Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

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Injuries

- Group of diseases that cause some kind of physical, mental or psychological injury, may or may not lead to death

- Accidents and violence

Traffic accidents

- Unintentional event that can cause physical or emotional injuries

- Brazil - 2011
  - 15.8% of the admissions in hospitals were due road traffic accidents
  - Rate of 8 hospitalizations per 100,000 inhabitants

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1 WHO, 2001; 2 Brazil, 2011
Surveillance of accidents

“Vigilância de Violências e Acidentes” – “VIVA”
Surveillance

“Vigilância de Violências e Acidentes” – “VIVA”

Component I
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Surveillance

“Vigilância de Violências e Acidentes” – “VIVA”

Component I

Violence
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Surveillance

“Vigilância de Violências e Acidentes” – “VIVA”

Component I

Violence

Healthcare
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

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“Vigilância de Violências e Acidentes” – “VIVA”

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Healthcare

Continuous collection
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“Vigilância de Violências e Acidentes” – “VIVA”

Component I

Violence

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Component II

Continuous collection
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Surveillance

“Vigilância de Violências e Acidentes” – “VIVA”

Component I

Violence

Healthcare

Continuous collection

Component II

Violence and accidents
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Surveillance

“Vigilância de Violências e Acidentes” – “VIVA”

Component I

Violence

Healthcare

Continuous collection

Component II

Violence and accidents

Sampling of emergency services
Surveillance

“Vigilância de Violências e Acidentes” – “VIVA”

Component I

Violence

Healthcare

Continuous collection

Component II

Violence and accidents

Sampling of emergency services

Data collection for 30 days
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Surveillance

“Vigilância de Violências e Acidentes” – “VIVA”

**Component I**
- Violence
- Healthcare
- Continuous collection

**Component II**
- Violence and accidents
- Sampling of emergency services
- Data collection for 30 days
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Background

Vida no Trânsito Project

- Road Safety in 10 Countries Project - RS10
- Since June, 2010
- 5 cities - epidemiological and structural criteria
- Focus on speed and alcohol consumption
Data source for traffic accidents

- Possible data of traffic accidents are distributed in various other systems
  - Police Report
  - Newsletter Registration Traffic Accidents
  - Work Accident Communication
  - The National Poison Information
  - Mortality Information System
  - Hospital Information System
Background

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Hospital Information System—“SIH”

- Covers the public hospitals (federal, state, local), private or nonprofit hospitals
- Represents approximately 80% of total admissions in the country
- Records informations of hospitalizations
- Process these information
- Generates reports
- Source of epidemiological data
A study about the morbidity due to traffic accidents in Brazil is needed

• Due the magnitude of the traffic accidents
• Information about traffic accidents can be found in various sources
• Other previous studies only evaluate mortality

SIH can be a potential source for the monitoring traffic accidents
Objectives

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

- Describe the clinical and epidemiological characteristics of hospital admissions due to traffic accidents
- Evaluate the utility of the Brazilian Hospital Information System as a tool for monitoring the morbidity from motor vehicle accidents, and describe its attributes
- Assess the quality of information on traffic accidents through the relationship of databases of mortality and morbity
- Propose recommendations for monitoring and evaluation traffic accidents
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Methods

Population
Registered in the database of the Hospital Information System due to injuries resulting from traffic accidents

Period of study
2002-2011

Variables
Primary and secondary diagnosis
Sex
Age
Reason for leaving
Race / color
Ethnicity
State of residence
Character of attendance
### Classification of traffic accidents

<table>
<thead>
<tr>
<th>Traffic accidents</th>
<th>ICD X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Traffic Accidents - RTA</td>
<td></td>
</tr>
<tr>
<td>Pedestrian</td>
<td>V01 a V09</td>
</tr>
<tr>
<td>Cyclist</td>
<td>V10 a V19</td>
</tr>
<tr>
<td>Motorcyclist</td>
<td>V20 a V39</td>
</tr>
<tr>
<td>Vehicle occupant</td>
<td>V40 a V79</td>
</tr>
<tr>
<td>Others (train, agricultural vehicle, others)</td>
<td>V80 a V89</td>
</tr>
<tr>
<td>Accident by water traffic</td>
<td>V90 a V94</td>
</tr>
<tr>
<td>Accident by air of space traffic</td>
<td>V95 a V97</td>
</tr>
<tr>
<td>Other specific traffic accidents</td>
<td>V98</td>
</tr>
<tr>
<td>Non specific traffic accidents</td>
<td>V99</td>
</tr>
</tbody>
</table>

