

PIMSA POLICY BRIEF: RURAL AND INDIGENOUS ORIGIN PREDICTS DIET AND DIET RELATED HEALTH OUTCOMES IN RECENT MIGRANTS TO TIJUANA, MEXICO

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Migration is a powerful force with numerous and far-reaching effects; As individuals migrate they enter new health and food environments, encounter and acculturate to new health behaviors. *Internal* migration, migration *within* national borders is an understudied and under-discussed part of migration. Almost all international migrations begin with one or a series of internal migrations. This is particularly true with lower-resource migrants, the same population more likely to be vulnerable to the health effects of changing environments.

Much of the internal migration in Mexico is rural-to-urban, or to increasingly urban areas (i.e., urban-to-urban). In addition, most international migrants move ‘up’ the development continuum of nations from less to more developed countries. Therefore migrants often pass through locations at different stages of the “Nutrition Transition”. The nutrition transition is a conceptual framework used to describe the drastic changes in human diet that have occurred over time and space, particularly in recent years. It proposes five categories: food gathering, famine, receding famine, chronic diseases, and behavior change (toward a healthy, balanced diet). To roughly characterize the current state of the world, the overwhelming majority of the population in developed nations is in the chronic disease stage, with some transitioning to behavior change. For developing nations, most of the population can be characterized by either receding famine or chronic disease. Recently, the developing world has undergone the transition at an alarming rate. Many areas are characterized by the ‘dual burden’: high levels of both the diseases of undernutrition and NR-NCDs. This divergence between stages can be seen in the same nation, the same city, the same neighborhood, and even the same household. Most migrants, as they move from rural to urban, and from developing towards developed, move ‘up’ the nutrition transition continuum and adopt a less healthy ‘Western’ diet, with a marked increase in meat and dairy, sugars and sweeteners, edible oils, and prepared and processed foods, accompanied by a decrease in fruits, vegetables, and legumes, all of which are risk factors for NR-NCDs. However, this transition does not happen evenly; some migrants preserve their healthier habits, although the predictors for such have yet to be fully explained.

The incidence of nutrition related non-communicable diseases (NR-NCDs), such as obesity and diabetes, has reached pandemic proportions in the United States and Mexico. However, these diseases do not strike uniformly. Ethnicity, poverty, socio-economic status (SES), education, access to healthy food, and access to health care all affect their manifestation in the population. When migrants enter the U.S., they have better health than their U.S.-born counterparts, including rates of diabetes and obesity. This outcome is observed despite lower incomes, lower SES, and lower access to health services than the U.S.-born Latino population. As immigrants adopt to urban U.S. lifestyles, their body-mass index (BMI) rises and the presence of NR-NCDs increases, despite increases in wealth, SES, and access to health services. There is a lack of literature concerning internal or rural-to-urban migrants within Mexico, however the clear evidence of the international migrants’ experience suggests that the trend should be similar.

We collected information from recently arrived (within five years) migrants to Tijuana, Mexico ($n=93$) using a modified snowball method. Study participants were residents of two *colonias* (small neighborhoods) that were known to have a high concentration of immigrants and indigenous residents. Participants answered a survey concerning their demographics, education, employment and income, personal and family health history, access to health care, their current diet and exercise, current household (HH) makeup and living situation, migration history, including diet and health behavior at migration ‘stops’ that lasted over three months, their origin HH, and comparisons of their current, origin, and intervention stops’ diet and health behaviors. In addition, we collected information on common diet related health measures: body mass index (BMI), waist circumference (WC), and glycated hemoglobin (HbA1c). Participants’ responses were examined using several statistical methods to determine possible associations between their current situation, their origin and migration history, changes in their diet, and measurements of their health. Results indicate that participants of indigenous origin and participants who were from *municipios* (equivalent to U.S. counties) with a high percentage of very small and rural *localidades* (the administrative level below *municipios*) had significantly more diet change, but better current health. These results demonstrate that more detailed information about migration path and origin is important in diet and health related research. It also points to recent rural and indigenous migrants as a potential high value population for diet and health related interventions.

Our study also sheds light on a rarely studied and difficult to encounter population. Migrants within Mexico and Latino migrants in or on their way towards the United States are a difficult population to encounter for logical reasons. They often have low levels of resources, some do not have official documentation or permissions, and they can be subject to harassment or arrest by officials in either Mexico or the United States. The recent political situation in the U.S. has served to heighten what was already an increasingly fraught position for these migrants, which became increasingly strict under the administration of Barack Obama in 2008.

