pesticides. The chronic disease of interest was asthma. The EHSS can be administered in less than 20 minutes. The surveillance protocol was approved by the Maryland Department of Health and Mental Hygiene (DHMH) Institutional Review Board (IRB). The presented results will include a preliminary analysis of all of the survey responses.

### Analysis of Survey Responses

The Spanish-English survey administrators recorded the participants' oral responses to the Spanish version of EHSS questions on hard copies of the survey. Responses were subsequently entered in a 2007 MS Access database (Microsoft, Redmond, WA). Accuracy of entered responses was checked at least once after all responses for the 261 participants were entered in the Access database. DBMS Copy software was used to create an exact copy of the entered values but in a SAS formatted dataset (Conceptual Software, Houston, TX). PC SAS, version 9.3, was used to complete all descriptive statistical analyses (SAS Institute, Cary, NC)<sup>12</sup>. SAS procedures were used to again check the accuracy of the entered values. The Chi Square test was implemented by using Proc Freq, and used to evaluate discrete values. Proc Means was used to compute measures of central tendency.

### Results

**Characteristics of participants:** Between August 9, 2010 and July 19, 2011 261 study participants completed the survey. Table 1 summarizes the characteristics of the participants. This community sample included: a) higher percentage of females than males; b) only 10.3% had a land line; c) all reported living in either Baltimore City (79.3%) or Baltimore County (20.7%). Figure 1 is a map showing the location of Baltimore City and Baltimore County. The testing site was in Baltimore City. Country of origin for 83.1% of the participants included five Spanish speaking countries in the Americas (Mexico, El Salvador, Honduras, Dominican Republic and Guatemala). Figure 2 is a map showing country of origin for countries with six or more study participants.

**Risk Factors:** Study participants demonstrated risk factors for possible adverse health effects, as shown in Table 2. The Body Mass Index (BMI) of males and females was above 30. As seen in Figure 3, the number of study participants who reported engaging in recreational exercise (53.1%) was significantly lower than the number of Maryland Hispanics (66.2%,  $p<0.001$ ) and all Maryland residents (76.2%,  $p<0.0001$ ); it was also lower than the percentage for all persons in the U.S. who participated in the 2009 BRFSS telephone survey (76.2%). Alcohol use in the past 30 days is shown in Figure 3. Significantly fewer study participants (29.5%) reported drinking alcohol than Maryland Hispanics (45.3%,  $p<0.01$ ) or all State residents (54.7%,  $p<0.0001$ ). As shown in Table 4, only 6.0% of the study participants received a health care referral.

**Pesticide Use During the Preceding 12 Months:** Pesticide use within the home and in the yard of a residence is summarized in Table 3. Nearly 30% of the participants reported the use of pesticides in their homes, between 2-4 days per year. About one in 10 of the study participants reported the use of pesticides in the yards, between 2-3 times in the preceding 12 months.

**Chronic Diseases and Other Health Outcomes:** Figure 4 shows the percentages for the four chronic diseases reported by study participants, and Maryland Hispanics and all State residents as well as everyone in the US who participated in the 2009 BRFSS telephone survey. The number of study participants who reported arthritis was significantly higher than Maryland Hispanics ( $p<0.05$ ) and all Maryland residents ( $p<0.0001$ ). The number of study participants who reported diabetes was marginally significantly higher than Maryland Hispanics ( $p=0.07$ ). Study participants were not significantly different from Maryland Hispanics in reported high blood pressure ( $p=0.05$ ). But, significantly fewer study participants reported being hypertensive relative to the persons in the 2009 Maryland BRFSS sample ( $p<0.0001$ ). Reported ever having asthma was significantly lower in study participants than in Maryland Hispanics ( $p<0.0001$ ) and in the Maryland sample ( $p<0.0001$ ). Current asthma was also significantly lower in the study sample than among Maryland Hispanics ( $p<0.01$ ) or the Maryland sample ( $p<0.0001$ ). Finally, cholesterol screening was significantly lower in study participants than in Maryland Hispanics ( $p<0.001$ ) and in persons in the Maryland sample ( $p<0.0001$ ).