Methods
Methods

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Attributes

- Simplicity
  - Refers to the structure and ease of the system operation

- Evaluated the flow of the system’s information including the number of institutions involved; method of data entry; time spent on data entry; data forwarding, storage and dissemination;

- Consultation to technical manuals, published articles and dissertations that described the characteristics and functioning of SIH
Attributes

• Flexibility

• Flexible system is one capable to adapt to change in the necessity of information or operational conditions with little additional cost in terms of time, people and financial resources

• Among the selected variables were evaluated the alterations occurred between these, the system’s adaptation to these changes, and its completion
Methods

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Attributes

• Data quality
  • Reflects the completeness and validity of the data system
  • Among the variables, it was observed the completeness, by calculating the average of its completion in the period
  • Parameter - Information System for Notifiable Diseases (SINAN)
    • < 70% - poor
    • 70 to 89% - regular
    • ≥ 90% - excellent
  • Consistency of the main diagnostic - must be fulfilled with a diagnostic related in Chapter XIX of ICD 10
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Methods

Atributes

• Acceptability
  • Reflects the will of the people and institutions to participate in the information system
  • Evaluated the use of SIH as a data source because it was noticed that the system’s completion is mandatory, as it’s a billing system, and helps managers to make payments to health establishments
## Methods

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

### Attributes

- **Utility**
  - The system is useful when it contributes to the prevention and control of diverse sanitary events and when its data contributes to performance measurements.
  - Evaluated if the SIH meets its goals, if it has the capability to promote estimates of magnitude and characterization of hospital morbidity by road traffic accident.
Methods
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Softwares

Microsoft Excel 2010 ®

TabWin

• Created by the Ministry of Health
• Allows managing different kinds of information (hospitalization, mortality and population data)
• Perform arithmetic and statistical operations
• Elaborate all kinds of figures, including maps, from the tables’ data
• Available free of charge on the internet
Hospital Information System - SIH

- Implemented in 1990
- Received the collection of a previous system and its instrument (Authorization for Hospitalization – “AIH”)
- Comprehend the hospital units of the public service (federal, state and municipal) and contracted (private with or without lucrative means)
- Represent about 80% of the total hospitalizations in the country
- Data related to the identification of the patient, diagnostic, institution, procedures and values for payment
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Results

Information flow

If External Cause:
Principal Diagnostic = Cap XIX
Secondary Diagnostic = Cap XX
Results

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Database variables

- 67 variables

- Related to social demographic profile of the individuals, attendance service (hospitals) and to the performed procedures
Clinical and epidemiological characteristics of admissions due to traffic accidents

Brazil, 2002 to 2011:

- 117,169,635 admissions
  - 7,343,141 due to external causes
    - 666,042 in 2002
    - 881,123 in 2011
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Results

Proportion of hospitalization due external causes, by type of external cause, Brazil.  

- Falls
- Road traffic accidents
- Other accidental events
- Agressions
### Proportion of hospitalization by traffic accidents

<table>
<thead>
<tr>
<th>Traffic Accidents</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Road Traffic Accidents</td>
<td>95,5</td>
<td>96,2</td>
<td>95,8</td>
<td>95,4</td>
<td>95,5</td>
<td>95,2</td>
<td>92,1</td>
<td>91,8</td>
<td>90,6</td>
<td>88,1</td>
<td>93,3</td>
</tr>
<tr>
<td>Water traffic accidents</td>
<td>0,1</td>
<td>0,1</td>
<td>0,1</td>
<td>0,1</td>
<td>0,0</td>
<td>0,1</td>
<td>0,1</td>
<td>0,2</td>
<td>0,7</td>
<td>0,7</td>
<td>0,2</td>
</tr>
<tr>
<td>Air/ space traffic accidents</td>
<td>0,0</td>
<td>0,1</td>
<td>0,0</td>
<td>0,0</td>
<td>0,0</td>
<td>0,0</td>
<td>0,0</td>
<td>0,1</td>
<td>0,1</td>
<td>0,1</td>
<td>0,1</td>
</tr>
<tr>
<td>Other specific traffic accidents</td>
<td>0,7</td>
<td>0,9</td>
<td>0,8</td>
<td>0,9</td>
<td>0,5</td>
<td>0,6</td>
<td>0,7</td>
<td>0,3</td>
<td>0,3</td>
<td>0,5</td>
<td>0,6</td>
</tr>
<tr>
<td>Other Non-specific traffic accidents</td>
<td>3,7</td>
<td>2,8</td>
<td>3,3</td>
<td>3,7</td>
<td>3,9</td>
<td>4,1</td>
<td>7,1</td>
<td>7,6</td>
<td>8,3</td>
<td>10,7</td>
<td>5,8</td>
</tr>
</tbody>
</table>
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Results

