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In Hindsight: Urban Exposure Explains the Association Between Prior Migration and Current Health of Older Adults in Mexico

Felicia V. Wheaton, BA¹ and Eileen M. Crimmins, PhD¹

¹Davis School of Gerontology, University of Southern California, Los Angeles, CA, USA

Abstract

Objective—This study examines sex differences in the association between migration and exposure to an urban environment and overweight, hypertension and diabetes in later life.

Methods—Interviews were conducted with 3,604 adults aged 50 and older in the Mexican Family Life Survey (MxFLS). Logistic regression analyses were used to examine the association between previous migration, urban exposure, and risk of overweight, hypertension, and diabetes.

Results—Migration itself was not associated with health outcomes after controlling for urban exposure. The risk of overweight and diabetes associated with urban exposure appeared to be greater for men. Sex differences were found in the covariates that helped explain differences in health between those with high and low urban exposure.

Discussion—These findings underscore the need to consider heterogeneity in health by urban exposure and by sex.

Keywords

migration; body mass index; chronic disease; sex differences

Introduction

An epidemiologic transition, characterized by a rise in chronic diseases (e.g., cardiovascular diseases and diabetes) coupled with decline in infectious diseases (Omran, 1971), is underway in many developing countries (World Health Organization, 2005). Yet this transition is not uniform within areas of countries; obesity and chronic diseases tend to be more common in urban areas of Latin America (Lerman-Garber et al., 1998; Lerman-Garber et al., 1999), Africa (Agyemang, 2006; Njelekela et al., 2003), and Asia (Hou, 2008). However, risk is not only higher among those who have always resided in urban environments. Rural-to-urban migration has been associated with the adoption of unhealthy lifestyles and increased weight, blood pressure, and prevalence of diabetes mellitus (Ebrahim et al., 2010; Lim et al., 2009; Lu, 2009; Poulter, Khaw, Mugambi, Peart, & Sever, 1985).

Changes in some health risk factors, such as cholesterol, blood pressure, and weight, may occur quite rapidly over only a few months (Poulter et al., 1985; Unwin et al., 2006);

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Corresponding Author: Felicia V. Wheaton, BA, Davis School of Gerontology, University of Southern California, 3715 McClintock Avenue, Los Angeles, CA 90089-0191, USA. fwheaton@usc.edu.

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Declaration of Conflicting Interests

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however, diabetes may take longer to develop (Sobngwi et al., 2004). Not surprisingly, longer exposure to an urban environment has been shown to be associated with a higher probability of developing lifestyle risk factors and disease (Sobngwi et al., 2004; Steyn, Kazenellenbogen, Lombard, & Bourne, 1997). Since 41% of urban growth between 1960 and 1980 in Latin America, Africa, and Asia was the result of rural-to-urban migration (United Nations, 2001), it is important to understand how the health of such migrants was shaped by both the experience of migration and exposure to an urban environment. Health changes may result from a combination of living in an urban environment and from the experience of migration. Yet few studies have attempted to examine the separate effects of migration and urban exposure.

Migration itself may influence health in various ways. Migrants may more readily embrace lifestyle changes, especially if motivated by a desire to improve standards of living. Migration also involves both short-term and chronic stress. Initially, migrants may experience loss of social networks, the financial burden of relocation, unfamiliarity with new surroundings, and other sources of stress (Lassetter & Callister, 2009). Over time, these stressors may abate depending on ability to adapt to new circumstances, satisfaction with the migration decision, and objective and subjective social status relative to the destination population (Bhugra, 2004). Thus, chronic stress could exert “wear and tear” on physiological systems and eventually contribute to obesity, diabetes, hypertension, and the development of chronic diseases (Logan & Barksdale, 2008). It is also possible that migrants are self-selected for either better or worse health.

Living in an urban environment may also affect health in several ways. Lifestyle changes related to urbanization have been well documented in the literature (Hawkes, 2006; Popkin, 1997, 2006) and include declines in physical activity and overnutrition. These may be due in part to rural-urban differences in socioeconomic status (SES). On average, individuals living in urban communities are socioeconomically advantaged and have greater access to health care compared with their rural peers (Smith & Goldman, 2007; Zimmer & Kwong, 2004). Although an inverse association between SES and obesity and chronic disease is well established in developed nations, in developing countries at earlier stages of epidemiologic transition, higher SES has been associated with greater risk of obesity and chronic disease (Sobal & Stunkard, 1989). The socioeconomically advantaged and those living in urban areas are early adopters of a “Westernized lifestyle” because they have greater access to and can afford modern conveniences and a sedentary lifestyle (Pearson, 2003; Wong, Ofstedal, Yount, & Agree, 2008). Older adults living in urban areas are more likely to have health insurance—a proxy for health care access (Salinas, Al Snih, Markides, Ray, & Angel, 2010; Zimmer, Kaneda, & Spess, 2007)—because health insurance is frequently tied to employment in the formal labor market and coverage is higher among those with greater financial resources (Zimmer, Kaneda, Tang, & Fang, 2010). Although access to health care contributes to an urban advantage in mortality (Zimmer et al., 2007), increased survival among those with chronic conditions and greater awareness of such conditions in urban communities may mean that urban populations appear less healthy.