In public health, even in studies that purposefully include migrants, a migrant’s history is often simply a ‘yes-or-no’ field, or at best one measured by ‘time since migration’. These studies make a number of assumptions which are often untrue; the main assumption being that time since migration to a new country serves as a proxy for changing health behaviors, acculturation, and exposure to the new culture. This approach ignores return migrants, circular migrants, the impact of the migration process, the similarities and differences between origin and destination, and the realities in between. Furthermore, much of the health research, and indeed much migration research, simply ignores internal migrants. This occurs not because of a lack of evidence that internal migration has important effects, including on health behaviors and outcomes, but simply because tracking (and classifying) internal migration is difficult (Nam 1990; Smith 2016). Migrants’ paths to international destinations are often lengthy, complex, and circular. We argue that more richness is needed in exploring migrants’ histories in health research. Nutrition Transition

Figure 1. Tijuana and Indigenous *Colonias*.

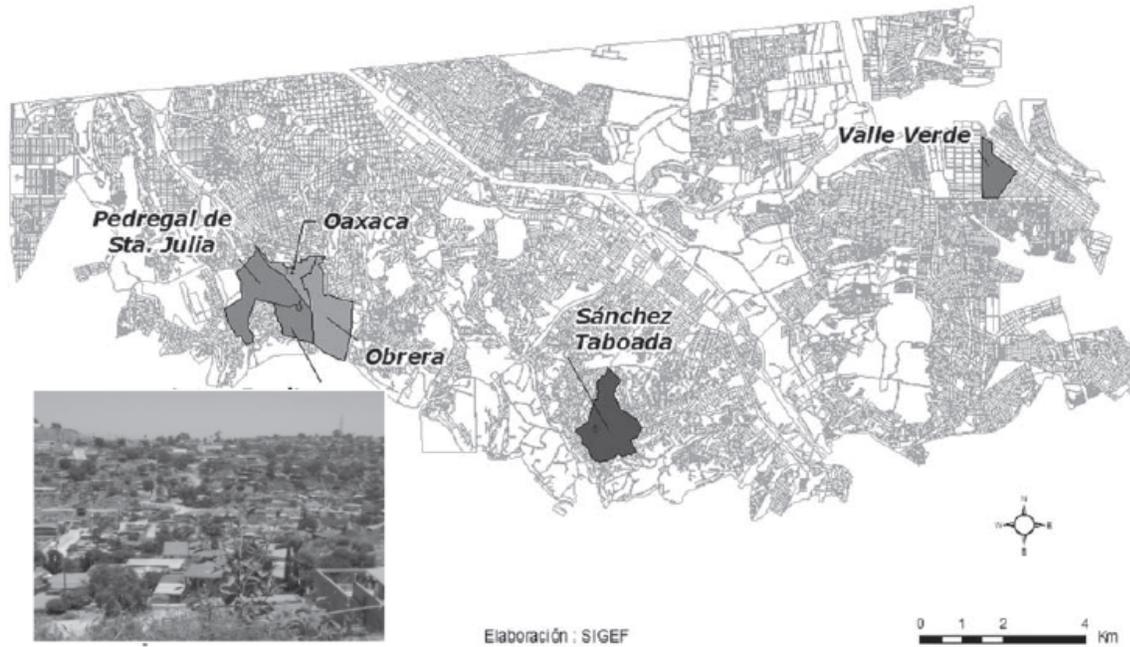


Image courtesy of Velasco Ortiz et al. 2010.

Table 2 contains counts and descriptive statistics concerning individual and household level characteristics for our study participants, while Table 3 contains the same for their migration path, and characteristics of their origin location. Each table contains information for all participants, and for our two sets of (non-exclusive) study groups.

Table 2 - Individual & Household Characteristics

Study Group Characteristics	All	Rural	Not-Rural	Indig.	Not Indig.
Male	38%	43%	32%	33%	39%
Female	62%	57%	68%	67%	62%
Age (mean)	35.2	35.3	35.0	28.1	36.6
Age (median)	33	32.5	33.0	28.0	34.0
Age (SD)	11.4	11.6	11.6	4.7	11.8
Indigenous	15	28%	0%		
Rural	54			100%	
Education Level					
<i>No Schooling</i>	6%	9%	5%	13%	5%
<i>Primary School (grade 1-6)</i>	26%	39%	18%	27%	31%
<i>Secondary School (7-9)</i>	37%	43%	44%	47%	37%
<i>Preparatoria (10-12)</i>	15%	9%	28%	13%	19%
<i>Additional</i>	6%	4%	8%	0%	0%
Employed					
<i>Yes</i>	62%	62%	62%	67%	61%
<i>No</i>	38%	62%	62%	33%	39%
Health Insurance					
<i>Seguro Social (IMSS)</i>	34%	35%	32%	40%	33%
<i>Seguro Popular</i>	38%	35%	43%	47%	36%
<i>None</i>	28%	30%	24%	13%	31%
Current HH count	5.0	4.9	5.2	5.7	4.9
Origin HH count	5.8	6.0	5.5	6.0	5.8
Current HH Age Mean	26.5	26.9	26.4	18.9	27.9
Origin HH Age Mean	25.5	25.3	26.4	22.8	26.0
Region					
<i>Noroeste</i>	18%	20%	16%	7%	21%
<i>Norte</i>	1%	2%	0%	0%	1%
<i>Noreste</i>	1%	0%	3%	0%	1%
<i>Centro-Occidente</i>	17%	7%	32%	7%	20%
<i>Centro-Este</i>	19%	15%	27%	7%	22%
<i>Sur</i>	32%	50%	8%	73%	25%
<i>Oriente</i>	8%	6%	11%	7%	8%
<i>Peninsula</i>	1%	0%	3%	0%	1%

