

The State of Diabetes in U.S. Hispanics: Knowledge, Action and Opportunities
Meeting of the Diabetes Mellitus Interagency Coordinating Committee
May 29, 2012

Overview of Demographics of Hispanic Populations in the United States—Dr. Larissa Avilés-Santa, NHLBI, NIH

Dr. Avilés-Santa noted that as Hispanic people immigrate to the United States, they bring with them cultural differences rooted in the regions of Latin America they come from: cultural distinctions that affect not only lifestyle and dietary choices, but also knowledge and attitudes regarding health and disease. Indeed, a majority do not identify with the terms Hispanic or Latino, but rather self-identify according to country of origin. She noted that the proportional population growth of these different groups in the last 10 years has varied, but has generally been fastest not in the U.S. regions that have been Hispanic population centers for many years, but rather in other areas throughout the country—an affect of immigration and birth rate, as well as longevity. She highlighted a key question that remains to be answered: whether various groups of Hispanic Americans share similar burdens of disease risk, or whether there is significant variation among health outcomes. Unfortunately, she noted that the most recent available data on U.S. Hispanic health comes from the 1991 Hispanic Health and Nutrition Examination Survey (Hispanic HANES) study, which focused only on the Mexican, Cuban, and Puerto Rican populations, which were considered the major immigrant groups when the data were collected. In closing, Dr. Avilés-Santa underlined the critical importance of updating these data to reflect the numerous demographic and public health changes that have affected Hispanic peoples in the years since.

Hispanic Health and Health Equity—Dr. Carol Mangione, David Geffen School of Medicine at UCLA

Dr. Mangione noted that U.S. Census data show the population of self-identified Hispanics increased much more quickly from 2000 to 2010 (increasing from 35 million to 50 million, about 43 percent) than did the non-Hispanic white (NHW) population, which grew from 194 million to 196 million in the same period (about 1 percent). Thus, 1 in 6 individuals in the Nation is Hispanic. She also echoed what Dr. Avilés-Santa said about the diversity of the Hispanic population, and about fractional growth rate increases being greatest in regions such as the Midwest, which were not previously major U.S. Hispanic population centers. Dr. Mangione noted that in 2007, diabetes prevalence was 11.1 percent for Latinos, compared to 6.4 percent for NHW, meaning Hispanics are about 1.7 times as likely to have diabetes as whites according to CDC data. This may be explained in part by the relative prevalence of obesity, which was 24 percent greater among Latinos than among non-Hispanic whites, in 2009 (according to NHANES data). National Center for Health Statistics data show that age-adjusted diabetes death rates in the U.S. population is 29 per 100,000 among Hispanics, intermediate between the rate for whites and African Americans (20 and 43 per 100,000, respectively). This diabetes health disparity is not evenly distributed among Hispanic ethnicities, however. In particular, it is highest among Puerto Ricans, followed by Mexican Americans and Cubans (rates of 172, 122, and 47 per 100,000, respectively, in the year 2000). Interestingly, despite their elevated risk for diabetes and for obesity, the overall age-adjusted death rate for Hispanics is lower than that of both African Americans and whites. Various theories have been suggested to explain this apparent paradox, but none have been conclusively tested.

Importantly, Hispanics were found to be one-third less likely to be counseled on obesity than were non-Hispanic whites. This is thought to be an effect of a known disparity in access to health care and in quality of care received. The differences in access to care result from the higher rate of poverty and lower rate of insurance among Hispanics compared to the U.S. population as a whole. In summary, Dr. Mangione noted that it is important to do research on diabetes in Hispanic/Latino people because—despite their elevated rate of DM, poor glycemic control, frequency of CVD and risk factors for complications, as well as their disparity in health care access—on average, they live longer. This unique combination of disparities and overall health makes the Hispanic population of particular interest for researchers. A better understanding of Hispanic health might therefore enable improvements in health outcomes not only for Hispanics but also for other U.S. populations.