Increasingly, studies have shown that the associations between rural-to-urban migration and obesity and chronic disease differ by sex (Ebrahim et al., 2010; Lim et al., 2009; Sobngwi et al., 2004; Torun et al., 2002). However, many of these studies do not control for SES, marital status, or access to health care. When studies do control for such factors, they do not examine how these factors mediate the relationship between migration and health. In addition, most theories of migration have focused on men, especially on male labor migration to the United States (Lindstrom & Lauster, 2001; Massey, 1990; Massey et al., 1993), whereas women are often viewed as “associational migrants” (Kanaiaupuni, 2000). However, it is important to keep in mind that the characteristics and motivations of female

migrants and their experiences of migration may differ from those of men (Kanaiaupuni, 2000). Female migrants are more likely to move with other family members, are more often motivated by marriage, and are less mobile during child-bearing years because of household responsibilities and social norms. Female migrants also have fewer opportunities for employment in well-paying jobs. Thus, although rural-to-urban migration and urban residence have been associated with higher odds of obesity and chronic disease among both men and women, it is important to understand whether there are sex differences in the factors that explain such health disparities.

To address this gap in the literature, we use data from the Mexican Family Life Survey (MxFLS), which provide a unique opportunity to assess the impact of earlier-life migration on risk of overweight, hypertension, and diabetes from a life-course perspective using extensive migration history. Like other developing countries, Mexico has experienced rapid urbanization: Between 1940 and 1980, the population living in rural communities declined from 72% to 33%, despite higher rural fertility (Moreno, 1991). Thus, understanding the health consequences of migration is of great importance because such migrants have played and continue to play an important role in the urbanization of Mexico and other developing countries. An assessment of the health needs of this population is important in its own right.

Our study contributes to the literature in several important ways. First, we examine whether previous migration is associated with overweight, hypertension, and diabetes. We then use logistic regression to determine whether greater cumulative exposure to an urban environment and/or socioeconomic factors explain the effect of migration. Many studies examine rural-urban differences in health without considering past migration, thus ignoring the fact that a substantial segment of the population moved between areas with differing levels of development. Studies that do examine migration tend to focus only on rural-to-urban migrants and, thus, overlook the possibility of other types of migration such as from rural areas to other rural areas. Finally, we stratify analyses by sex because we hypothesize that the effect of migration and urban exposure will vary by sex, as will the factors mediating their effects. We predict that migration will be associated with greater risk of overweight and chronic disease but that much of the effect is due to migrants' greater exposure to an urban environment. We also predict that the factors that help explain the effect of migration and urban exposure will differ between men and women, particularly with respect to education.

Methods

Data

The MxFLS is a large, nationally representative longitudinal survey of the social, economic, demographic, and health characteristics of individuals and households in Mexico (Rubalcava & Teruel, 2006). Data from the first wave, collected in 2002, included approximately 5,022 Mexican-born individuals aged 50 years and above. Individuals provided data on both current and retrospective health and economic and social characteristics.

The analytic sample size with complete data on all variables except hypertension and diabetes was 3,604: A total of 663 individuals were excluded because they had missing data on body mass index (BMI), an additional 724 had incomplete migration history information, and 31 were missing data on additional control variables. A further 28 and 363 were missing data on measured hypertension and self-reported diabetes, respectively. Those with missing data were more likely to be male and had higher SES as indicated by a higher proportion among the missing with 6 or more years of education and an indoor toilet. However, no differences were found with respect to age, marital status, or health outcomes (BMI, hypertension, and diabetes).

Measures

Independent variables—Respondents were categorized as migrants if they reported moving to a different locality for at least 1 year since age 12. Urban exposure since age 12 was calculated from self-reported community size at age 12 and at each move. Those who indicated a village, small town, hacienda, or ejido were defined as “rural” and those reporting that they lived in a city were designated as “urban.” We calculated the number of years spent in an urban environment since age 12 and recoded this as a dichotomous variable indicating whether a person had spent 10 or more years in an urban environment.

