Health of the Mexican population: Results from the Mexican Family Life Survey (MxFLS)

Eileen Crimmins, USC
Thom McDade, Northwestern
Luis Rubalcava, CAMBS
Teresa Seeman, UCLA
Graciela Teruel, UIA
Duncan Thomas, Duke
Mexican Family Life Survey (MxFLS)
Mexican Family Life Survey

Longitudinal survey of individuals, households and communities in Mexico

MxFLS1  2002  8,400 HHs
35,000 individuals (all ages)
Population representative

MxFLS2  2005-6  Follow baseline respondents
& children born after baseline
All HH members: ivw & health assess

MxFLS3  2009-13  Same protocol as MxFLS2
Mexican Family Life Survey

Longitudinal survey of individuals, households and communities in Mexico

MxFLS1  2002  8,400 HHs
35,000 individuals (all ages)
Population representative

MxFLS2  2005-6  Follow baseline respondents & children born after baseline
All HH members: ivw & health assess
90% recontact

MxFLS3  2009-13  Same protocol as MxFLS2
87% recontact
## Biomarkers in MxFLS

<table>
<thead>
<tr>
<th>Assessments (all conducted in home)</th>
<th>MxFLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height (Shorr board)</td>
<td>✅</td>
</tr>
<tr>
<td>Weight (SECA scale)</td>
<td>✅</td>
</tr>
<tr>
<td>Blood pressure (Omron cuff)</td>
<td>✅</td>
</tr>
<tr>
<td>Hb (Hemocue)</td>
<td>✅</td>
</tr>
<tr>
<td>HbA1c (In2It)</td>
<td>✅</td>
</tr>
<tr>
<td>Total cholesterol (CardioCheck)</td>
<td>✅</td>
</tr>
<tr>
<td>HDL</td>
<td>✅</td>
</tr>
<tr>
<td>DBS – [CRP in process]</td>
<td>✅</td>
</tr>
</tbody>
</table>

HbA1c, total chol, HDL: All resp age>=45
Random sub sample resp age 15-44.
Health of adult Mexicans
MxFLS: Biomarkers, age and gender

![Graph showing the percentage of obese individuals by age and gender.](image-url)
MxFLS: Biomarkers, age and gender
MxFLS: Biomarkers, age and gender

- **% Obese**
  - Females
  - Males

- **% Hypertensive**
  - (BP>140 or 90|diagnosis)

- **% Diabetes**
  - (HbA1c>6 |diagnosis)
MxFLS: Biomarkers, age and gender

- **% Obese**
  - Females
  - Males

- **% Hypertensive**
  - (BP>140 or 90 | diagnosis)

- **% Diabetes**
  - (HbA1c>6 | diagnosis)

- **% Elev cholesterol**
  - (Total chol>200)
Health disparities:
Biomarkers and education
MxFLS: Biomarkers and education

Control age, municipality

Better educated females on vanguard of nutrition transition
MxFLS: Biomarkers and education

- **% Obese**:
  - Females: % Obese decreases with increasing years of education.
  - Males: % Obese increases with increasing years of education.

- **% elev HbA1c**:
  - (HbA1c > 6 | diagnosis): % elev HbA1c decreases with increasing years of education.
MxFLS: Biomarkers and education

- **BMI > 30**
  - Females: 20%
  - Males: 25%

- **BP > 140 or 90 | diagnosis**
  - Females: 15%
  - Males: 20%

- **HbA1c > 6 | diagnosis**
  - Females: 25%
  - Males: 30%

- **Total chol > 200**
  - Females: 25%
  - Males: 30%

Graphs show the percentage of individuals with each biomarker over different years of education.
MxFLS: Biomarkers and education

% Obese

% Hypertensive

% elev HbA1c

% elev Cholesterol
Health of Mexican migrants in US
Health of Mexican migrants in US

Mexican-origin migrants in better health than native born
Why?

