

Marshall University
Marshall Digital Scholar

Management Faculty Research

Management, Marketing and MIS

1-1-2009

Disparities in ADL and IADL Disabilities among Elders of Hispanic Subgroups in the United States: Results from the National Health Interview Survey 2001-2003

Alberto Coustasse

Marshall University, coustassehen@marshall.edu

Sejong Bae

Cody Arvidson

Karan P. Singh

Fernando Trevino

Follow this and additional works at: http://mds.marshall.edu/mgmt_faculty

 Part of the [Race and Ethnicity Commons](#)

Recommended Citation

Coustasse, A., Bae, S., Arvidson, C., Singh, K. P., & Treviño, F. (2009). Disparities in ADL and IADL Disabilities among Elders of Hispanic Subgroups in the United States: Results from the National Health Interview Survey 2001-2003. *Hospital Topics*, 87(1), 15-23.

This Article is brought to you for free and open access by the Management, Marketing and MIS at Marshall Digital Scholar. It has been accepted for inclusion in Management Faculty Research by an authorized administrator of Marshall Digital Scholar. For more information, please contact zhangj@marshall.edu.

**Disparities in ADL and IADL Disabilities among Elders of Hispanic Subgroups in the
USA: Results from the National Health Interview Survey 2001-2003**

Corresponding Author:

Alberto Coustasse

Research Assistant Professor, Health Management and Policy department, School of
Public Health

University of North Texas Health Science Center at Fort Worth

3500 Camp Bowie Blvd, Fort Worth, TX, 76107

(817) 735-0150 Office; (817) 735-0324 Fax

acoustas@hsc.unt.edu

Sejong Bae, PhD

Associate Professor, Biostatistics, School of Public Health

University of North Texas Health Science Center

3500 Camp Bowie Blvd

Fort Worth, TX 76107

817 735-5162

817 735-2314 Fax

sbae@hsc.unt.edu

Cody Arvidson, PhD

Research Consultant, Division of Student Affairs

University of North Texas Health Science Center

3500 Camp Bowie Blvd

Fort Worth, TX 76107

817 735-2407

817 735-0448 Fax

carvidson@hsc.unt.edu

Fernando M., Treviño., PhD, MPH,

Chancellor, Southern Illinois University Carbondale,

1265 Lincoln Drive,

Carbondale, Illinois, 62901

618 4532341

618 4535362 Fax

ftevino@siu.edu

Karan P. Singh, PhD.,
Professor and Chair, Biostatistics, School of Public Health
University of North Texas Health Science Center
3500 Camp Bowie Blvd
Fort Worth, TX 76107
817 735-0490
817 735-2314 Fax\
ksingh@hsc.unt.edu

**Disparities in ADL and IADL Disabilities among Elders of Hispanic Subgroups in the
USA: Results from the National Health Interview Survey 2001-2003**

ABSTRACT

The purpose of this study was to compare disability and functional limitation among elder Hispanic subgroups using data from the 2001-2003 NHIS. Results revealed a 21.4% disability of any type in Hispanics. Puerto Ricans reported the highest rates of ADL, IADL disability compared with other Hispanic subgroups (Mexicans, Cubans, Central and South Americans) and higher than blacks. Cubans showed the lowest rate in IADL and any disability within Hispanics and even lower than whites. The findings highlights the high rates of inter group variability among the US Hispanic population. Among seniors, ADLs and IADLs are significant predictors of admission to nursing homes, use of paid home care, use of physician services, and palliative care.

Key Words: Elders; Hispanic subpopulations; ADL and IADL disability; health disparity; National Health Interview Survey.

INTRODUCTION

The number of older adults in the United States (U.S.) is rapidly increasing. According to the Administration on Aging (AOA), in 2004 elderly minorities aged 65 years and above, constituted 18.1% of the population and were projected to compose 25% of the total population by 2030. By that year, all of the baby boomers will have reached age 65. Additionally, by 2050, the number of older Americans is expected to reach 86.7 million. Individuals in this age group would comprise 21% of the U.S. population (AOA 2004; 2006; American Geriatric Society Foundation for Health in Aging 2005; Centers for Disease Control [CDC] 2004). Among the older adult population, the Hispanic population is projected to grow the fastest (AOA 2004). In absolute numbers, elder Hispanics are expected to be over 13 million by 2050, and will become a greater percentage of the overall U.S. population, growing from 6% in 2003 to 18% by 2050 (Federal Inter Forum on Aging Related Statistics 2006).

