

# *Evaluation Report*

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## Hablemos de Diabetes Pilot

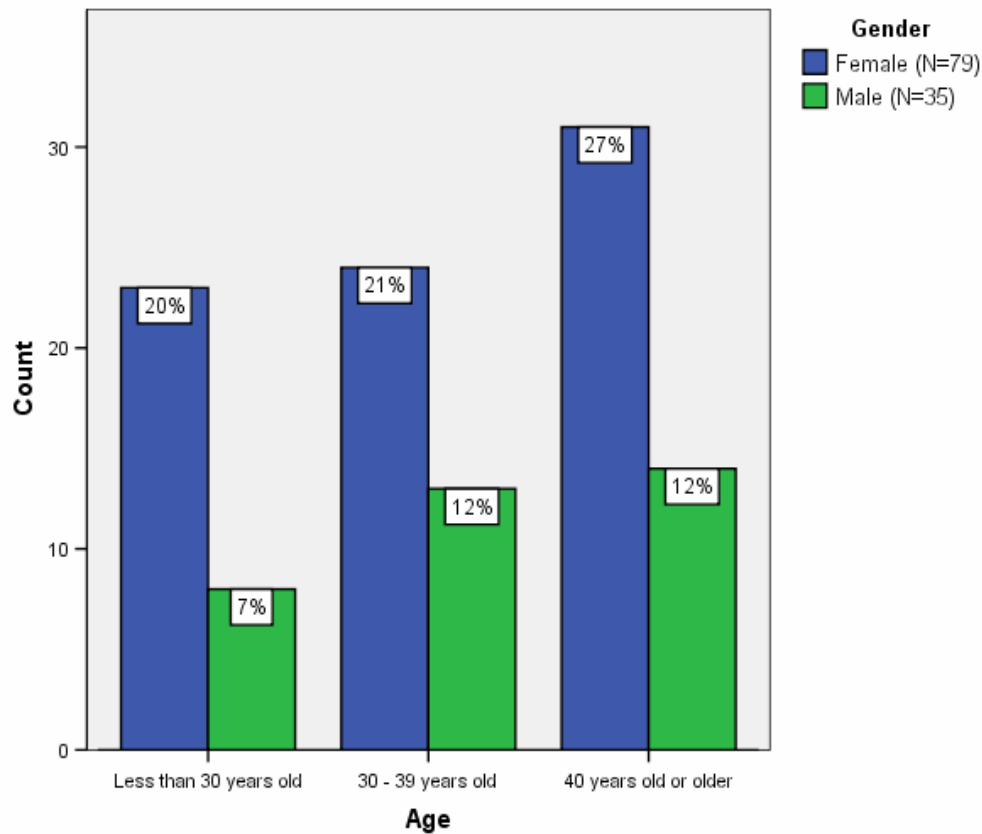
### **Introduction**

This report summarizes the evaluation results from the pilot of the Hablemos de Diabetes program, co-sponsored by the Community Health Access Network (CHAN) and the Racial and Ethnic Approaches to Community Health (REACH) program in New Hampshire. The program offers diabetes education in Spanish to Latinos in Manchester and Nashua. Participants are educated about the basic pathophysiology of Type 1 and Type 2 diabetes in small group sessions that typically last about an hour. They are also taught how to identify and reduce their own personal risk factors for developing Type 2 diabetes, with an emphasis on improving their dietary and exercise habits. The evaluation is based on a pre-test, post-test design. Pre-test assessments were administered prior to the classes that were held from April through June of 2005. Post-test assessments were conducted over the telephone three months later, in August and September of 2005.

During the Hablemos pilot, 114 Latinos participated in the program and agreed to take the pre-program assessment, which generally took less than 15 minutes to complete. On the assessment, participants were first asked 12 questions about their background, and then a series of true/false questions about diabetes and hypertension. Program staff also measured each participant's height, weight, and blood pressure while asking the participant if s/he had previously been diagnosed with diabetes or hypertension by a doctor. At the end of the educational session, participants were also invited to answer open-ended questions about what they learned from the program and how they planned to use what they learned to improve their health. To determine whether participants retained the information they learned during the educational session, we attempted to contact them over the telephone three months later to repeat the 31-item knowledge quiz with them. Using the contact information participants listed in their pre-program assessment, staff placed over 200 telephone calls in an effort to follow-up with as many participants as possible. We succeeded in repeating the assessment with 64 of the 114 participants from the Hablemos pilot, resulting in a follow-up rate of 56 percent.

