

Binational Research challenges: Assessing diabetes Self- Management Behaviors in the U.S.-Mexico Border Region

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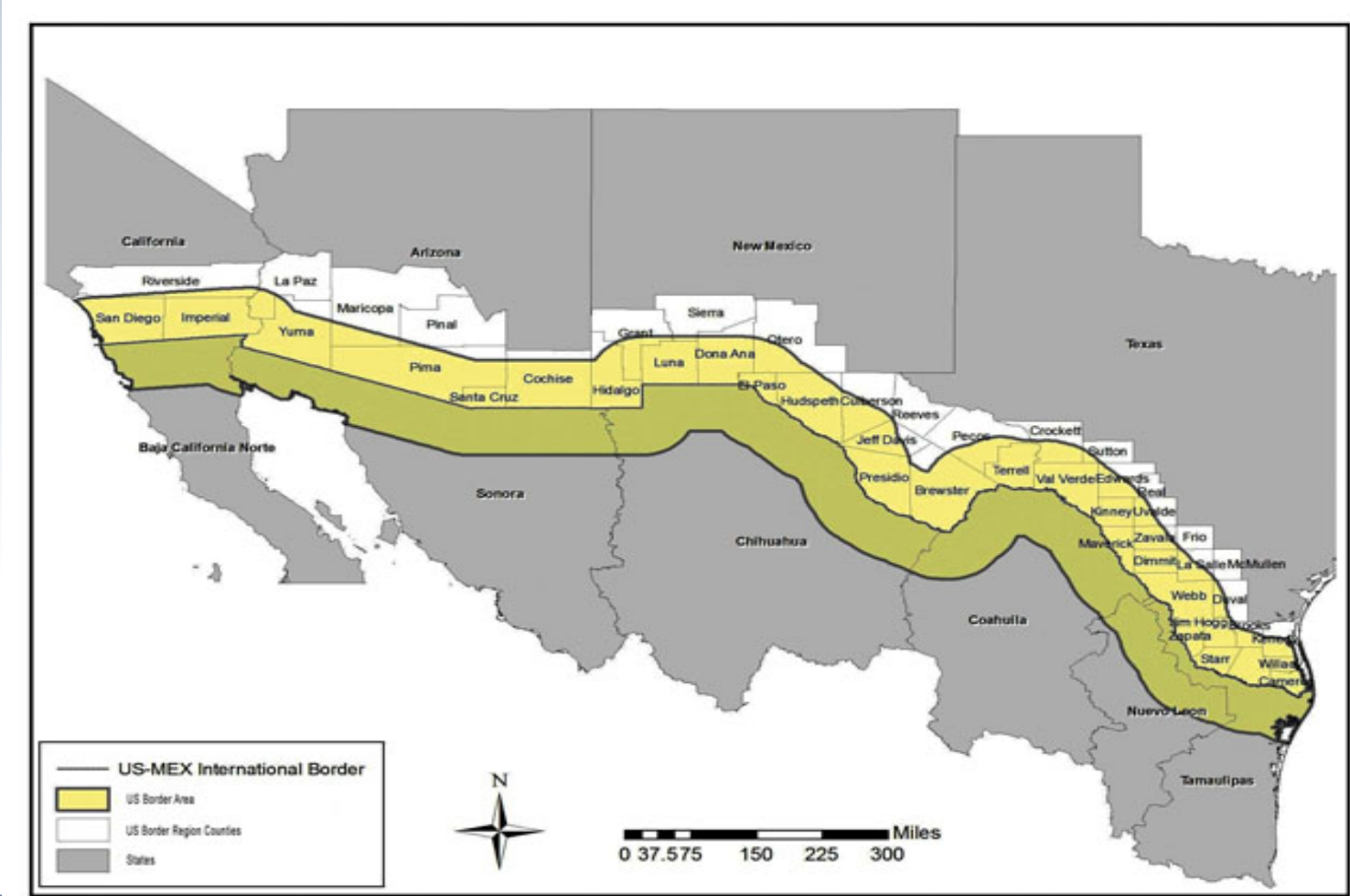
Learner Objectives

- Describe the barriers to conducting binational diabetes research in the U.S.-Mexico border region.
- Describe the adaptation used to collect data in this binational context.
- Describe personal characteristics, T2DM self-management behaviors & health care access of adults in Monterrey, NL, MX and Arizona border counties.
- Summarize approaches to strengthening binational research in this geopolitical region.