Table 3 - Geographic & Migration Characteristics

Study Group	All	Rural	Not-Rural	Indig.	Not Indig.
Number of Stops					
1	57%	56%	57%	47%	58%
2	24%	24%	22%	20%	24%
3	10%	13%	5%	20%	8%
4+	11%	7%	16%	13%	10%
International					
Yes	16%	9%	24%	20%	15%
No	84%	91%	76%	80%	85%
Years since left origin					
0-4	62%	48%	61%	40%	55%
5+	38%	52%	39%	60%	45%
Origin Population (<i>Municipio</i>)					
1-2500	28%	44%	0%	33%	27%
2500-15,000	8%	13%	5%	27%	4%
15,000-100,000	23%	32%	11%	13%	24%
100,000-500,000	23%	9%	43%	13%	24%
500,000+	18%	2%	40%	13%	19%
Origin Grade of Marginalization					
Very Low	31%	26%	78%	20%	33%
Low	20%	43%	14%	13%	22%
Medium	28%	13%	8%	0%	33%
High	8%	19%	0%	27%	4%
Very High	11%	0%	0%	40%	5%
Origin Grade of Migration Intensity					
Very Low	5%	4%	8%	13%	4%
Low	38%	32%	49%	53%	35%
Medium	44%	48%	41%	13%	50%
High	11%	17%	3%	20%	9%
Origin Employment in Primary Sector	27.4%	41.8%	6.5%	39.9%	25.0%
Origin Unemployment	4.3%	4.4%	4.2%	5.2%	4.1%
Origin Indigenous	16.8%	24.0%	6.2%	55.0%	9.3%

These tables highlight the similarities and differences between these groups and indicate that the indigenous group (all of which are also in the rural group) in many ways are ‘extreme’ representatives of the rural group. Both rural and the indigenous group have less schooling than the comparative groups and lower rates of literacy (not shown), and the majority of both groups are from the southern region. The indigenous group in addition is younger and originated and

currently live in larger and younger households. When we examine Table 2 we again see the differences between the rural and non-rural groups and how the indigenous group is an extreme version of the rural group. Unsurprisingly both rural and indigenous participants come from smaller *municipios* that are more marginalized, with more employment in the primary sector, more unemployment, and with a higher percentage of indigenous population.

Statistically significant differences were observed between one set of our two groups for each outcome variable tested; Rural or indigenous groups had more diet change towards our definition of ‘unhealthy’ eating practices, lower BMI and waist circumferences. In addition, rural and indigenous status effects all moved in the same direction excepting HbA1c, which we take as a positive sign, given our assertion that indigenous participants were ‘extreme’ rural inhabitants in many ways.

Migrants from rural places and of indigenous status had significantly different diet change and health outcomes than those of the other groups. Past research has demonstrated that those from more rural and more indigenous places have generally better diet related health, which was consistent with our study: these recent migrants still maintained their health advantages, despite their common food and health environments with migrants from other groups. However, these same groups saw the highest level of negative diet change, again a previously observed pattern. Despite length of time since migration and intervening stops, migrants’ origin locations had significant relationships with their diet and their diet related health.

Our results suggest that indigenous heritage migrants and those from rural places represent a prime opportunity to stop negative dietary acculturation and slow the advancement of NR-NCDs in Mexico and the United States. In addition, the significance of origin characteristics supports our call for greater geographic history in public health work with migrants. Results prompt us to call for further research on migrants’ intervening paths and the effects of circular and other migration histories, as our study was unable to address these questions, but feel it is one that continues to deserve attention. Acculturation and diet is a topic that deserves more study and offers opportunities to stop negative health acculturation and could potentially allow migrants to retain their health advantages. Results also have implications for the Latino paradox: internal migration patterns before the cross-border trip may be an important factor, as negative health acculturation (here in the form of diet) appears to begin before arrival in the U.S.. The initial promise of this study prompts us to call for future work in this area.

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