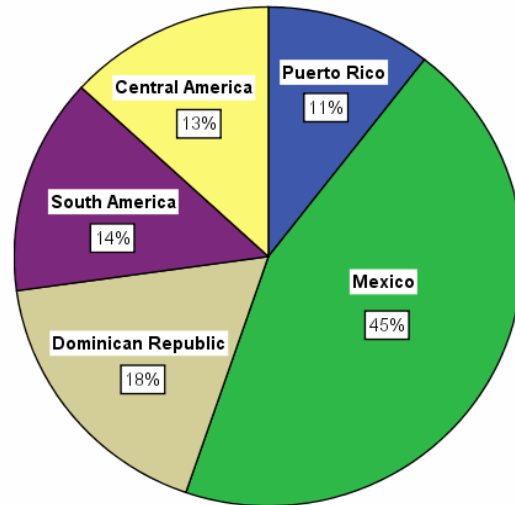
### Describing Hablemos participants

For most participants, Hablemos de Diabetes was their first experience with the NH REACH program (77%,  $n = 88$ ). Most were women, and 41 percent of all participants were women under 40 years of age. The bar chart below displays the number of participants by age and gender, along with the proportion of the total sample represented by each subgroup.



When asked about their income, a quarter of the participants ( $n = 32$ ) either did not know or refused to report their household income. Of the people who did provide information on their income, nearly two thirds reported their household income to be less than \$20,000 a year ( $n = 53$ ). Participants were more diverse in terms of their educational attainment. While a third of the participants had graduated from high school and some had even attended college ( $n = 14$ ), half had less than an 8<sup>th</sup> grade education ( $n = 56$ ).

Participants came from several different Latin American countries and had been in the United States for an average of seven years. Sixteen participants had been in the U.S. for less than a year, while 36 others had been in the country for ten or more years. About half of the participants in the Hablemos pilot reported that they speak at least some English ( $n = 62$ ). Nearly half were from Mexico ( $n = 51$ ), while another fifth were from the Dominican Republic ( $n = 20$ ) and about ten percent were from Puerto Rico ( $n = 12$ ). Other participants came to the U.S. from various South American ( $n = 16$ ) or Central American countries ( $n = 15$ ).

