DEVELOPING CHILD ROAD SAFETY INDICATORS FOR COMMUNITIES

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Orly Silbinger, CEO, Beterem – Safe Kids Israel
Liri Endy-Findling, Sharon Levi, Victoria Gitelman
About Israel

Area of the country: 22,072 sq. km.

Population-Total 7,243,600

Child Population- 2,300,000

Children age 0-14 make up 28.4% of the population

Population density
(persons per km²) 315.6

Jews and Others 80.0%

Arabs 20.0%
Children as Vulnerable Road Users

In 2008 *

- **64%** of child fatalities and severe injuries on Israel’s roads were as pedestrians
- **10%** as bicyclists

*Israel National Road Safety Authority 2009*
Why are Children Vulnerable Road Users?

- Due to limitations in cognitive, physical, sensory, and behavioral development
  - Ability to hear and see
  - Ability to judge distance and space
  - Ability to scan the environment

- Environment is not designed for children
  - Fast and heavy traffic
  - Poor visibility
  - Lack of play facilities

- Adults overestimate a child’s ability


Child Road Safety Indicators for Communities

- **Research initiative** to develop indicators and general assessment method to diagnose and promote child road safety issues in local communities.
- Developed **by interdisciplinary team**
- **Analysis conducted** to create a **composite indicator** of child road safety in a city
Indicators developed cover children travelling by bicycle, vehicle and as pedestrians

- Child injury data
- Behavioral observations
- KAP surveys
- Management analysis
- Infrastructure and walkability assessments
- Surveys of children's trips
Child Road Safety Indicators for Communities

Pilot study conducted in four municipalities

1. Bat Yam
2. Bnei Brak
3. Herzliya
4. Kefar Kassem

Thank you for the cooperation!
Sampling in the Urban Area

Representative sample of neighbourhoods in each city based on

- Census track
- Socio-demographic
- GIS data
- Land-use
- Building density
- Roads

Survey sites were selected based on the sample with additional pertinent sites added for observational surveys as necessary
Results
Use of seatbelts and child restraints

<table>
<thead>
<tr>
<th>Location</th>
<th>Unrestrained</th>
<th>Restrained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>38%</td>
<td>62%</td>
</tr>
<tr>
<td>Kefar Kassem</td>
<td>45%</td>
<td>55%</td>
</tr>
<tr>
<td>Bnei Brak</td>
<td>56%</td>
<td>44%</td>
</tr>
<tr>
<td>Bat Yam</td>
<td>68%</td>
<td>32%</td>
</tr>
<tr>
<td>Hertzeliya</td>
<td>12%</td>
<td>88%</td>
</tr>
</tbody>
</table>
**Arrival to School**

**Mode of travel to school**

- **Kefar Kassem (n=623)**
  - Pedestrian, 94%
  - POV, 34%
- **Bnei Brak (n=924)**
  - Pedestrian, 94%
  - POV, 34%
- **Bat Yam (n=723)**
  - Pedestrian, 66%
  - Pedestrian, 88%
- **Hertzliya (n=645)**
  - Pedestrian, 59%
  - POV, 38%

Cremer’s V = .26, p < .00
Helmet Use

<table>
<thead>
<tr>
<th>City</th>
<th>Yes (%)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hertzliya</td>
<td>80%</td>
<td>20%</td>
</tr>
<tr>
<td>Bat Yam</td>
<td>97%</td>
<td>3%</td>
</tr>
<tr>
<td>Bnei Brak</td>
<td>96%</td>
<td>4%</td>
</tr>
<tr>
<td>Kefar Kassem</td>
<td>95%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Cremer's $V = .251$, $p < .0$
### Travel accompaniment and mode

<table>
<thead>
<tr>
<th>Accompaniment</th>
<th>Pedestrian</th>
<th>Adult, Other</th>
<th>Parent</th>
<th>Sibling</th>
<th>With Peers</th>
<th>Alone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alone</td>
<td>82%</td>
<td>63%</td>
<td>17%</td>
<td>100%</td>
<td>87%</td>
<td>85%</td>
</tr>
<tr>
<td>With Peers</td>
<td>8%</td>
<td>21%</td>
<td>82%</td>
<td>0%</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>Sibling</td>
<td>6%</td>
<td>4%</td>
<td>100%</td>
<td>5%</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>Parent</td>
<td>5%</td>
<td>4%</td>
<td>87%</td>
<td>5%</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>Adult, Other</td>
<td>4%</td>
<td>6%</td>
<td>5%</td>
<td>100%</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>Pedestrian</td>
<td>8%</td>
<td>21%</td>
<td>82%</td>
<td>100%</td>
<td>87%</td>
<td>85%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>6%</td>
<td>4%</td>
<td>100%</td>
<td>5%</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>Pupil Transport</td>
<td>5%</td>
<td>4%</td>
<td>87%</td>
<td>5%</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>Bus</td>
<td>4%</td>
<td>6%</td>
<td>5%</td>
<td>100%</td>
<td>5%</td>
<td>6%</td>
</tr>
</tbody>
</table>
Factor analysis was used to identify correlation between different indicators

A composite index was identified for each layer of indicators

The analysis resulted in an essential set of road safety indicators

Visual tools were developed to present comparisons across municipalities
Comparison of Child Road Safety Scores

- Ranking of municipalities in pilot study- score for each type of indicator and composite score
- Table will expand as more cities are evaluated

<table>
<thead>
<tr>
<th>City</th>
<th>Background Indicators</th>
<th>Injury Indicators</th>
<th>Behavior Indicators</th>
<th>KAB Indicators</th>
<th>Management Indicators</th>
<th>Summary Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hertzliya</td>
<td>1</td>
<td>1-2</td>
<td>1</td>
<td>1</td>
<td>1-2</td>
<td>1</td>
</tr>
<tr>
<td>Bat Yam</td>
<td>2</td>
<td>1-2</td>
<td>2-3</td>
<td>2-3</td>
<td>1-2</td>
<td>2</td>
</tr>
<tr>
<td>Bnei Brak</td>
<td>3</td>
<td>4</td>
<td>2-3</td>
<td>2-3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Kefar Kassem</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
Conclusions

• Children are vulnerable to injury on roads
• Children are in fact on the roads traveling in the city
• Differences across the cities in the study
• Each of the measurements provides unique data
• An essential set of child road safety indicators is available for future evaluation
Next Steps

• Expand to a larger sample of cities
• Publication of the tools and methodology for use by local communities
• Encourage cities to conduct measurements using the indicators
• Encourage cities to tailor road safety interventions based on the results of the measurements
Our Vision-
A Safer World for Children

Thank you!

Orly Silbinger
CEO, Beterem – Safe Kids Israel
orlys@beterem.org