Additional variables include age in years, level of education (none, 1–5 years, and 6+ years), marital status (married, widowed, and single/separated/divorced), and presence of an indoor toilet in the home at age 12 and in 2002. Education reflects both childhood and adult SES, whereas presence of an indoor toilet is an indicator of material SES and household sanitation (Galobardes, Shaw, Lawlor, Lynch, & Davey Smith, 2006). Finally, health insurance was included to control for potential differences in self-reported hypertension and diabetes resulting from differences in use of health care (Wong & Díaz, 2007). Obesity is a well-known risk factor for both hypertension and diabetes; thus, an indicator of obesity was included in those models to determine whether differences by migration and urban exposure were explained by differences in obesity.

Health outcomes—Dependent variables include overweight, measured hypertension, and self-reported diabetes. Overweight was calculated from measured height and weight and defined as BMI ≥ 25 kg/m². Interviewers also measured blood pressure; thus, measured hypertension is defined as systolic blood pressure >140 mm Hg and/or diastolic blood pressure >90 mm Hg. Those who take blood pressure medication are also considered hypertensive, even if they have measured blood pressure below risk levels. For diabetes, respondents were asked whether a doctor had ever told them they had the condition.

Analysis

Logistic regression was used to analyze the presence of obesity, hypertension, and diabetes, stratified by sex. The first model included age and previous migration only, whereas the second model also controlled for urban exposure. The final model controlled for education, presence of an indoor toilet at age 12 and in 2002, and marital status. The third model for hypertension and diabetes also controlled for health insurance and obesity. Data were analyzed with SAS (v 9.2).

Results

Descriptive Results

Table 1 shows descriptive statistics for rural nonmigrants, urban nonmigrants, and migrants for men and women. Of the total sample of 3,604 adults aged 50 and older, 54.9% were women. Surprisingly, gender differences in migration history were very small; nearly 37% of respondents of both sexes migrated for at least a year within Mexico since age 12. Approximately 70% of male migrants and 62% of female migrants had spent 10 or more years in an urban environment. About half were rural nonmigrants, and one sixth were urban nonmigrants. Most men were married, and marital status differed little among groups. Women were more likely than men to be widowed or single/separated/divorced, and nonmigrant urban women had the highest prevalence of being single/separated/divorced (19.1%). Men also had much greater education than women, but among both sexes there was a consistent pattern where higher education (6+ years) was most common among urban nonmigrants, followed by migrants, with rural nonmigrants having the least education. This gradient was also apparent for prevalence of an indoor toilet at age 12 and in 2002, health

insurance, and the proportion of respondents who had ever worked. In terms of health, overweight was more prevalent among urban nonmigrants of both sexes, followed by migrants. The same was true for both hypertension and diabetes.

Migrant characteristics are shown in Table 2 by sex. The average age at first migration was around 25 for men and 23 for women. Men had a higher average number of moves (1.8) compared with women (1.5) and were also more likely to migrate alone during their first move (45% versus 17%). Work/education was the most frequently mentioned reason for the first migration among men and women, but marriage/pregnancy was also a quite common reason for migration among women. When comparing level of development at age 12 and in 2002, the majority of migration was from rural to urban areas (44%), followed by rural-to-rural migration (33%–37%), and urban-to-urban migration (19%–23%). Urban-to-rural migration, on the other hand, was very uncommon.

Logistic Regression Results

Among both sexes, odds of being overweight were 30% to 34% higher among those who migrated, controlling for age (Table 3). However, once urban exposure was controlled for, previous migration was not significant. Men and women with high urban exposure were 2.33 and 1.48 times more likely to be overweight, respectively. After controlling for SES and marital status, migration was no longer associated with greater odds of being overweight among women, and the effect of urban exposure was only significant among men. Odds of being overweight were 2.22 times higher for men and 1.91 times higher for women with an indoor toilet in 2002. Among men only, those with greater education had higher odds of overweight, compared to men with no education, whereas men who were single/separated/divorced had lower odds of being overweight (odds ratio [OR] = 0.34).