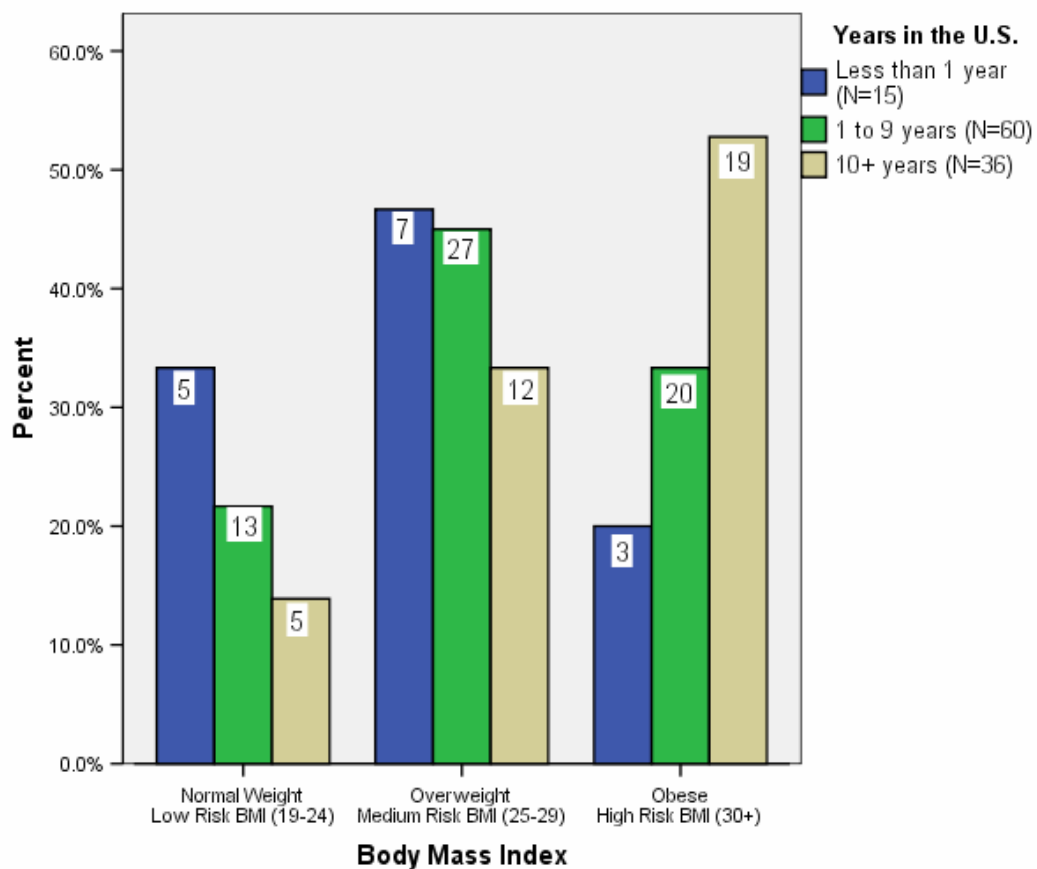


Some of the educational differences observed among participants were related to their countries of origin. The majority of participants from Mexico ( $n = 29$ ), the Dominican Republic ( $n = 10$ ), and Central American countries ( $n = 9$ ) had less than an 8<sup>th</sup> grade level of education. Participants from Puerto Rico (41.7%,  $n = 5$ ) or from South American countries (67%,  $n = 10$ ) were significantly more likely to have graduated from high school.

### Body Mass Index and Diabetes

In addition to questions about their background, participants were also asked if they had already been diagnosed with diabetes. One fifth of them had been diagnosed ( $n = 23$ ) before they attended the Hablemos de Diabetes session. A quarter of the participants also reported they had been diagnosed with hypertension ( $n = 31$ ) on the pre-program assessment. Based on the height and weight measurements taken by staff in the Hablemos session, we found that most of the participants were overweight or obese. Forty percent had a Body Mass Index (BMI) from 25 to 29 ( $n = 46$ ) and 37% had a BMI of 30 or higher ( $n = 42$ ). Just 26 participants (23%) had a BMI of less than 25, associated with a lower risk for hypertension or diabetes. The rates of diabetes, overweight, and obesity among Hablemos participants are higher than those found in the REACH Risk Factor Survey that was conducted with a representative sample of Latino households from Hillsborough County in 2003. This suggests that program staff were successful in recruiting Latinos who were at particular risk for developing Type 2 diabetes.

Consistent with findings from national studies (described below), we also found that BMI is significantly associated with the number of years participants have lived in the U.S. The bar chart below illustrates this association, showing the rates of overweight or obesity among new arrivals (in blue), those who have lived in the U.S. for 1 to 9 years (in green) and those who have done so for 10 years or longer (in beige). For example, the chart shows that over half of those who have lived in the U.S. for a decade or longer ( $n = 19$ ) are obese, with a BMI of 30 or higher. This compares to about 30% of those living here for 1 to 9 years ( $n = 20$ ) and less than 20% of those who arrived in the past year ( $n = 3$ ). This association was confirmed by an analysis of variance (ANOVA) test for the sample as a whole [ $F(2, 111) = 3.75, p = .03$ ]. We also analyzed the group of people who have lived in the United States for 10 years or more and compared them to new arrivals using the post hoc Honestly Significant Difference (HSD) test by Tukey. We found that those who had been in the U.S. for a decade or more tended to have a significantly higher BMI ( $p = .05$ ) than did people who have lived in the U.S. for less than a year.