Exploring the definition and ramifications of *health disparities* as defined in *Healthy People 2010* highlights the need to address the issue and becomes critical to the present study (U.S. Department of Health and Human Services 2000). Health disparities are defined as differences in morbidity and mortality, occurring by gender, race, or ethnicity, income level, education level, disability, geographic location, or sexual orientation. The Institute of Medicine's (IOM) *Unequal Treatment* indicated healthcare workers need to learn the underlying causes of health disparities and to prepare themselves to care for diverse patient populations (Institute of Medicine 2002). The Hispanic population composition reveals the importance of improving access to health care for Hispanic elders. Many of the same disparities and barriers present in younger populations will continue into old age when access to health care can be even more vital and critical (Trevino and Coustasse 2007). Older minorities tend to be in poorer health than

older Non-Hispanic Whites (NHW) and incur greater out-of-pocket cost, which can be more than 31% of the total income for those at the lowest income levels (AOA 2004; Krisberg 2005). In comparison to those without activity limitations, older adults reporting functional limitations, regardless of their race, ethnicity, or Socio-Economic Status (SES), reported spending three times more money for medical care. Additionally, half of all medical expenditures for the disabled are paid for by public health programs, such as Medicare and Medicaid, (Trupin, Rice, and Max 1996; Cutler 2001; Freedman, Martin, and Schoeni 2002). With these disparities in mind, understanding efforts to reduce the disparities and improve Hispanic elders' quality of life becomes paramount. The publication of *Healthy People 2010* advanced two critical goals for achieving a healthier U.S. The first goal involves increasing the quality of life and number of years of healthy life for those in the U.S. The second goal is the elimination of all health disparities in the U.S. A comprehensive strategy incorporating research, education, policy changes, and community partnerships to accomplish these goals was proposed (U.S. Department of Health and Human Services 2000). Of importance in the current Hispanic elder population is not only access to health care but also the impact of daily activity levels and physical functioning on this population's quality of life.

There are several components to a comprehensive assessment of an older adult's ability to function. Physical functioning usually is measured by the ability to accomplish basic Activity of Daily Living (ADL) and limitations to Instrumental Activity of Daily Living (IADL). The six ADLs traditionally measured are bathing, dressing, getting in or out of bed, getting around inside, toileting, and eating. The eight IADLs measured are light housework, laundry, grocery shopping, getting around outside, managing money, taking medications, and telephoning (Katz and Akpom 2001; Lubitz et al. 2003). A recent study using the National Health Interview

Survey (NHIS) data has shown the declining prevalence of any self-reported disability from 1982 to 2002 among all socioeconomic and ethnic groups. The proportion of the population over 70 years of age reporting any disability declined from 22.7% to 15.5% during this time. The apparent reduction in elders reporting any disability was due to a reduction in IADL disability with a decrease from 14.5% to 8.1% (Schoeni et al. 2005). However, the increase in ADL disability during the same period of time, particularly among the least educated, who tended to be minorities, was considered disturbing for Schoeni et al. (2005). Because this recent study did not examine variations in reported disability among Hispanic subgroups of the U.S. population, such examination has grown in importance if the U.S. policy makers and healthcare professionals intend to achieve the goals of *Health People 2010*.

Data for all Hispanics combined disguise substantial variations among the major subgroups (Mexicans, Puerto Ricans, Cubans, Central and South Americans, and Other Hispanics). Hispanic subgroups differ distinctly in their migration experiences, SES, occupation, environmental exposure and degree of integration into the American society (Bean and Tienda 1987; Jaffe, Cullen and Boswell 1980), which can impact significantly on the disablement process and their access to healthcare.

The purpose of this study was to compare rates of self-reported disability and functional limitation among Hispanic subgroups using data from adults aged 65 years old and older who were sampled in the 2001-2003 National Health Interview Survey.