Results for hypertension show that previous migration is associated with higher odds of high blood pressure but only among men (Table 4). Male migrants had 36% higher odds of hypertension relative to nonmigrants. After controlling for urban exposure, migration was no longer associated with hypertension, although urban exposure was associated with 36% higher risk of hypertension. When additional variables were included in the model, the effect of urban exposure was no longer significant among men but actually increased among women. Thus, differences in covariates may have been suppressing some of the effect of high urban exposure. Men with 6+ years of education and women with 1 to 5 years of education had higher odds of hypertension relative to those with no education. Among women, an indoor toilet at age 12 was protective factor for diabetes (OR = 0.72), whereas widowed women were more likely to be hypertensive (OR = 1.33). Having health insurance was associated with increased risk of hypertension among men (OR = 1.41) but not among women. Obesity, however, was significantly associated with hypertension in both sexes (OR = 1.80–1.86).

As with hypertension, previous migration was only associated with higher odds of diabetes among men (Table 5). Male migrants were 1.45 times more likely to have diabetes compared to nonmigrants. However, migration was no longer statistically significant when controlling for urban exposure. Men and women with higher urban exposure had 2.52 and 1.27 times higher odds of diabetes, holding age and migration constant. The magnitude of the urban exposure effect was modestly reduced among men after controlling for additional variables in Model 3 but was not significant among women. Presence of an indoor toilet in 2002 was associated with much higher risk of diabetes among both sexes (OR = 2.44–3.08), although an indoor toilet at age 12 was a protective factor among men (OR = 0.49). Men with 1 to 5 years of education were more likely to be diabetic (OR = 2.20) compared to men with no education; however, women with 6+ years of education were significantly less likely to have diabetes (OR = 0.65). Single/separated/divorced women were also less likely

to be diabetic, relative to married women (OR = 0.56). Similar to results for hypertension, health insurance was associated with significantly higher odds of diabetes among men only (OR = 1.69). Somewhat surprisingly, obesity was not associated with diabetes, after controlling for other factors.

Discussion

Analyses for overweight, hypertension, and diabetes show that migration was associated with greater risk of all outcomes for men but among women was only associated with a greater likelihood of being overweight. These findings suggest that migration has a stronger and more consistent relationship with later life health among men. Sex differences in the characteristics of migration, such as the finding that men average a greater number of moves, are more likely to migrate for work or education, and are more likely to migrate alone, may contribute to the observed sex differences. For example, in a previous study, migrating alone has been associated with greater risk of depression (Lu, 2009), which could lead to greater risk of chronic conditions.

Yet when we adjusted for high urban exposure in addition to migration, the association between migration and each health outcome was no longer significant. Rural-to-urban migration was the most common type of movement among this population, and the majority of migrants had spent 10 or more years in an urban environment. Thus, these findings suggest that urban exposure is of greater importance than migration per se. Most previous studies of rural-to-urban migration did not attempt to examine the separate effects of migration and urban exposure (Ebrahim et al., 2010; Torun et al., 2002). Conversely, other studies of life-course exposure to an urban environment did not explicitly examine migration (Sobnogi et al., 2004; Steyn et al., 1997).

We also found that greater urban exposure was associated with much higher odds of overweight and diabetes among men compared with women, although results for hypertension were similar. These findings are in agreement with those from other studies that find a greater deleterious effect of rural-to-urban migration on men's health. Ebrahim and colleagues (2010) found that in India, migration was associated with higher blood pressure, lipids, insulin, and fasting glucose, but only among men. Similar results were found among young Guatemalans (Torun et al., 2002). Indeed, there is some evidence to suggest that lifestyle differences between rural and urban areas may be wider for men. For instance, Torun and colleagues (2002) found that in Guatemala, young rural women's physical activity was already quite low; thus, rural-urban differences were less pronounced than among men. Yet when models were further adjusted for SES and other control variables, the magnitude of the association between high urban exposure and each outcome was substantially reduced and, in some cases, was no longer significant.

Sex differences were found not only in the association between migration and urban exposure and overweight, hypertension, and diabetes but also in the factors that help explain such differences. In general, greater education was associated with poorer health among men. Women with intermediate levels of education had greater odds of hypertension, but women with high education had lower odds of diabetes, and education was not associated with being overweight. Other studies have also found that the burden of obesity shifts toward those with lower SES at earlier stages of economic development among women (McLaren, 2007; Monteiro, Moura, Wolney, & Popkin, 2004). Also, in less developed countries, inverse associations between education/SES and biological risk factors tend to be more common and stronger among women, especially in urban areas (Buttenheim, Wong, Goldman, & Pebley, 2009; Fleischer, Diez Roux, Alazraqui, Spinelli, & De Maio, 2011; Smith & Goldman, 2007). On the other hand, among both sexes, an indoor toilet at age 12

was protective for health outcomes when significant, whereas an indoor toilet in 2002 was associated with higher odds of both overweight and diabetes. Other studies in Mexico have also found a positive relationship between current assets and obesity (Buttenheim et al., 2009; Fernald, 2007); thus the relationship between SES and obesity appears to depend on the measure of SES used. We find that these relationships also vary for hypertension and diabetes as well.