1. Migrants selected on good health

2a. Migrants in poorer health return to Mexico
2b. Migrants become healthier in US

⇒ Mexican migrants in US should be healthier than people like them in Mexico
Health of Mexican migrants in US

Tracked & interviewed baseline respondents who moved to US

MxFLS1  2002  8,400 HHs, 35,000 individuals
         Population representative

MxFLS2  2005-6  Follow baseline respondents
              90% recontact

MxFLS3  2009-13  87% recontact
Health of Mexican migrants in US

Tracked & interviewed baseline respondents who moved to US

MxFLS1  2002  8,400 HHs, 35,000 individuals
          Population representative

MxFLS2  2005-6  Follow baseline respondents
             90% recontact
             91% if in US

MxFLS3  2009-13  87% recontact
                88% if in US
Health of Mexican migrants in US

Tracked & interviewed baseline respondents who moved to US

MxFLS1  2002  8,400 HHs, 35,000 individuals
Population representative

MxFLS2  2005-6  Follow baseline respondents
90% recontact
91% if in US

MxFLS3  2009-13  87% recontact
88% if in US

MxFLS respondents interviewed in US:
Representative of Mexican-origin migrants moved to US after 2002
>90% undocumented; estimate 25% undercount in ACS;
undercount concentrated among those who are both less educated
and lower income (and possibly less healthy).
### Health of Mexican migrants to US relative to those who stay in Mexico

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>US - Mex Mean</td>
<td>US - Mex Mean</td>
</tr>
<tr>
<td>% obese (BMI&gt;30)</td>
<td>25.3</td>
<td>34.3</td>
</tr>
</tbody>
</table>

Sample: 9,200 males and 11,390 females age 18 to 75 at time of MxFLS3 assessment.
Health of Mexican migrants to US relative to those who stay in Mexico

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>US - Mex</td>
<td>US - Mex</td>
</tr>
<tr>
<td>% obese (BMI&gt;30)</td>
<td>25.3</td>
<td>34.3</td>
</tr>
<tr>
<td></td>
<td>[7.8]</td>
<td>[4.7]</td>
</tr>
<tr>
<td></td>
<td>[1.8]</td>
<td>[3.0]</td>
</tr>
</tbody>
</table>

Sample: 9,200 males and 11,390 females age 18 to 75 at time of MxFLS3 assessment.
Note: [Standard error] Red= sig at 5%.
US-Mex = difference adjusting for age and education
Health of Mexican migrants to US relative to those who stay in Mexico

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>% obese</td>
<td>Mean 25.3 US-Mex 7.8</td>
<td>Mean 34.3 US-Mex 4.7</td>
</tr>
<tr>
<td>(BMI&gt;30)</td>
<td>[1.8] Family FE 8.4</td>
<td>[3.0] Family FE 4.6</td>
</tr>
</tbody>
</table>

Sample: 9,200 males and 11,390 females age 18 to 75 at time of MxFLS3 assessment.

Note: [Standard error] Red=sig at 5%.

US-Mex = difference adjusting for age and education

Family FE = within family differences between migrants and those in Mexico
Health of Mexican migrants to US relative to those who stay in Mexico

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>US - Mex</td>
</tr>
<tr>
<td>% obese (BMI&gt;30)</td>
<td>25.3</td>
<td>7.8</td>
</tr>
<tr>
<td></td>
<td>[1.8]</td>
<td>[1.8]</td>
</tr>
<tr>
<td>% HTN (BP=120/90</td>
<td>diag)</td>
<td>27.0</td>
</tr>
<tr>
<td></td>
<td>[2.1]</td>
<td>[2.1]</td>
</tr>
</tbody>
</table>