METHODS

Data from National Health Interview Survey (NHIS), a cross sectional survey of the community dwelling population of U.S., were used. The NHIS is an annual, continuous,

multipurpose, and multistage probability survey of the US civilian non institutionalized population and is conducted by the National Center for Health Statistics (Fowler 1996; Botman, Moore, Moriarty and Parsons 2000). A probability sample of households is selected with family members interviewed by trained personnel; one adult from each household is selected at random and administered a health oriented questionnaire (that is, "the adult core"), which includes questions about ADL and IADL. Annual response rates to the 2001 to 2003 adult core ranged from 73.8% (in 2001) to 74.4%% (in 2002), (Lethbridge-Çejku, Schiller, Bernadel 2004; Lucas, Schiller and Benson 2004; Lethbridge-Çejku and Vickerie 2005). For this study, individuals aged 65 years and above were pooled from the 2001-2003 NHIS survey. The resulting sample included 31,875 men and women.

Measures

To measure ADL and IADL disabilities, two dependent variables were identified. ADL disability was stated in the NHIS question, "Because of a physical, mental, or emotional problem, {do/does} {person} need the help of other persons with personal care needs, such as eating, bathing, dressing, or getting around inside this home?" The IADL disability item asked, "Because of a physical, mental, or emotional problem, {do/does} {person} need the help of other persons in handling routine needs, such as everyday household chores, doing necessary business, shopping, or getting around for other purposes?" Finally, the estimate of demonstrating "any disability" was defined as having either ADL or IADL disability.

Independent Variables

The NHIS categorized race and ethnicity first by three categories of Hispanic, Black, but not Hispanic, and others, and next in two classifications of Asian or Pacific origin and Other. In this study, race and ethnicity were restructured with the four major groups of Non-Hispanic

Whites (NHW), Non-Hispanic Blacks (NHB), Hispanics, and Other. Individuals reporting as Hispanics were further classified into five major subgroups: Puerto Ricans, Mexican/Mexican Americans, Cuban/Cuban Americans, Central and South Americans, and Other Hispanics.

The NHIS's highest age classification was 65 years and older. Thus, NHIS respondents aged 65 and older were divided into three new intervals of 65-74, 75-84, and 85 and above. Next, educational attainment was divided into the three categories of less than 8th grade, 9-12th grade without high school diploma or equivalent, and high school diploma, its equivalent, or higher. Lastly, annual household income was categorized either as \$20,000 or greater or less than \$20,000.

Analysis

Chi-square analysis was applied for bivariate comparisons. Multiple logistic regression analysis was used to estimate Odds Ratios (ORs) and to determine risk for models predicting ADL and IADL disability, first, by the four major race and ethnicity groups (Table 2) and second, by the five Hispanic subgroups (Table 3). Results descriptions included comparison between Hispanic subgroups, as well as with NHW (control group for assessing disparities in race/ ethnicity studies), and with NHB to evaluate magnitude of disparities between minorities groups. Statistical significance was assessed at the 0.05 level. All statistical analyses were conducted with SAS version 9.1 and STATA 8.0 to account the complex survey design and weighted sampling probabilities from the data source.

RESULTS

Data presented in Table 1 illustrate the overall rates of self-reported ADL and IADL disabilities among older adults in 2001-2003. The ADL disability self-report rate was 6.4%,

while the IADL disability self-report rate was 12.5%. The frequency of the third disability category, any disability, was 13.5% for the overall elder population and 21.4% and 27.8% for the Hispanic and NHB, respectively. For both the ADL and IADL disabilities, respondents from the NHB and Hispanic categories showed significantly higher self-report rates than their NHW counterparts. Puerto Ricans reported the highest rates of ADL, IADL disability ($p<0.05$), when compared with the other Hispanic subgroups and higher than NHB respondents. On the other hand, the Central and South American and the Cuban subgroups showed the lowest ADL disability levels and IADL disability, respectively ($p<0.05$), among the Hispanic subgroups and these disabilities rates were even lower than the NHW group at 5.8% and 11.9%, respectively ($p<0.05$). In addition, the rates of both ADL and IADL increased significantly for respondents who were older, female, less educated, and earning an income less than \$20,000 (Table 1).

Table 1 about here

Table 2 displays the results of four multivariate logistic regression models for the NHW, NHB, Hispanics, and individuals of other groups predicting self-reported ADL disability. Non-Hispanic Black males were 38% less likely than NHB females to report ADL disability, ($p<0.05$). For all racial and ethnic groups, age was significantly associated with being more likely to report ADL disability. In addition, regarding NHW educational levels, for less than a high school education and attaining high school diploma or more, increased educational attainment was significantly associated with 41% and 43% less like hood to report ADL disability, respectively (Table 2).

