Performance of Weighted and Non-weighted Estimators in a Cell-phone based Electoral Poll:

Olivia Carrillo-Gamboa
Rosa Isela Hernández-Zamora
Jesús Cantú-Escalante

Tecnológico de Monterrey
Monterrey, MEXICO

Washington, D.C.  November 5th. 2013
Study undertaken in the project:

Observatorio de Medios y Opinión Pública
(Media and Public Opinion Observatory)

Funds by:

Tecnológico de Monterrey and Fondo de Observación Electoral 2012 del Programa de las Naciones Unidas para el Desarrollo, PNUD.
(Fund for the 2012 elections observation. United Nations Development Programme, UNDP)
Study Goal

Estimate the electoral results of the 2012 presidential election in Mexico to take place on July 1\textsuperscript{st}...

- Four registered candidates: JVM; EPN; AMLO; GQT.

\textbf{NATIONAL Pre-election phone survey based on a sample of random cell phone numbers.}

\textbf{APPLIED from June 25th to June 28th 2012}

- 3304 Interviews
- 2436 planning to vote for registered candidates.
Surveys in Mexico

• Electoral polls and surveys directed to open adult population in Mexico have being used widely for more than two decades.

  – Most methodologies are based on household sampling procedures and face-to-face interviews.

  – Problem: Nowadays, household communities with restricted or no public access are too common for “middle” to “high” socioeconomic levels.

  – COVERAGE of target population should be a concern.
Telephone Interviews

- **Landline phone sample:**
  - Coverage of target population by landline sampling frames is becoming shorter in time:
  - Households in Mexico with landline phone:
    - 53% in 2007 (INEGI, 2007);
    - 44% in 2011 (INEGI, 2011).

Landline population coverage:
- 19% in 2007 (COFETEL, 2013);
- 17% in 2011 (COFETEL, 2013).
Telephone Interviews

- **Cell phone sample:**
  - Increasing coverage in time (COFETEL, 2013):
    - 64 subscriptions per 100 habitants (December 2007);
    - 87 subscriptions per 100 habitants (June 2012).
  - Reaches citizens from *all-profiles and everywhere*
  - Good practical results in previous local studies
Sample Description

Mobile Phone Sample vs Target Population
GENDER

- **Female**: 51.8% (Nominal List) vs 52.2% (Cell Phone Sample)
- **Male**: 48.2% (Nominal List) vs 47.8% (Cell Phone Sample)

Legend:
- **NOMINAL LIST (Citizens with right to vote)**
- **CELL PHONE SAMPLE**
Sample Description

Mobile Phone Sample vs Target Population

TYPE OF ZONE

Urban
- NOMINAL LIST (Citizens with right to vote): 69.6%
- CELL PHONE SAMPLE: 66.9%

Non urban
- NOMINAL LIST (Citizens with right to vote): 30.4%
- CELL PHONE SAMPLE: 33.1%
Sample Description

Mobile Phone Sample vs Target Population

Region:
- North: 26.0% (Nominal List) vs 28.6% (Cell Phone Sample)
- Center: 47.8% (Nominal List) vs 49.3% (Cell Phone Sample)
- South: 26.2% (Nominal List) vs 22.1% (Cell Phone Sample)

Legend:
- NOMINAL LIST (Citizens with right to vote)
- CELL PHONE SAMPLE
Sample Description

Mobile Phone Sample vs Target Population

AGE GROUPS

<table>
<thead>
<tr>
<th>AGE GROUP</th>
<th>Percent of cases</th>
<th>Nominal List</th>
<th>Mobile Phone Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-19 years</td>
<td>34.5%</td>
<td>7.3%</td>
<td>4.4%</td>
</tr>
<tr>
<td>20-29 years</td>
<td>26.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-39 years</td>
<td>23.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-49 years</td>
<td>25.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50-59 years</td>
<td>18.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60+ years</td>
<td>12.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>14.4%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AGE GROUP

NOMINAL LIST (Citizens with right to vote)

CELL PHONE SAMPLE

Percent of cases

0.0%  5.0%  10.0%  15.0%  20.0%  25.0%  30.0%  35.0%  40.0%
## Voting Preferences