**Barriers to Health Care Access:** Insurance coverage was significantly lower in study participants (7.8%) than in Maryland Hispanics (61.2%,  $p<0.0001$ ) and in the Maryland sample (88.5%,  $p<0.0001$ ). These group differences are shown in Figure 4 and Table 4. Among study participants 39.9% could not see a doctor when there was a medical necessity. Of the 9 persons who reported having asthma, 3 (33.3%) could not go to a doctor for asthma treatment. Four of the persons with asthma (44.4%) could not afford asthma medication.

### Discussion

Many of the same BRFSS questions used in the telephone survey were administered orally in Spanish to study participants who only communicated Spanish. These BRFSS survey results provide new factual information about Spanish only speakers tested using similar BRFSS questions and testing methods but because only 10.3% had a land line telephone in their homes these study participants could not be included in the traditional BRFSS telephone survey<sup>13</sup>. For the most part, these results confirm and contribute to the findings of DuBard and Gizlice<sup>14</sup>, by again demonstrating that persons who only speak Spanish in the US experience barriers to health care access and report lower prevalence of some chronic diseases. Another recently published study by Crowder and Downey<sup>15</sup> also reported that next to Blacks, Hispanics lived in areas that had higher industrial pollution than was found for Whites. This study showed that persons who only communicate in Spanish are also exposed to pesticides. Spanish only speakers in this study also demonstrated risk factors for poorer health outcomes that included inactivity, obesity, infrequent cholesterol screening, low intake of fruits and vegetables and changes in the kind of foods eaten since living in the US. Another interesting finding, which may also be a limitation of this environmental public health surveillance project, is that only 6% of the participants received a medical referral. But, this outcome could explain why chronic disease prevalence was lower among study participants than in Hispanics tested in the 2009 BRFSS telephone survey. Another explanation could be due to the healthy migrant hypothesis<sup>16</sup>. The hypothesis states that persons who have recently settled in the US and arrived in this country from another country, should be healthier than Hispanics who have lived in the US for a longer period of time, i.e., more than 10 years, as defined in this community study.

The results of this environmental public health study suggest that persons who only speak Spanish should encounter more barriers to health care access than persons who are also able to speak, read and write English. The Spanish speaking persons in this study also reported coming in contact with and were exposed to pesticides while at home. The results of this study and the findings reported by others<sup>13-14</sup> suggest that the prevalence of chronic diseases adversely impacted by contact with and exposure to environmental hazards is, more than likely, underestimated in Spanish only speaking persons, based on the results from the administration of BRFSS surveys, either by telephone or in person. The available evidence suggests that EPHT outreach efforts should be directed towards an accurate description of how environmental hazards adversely contribute to the appearance of selected chronic diseases in Spanish only speakers. The environmental health profile of this high risk group can be used to develop and deliver risk communication messages, followed by putting in place an intervention method that can possibly decrease future contact with or exposure to environmental hazards. Tracking portals, such as the Maryland Tracking Network (MTN), with its diverse source of environmental hazard, chronic disease and exposure data, is well equipped to address the environmental public health issues confronting Spanish only speakers who have lived in the US for less than 10 years. The challenge for EPHT outreach efforts will be to deliver meaningful risk communication messages in Spanish and develop appropriate intervention procedures that can be used by persons who are unlikely to obtain health information by using personal computers.