Not surprisingly, obesity was significantly associated with hypertension and may be one pathway by which urban exposure contributes to hypertension. Yet obesity was not significantly associated with diabetes, despite being a well-known risk factor. Finally, results for hypertension and diabetes show that health insurance was only significantly related to higher odds of both conditions among men, perhaps because women have greater contact with the health care system even without health insurance, due to their generally greater health care needs.

Limitations

This study has several limitations. First, reliance on cross-sectional data obscures the magnitude of migrant self-selection. However, education and presence of an indoor toilet at age 12 were examined to infer differences between migrants and nonmigrants earlier in life. Also, exclusion of individuals with missing data could have had some effect on findings because those with higher SES were both more likely to be missing and tended to be urban nonmigrants. As men were more likely to have missing data and to have stronger links between education and the health outcomes, some caution must be exercised in interpreting this result. In addition, we reiterate that no differences between missing and nonmissing individuals were observed for health outcomes. Another limitation is the use of a simple rural-urban dichotomy that has been critiqued for obscuring heterogeneity in community characteristics (Dahly & Adair, 2007). Yet the use of a subjective measure may better reflect the level of development, degree of modernization, and infrastructure than the commonly used population cutoff of 2,500 residents in Mexico. Finally, it is possible that communities have grown over time even among nonmigrants and what were rural areas are now urban. However, we find that 86.4% of rural nonmigrants live in communities with a population of less than 15,000, whereas 91.9% of urban nonmigrants live in communities with 15,000 or more residents.

Conclusion

Overall, results are consistent with the previous literature on rural-to-urban migration and rural-urban differences in overweight and chronic disease. In addition, results indicated that although migration was associated with greater risk of all outcomes among men and greater risk of being overweight among women, the effect was explained by increased exposure to an urban environment. The risk of overweight and diabetes associated with urban exposure appeared to be higher among men. Some of the effect of greater urban exposure is in turn associated with differences in SES, health insurance coverage, and obesity. In addition to differences by sex, this study also found heterogeneity in the factors that help mediate these outcomes. This highlights the need to avoid making broad generalizations about chronic conditions because although all were associated with urban exposure in intermediate models, important differences were found in the factors that help explain the association between urban exposure and each outcome. By examining such heterogeneity, we can better understand the mechanisms underlying the observed health disparities stemming from migration and urban exposure. Finally, a more nuanced understanding of the relationship between migration, urban exposure, and health can lead to more appropriate public policies to meet the needs of Mexico's aging population.

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Table 1

Characteristics of Migrants and Nonmigrants by Sex.

	Men (n = 1,627)		
	Nonmigrant	Nonmigrant	Migrant
	Rural	Urban	
Age (years)	63.5 (8.8)	61.0 (11.1)	62.8 (9.4)
Married	83.5	83.2	83.7
Widowed	10.5	7.9	8.0
Single/separated/divorced	6.0	8.9	8.3
0 years education	37.7	7.2	25.5
1–5 years education	39.9	27.1	33.1
6+ years education	22.4	65.7	41.4
Indoor toilet (2002)	52.4	97.7	85.1
Indoor toilet (12 years)	8.3	71.0	24.0
Health insurance	33.5	62.9	57.2
Underweight (<18 kg/m ²)	2.7	3.3	1.4
Normal Weight (18–25 kg/m ²)	39.0	19.2	28.4
Overweight (≥ 25 kg/m ²)	58.4	77.5	70.3
Hypertension (n = 1,611)	52.2	64.1	62.9
Diabetes (n = 1,459)	6.4	17.0	13.3
Urban exposure 10 years	0	100	69.3
N (%)	828 (50.9)	204 (12.5)	595 (36.6)