<table>
<thead>
<tr>
<th>Age Group</th>
<th>JVM</th>
<th>EPN</th>
<th>AMLO</th>
<th>GQT</th>
<th>Someone else</th>
<th>Undecided</th>
<th>Null vote</th>
<th>No response</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-19 years</td>
<td>35</td>
<td>68</td>
<td>65</td>
<td>16</td>
<td>1</td>
<td>30</td>
<td>4</td>
<td>21</td>
<td>240</td>
</tr>
<tr>
<td>20-29 years</td>
<td>199</td>
<td>317</td>
<td>299</td>
<td>41</td>
<td>4</td>
<td>183</td>
<td>17</td>
<td>79</td>
<td>1139</td>
</tr>
<tr>
<td>30-39 years</td>
<td>169</td>
<td>242</td>
<td>197</td>
<td>18</td>
<td>1</td>
<td>124</td>
<td>6</td>
<td>70</td>
<td>827</td>
</tr>
<tr>
<td>40-49 years</td>
<td>126</td>
<td>168</td>
<td>107</td>
<td>10</td>
<td>1</td>
<td>73</td>
<td>6</td>
<td>71</td>
<td>562</td>
</tr>
<tr>
<td>50-59 years</td>
<td>48</td>
<td>112</td>
<td>70</td>
<td>4</td>
<td>1</td>
<td>58</td>
<td>4</td>
<td>54</td>
<td>351</td>
</tr>
<tr>
<td>60+ years</td>
<td>34</td>
<td>57</td>
<td>34</td>
<td>0</td>
<td>2</td>
<td>25</td>
<td>1</td>
<td>32</td>
<td>185</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>611</td>
<td>964</td>
<td>772</td>
<td>89</td>
<td>10</td>
<td>493</td>
<td>38</td>
<td>327</td>
<td>3304</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>18.5%</th>
<th>29.2%</th>
<th>23.4%</th>
<th>2.7%</th>
<th>0.3%</th>
<th>14.9%</th>
<th>1.2%</th>
<th>9.9%</th>
<th>100.0%</th>
</tr>
</thead>
</table>
Estimates and Official Results ("Effective" votes)

WEIGHTED AND NON WEIGHTED ESTIMATES
vs
OFFICIAL RESULTS

40.562% 39.190% 39.573%
30.813% 32.400% 31.691%
25.568% 26.060% 25.082%
3.057% 2.350% 3.654%

JVM  EPN  AMLO  GQT

Age Weighted  Official Results  Nonweighted
Closeness to Official Results: Unweighted estimator performs better
The Nominal List is NOT the Target Population

Mobile Phone Sample vs Nominal List Population

AGE GROUPS

PERCENT OF CASES

<table>
<thead>
<tr>
<th>AGE GROUP</th>
<th>NOMINAL LIST (Citizens with right to vote)</th>
<th>CELL PHONE SAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-19 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-39 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-49 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50-59 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60+ years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
“Real” Target Population seems YOUNGER (voters from post-electoral survey, n=3171)
Young voters

• Younger voters seem to have had a stronger participation than in previous federal (intermediate) elections (IFE, 2011).

Some possible explanations of younger voters

• Events at universities all over the country.
• Young voters activism:
  – #Yosoy132 movement.
  – Role of internet and social networks (university students AND not students as well).
How the mobile point estimates compare to published surveys

DIFF EPN

<table>
<thead>
<tr>
<th>Survey</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCG-Nonweighted</td>
<td>0.4%</td>
</tr>
<tr>
<td>MERCAEI</td>
<td>0.7%</td>
</tr>
<tr>
<td>María de las Heras/UNOTV</td>
<td>0.8%</td>
</tr>
<tr>
<td>OCG-Weighted</td>
<td>1.4%</td>
</tr>
<tr>
<td>Reforma</td>
<td>1.8%</td>
</tr>
<tr>
<td>Covarrubias-SDP Noticias</td>
<td>1.8%</td>
</tr>
<tr>
<td>Votia</td>
<td>2.1%</td>
</tr>
<tr>
<td>PARAMETRÍA/Sol de México</td>
<td>4.7%</td>
</tr>
<tr>
<td>Con Estadística/Grupo Fórmula</td>
<td>4.8%</td>
</tr>
<tr>
<td>BGC-Excelsior</td>
<td>4.8%</td>
</tr>
<tr>
<td>IPSOS</td>
<td>4.8%</td>
</tr>
<tr>
<td>Buendía &amp;Laredo-El Universal</td>
<td>5.8%</td>
</tr>
<tr>
<td>Consulta Mitofsky</td>
<td>5.8%</td>
</tr>
<tr>
<td>GEA-ISA/Milenio</td>
<td>7.7%</td>
</tr>
<tr>
<td>Indermerc-Harris-El Financiero</td>
<td>8.0%</td>
</tr>
</tbody>
</table>
How the mobile point estimates compare to published surveys