Sample: 9,200 males and 11,390 females age 18 to 75 at time of MxFLS3 assessment.
Note: [Standard error] Red=sig at 5%.
US-Mex = difference adjusting for age and education
Family FE = within family differences between migrants and those in Mexico
# Health of Mexican migrants to US relative to those who stay in Mexico

|                      | Males | | | | | | Females | | | |
|----------------------|-------|---|---|---|---|---|---|-------|---|---|---|---|---|
|                      | Mean  | US - Mex | Family FE | Mean  | US - Mex | Family FE | | | | | | |
| % obese (BMI>30)     | 25.3  | 7.8 [1.8] | 8.4 [1.8] | 34.3  | 4.7 [3.0] | 4.6 [3.0] | | | | | | |
| % HTN (BP=120/90|diag) | 27.0  | 8.2 [2.1] | 10.5 [2.1] | 21.6  | -3.0 [1.8] | -1.4 [1.8] | | | | | |

Sample: 9,200 (4,800) males and 11,390 (4,800) females age 18 to 75 at time of MxFLS3 assessment.
Note: [Standard error] Red= sig at 5%.
US-Mex = difference adjusting for age and education
Family FE = within family differences between migrants and those in Mexico
## Health of Mexican migrants to US relative to those who stay in Mexico

<table>
<thead>
<tr>
<th></th>
<th>Males Mean</th>
<th>US - Mex</th>
<th>Family FE</th>
<th>Females Mean</th>
<th>US - Mex</th>
<th>Family FE</th>
</tr>
</thead>
<tbody>
<tr>
<td>% obese (BMI&gt;30)</td>
<td>25.3</td>
<td>7.8</td>
<td>8.4</td>
<td>34.3</td>
<td>4.7</td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td>[1.8]</td>
<td>[1.8]</td>
<td></td>
<td>[3.0]</td>
<td>[3.0]</td>
<td></td>
</tr>
<tr>
<td>% HTN (BP=120/90</td>
<td>27.0</td>
<td>8.2</td>
<td>10.5</td>
<td>21.6</td>
<td>-3.0</td>
<td>-1.4</td>
</tr>
<tr>
<td>diag)</td>
<td>[2.1]</td>
<td>[2.1]</td>
<td></td>
<td>[1.8]</td>
<td>[1.8]</td>
<td></td>
</tr>
<tr>
<td>% diabetes (HbA1c&gt;5.7</td>
<td>59.6</td>
<td>9.6</td>
<td>19.6</td>
<td>63.1</td>
<td>8.1</td>
<td>8.7</td>
</tr>
<tr>
<td>diag)</td>
<td>[3.9]</td>
<td>[3.9]</td>
<td></td>
<td>[4.7]</td>
<td>[4.7]</td>
<td></td>
</tr>
<tr>
<td>% elev total chol</td>
<td>27.8</td>
<td>10.2</td>
<td>8.2</td>
<td>36.1</td>
<td>5.8</td>
<td>11.1</td>
</tr>
<tr>
<td>(&gt;200)</td>
<td>[3.0]</td>
<td>[3.0]</td>
<td></td>
<td>[2.9]</td>
<td>[2.9]</td>
<td></td>
</tr>
</tbody>
</table>

Sample: 9,200 (4,800) males and 11,390 (4,800) females age 18 to 75 at time of MxFLS3 assessment.

Note: [Standard error] Red=sig at 5%.

US-Mex = difference adjusting for age and education
Family FE = within family differences between migrants and those in Mexico
Health of Mexican migrants in US

Mexican-origin migrants in better health than native born

Why?

1. Migrants selected on good health (Little evid)

2a. Migrants in poorer health return to Mexico
2b. Migrants become healthier in US

⇒ Mexican migrants in US should be healthier than people like them in Mexico

But, Mexican migrants in US in worse health than those like them in Mexico (from same family)
Health of Mexican migrants in US

Mexican-origin migrants in better health than native born

Why?

1. Migrants selected on good health (Little evid)

2a. Migrants in poorer health return to Mexico
2b. Migrants become healthier in US

⇒ Mexican migrants in US should be healthier than people like them in Mexico

But, Mexican migrants in US in worse health than those like them in Mexico (from same family)

Possibly

Recent migrants are different

Samples in US not representative of Mexican migrants