Hispanic Health and Health Equity: Best Health Outcomes for All—Dr. Jane Delgado, National Alliance for Hispanic Health

Dr. Delgado described her organization, the National Alliance for Hispanic Health, which seeks to improve the health of Hispanic communities and to work with others to secure health for all. The Alliance provides information and advocacy on behalf of all U.S. Hispanic groups. Dr. Delgado then identified factors likely to affect Hispanic health in 2012 and beyond, including: scarcity of resources; economic sluggishness; federal, state, and local budget issues; and uncertainties in regard to the implementation of the Patient Protection and Affordable Care Act. Dr. Delgado reviewed in detail what is known of the epidemiology of Hispanic health in light of the long Hispanic life spans. She made the point that to achieve health equity for Hispanics it will be necessary to take a more comprehensive approach to health care, considering environmental as well as epigenomic factors; delivering care in the home and community, rather than primarily in the hospital setting; recognizing the importance of effective communication between provider and patient in the patient's primary language; personalized medicine; and including patient advocacy in the healthcare workforce.

Profiles of Diabetes Among Hispanics Living in the United States

Hispanic Community Health Study: Study of Latinos—Dr. Larissa Avilés-Santa, NHLBI, NIH

Dr. Avilés-Santa referred again to the Hispanic HANES study published in 1991 (which analyzed data collected from 1982 to 1984). Findings from the paper showed the diabetes prevalence (in percent) among Hispanic people aged 45 to 74 was 15.8 among Cubans, 23.9 among Mexicans, and 26.1 among Puerto-Ricans; this compares to 12 percent for whites in this age group. She then presented an update of these data, based on unpublished findings from the NHLBI-led Hispanic Community Health Study - Study of Latinos (HCHS-SOL). The study's four U.S. field centers exceeded recruitment goals, and included not only people of Mexican, Cuban, and Puerto-Rican background, but also sizable numbers of participants self identifying as Dominican, or from Central or South America. She discussed some characteristics of the study population, as well as preliminary data from her presentation at the 2012 American Diabetes Association Meeting. In particular, she noted that new study data show age-adjusted diabetes prevalence across Hispanic groups [is about 17 percent](#). She concluded, however, by noting that HCHS-SOL is the first study to measure diabetes and prediabetes in selected U.S. Hispanic populations since the Hispanic HANES. Detailed prevalence data by country of origin is expected to yield insights that are helpful not only for improving prevention and treatment of

diabetes in various Latino groups, but also that may be of benefit to health for non-Hispanic people in the U.S.

Profile of Diabetes in Puerto Rico—Dr. Larissa Avilés-Santa for Dr. Cynthia Pérez, University of Puerto Rico School of Medicine

Dr. Avilés-Santa reflected on the history of the territory of her birth, Puerto Rico, which has been a U.S. Commonwealth since 1952. At around that time, public health in Puerto Rico improved significantly, with a drop in rates of infectious diseases, better nutrition, and an increase in life expectancy; however, prevalence of chronic diseases increased. Notably, mortality due to diabetes and its complications has been increasing since the 1980s, and now represents the third leading cause of death on the island, according to the Center of Health Statistics in Puerto Rico, listed as causal in 9 percent of deaths. She remarked that the Puerto Rico Heart Health Program, initiated in 1965, found a lower rate of mortality from cardiovascular disease (CVD) than on the mainland. However, the study also examined risk factors for CVD, and noted that the prevalence of diabetes, as defined by the diagnostic criteria of the time, was higher in urban than in rural Puerto Rico, and the overall prevalence exceeded that of the U.S. population as a whole since at least the 1970s. Since that time, while the proportion of the Puerto Rican population with some form of insurance coverage is quite high, both obesity and diabetes rates there have risen significantly, becoming quite common: according to CDC statistics, Puerto Rico had the highest rate of self-reported diabetes in the country until 2010, when Alabama's rate became higher; in 2010 Puerto Rico also had the 4th highest prevalence of overweight, and 28th highest prevalence of obesity in the country.