DIFF AMLO

<table>
<thead>
<tr>
<th>Survey</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>María de las Heras/UNOTV</td>
<td>0.6%</td>
</tr>
<tr>
<td>OCG-Nonweighted</td>
<td>0.7%</td>
</tr>
<tr>
<td>Reforma</td>
<td>1.4%</td>
</tr>
<tr>
<td>MERCAEI</td>
<td>1.4%</td>
</tr>
<tr>
<td>Votia</td>
<td>1.5%</td>
</tr>
<tr>
<td>OCG-Weighted</td>
<td>1.6%</td>
</tr>
<tr>
<td>Covarrubias-SDP Noticias</td>
<td>2.4%</td>
</tr>
<tr>
<td>Consulta Mitofsky</td>
<td>3.4%</td>
</tr>
<tr>
<td>IPSOS</td>
<td>3.4%</td>
</tr>
<tr>
<td>PARAMETRÍA/Sol de México</td>
<td>3.7%</td>
</tr>
<tr>
<td>GEA-ISA/Milenio</td>
<td>3.9%</td>
</tr>
<tr>
<td>BGC-Excelsior</td>
<td>4.4%</td>
</tr>
<tr>
<td>Buendía &amp;Laredo-El Universal</td>
<td>4.5%</td>
</tr>
<tr>
<td>Indermerc-Harris-El Financiero</td>
<td>5.3%</td>
</tr>
<tr>
<td>Con Estadística/Grupo Fórmula</td>
<td>5.4%</td>
</tr>
</tbody>
</table>
How the mobile point estimates compare to published surveys

**DIFF JVM**

- Covarrubias-SDP Noticias: 0.1%
- OCG-Weighted: 0.5%
- OCG-Nonweighted: 1.0%
- Con Estadística/Grupo Fórmula: 1.1%
- BGC-Excelsior: 1.1%
- IPSOS: 1.1%
- MERCAEI: 1.1%
- Buendía & Laredo-El Universal: 1.7%
- Consulta Mitofsky: 2.1%
- Reforma: 2.1%
- PARAMETRÍA/Sol de México: 2.5%
- Votia: 3.0%
- María de las Heras/UNOTV: 3.1%
- Indermerc-Harris-El Financiero: 3.3%
- GEA-ISA/Milenio: 3.7%
How the mobile point estimates compare to published surveys

DIFF GQT

- GEA-ISA/Milenio: 0.2%
- Buendía & Laredo-El Universal: 0.4%
- Consulta Mitofsky: 0.4%
- IPSOS: 0.4%
- Indermerc-Harris-El Financiero: 0.6%
- Votia: 0.6%
- OCG-Weighted: 0.7%
- BGC-Excelsior: 0.7%
- Covarrubias-SDP Noticias: 0.7%
- MERCAEI: 1.0%
- OCG-Nonweighted: 1.3%
- PARAMETRÍA/Sol de México: 1.5%
- Con Estadística/Grupo Fórmula: 1.7%
- Reforma: 1.7%
- María de las Heras/UNOTV: 1.7%
How the mobile point estimates compare to published surveys

**TOTAL DIFFERENCES**

![Bar chart showing total differences between mobile point estimates and published surveys.](chart_image)
Estimating the “worst” case (p=0.5) can be seen as of the GENDER proportion estimation. Observed difference: ± 0.4 percent points
Conclusions

• Under the conditions applied in the electoral polls reported, cell phone sampling methodology does work for interviewing the open adult population in Mexico.

• Other than age group, population characteristics are very well reproduced by the samples.

• Age group-weighted and non-weighted estimators based on the mobile phone samples had an excellent performance with respect to other results published.
Conclusions

- The *non-weighted* estimator performed better, being closer to the official results.

- Weighting *may not be necessary* if the *real target* population is “younger” than the census population as in the 2012 presidential pre-electoral survey case.
Further Research

• Validate age group distribution of voting citizens.
  – Upcoming study from IFE on voters profile (IFE, 2012)
  – Analyze published data from exit polls
References