Table 2 also presents the results of four multivariate logistic regression models for the NHW, NHB, Hispanics, and individuals of other groups predicting self-reported IADL disability.

Regardless of racial and ethnic group, males were significantly less likely than females to report the IADL disability. Age was again associated with being more likely to report IADL disability across all racial and ethnic groups ($p < 0.05$). Educational attainment was significantly associated with 30% and 46% less likely to report IADL disability for the NHW group (less than a high school education and for attaining high school diploma or more, respectively). Household income above \$20,000 was associated with the reduced likelihood of reporting the IADL disability for all racial and ethnic groups except the subgroup of Other ($p < 0.05$, Table 2).

Table 2 about here

Table 3 presents the results of five multivariate logistic regression models predicting ADL disability across the five Hispanic subgroups. Mexican and Mexican American males were 49% less likely to report the ADL disability than Mexican and Mexican American females ($p < 0.05$). For all subgroups, age was significantly associated with being more likely to report the ADL disability. Respondents with high school or more education were 57% less likely to report ADL disability for the Mexican and Mexican American group ($p < 0.05$, Table 3).

Table 3 also presents the results of five multivariate logistic regression models predicting IADL disability across the five Hispanic subgroups. Mexican and Mexican American males and Cuban and Cuban American males were 49% and 59% less likely to report the IADL disability compared with Mexican and Cuban American females respectively, ($p < 0.05$). For all Hispanic subgroups, age was significantly associated with being more likely to report IADL disability. Respondents with some high school education were significantly 5.88 times more likely to report IADL disability only in Cuban and Cuban American. Those with the higher income level were

significantly associated with 47% and 68% less likely to report the IADL disability for the Mexican and Mexican American and Other subgroups, respectively (Table 3).

Table 3 about here

DISCUSSION

The results of this study revealed, for the overall U.S. population of elders, the rate for any type of disability to be 13.5% (including any disability, ADL, and IADL). This rate was slightly lower than the rate provided by Schoeni et al. (2005), who found an overall disability of 15.5%. The difference between these results has confirmed the declining prevalence of any self-reported disability reported by these scholars (Schoeni et al. 2005).

Non-Hispanic Blacks and Hispanics reported more ADL, IADL, and any disabilities compared to NHW which is consistent with a number of local and national studies (Villa and Torres-Gil 2001; Zsembik and Fennell 2005; Markides et al. 2007). Among Hispanics, the highest rate for ADL and IADL disability was in older Puerto Ricans and this rate was even higher than NHB, who showed the second highest rate of reporting these disabilities. This finding is consistent with similar findings described by Trevino and Moss (1984) and a study done in New York City involving a high level of functional disability among elderly Puerto Ricans relative to NHW and NHB (Trevino and Moss 1984; O'Donnell 1989). Furthermore, according to the 2000 U.S. Census, about 11% of the Puerto Rican racial and ethnic population identified their race as black (U.S. Census Bureau 2000b). According to the U.S. Centers for Disease Control, NHB and Hispanics are two times more likely to have type 2 diabetes than NHW of similar age (CDC 2005; OMHD 2007). About 90% of people with type 2 diabetes have

presented obese or overweight, and Ozcan and colleagues have reported a direct link between diabetes and obesity (Ozcan et al. 2004). Furthermore, several studies have reported whole genome scans connecting obesity in the NHB population (Chen et al. 2002; Zhu et al. 2002; Palmer et al. 2004). The greater mixture of Hispanic and NHB identification among Puerto Ricans might have contributed to them having higher risk for activity limitation. Other scholars have explained as a contributing factor over reporting by older Puerto Ricans being due to the structure of their healthcare system and their cultural beliefs (Tucker et al. 2000). Further research in this Hispanic subpopulation is needed.