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### Additional Information

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- To obtain a copy of this poster or additional information, contact: John T. Braggio, PhD, MPH, Maryland EPHT, Bureau of Environmental Health, Maryland Department of Health and Mental Hygiene, 3rd Floor, 201 West Preston Street, Baltimore, MD 21201-2301; E-Mail, [john.braggio@maryland.gov](mailto:john.braggio@maryland.gov); Telephone: (410) 767-6661.
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Table 1: Characteristics of Participants

Age in years (n=257; mean & 95% CI): 34.1 (32.8-35.3)  
Gender (n=260, %): females (71.9%), males (28.1%)  
Race/Ethnicity (n=261, %): White (14.2%), Black (2.7%), Hispanic (63.6%), Other (19.5%)  
Residence (n=261, %): Baltimore City (79.3%), Baltimore County (20.7%)  
Telephone (n=252, %): Land line only (10.3%), Cellular only (16.7%), Both (4.4%), No land or cellular (68.6%)  
Years in US (n=259; mean & 95% CI): 5.9 (5.3-5.9)  
Country or origin (n=259, %): Mexico (25.9%), El Salvador (19.3%), Honduras (17.8%), Dominican Republic (11.2%), Guatemala (9.7%), Ecuador (4.2%), Puerto Rico (2.7%), Peru (2.3%), Columbia (2.3%), Venezuela (1.2%), Nicaragua (1.2%), Cuba (1.2%), Bolivia (0.4%), Panama (0.4%), Argentina (0.4%)  
Language knowledge (n=230, %): Spanish only (83.0%), English only (0.0%), Both (17.0%)

Table 2: Risk Factors of Participants

Exercise days past month (n=127; mean & 95% CI): 6.9 (5.3-8.2)  
Vegetables eaten past week (n=185; mean & 95% CI): 3.8 (3.5-4.1)  
Fruits eaten past week (n=153; mean & 95% CI): 3.9 (3.6-4.2)  
Eating differently in US (n=247, %): Yes (48.6%), No (51.4%)  
BMI males (n=58; mean & 95% CI): 32.1 (30.2-34.0)  
BMI females (n=128; mean & 95% CI): 30.7 (29.6-31.9)  
Health information (n=261 for each source, %): Radio (30.3%), Television (82.4%), Print (4.2%), Computer (18.0%), Other (4.2%)  
Last cholesterol test (n=256, %): <1 year (14.8%), 1 year (4.3%), >2-4 years (2.3%)  
Smoking frequency (n=250, %): Every day (9.6%), Some days (5.6%)  
Alcohol use past month (n=59; mean & 95% CI): 4.5 (3.5-5.6)  
Health care referral (n=251, %): Yes (6.0%), No (94.0%)  
Over-the-counter pharmacy voucher accepted (n=258, %): Yes (99.2%), No (0.8%)

Table 3: Reported Pesticide Use During Last 12 Months

Pesticides in home (n=261, % or mean and 95% CI)  
– Persons, 29.9%  
– Mean days, 3.4 (2.5-4.3)  
Pesticides in yard (n=261, % mean and 95% CI)  
– Persons, 9.2%  
– Mean days, 2.5 (1.7-3.3)

Table 4: Barriers to Health Care Access

Health insurance:  
– Study (n=256, %): Yes (7.8%), No (90.2%)  
– Maryland BRFSS Hispanics (n=248, %): Yes (61.2%), No (38.8%)  
– Maryland BRFSS (n=8,569, %): Yes (88.5%), No (11.5%)  
– US BRFSS (n=51 states/DC, %): Yes (85.6%), No (14.4%)  
Could not see a doctor:  
– Study (n=253, %): Yes (39.9%), No (60.1%)  
Cost as barrier to asthma health care:  
– Study (n=254 participants/n=9 asthma ever): Yes (1.2%/33.3%), No (98.8%/66.7%)  
Cost as barrier to asthma medication:  
– Study (n=254 participants/n=9 asthma ever): Yes (1.6%/44.4%), No (98.4%/55.6%)

Figure 1: Baltimore City and County Study Area



Figure 2: Map of Country of Origin of Participants



Figure 3: Risk Factors in Study Participants and 2009 BRFSS Results for Maryland (Hispanics, All) and US as Percent

