The Mexican experience in the RS-10 project

Ricardo Pérez-Núñez
Outline

- **Background**
  - IMESEVI
  - RS-10
    - DUI
    - Safety restraint devices

- Driving Under the Influence
- Safety restraint devices
- Quality analysis of mortality data
- Concluding remarks
IMESEVI

- July 2008: M of H in Mexico (CENAPRA) partnered with WHO, funded by Bloomberg
- Risk factors: phase I
  - Helmet use
  - Driving under the influence of alcohol
  - Non-use of restraint devices (seatbelt, child restraints)
- Risk factors: phase II (not yet implemented)
  - Pedestrians
  - Speeding
  - Road safety education
IMESEVI

• 6 main components of intervention:
  – Diagnostic of the problem: information system
  – Social marketing campaigns (radio)
  – Educative programs (talks, workshops, youth camping)
  – Capacity development (police, health professionals)
  – Legal framework (identify changes needed)
  – Law enforcement
  – Prevention and promotion

• 4 targeted cities: Guadalajara (Jalisco), Mexico City, Monterrey (Nuevo León) and León (Guanajuato)
IMESEVI: results

• Great success claimed:
  – Decrease in number of deaths, injuries
  – Increment in seatbelt and child restraint use
  – Decrement of D&D

• Methodological issues:
  – Study design:
    • Ethical issues
    • Failure in using control groups
  – Not convincing evidence
RS-10 in Mexico

• Starting in January 2010:
  – A consortium of partners: local authorities, WHO/PAHO, JHU, EMBARQ, GRSP
  – JHU in charge of M&E with INSP support

• Risk factors:
  – Driving under the influence of alcohol
  – Non-use of restraint devices (seatbelt, child restraints)
RS-10 in Mexico

• Main components of interventions:
  – Social marketing campaigns (radio)
  – Educative programs (talks, workshops, youth camping)
  – Capacity development (police, health professionals, etc.)
  – Guadalajara: changes to D&D legislation
  – Alcohol checkpoints

• Implementing and M&E separated!

• Cities:
  – Guadalajara-Zapopan
  – León
Para hacer mapa de las dos ciudades!

http://sigsalud.insp.mx/naais/mapamex/

León, Guadalajara-Zapopan, Jalisco

León, Guanajuato 1,484,326 inhabs

Guadalajara-Zapopan, Jalisco 2,855,460 inhabs
Outline

• Background

• **Driving Under the Influence**
  – Analysis of indicators employed
  – Main findings

• Safety restraint devices

• Quality analysis of mortality data

• Concluding remarks
<table>
<thead>
<tr>
<th></th>
<th>Ideal indicator</th>
<th>Indicator used in RS-10</th>
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</thead>
<tbody>
<tr>
<td><strong>Pre-crash</strong></td>
<td>% Drivers UI</td>
<td>% Drivers stopped at checkpoints UI</td>
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<tr>
<td><strong>Crash</strong></td>
<td>% crashes due to D&amp;D</td>
<td>% crashes in which driver was UI</td>
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<td>Severity of crashes</td>
<td>% crashes: only property damage, with injured, with deaths</td>
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<td><strong>Post-crash</strong></td>
<td>#-rate-% Deaths attributed to D&amp;D</td>
<td>% Deaths with BAC+</td>
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<td>#-rate-% Injuries attributed to D&amp;D</td>
<td>% injured users with alcohol in breath / self-reporting</td>
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<td>#-rate-% Disabilities attributed to D&amp;D</td>
<td>NA</td>
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<td>Economic studies</td>
<td>NA</td>
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<tr>
<td>Indicator used in RS-10</td>
<td>Source of information</td>
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<tr>
<td>% Drivers stopped at checkpoints UI</td>
<td>1. Secondary information from police (secondary infraction, no report of “-”), delay</td>
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<td>2. Passive observation of checkpoints sampled</td>
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<td>Representative?, $</td>
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<tr>
<td>Infractions for D&amp;D</td>
<td>1. ATUS 1 year delay, only responsible driver reported, % unreported?, % unregistered?</td>
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<td>2. Police reports</td>
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<td>% Deaths with BAC+</td>
<td>SISVEA &amp; SEMEFO &lt;10% unreported, driving?, don’t know where RTI happened, hard to get</td>
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<tr>
<td>% injured users with alcohol in breath / self-reporting</td>
<td>1. SISVEA-Centinel representative? (small numbers), hard to get</td>
<td></td>
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<tr>
<td></td>
<td>2. Hospital injury surveillance (primary–secondary) $, self-report bias, 1 city, h to g, representative?</td>
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Alcohol and RTIs