On the other hand, the Central and South American subgroup presented the lowest ADL disability levels and the Cuban subgroup displayed the lowest rate for IADL disability, which was even lower than the IADL rate reported by NHW. The lower rate of IADL and any disability among the Cuban American population may reflect their greater access to medical care and improved SES condition across their lifespan, as these elders were healthier and wealthier immigrants from Cuba, as well as any benefits of migration selection they experienced (Markides and Coreil 1986; Palloni and Morenoff 2001; Markides and Eschbach 2005). The same can be stated for the Central and South American subgroups, who presented the lowest ADL disability rates compared to other elder Hispanic subgroups, which can also be explained by migration selection. Migration selection is similar to the natural selection process. In migration selection, of those who choose to immigrate to the U.S. from other countries, legally or illegally, only the strongest arrive inside the U.S. borders (Markides et al. 1997; Markides et al. 2007). The weak, ill, or disabled who want to immigrate to the U.S. will not arrive inside the U.S. border, according to migration selection theory. Those who are not healthy or wealthy enough to enter the U.S. are effectively selected out of the migration process. Therefore, those

who enter the U.S. with financial wealth will have greater access to health care services and ability to maintain their quality of life.

Finally, reporting an income above \$20,000 represented a protective factor against IADL disability only for the Mexican and Mexican American Hispanic subgroup. However, this was hindered when the analysis was performed for all Hispanics. There was no significant difference in Cuban and Central and South American Hispanic subgroups for IADL. Our results concur with the existence of possible gender-based migration selection as suggested by Markides et al. (1997), favoring males over females in immigrant Mexican and Cuban Hispanic subpopulations in IADL disability. This finding represents process of migration selection as discussed above.

Limitations

Several limitations of the current study must be noted before the conclusions are presented. For the purposes of this study and in order to compare across surveys, we used the terms ADL and IADL disability interchangeably regarding personal care and routine care limitations, respectively, when using the NHIS, as suggested by the U.S. Commission on Behavioral and Social Sciences and Education (1994). In contrast, because ADLs and IADLs focus on the level of dependence respondents self-report for accomplishing activities rather than the underlying cause of any dependence, distinctions between physical and cognitive impairments could not be made. The health measures in the NHIS have not been clinically confirmed, and the language spoken during the interviews might have affected respondents' self-reported health status. Finally, this study did not control for availability of health insurance or for regional differences in the rates of ADL and IADL prevalence.

CONCLUSION

Since the presence of disabilities increases with age and our U.S. population is living longer, the number of individuals with activity, work, or functional limitations will increase and continue to constitute a real public health challenge in the near future. Our findings highlight the intra-group variability among the five subgroups of the U.S. Hispanic population. In addition, elder Hispanics and NHB have demonstrated higher disabilities rates than NHW demonstrating clear disparities in ADL and IADL disabilities. The extent and nature in particular of Hispanic health disparities in the U.S. is inconclusive due to an especially lean level of knowledge about the general health of Puerto Ricans, Cubans, Central and South Americans, and other non-Mexican Hispanics.

Since the likelihood of experiencing disabilities increases with age and the population is living longer, the number of individuals, particularly among elder Hispanics, will have an impact increasing their functional limitations. Elder Hispanics most of the time in their life have been exposed to lack of healthcare, to a diverse toxins and pollutants in their environments, and to labor intensive activities due to their type of work, such as construction, landscaping, farming and agriculture, etc. An underlying theme reinforced in this study involves the growing societal problem of racial and ethnic health disparities among older adults. Two factors contribute to the urgency of this problem, the dramatically aging U.S. population and the growing proportion of racial and ethnic minority groups within the U.S. population.

Future studies should make every possible effort to generate nation-of-origin specific data for the Hispanic population. Given the significance of race on health and the racial heterogeneity among Hispanics, health by race for the Hispanic subgroups should be further studied whenever the data allow it.

PRACTICE IMPLICATIONS

Disability, which might be the result of chronic disease, is an indicator of long-term health and associated with higher demand for medical services and the use of medications. Among the elderly, ADL and IADL are significant predictors of admissions to nursing homes, use of paid home care and palliative care. The most severe disparities in disabilities in the United States are concentrated among minority groups in particular in Hispanics elders from disadvantaged and diverse backgrounds.