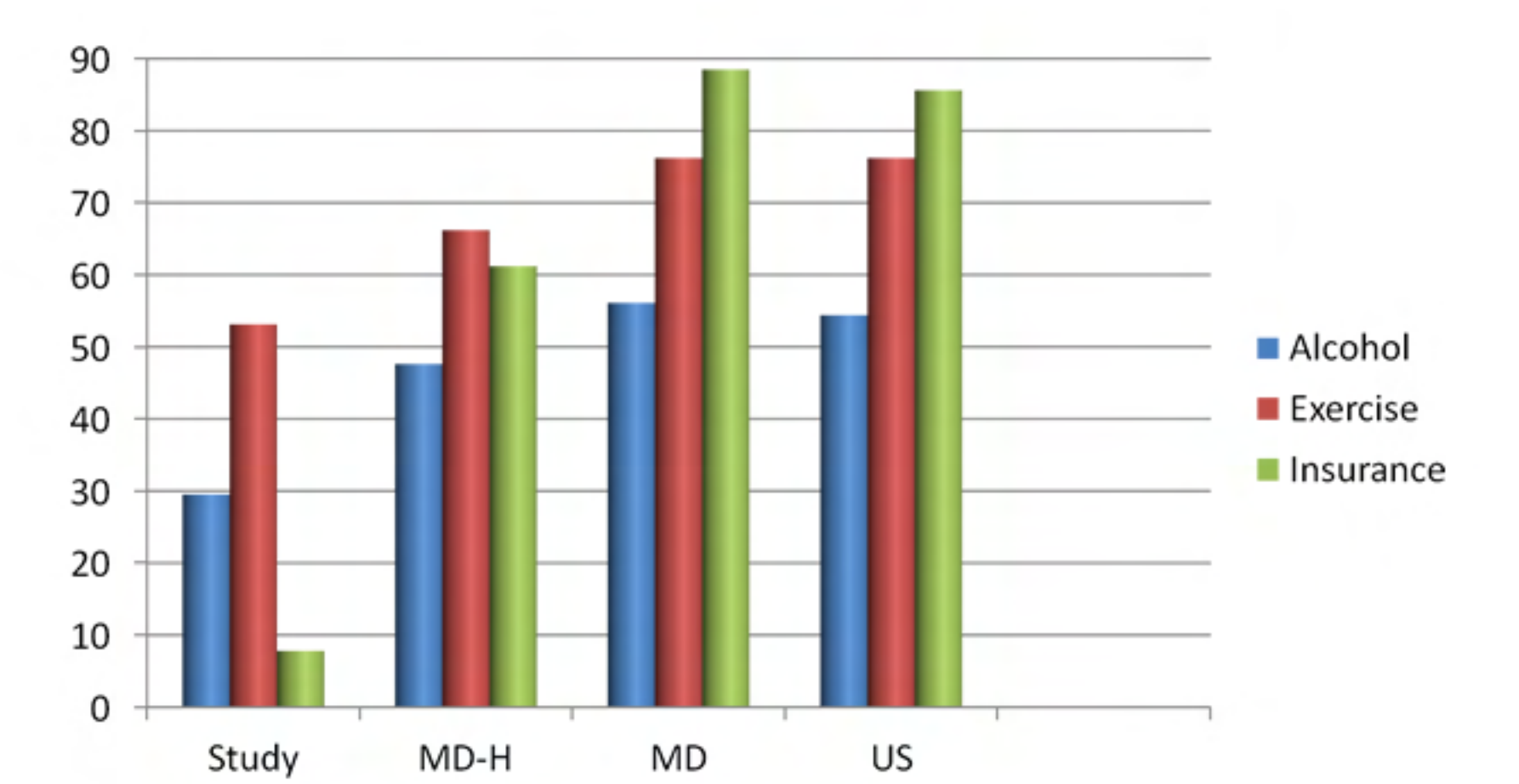


Figure 4: Chronic Diseases in Study Participants and 2009 BRFSS Results for Maryland (Hispanics, All) and US as Percent