Gdl-Zap

Leon

Sources of Information

95% CI
Main findings: alcohol

• Alcohol present in all type of road users!
• Alcohol related vs directly attributed to alcohol
  – Four wheelers: where they driving?
  – % pedestrian injuries caused by DUI
• Difficult to evaluate time trend: in process!
Outline

• Background
• Driving Under the Influence
• Safety restraint devices
  – Analysis of indicators employed
  – Main findings
• Quality analysis of mortality data
• Concluding remarks
Use of safety restraint devices

- Prevalence of use in general population
  - Road side observations (primary information)
    Representative?, no information on knowledge and attitudes

- Prevalence of use in drivers (collisions)
  - Analysis of ATUS database (secondary information, validated)
    No data on passengers, 49-99% not registered, 10 months delay once per year
Use of safety restraint devices

- **Use in RT injured attending medical units**
  - representative?, self-report bias sample size
  - $, representative?, 1 city, self-report bias, sustainable?
  - Representativeness: few hospitals reporting (none private), sample size, hard to get, quality of info

- **Traffic fines**
  - Child restraints are mandatory in Mexico, but not in legislation of León, no information on level of local law enforcement (1/10 child restraints and 5/10 seatbelts)
Prevalence of seatbelt use (%)

Drivers

León                      Guadalajara-Zapopan             Cuernavaca

Front- seat

Rear-seat

39.3% (38.3-40.3)

45.4% (44.7-46.1)

53.7% (52.7-54.7)

95% CI
Prevalence of child restraint use (%)

- León: 17.1% (14.2-20.2)
- Guadalajara-Zapopan: 8.2% (5.8-11.2)
- Cuernavaca: 8.1% (5.1-12.2)

All passengers <5 years

95% CI
Uso de cinturón de seguridad

Gdl-Zap

Leon

Sources of Information

95% CI
Main findings: seatbelt

• Injured report less seatbelt use rates than what it’s observed in general population

• An increase in restraint it’s been observed in drivers of Guadalajara-Zapopan:
  – Less injuries/severity?
  – Same phenomenon observed in Cuernavaca
Main findings: child restraints

• No changes have been observed in the two (three) cities
Outline

• Background
• Driving Under the Influence
• Safety restraint devices
• Quality analysis of mortality data
  – Garbage coding
  – Approaches to data quality improvements
  – Potential underestimation
• Concluding remarks
Four corrections made

• According to GBD: good coverage of mortality registration
• We still have “garbage codes” (not useful for public health analysis of mortality):
  1. “R” codes: ill-defined or unknown cause of death
  2. “Y32-34” codes: intentionality not specified
  3. “X59” codes: other and non correctly specified non-intentional injuries
  4. “V87, V892 y V899” codes: other RTI (mode of transportation not specified)
Total number of death

Group I: Communicable, maternal, perinatal and nutritional

Group II: Noncommunicable diseases

Group III: Injuries

Grabage codes (all R)

# Injured (adjusted)

Intentional

Non - Intentional

Unspecified (ICD codes Y10 – Y34)

# Non intentional injured (adjusted)

Accidental Poisoning

Forces of nature

Contact with venomous animals and plants

Heat, hot substances

Smoke, fire and flames

Electricity, radiation, extreme temperature and pressure

Other threats to breathing

Drowning

Animate mechanical forces

Inanimate mechanical forces

Transport

Other

Unspecified (ICD codes X50-X59)

# Injured due to transport (adjusted)

Pedestrians

Cyclists

Motorcyclists

Occupants >=4 wheels

Other

Unspecified (ICD codes V87-V892, V899)