REFERENCES

- Administration on Aging (AOA). 2004. *Disabilities and Aging*. U.S Department of Health and Human Services. http://www.aoa.gov/prof/notes/Docs/Disability_and_Aging.pdf.
- Administration on Aging (AOA). 2006. *A profile of older Americans: 2006*. U.S Department of Health and Human Services. <http://www.aoa.gov/PROF/Statistics/profile/2006/2006profile.pdf>.
- American Geriatric Society (AGS) Foundation for Health in Aging. March 15, 2005. *Trends in the elderly population*.
http://www.healthinaging.org/agingintheknow/chapters_ch_trial.asp?ch=2
- Bean, F.D, and M. Tienda, 1987. *The Hispanic population of the United States*. New York: Academic Press.
- Botman S.L., T.F., Moore, C.L., Moriarty, and V.L., Parsons. 2000. Design and estimation for the National Health Interview Survey, 1995-2004. *Vital Health Stat* 2.130:1-31.
- Centers for Disease Control (CDC). 2005. *National diabetes fact sheet*. <http://www.cdc.gov/diabetes/pubs/estimates.htm#prev4>.
- CDC. 2004. *The State of Aging and Health in America 2004*. http://www.cdc.gov/aging/pdf/State_of_Aging_and_Health_in_America_2004.pdf
- Chen G., J. Zhou, A. Doumatey, A. Amoah, J. Acheampong, K. Agyenim-Boateng, B. Eghan, J. Oli, G. Okafor, E. Ofoegbu, et al. 2002. Scanning the genome for obesity susceptibility genes in Type 2 diabetes patients from West Africa. *The American Journal of Human Genetics* 71:189.

- Commission on Behavioral and Social Sciences and Education. 1994. *Trends in disability at older ages: summary of a workshop*. Washington, DC. The National Academies Press.
- Cutler D. M. 2001. Declining disability among the elderly. *Health Affairs* 20:11-27.
- Federal Inter Forum on Aging Related Statistics. May, 2006. *Older Americans update 2006: Key indicators of well being*. Washington, DC, U.S. Government Printing Office.
- Fowler FJ, Jr. 1996. The redesign of the National Health Interview Survey. *Public Health Reports*. 111: 508-511.
- Freedman V. A., L. G. Martin, and R. F. Schoeni. 2002. Recent trends in disability and functioning among older adults in the United States: A Systematic Review. *Journal of the American Medical Association*. 288:3137-3146.
- Jaffe, A., R. Cullen, and T., D Boswell. 1980. *The Changing demography of Spanish American*. New York: Academic Press.
- Institute of Medicine. 2002. *Unequal treatment: Confronting racial and ethnic disparities in healthcare*. In B. D. Smedley, A. Y. Stith, and A. N. Nelson, eds. Washington, DC: National Academies Press.
- Katz, S., and C. A. Akpom. 2001. A measure of primary socio biological functions. *International Journal of Health Services*. 6(3):493-508.
- Krisberg, K. 2005. Cultural competencies needed to serve all older Americans: Cultural skills will help bridge health gaps. *The Nation's Health*. 35(5).
- Lethbridge-Çejku M., J.S. Schiller, and L. Bernadel. 2004. Summary Health Statistics for U.S. Adults: National Health Interview Survey, 2002. National Center for Health Statistics. *Vital Health Stat*.10 (222).

- Lethbridge-Çejku M., J., Vickerie. 2005. Summary health statistics for U.S. adults: National Health Interview Survey, 2003. National Center for Health Statistics. *Vital Health Stat.* 10(225).
- Lubitz, J., L. Cai, E. Kramarow, and H. Lentzner. 2003. Health, life expectancy and health care among the elderly. *New England Journal of Medicine.* 349(11); 1048-1055.
- Lucas J.W., J.S. Schiller, and V.Benson. 2004. Summary Health Statistics for U.S. Adults: National Health Interview Survey, 2001. National Center for Health Statistics. *Vital Health Stat.* 10(218).
- Markides K.S., and J. Coreil. 1986. The health of Hispanics in the Southwestern United States: An epidemiologic paradox. *Public Health Report.* 101(3):253–265.
- Markides K. S., L. Rudkin, R.J. Angel, and D. V. Espino. 1997. Health status of Hispanic elderly in the United States. In *Racial and ethnic differences in the health of older Americans*, edited by L. G. Martin and B. Soldo. Washington, D.C.: National Academies Press.
- Markides K. S. and K. Eschbach. 2005. Aging, migration, and mortality: Current status of research on the Hispanic paradox. *Journal of Gerontology: Social Sciences.* 60B:68-75.
- Markides, K. S., K. Eschbach, L.A. Ray, and M. K. Peek. 2007. Census disability rates among older people by race/ethnicity and type of Hispanic origin. In *The health of aging Hispanics: The Mexican-origin population*, edited by J. L. Angel and K. E. Whitfield. New York: Springer Publishing Co.
- O'Donnell R. M. 1989. Functional disability among the Puerto Rican elderly. *Journal of Aging and Health.* 1:244-264.
- Office of Minority Health & Health Disparities (OMHD). 2007. *Eliminate disparities in diabetes.* <http://www.cdc.gov/omhd/AMH/factsheets/diabetes.htm>.