San Luis Valley Diabetes Study and San Antonio Heart Study—Dr. Richard Hamman, Colorado School of Public Health

Dr. Hamman reviewed data from two observational studies. The San Luis Valley Diabetes Study (SLVDS) examined a cohort of about 1800 people self-identifying as Hispanic in the rural San Luis Valley of Colorado, with data collected from the mid-1980s to the late 1990s. Much of the population in this area is descended from residents who were already there centuries ago, in the time it was a part of New Spain. In contrast, the San Antonio Heart Study (SAHS) examined a population with a significant component of recent immigrants, in an urban and suburban environment in three neighborhoods in and around San Antonio, Texas. The SAHS population was 64 percent Latino, and 36 percent NHW, and the three neighborhoods were selected to sample a broad socioeconomic gradient (from barrio, with the lowest socioeconomic standard (SES) and essentially a 100 percent Hispanic population, to a transitional neighborhood with intermediate SES and a significant non-Hispanic population, to a suburban population that was high SES and high NHW.)

Both studies were population-based, and included a cohort with a spectrum of metabolic profiles – from normal, through IGT, to diabetes. Both collected cross-sectional prevalence data, and also followed incidence prospectively. For men, diabetes prevalence was about twice that seen in San Antonio's NHW population, roughly the same proportion as was found in the Hispanic HANES. Among women, diabetes prevalence was about 3 times the NHW average in the SAHS, and almost 5 times the local NHW average in the SLVDS. Interestingly, SAHS investigators found that although the diabetes prevalence was extremely high in the barrio and only a bit lower among Hispanics in the transitional neighborhood, there was no difference at all in diabetes prevalence among Hispanics and non-Hispanic whites within the suburban

neighborhood. In contrast, within the rural study population of the SLVDS, although Hispanic participants had a substantially higher prevalence of diabetes than was found among the non-Hispanic whites in the area, it was quite similar to the rate observed in both suburban whites and Hispanics by the SAHS. In regard to incidence, both studies found that impaired glucose tolerance (IGT) was more strongly predictive of conversion to type 2 diabetes among Hispanics than among the NHW population. The effect was particularly strong among Hispanics in the SLVDS, where IGT led to incident diabetes at about twice the rate seen among the NHW population in the area, about 100 per 1000 person-years, comparable to the conversion rate seen among Pima people with IGT.

Importantly, data from both studies indicate that risk factors operate similarly in Hispanics and non-Hispanic whites, explaining only part of the excess Hispanic risk. Findings of the studies also suggest that an admixture of American Indian genetic traits within this population likely does account for some part of the additional risk, but the extent of this affect remains to be determined. Although hypertension was seen at similar rates among the Hispanic and NHW populations, there were notably lower rates of myocardial infarction among Hispanic men in the SAHS. Among participants who had diabetes, the prevalence of other macro- and micro-vascular complications was similar among Hispanics and non-Hispanic whites. Dr. Hamman noted, however, that there is an unfortunate dearth of interventional studies testing careful control of risk factors for prevention of complications among these populations. Dr. Hamman drew a notable contrast between the SAHS and SLVDS versus other studies which had found a higher life-expectancy for Hispanics than non-Hispanic whites. In particular, the SAHS found that among those without diabetes, all-cause mortality was higher among Hispanics than in the NHW population. Further, all-cause mortality rates among people with diabetes who do not take insulin were twice as high among Hispanics and non-Hispanic whites.

The HEALTHY Study—Dr. Barbara Linder, NIDDK, NIH

Dr. Fradkin noted that the seeds of the HEALTHY Study originated in a DMICC meeting organized by Dr. Linder in July, 1999 on what was the then emerging problem of type 2 diabetes in children. The meeting identified unmet research needs to stem this growing problem, and the studies that are the subject of the next two talks arose to address those needs. Dr. Linder presented the HEALTHY Study, which was designed to test a middle-school-based intervention to reduce risk factors for diabetes in children. Baseline data were collected in fall 2006 and outcomes data in spring 2009. The intervention started in spring semester 2007 and continued through spring semester 2009. The data were collected from children entering the sixth grade as the study began, who were then followed prospectively through the end of the eighth grade. The 42 schools meeting selection criteria and agreeing to participate were randomly assigned either to receive the intervention or to serve as controls. All students at the school were exposed to the intervention, rather than just individuals with particular risk factors, but data were only collected from children whose parents consented to data collection. The study was designed to give the intervention in middle schools, for a variety of reasons: the target demographic is already present and attending; the children at the schools eat one to two meals there every day; schools offer physical education and sports; role models and peers are characteristic of schools; and middle school age is a key period in physical and metabolic development as well as emotional maturation.