This trend toward obesity as immigrants continue to live in the U.S. has been replicated in numerous national studies. One of the more recent of these was conducted by Goel and colleagues<sup>1</sup> analyzing data from the 2000 National Health Interview Survey (NHIS). From this sample of over 5,000 foreign-born U.S. residents, they found that the risk for obesity increases for immigrants who have lived in the U.S. for at least ten years, and approaches that of the U.S. born after 15 years. This pattern of increased weight gain after a decade of living in the U.S. was found for Latinos, immigrant whites, and Asians. This relationship between years in the U.S. and obesity endured in these subgroups even after the analysis adjusted for physical activity levels, both in leisure time and on the job. Interestingly, this relationship was *not* found among the 405 African immigrants surveyed, who continued to be less likely to be overweight or obese even after many years of U.S. residence.

This relationship between obesity and duration of US residence has been studied extensively among Hispanic immigrants in other national surveys.<sup>2</sup> Many point to the American diet as a likely explanation for this trend. For example, Dixon and colleagues<sup>3</sup> found that immigrants who were born in Mexico reported eating a healthier diet (defined as lower in fat and higher in fiber, vitamins and minerals) than Mexican Americans born in the U.S. Specifically, they found that Mexican-born US residents had more fruits and vegetables, grains and legumes in their diets than their US-born counterparts.

Another national study of Hispanic adolescents also found a significant connection between healthier diet and acculturation to American norms and lifestyles.<sup>4</sup> Gordon-Larsen and colleagues concluded that Hispanic adolescents, even those in low-income families with less educated mothers, may be protected from unhealthy American lifestyle patterns by retaining their native language and living in ethnic neighborhoods where traditional foods remain available. These findings suggest that the Hablemos de Diabetes program is right to focus on reaching immigrant populations, hopefully before they have adopted unhealthy American habits of physical inactivity and poor dietary choices.

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<sup>1</sup> Goel MS, McCarthy EP, Phillips RS, Wee CC. Obesity among US immigrant subgroups by duration of residence. *JAMA*. 2004; 292: 2860-2867.

<sup>2</sup> Kaplan MS, Hugueta N, Newsom, JT, McFarland, BH. The association between length of residence and obesity among Hispanic immigrants. *Am J Prev Med*. 2004; 27: 343-326.

<sup>3</sup> Dixon LB, Sundquist J, Winkleby M. Differences in energy, nutrient, and food intakes in a US sample of Mexican-American Women and Men. *Am J Epi*. 2000;152: 548-557.

<sup>4</sup> Gordon-Larsen P, Harris KM, Popkin BM. Acculturation and overweight-related behaviors among Hispanic immigrants to the US: the National Longitudinal Study of Adolescent Health. *Soc Sci Med*. 2003; 57: 2023-2034.

## **Knowledge about Diabetes and Hypertension**

The primary emphasis of the assessments was to determine how much participants knew about the causes, risk factors, and consequences of diabetes and hypertension. This was measured in 31 true or false questions administered prior to program participation for those adults willing to take the test ( $n = 114$ ), and again three months later for those we were able to reach by telephone ( $n = 64$ ). The remainder of this report will be devoted to presenting findings from the knowledge tests in the two assessments.

### *Knowledge before program participation*

Before participating in the Hablemos program, people answered an average of 19 of the 31 test items correctly, which means they answered just 61 percent of these true/false questions correctly. The lowest score any participant received was 8 correct items, and the highest was 27 correct items. This compares to a significantly higher average score, three months after program participation, of 23 items or 74 percent correct (for more findings on the follow-up assessments, see the next section, below).