- Ozcan U., Q. Cao, E. Yilmaz, A. H. Lee, N. N. Iwakoshi, E. Ozdelen, G. Tuncman, C. Görgün, L. H. Glimche, and G. S. Hotamisligil. 2004. Endoplasmic reticulum stress links obesity, insulin action, and type 2 diabetes. *Science*. 306(5695):457-61.
- Palloni A. and J. Morenoff. 2001. Interpreting the paradoxical in the “Hispanic Paradox”. Demographic and epidemiological approaches. In *Population health and aging*, edited by Weinstein, A., Hermalin, and M. Soto. New York: Academy of Sciences.
- Palmer L. J., S. G. Buxbaum, E. K. Larkin, S. R. Patel, R. C. Elston, P. V. Tishler, and S. Redline. 2004. Whole genome scan for obstructive sleep apnea and obesity in African-American families. *American Journal of Respiratory and Critical Care Medicine*. 169:1314-132.
- Schoeni R. F., L. M. Martin, P. M. Andreski, and V. A. Freedman. 2005. Persistent and growing socioeconomic disparities in disability among the elderly: 1982-2002. *American Journal of Public Health*. 95:2065-2070.
- Trevino F. M., and A. J. Moss. 1984. Health indicators for Hispanic, Black, and White Americans. *Vital Health Stat*. 148:1-88.
- Trevino F.M., and A. Coustasse. 2007. Disparities and access barriers to healthcare among Mexican American elders. In *The health of aging Hispanics: The Mexican-origin population* edited by J. L. Angel, and K.E. Whitfield. New York, NY: Springer Publishing.
- Trupin L., D. P. Rice, and W. Max. 1996. *Who pays for the medical care of people with disabilities?* Washington, DC: U.S. Department of Education, National Institute on Disability and Rehabilitation Research.

- Tucker K. L., L. M. Falcon, L. A. Bianchi, E. Cacho E, and O. I. Bermudez. 2000. Self-reported prevalence and health correlates of functional limitation among Massachusetts elderly Puerto Ricans, Dominicans, and a Non-Hispanic neighborhood comparison group. *Journal of Gerontology: Med. Science*, 55A: M90-M97.
- U.S. Census Bureau. 2000a. *Census 2000 Summary File 1*. <http://www.census.gov/population/cen2000/phc-t13/tab01.xls>.
- U.S. Census Bureau. 2000b. *The Black Population: 2000, Census 2000 Brief*. <http://www.census.gov/prod/2001pubs/c2kbr01-5.pdf>.
- U.S. Department of Health and Human Services. 2000. *Healthy people 2010. With understanding and improving health and objectives for improving health*. 2 vols. 2nd ed. Washington, DC: U.S. Government Printing Office.. http://www.healthypeople.gov/Document/html/uih/uih_bw/uih_1.htm
- Villa V. M., and F. M. Torres-Gil. 2001. The later years. In *Health issues in the Latino community*, edited by M .Aguirre-Molina, C. Molina, and R. Zambrana. San Francisco: Jossey Bass.
- Zhu X., R. S. Cooper, A. Luke, G. Chen, X. Wu, D. Kan, A. Chakravarti, and A. Weder. 2002. A genome-wide scan for obesity in African-Americans. *Diabetes*. 51:541–544.
- Zsembik B. A., and D. Fennell. 2005. Ethnic variation in health and the determinants of health among Latinos. *Social Science and Medicine*. 61:53-63.

ABOUT THE AUTHOR

Alberto Coustasse, MD, MBA, DrPH, is a Research Assistant Professor at the Department of Health Management and Policy of the School of Public Health at University of North Texas Health Science Center at Fort Worth. His

research interests include healthcare disparities; geriatrics and gerontology; hospital management; health services research and pension systems.