The intervention included environmental changes to school food service and physical education class activities, a behavior change curriculum and activities in the classroom, and a communications and promotional campaign. Study schools were located in seven cities around the country. Fifty-three percent of participants were Hispanic, 20 percent African American, and 19 percent white; 76 percent were eligible for free or reduced price lunch, and the parents of more than half of the students had an educational background of high school or less. At the conclusion of the study, the researchers found that the combined prevalence of overweight and obesity fell by 4 percent in both intervention and control schools. However, among the students at highest risk—those who were already overweight or obese at the beginning of the study—the prevalence of obesity at the end of 8th grade was significantly lower in the intervention schools. In addition, body mass-index (BMI), prevalence of large waist circumference, and fasting insulin levels all declined significantly in the intervention schools in comparison to control schools. HEALTHY curriculum materials are available to the public at www.healthystudy.org.

The Proyecto Bienestar Studies—Dr. Roberto Treviño, Social & Health Research Center, San Antonio, TX

The studies presented by Dr. Treviño also took a school-based approach to intervention and randomization, in their case Texas schools. He first described a pilot study, performed by the investigators in San Antonio, with support from the San Antonio Independent School District. As in the HEALTHY Study, lesson plans were developed to influence lifestyle, increase exercise and reduce calorie intake. Study measures included BMI, adiposity, blood glucose, fitness level, and dietary intake. Results from the pilot showed the intervention correlated with significant improvements in blood glucose, fitness levels, and dietary fiber intake. To test how their approach would work if implemented in a larger number of schools, with minimal influence or guidance from researchers, Dr. Treviño and colleagues provided the curriculum and other study materials to the Laredo Independent School District. Complications arose during the implementation of the study, as the school district instituted policies that caused all schools in their jurisdiction—including the control schools—to adopt portions of the Bienestar curriculum. In fact, the Texas legislature mandated additional such changes in all Texas schools. For example, as part of the intervention, sugar sweetened beverages were removed school cafeterias; as a result of policy changes, this change was made in control schools, as well as in those receiving the intervention. Ultimately, these similarities between practices at the intervention and control schools led to very similar outcomes, and no significant differences were seen between them. Dr. Treviño noted that although their experiment highlighted some potential pitfalls in this translational approach, it may actually be possible to utilize policy changes to test hypotheses through natural experiments. In conclusion, he informed the Committee that Bienestar curriculum materials are publicly available on the study website, www.sahrc.org.

The SEARCH for Diabetes in Youth Study—Dr. Sharon Saydah, CDC, DHHS

Dr. Saydah reviewed the ongoing SEARCH for Diabetes in Youth Study, a multi-center observational epidemiology study that began in 2001. Its objectives are to identify incident diabetes cases among youth 20 years of age and younger; to inform the development of sustainable surveillance for diabetes in youth; to determine prevalence and incidence of risk factors for complications, and for the complications themselves; and to document barriers to care, quality of care, and processes of care among youth and young adults with diabetes. Dr. Saydah presented data from the study detailing prevalence and incidence of diabetes, characteristics of Hispanic youth with diabetes, as well as projections for future diabetes burden.

Among the results she presented were: that the prevalence of all diabetes (types 1 and 2) among Hispanic youth was 1.68/1,000 in 2009; incidence of both major forms of the disease depends on age and sex; good glycemic control was maintained by about 40 percent of the participants with type 1 diabetes and by about 50 percent of those with type 2 diabetes; and Hispanic youth with diabetes have many risk factors for complications of the disease, including high lipid levels, poor diet, and obesity, similar to those of Hispanic adults.