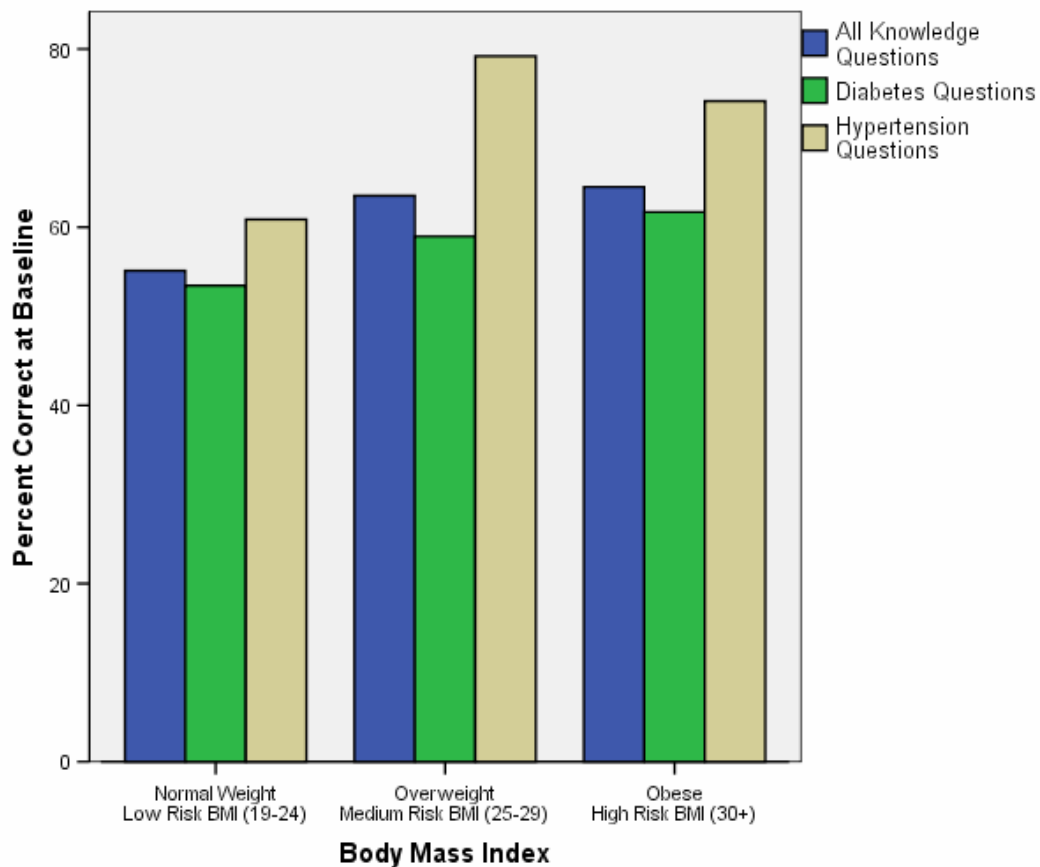
Most people already knew something about diabetes and hypertension before participating in the program. The questions that were most commonly answered correctly in the pre-program assessment were:

- The risk of getting Type 2 diabetes can be reduced by eating a healthy diet (90% answered this correctly)
- Obesity is a risk factor for developing diabetes or hypertension (84% answered these two items correctly)
- Family history of diabetes is a risk factor for developing diabetes (86% answered this correctly)
- Having diabetes can cause blindness (86% answered this correctly) or amputations (89% answered this correctly)
- Diabetes can cause heart attacks (84% answered this correctly)

We also examined the group of people who had previously participated in other NHMHC programs ( $n = 26$ ) to determine if they had more pre-program knowledge about diabetes or hypertension than the majority of participants ( $n = 88$ ) for whom Hablemos de Diabetes was their first NHMHC program. Not surprisingly, people with

prior experience in other NHMHC programs had more knowledge about diabetes at the baseline than people who were new to the coalition ( $F(2, 112) = 4.81, p = .03$ ).

The other factor that seemed to influence participants' pre-program knowledge was their BMI. Pre-program differences in knowledge of risk factors associated with both diabetes ( $F(2, 108) = 5.31, p = .006$ ) and hypertension ( $F(2, 108) = 5.56, p = .005$ ) were significantly related to body mass index. The lower the BMI, the less likely someone was to answer the knowledge test questions correctly prior to participating in the Hablemos program. Further analysis (again using Tukey's post hoc HSD test) revealed that participants with a BMI of less than 25 were significantly less likely ( $p < .005$ ) to know about diabetes or hypertension before the program, especially when compared to obese participants. The figure below illustrates how those whose health was not at risk due to their weight (at left) answered fewer questions correctly on the knowledge test than those who were either overweight or obese.