# Non-traffic injuries

# Road traffic injuries (adjusted)

Pedestrians

Cyclists

Motorcyclists

Occupants >=4 wheels

Other
Misclasification of deaths

Increment 19.3%

Number of garbage codes per year and type

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
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<th>2001</th>
<th>2002</th>
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<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
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<tbody>
<tr>
<td>R codes</td>
<td>9,474</td>
<td>8,648</td>
<td>9,311</td>
<td>9,444</td>
<td>9,976</td>
<td>9,463</td>
<td>9,509</td>
<td>9,466</td>
<td>10,577</td>
<td>10,529</td>
<td>11,995</td>
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<tr>
<td>Y32-Y34 codes</td>
<td>1,680</td>
<td>1,291</td>
<td>1,164</td>
<td>1,408</td>
<td>1,342</td>
<td>1,405</td>
<td>1,256</td>
<td>1,263</td>
<td>901</td>
<td>961</td>
<td>1,043</td>
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<tr>
<td>X59 codes</td>
<td>7,630</td>
<td>8,140</td>
<td>8,035</td>
<td>7,871</td>
<td>7,124</td>
<td>6,849</td>
<td>7,094</td>
<td>6,999</td>
<td>11,092</td>
<td>9,211</td>
<td>8,740</td>
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<tr>
<td>V87-V892 and V899 codes</td>
<td>5,032</td>
<td>4,980</td>
<td>5,149</td>
<td>5,464</td>
<td>5,759</td>
<td>6,097</td>
<td>6,689</td>
<td>7,033</td>
<td>6,299</td>
<td>7,692</td>
<td>7,512</td>
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<td>V99</td>
<td>78</td>
<td>29</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
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<td>1</td>
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</tbody>
</table>

Fuente: SSA, INEGI, varios años
RT mortality rate trend in Mexico

Fuente: INSP-JHU, 2011
Potential underestimation of RTI due to misclassification

[Graph showing the percentage of potential underestimation of RTI over years, with three methods: Proportional method, Multiple imputation method, and Regression method. The graph indicates an average of 27% to 34% over the years 1999 to 2009.]

Fuente: INSP-JHU, 2011
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**Concluding remarks**
- Lessons learnt
- Missing information
- Contributions to local knowledge
- Reflections
Lessons learnt...

• More information than we thought it was available!
  – In many places
  – Long processes required to access it (sometimes impossible!): there is an urgent need to share information and to be accountable!
  – Quality issues: mortality registration
    • Some adjustments were both needed and possible to be done
Missing information

• Transport:
  – Systematic and continuous georeferencing of collisions-injuries deaths

• Health:
  – Hospital discharge information from ~50% of public sector and 100% from private sector
  – Poor ER information
  – Disabilities caused by RTI
  – Attributable burden due to different risk factors (alcohol, seatbelt, child-restraints, helmet, etc)

• Data linkage per injured-death:
  – Police information on the collision
  – ER information
  – Hospital information
  – Forensic information
Contribution to local knowledge

• Potential underestimation of RT mortality in Mexico

• Seat-belt and child restraint use

• Mobile phone use while driving & riding
Future contributions (2013)...

• Short term impact of IMESEVI & RS-10

• Intention to change behavior after being exposed to different road safety interventions
  – Híjar M, Pérez-Núñez R, Santoyo-Castillo D, Lunnen JC, Chandran A, Celis A, Carmona-Lozano MS, Hyder AA. Attitude change in youth after being exposed to different road safety interventions in two Mexican cities. To be sent during 2013

• Helmet use
Some reflections…

• About the interventions
  – No good communication amongst partners: improving
  – Are evidenced based?
    • Changes to alcohol legislation in Guadalajara-Zapopan does not allow police to perform random screening
    • Long administrative process to enforce law
  – Focus on the most adequate road user?

• Expansion to other 4 cities during 2013
  – We are not participating in the process
  – The best way to go?: same interventions = same mistakes?
  – M&E not being considered: missing the opportunity life is giving us!
Gracias...
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