Background

- U.S. and Mexico (MX) border states have the highest diabetes prevalence at the national level in both countries (9.4% and 9.2-14.5% respectively).
- The chronic and complex trajectory of type 2 diabetes (T2DM) requires daily engagement in self-management activities.
- Assessing binational T2DM self-management behaviors is challenging due to a paucity of binational and bilingual scientific protocols and infrastructure to guide systematic data collection and analysis.

U.S.-Mexico Border Map



Purpose

- Describe the data collection adaptation used to collect demographic data and responses to the BRFSS diabetes questions with participants diagnosed with T2DM residing in Monterrey, a municipality of Nuevo Leon, MX.
- Use BRFSS diabetes data to describe personal characteristics, diabetes self-management behaviors and health care access for diabetes care for participants diagnosed with T2DM residing in Monterrey, MX and Hispanics diagnosed with T2DM residing in 4 Arizona (AZ) border counties.



Research Questions

- Is it feasible to collect BRFSS diabetes data using a face-to-face survey method and convenience sampling in Monterrey, MX?
- What are the differences and similarities between demographic characteristics, diabetes self-management behaviors, and diabetes care delivered by a health care provider between Hispanics in 4 AZ border counties and Mexicans in Nuevo Leon, MX diagnosed with T2DM?

Behavioral Risk Factor Surveillance System (BRFSS) *

Module 2: Diabetes (question examples)

- Are you now taking insulin?
 - 1=Yes 2=No 9=Refused
- About how often do you check your blood for glucose or sugar?
 - Include times when checked by a family member or friend, but do NOT include times when checked by a health professional.
 - Times per day; Times per week; Times per month; Times per year; Never; Don't know / Not sure; Refused

* Centers for Disease Control & Prevention

Methods

- **Arizona, U.S.**
 - Sample for cohort selected from 2014 and 2015 BRFSS survey conducted by the AZ state health department using a disproportionate stratified sample design for telephone survey.
 - Survey conducted in either English or Spanish based on participant preference.
 - Diabetes data from 4 AZ counties that border MX were selected for this study.
- Descriptive statistics were used to describe sample characteristics, diabetes self-management behaviors and health care access for diabetes care among the US and MX cohorts.

Methods

- **Nuevo Leon, MX**
 - Sample for cohort selected using convenience sampling.
 - Potential participants were recruited at 6 supermarkets in metropolitan areas of Monterrey.
 - Data were collected by trained researchers using the 2015 BRFSS diabetes questions in a face-to-face interview.
- Descriptive statistics were used to describe sample characteristics, diabetes self-management behaviors and health care access for diabetes care among the US and MX cohorts.

Results: Demographic Characteristics

Characteristic	AZ Border Counties N=216	Nuevo Leon, MX N=351
Gender		
Male	81 (37.5%)	131 (37.3%)
Female	135 (62.5%)	220 (62.7%)
Age (Mean, SD, Range)	65.54 (11.1) 34-88	59.36 (11.5) 31-94
Marital Status		
Married	108 (50.0%)	258 (73.5%)
Not married	108 (50.0%)	92 (26.2%)
Education		
Some high school or less	86 (39.8%)	235 (67.0%)
High school or greater	129 (59.7%)	116 (33.0%)
Currently employed		
Yes	85 (39.4%)	146 (41.6%)
No	129 (59.7%)	205 (58.4%)
Income (U.S.)		
\$20,000 or less/year	95 (44.0%)	270 (76.9%)
Greater than \$20,000/year	84 (38.9%)	45 (12.8%)
Health care insurance		
Yes	199 (92.1%)	333 (94.9%)
No	17 (7.9%)	16 (4.6%)
Personal health care provider		
Yes	184 (85.2%)	265 (75.5%)
No	29 (13.4%)	86 (24.5%)
Body mass index (BMI)		
25 kg/m ² or less	42 (19.4%)	58 (16.5%)
Greater than 25 kg/m ²	156 (72.2%)	260 (74.1%)
Exercise		
Yes	146 (67.6%)	161 (45.6%)
No	63 (29.2%)	188 (53.6%)
Current smoker		
Yes	21 (9.7%)	48 (13.7%)
No	65 (30.1%)	299 (85.2%)