*Improvements in knowledge after program participation*

We are pleased to report that this evaluation found that participants did learn about diabetes and hypertension from the Hablemos de Diabetes program, and that they retained this knowledge for at least three months after participating in the program. REACH team members were able to reach 64 program participants by telephone to complete the follow-up assessment three months later. On average, their knowledge about diabetes and hypertension had improved as compared to what they knew before participating in the program. The average number of correct answers on the knowledge test in the follow-up assessment was significantly higher at 22.5 when compared to the average at baseline of 19.3 ( $t(2, 64) = 6.88, p < .001$ ). Significant improvement in knowledge was found for both the subset of 24 questions about diabetes ( $t(2, 64) = 5.82, p < .001$ ) and the smaller subset of 7 questions about hypertension ( $t(2, 64) = 4.96, p < .001$ ).

*What did people learn?* From baseline to follow up, participants' knowledge improved about both health conditions, diabetes and hypertension that are targeted by the program (see Tables 1 and 2 below for details). More importantly, participants recalled this new information three months after attending the program. Table 1 displays the knowledge test items that showed significant improvement on the follow-up assessments. The majority of participants understood that a person can have diabetes and/or hypertension yet experience no noticeable symptoms. They also remembered some of the important risk factors and consequences of diabetes, such as:

- Being Latino or of African descent is a risk factor for developing diabetes.
- Lack of regular exercise or being over age 40 are also risk factors
- Diabetes can cause blindness
- Diabetes can develop in both young and old people

<b>Table 1. Improvement in Knowledge about Diabetes</b>					
True or False?	<b>Number and percent of people answering correctly</b>				
	Pre-program (N=114)		3 Month Follow-up (N=64)		% change
	N Correct	% Correct	N Correct	% Correct	
<b>Understanding the causes and risk factors associated with developing diabetes</b>					
Diabetes develops only in people when they are young, not when they get older (False)	84	74%	62	97%	23% ‡
Risk factors for diabetes include being over 40 (True)	60	53%	48	75%	22% ‡
Diabetes is caused by eating too much sugar and sweet foods (False)	29	25%	39	61%	36% ‡
Risk factors for diabetes include being Latino or African Descendent (True)	44	39%	39	61%	22% ‡
The risk of getting Type 2 diabetes cannot be reduced (False)	74	65%	56	88%	23% **
<b>Understanding the complications associated with having diabetes</b>					
Diabetes can cause blindness (True)	98	86%	63	98%	12% ‡
Diabetes can cause asthma (False)	63	55%	49	77%	22% *
Usually there are no symptoms when a person develops diabetes and they do not know right away that they have diabetes (True)	79	69%	55	86%	17% *
Risk factors for hypertension include smoking (True)	83	73%	56	88%	15% *
* p < .05, ** p < .01, ‡ p < .005					

Because it is the focus of the Hablemos de Diabetes program, more questions were asked about diabetes than hypertension. The assessment included seven questions about hypertension, four of which showed significant improvement on the three-month follow-up assessments. As shown in Table 2, below, a significant majority of participants knew that being over 40, lack of exercise, and smoking are risk factors for developing hypertension. They also understood, as with diabetes, that one can have hypertension and be asymptomatic.

<b>Table 2. Improvement in Knowledge about Hypertension</b>					
	<b>Number and percent of people answering correctly</b>				
	<b>Pre-program (N=114)</b>		<b>3 Month Follow-up (N=64)</b>		<b>% change</b>
<b>True or False?</b>	<b># Correct</b>	<b>% Correct</b>	<b># Correct</b>	<b>% Correct</b>	
<b>Understanding the causes and risk factors associated with developing hypertension</b>					
Risk factors for hypertension include being over 40 (True)	62	54%	55	86%	32% ‡
Risk factors for hypertension include not exercising (True)	92	81%	61	95%	14% **
Risk factors for hypertension include smoking (True)	83	73%	56	88%	15% *
<b>Complications associated with having hypertension</b>					
Usually there are no symptoms when a person develops hypertension and they do not know right away that they have hypertension (or high blood pressure) (True)	73	64%	56	88%	24% *
* p < .05, ** p < .01, ‡ p < .005					

*Which kinds of people learned the most?* The relatively small sample size for the follow-up assessments of just 64 participants precludes a full multivariate analysis of knowledge improvements over time. However, we did analyze the knowledge test results to determine if any particular subgroups were more likely to score well on the three-month follow-up assessments. No significant differences in post-program knowledge scores were found for age group or gender, nor were they found by country of birth or years of US residence. We did find greater improvement in knowledge about diabetes and hypertension among more highly educated participants ( $F(3, 63) = 3.07, p = .035$ ). The ANOVA revealed a linear relationship, meaning the more years of school the participants had completed, the more likely they were to answer the follow-up knowledge questions correctly. Further, this relationship was not found for participants' pre-program knowledge, which suggests that those with more educational experience were better able to learn from the program. Although the Hablemos de Diabetes program is designed to accommodate low literacy participants, this finding is perhaps not surprising in that it is fundamentally an educational program.