	Women (n = 1,977)		
	Nonmigrant	Nonmigrant	Migrant
	Rural	Urban	
Age (years)	62.6 (9.1)	60.2 (10.0)	61.3 (9.5)
Married	62.0	58.7	59.8
Widowed	26.1	22.2	23.6
Single/separated/divorced	11.9	19.1	16.6
0 years education	49.3	15.2	34.8
1–5 years education	35.4	26.0	27.7
6+ years education	15.4	58.8	37.5
Indoor toilet (2002)	58.2	98.7	86.3
Indoor toilet (12 years)	10.0	75.6	22.7
Health insurance	37.5	71.5	59.4
Underweight (<18 kg/m ²)	4.0	0.4	0.2
Normal weight (18–25 kg/m ²)	27.6	19.8	22.5
Overweight (≥ 25 kg/m ²)	68.4	79.9	77.2
Hypertension (n = 1,965)	54.3	63.2	59.6
Diabetes (n = 1,781)	17.7	23.9	19.3
Urban exposure 10 years	0	100	61.50

	Women (<i>n</i> = 1,977)		
	<u>Nonmigrant</u>	<u>Nonmigrant</u>	Migrant
	Rural	Urban	
<i>N</i> (%)	955 (48.3)	292 (14.8)	730 (36.9)

Table 2

Characteristics of Migrants by Sex.

	Men	Women
Age at first migration	24.7 (11.9)	23.3 (11.3)
Number of moves	1.8 (1.4)	1.5 (0.9)
Migrated alone	44.7	17.0
Reason for first migration		
Work/education	75.6	51.2
Marriage/pregnancy	5.3	25.1
Health	3.8	5.8
Other	15.3	17.9
Direction of migration		
Rural-rural	32.5	37.1
Rural-urban	43.6	43.5
Urban-rural	1.0	0.1
Urban-urban	22.9	18.7

Table 3

Odds From Logistic Regression of Overweight by Sex.

	Men (n = 1,627)			Women (n = 1,977)		
	1	2	3	1	2	3
	Exp. β	Exp. β	Exp. β	Exp. β	Exp. β	Exp. β
Age (years)	0.97***	0.97***	0.98**	0.96***	0.96***	0.96***
Migrant	1.34*	0.95	0.98	1.30*	1.16	1.10
Urban exposure		2.33***	1.42*		1.48***	1.25
Marital status (ref. = married)						
Widowed			0.78			0.98
Single/separated/divorced			0.34***			1.13
Education (ref. = 0 years)						
1–5 years			1.40*			1.21
6+ years			1.59**			0.98
Toilet (2002)			2.22***			1.91***
Toilet (12 years)			1.21			0.88
df	2	3	9	2	3	9
χ^2	40.25	87.52	171.68	57.90	70.58	99.58

* $p < .05$.** $p < .01$.*** $p < .001$.

Table 4

Odds From Logistic Regression of Hypertension by Sex.

	Men (n = 1,611)			Women (n = 1,965)		
	1	2	3	1	2	3
	Exp. β	Exp. β	Exp. β	Exp. β	Exp. β	Exp. β
Age (years)	1.01	1.01	1.02*	1.02***	1.02***	1.02***
Migrant	1.36**	1.20	1.15	1.12	1.02	0.96
Urban exposure 10 years		1.36**	1.07		1.36**	1.45**
Marital Status (ref. = married)						
Widowed			0.69*			1.33*
Single/separated/divorced			1.08			1.03
Education (ref. = 0 years)						
1–5 years			1.26			1.44**
6+ years			1.40*			1.17
Toilet (2002)			1.26			1.07
Toilet (12 years)			0.84			0.72**
Health insurance			1.41**			1.03
Obese			1.86***			1.80***
df	2	3	11	2	3	11
χ^2	8.87	15.92	67.81	20.62	30.86	92.99

*
p < .05.**
p < .01.***
p < .001.

Table 5

Odds From Logistic Regression of Diabetes by Sex.

	Men (<i>n</i> = 1,459)			Women (<i>n</i> = 1,781)		
	1	2	3	1	2	3
	Exp. β	Exp. β	Exp. β	Exp. β	Exp. β	Exp. β
Age (years)	1.00	1.00	1.01	1.01	1.01	1.01
Migrant	1.45*	1.03	0.81	0.97	0.91	0.83
Urban exposure 10 years		2.52***	2.20***		1.27*	1.13
Marital Status (ref. = married)						
Widowed			0.74			0.85
Single/separated/divorced			1.14			0.56**
Education (ref. = 0 years)						
1–5 years			2.20**			0.92
6+ years			1.43			0.65**
Toilet (2002)			3.08***			2.44***
Toilet (12 years)			0.49**			0.88
Health insurance			1.69**			1.31
Obese			0.83			1.09
<i>df</i>	2	3	11	2	3	11
χ^2	4.84	29.40	77.52	1.53	5.55	61.04

* $p < .05$.** $p < .01$.*** $p < .001$.