Note: Numbers vary because of refused or not sure or missing values
SD = Standard deviation

Results: T2DM Self-Management Behaviors

Variable	AZ Border Counties N=216	Nuevo Leon, MX N=351
Age at diabetes diagnosis (Mean, SD, Range)	52.54 (13.3) 6-80	47.31 (12.3) 8-81
Years with diabetes (Mean, SD, Range)	12.53 (11.2) 0.51	12.26 (9.8) 1-59
Currently taking insulin		
Yes	67 (31.0%)	120 (34.2%)
No	148 (68.5%)	228 (65.0%)
Check blood sugar		
Never	21 (9.7%)	79 (22.5%)
Daily	131 (60.6%)	31 (8.8%)
Weekly	45 (20.8%)	60 (17.1%)
Monthly	11 (5.1%)	86 (24.5%)
Yearly	2 (0.9%)	73 (20.8%)
Check feet for sores		
Never/No feet	21 (9.7%)	53 (15.1%)
Daily	150 (69.4%)	199 (56.7%)
Weekly	26 (12.0%)	66 (18.8%)
Monthly	11 (5.1%)	13 (3.7%)
Yearly	3 (1.4%)	7 (2.0%)
Times in past 12 months seen HCP for diabetes care (Mean, SD, Range)	4.49 (8.3) 0-76	9.09 (6.8) 0-102
Times in past 12 months HCP checked A1C (Mean, SD, Range)	2.67 (2.3) 0-20	2.61 (2.7) 0-12
Times in past 12 months HCP checked feet for sores (Mean, SD, Range)	2.12 (2.7) 0-22	3.54 (4.7) 0-20
Had eye exam with pupil dilation		
Never	19 (8.8%)	142 (40.5%)
Within past month	44 (20.4%)	29 (8.3%)
Within past year	96 (44.4%)	90 (25.6%)
Within past 2 years	31 (14.4%)	23 (6.6%)
2 or more years ago	22 (10.2%)	56 (16.0%)
Told diabetes affected eyes or have retinopathy		
Yes	47 (21.8%)	145 (41.3%)
No	166 (76.9%)	198 (56.4%)
Taken a diabetes management course or class		
Yes	109 (50.5%)	147 (41.9%)
No	105 (48.6%)	199 (56.7%)

Conclusions

- This study is the first to use BRFSS diabetes items to examine demographic characteristics, diabetes self-management behaviors and diabetes care delivered by a health care provider between AZ border Hispanics and residents of Monterrey, MX diagnosed with T2DM.
- Despite robust evidence for shared treatment protocols and self-management education for diabetes control and prevention of complications, a gap continues to exist in translating the evidence into binational clinical practice and in engaging US-MX border residents in T2DM self-management behaviors.
- Conducting research in a bicultural and binational environment is complex and requires a skilled and expert interprofessional team. Approaching the US-MX border region as an integral epidemiological unit in which standards of diabetes care are consistently implemented and binational data collection tools and data analysis are shared, has the potential to strengthen diabetes surveillance, binational policies for decreasing diabetes health disparities and informing the development, effective targeting, and evaluation of future binational health interventions in this unique geopolitical region



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- **McEwen, M.M.**, Rogelio Elizondo-Pereo, R., **Pasvogel, A.**, Meester, I., Vargas-Villarreal, J. & **González-Salazar, F.** (2017). A Modified Behavior Risk Factor Surveillance System to Assess Diabetes Self-Management Behaviors and Diabetes Care in Monterrey Mexico: A Cross-Sectional Study. *Frontiers in Public Health*, 02 May 2017 | <https://doi.org/10.3389/fpubh.2017.00097>
- **McEwen, M.M.**, Lin, P.C. & **Pasvogel, A.** (2013). Analysis of Behavior Risk Factor Surveillance System Data to Assess the Health of Hispanics with Diabetes in US-Mexico Border Communities. *Diabetes Educator*, 39(6), 742-751. DOI: 10.1177/0145721713504629
- **McEwen, M.M.**, **González-Salazar, F.**, **Pasvogel, A.**, Elizondo-Pereo, R., Meester, I. & Vargas-Villarreal, J. Challenges in conducting binational (U.S.-Mexico) community-based research. In Review.