#### *Lost to Follow-up*

NHMHC staff went to great lengths to follow-up with as many participants from the Hablemos de Diabetes program as possible. Even with our best efforts, however, we were able to complete follow-up assessments with just over half of the participants. Whenever the follow-up sample contains less than a clear majority of participants, the evaluation must ensure that no bias has been inadvertently introduced by a low follow-up rate. To do this, we compared the baseline assessments of those who completed the three-month follow-up to determine if they differed significantly from those who were lost to follow-up. Most importantly, the people in the follow-up sample, upon whom conclusions about program outcomes were based, had no more (or less) knowledge about diabetes or hypertension before entering the program than did those who were not re-interviewed three months later.

The only two characteristics that seemed to influence whether people were found three months after participating in the program was their age and prior experience with NHMHC. Age was not related to completing the follow-up assessment in a straightforward linear fashion. Hablemos participants who were in their thirties were the most likely to respond to the follow-up telephone interview ( $\chi^2 = 7.85, p = .02$ ). A larger majority (73%) of those 30 to 39 years of age took the three-month follow-up assessment, compared to 58 percent of those younger than 30 and 42 percent of those 40 and older. The other significant influence for inclusion in the follow-up sample was previous participation in another NHMHC educational program. Even if their participation had been long ago in the home-based education program, prior participants were more likely to take the follow-up assessments than were those who were new to NH Minority Health Coalition programs ( $\chi^2 = 10.06, p = .007$ ).

## **Reported Behavior Changes**

At the end of both the pre-program and follow-up assessments, participants were asked an open-ended question about their health habits. Before participating in the program, participants most commonly reported that they wanted to change the following health habits:

- Eating a healthier diet (N=46)
- Getting more exercise, especially walking (N=27)
- Following doctor's recommendations (N=31)
- Not drinking alcohol or smoking (N=5)

After they had answered the knowledge test questions over the telephone, participants were also asked about how they had changed their health habits in the three months since they had attended the Hablemos de Diabetes program. These quotes were typical of those reported by participants:

"I do more exercise now. I used to do 15 minutes a day and now I do 30 to 40 minutes a day."

"I cook with less oil, eat less, and drink water instead of soda."

"I learned I need to take my medicines because I have high blood pressure."

## **Summary and Conclusions**

This evaluation of the 2005 pilot of the Hablemos de Diabetes program has shown its small group sessions to be effective in educating Latinos about the risk factors associated with diabetes and hypertension. The program succeeded in recruiting Latinos at risk for diabetes in that 40% of participants were overweight and nearly as many were obese. Further, we also found that participants' BMI tended to be higher the longer they had lived in the United States.

For the evaluation, the Latino staff of the REACH team conducted pre-program assessments with 114 adult participants. To determine if they had retained the knowledge gained during the educational sessions, staff re-administered the assessments over the telephone three months later. Because these participants tend to

be highly mobile, the REACH team spent many hours locating just over half of them, resulting in 64 completed telephone follow-up interviews.

Before the program, most participants already knew that obesity, an unhealthy diet, and family history are important risk factors for developing diabetes. After attending a Hablemos de Diabetes session, nearly all knew that one can develop diabetes at any age. Most also knew that one can reduce one's risk of developing diabetes and that one can have diabetes and have no noticeable symptoms. Participants also learned about hypertension, especially that smoking and lack of exercise increase one's risk of developing hypertension.

In conclusion, this evaluation has demonstrated that the Hablemos de Diabetes program succeeded in teaching Latinos at risk for diabetes about the disease, and that most participants retained this knowledge three months after attending the program.