Rate of hospitalization according to the victim’s characteristics

<table>
<thead>
<tr>
<th>Year of hospitalization</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian</td>
<td>30.0</td>
<td>25.0</td>
<td>20.0</td>
<td>15.0</td>
<td>10.0</td>
<td>7.0</td>
<td>5.0</td>
<td>4.0</td>
<td>3.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Cyclist</td>
<td>10.0</td>
<td>8.0</td>
<td>6.0</td>
<td>5.0</td>
<td>4.0</td>
<td>3.0</td>
<td>2.0</td>
<td>1.0</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Motorcyclist</td>
<td>15.0</td>
<td>12.0</td>
<td>10.0</td>
<td>9.0</td>
<td>8.0</td>
<td>7.0</td>
<td>6.0</td>
<td>5.0</td>
<td>4.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Vehicle occupant</td>
<td>2.0</td>
<td>1.5</td>
<td>1.0</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Others</td>
<td>7.0</td>
<td>6.0</td>
<td>5.0</td>
<td>4.0</td>
<td>3.0</td>
<td>2.0</td>
<td>1.0</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Hospitalization rate / 100,000 inhab
Results

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Hospitalization by road traffic accidents, by gender

% of hospitalization by gender over years 2002-2011.
### Number of hospitalizations, rate and gender ratio

<table>
<thead>
<tr>
<th>Year</th>
<th>Sex</th>
<th>n</th>
<th>Population</th>
<th>Rate</th>
<th>Ratio M/W</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>Men</td>
<td>85.432</td>
<td>85.702.748</td>
<td>99.7</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>27.500</td>
<td>88.077.747</td>
<td>31.2</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>Men</td>
<td>122.778</td>
<td>94.419.268</td>
<td>130.0</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>33.573</td>
<td>98.524.047</td>
<td>34.1</td>
<td></td>
</tr>
</tbody>
</table>
Distribution of hospitalizations by road traffic accidents according to type of victim and age

- Pedestrian
- Cyclist
- Motorcyclist
- Vehicle occupant

Results
# Distribution of hospitalization by road traffic accident according to the race/color of the victim

<table>
<thead>
<tr>
<th>Year</th>
<th>Victim</th>
<th>Caucasian</th>
<th>African American</th>
<th>Mulatto</th>
<th>Asian</th>
<th>Indian</th>
<th>No information</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>2008 to 2011</td>
<td>Pedestrian</td>
<td>45199</td>
<td>31,0</td>
<td>5471</td>
<td>3,8</td>
<td>30189</td>
<td>20,7</td>
<td>424</td>
</tr>
<tr>
<td></td>
<td>Cyclist</td>
<td>12476</td>
<td>34,7</td>
<td>1195</td>
<td>3,3</td>
<td>8840</td>
<td>24,6</td>
<td>236</td>
</tr>
<tr>
<td></td>
<td>Motorcyclist</td>
<td>71968</td>
<td>28,9</td>
<td>6908</td>
<td>2,8</td>
<td>56837</td>
<td>22,8</td>
<td>834</td>
</tr>
<tr>
<td></td>
<td>Vehicle Occupant</td>
<td>25654</td>
<td>43,7</td>
<td>1787</td>
<td>3,0</td>
<td>10465</td>
<td>17,8</td>
<td>213</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>16063</td>
<td>38,0</td>
<td>1108</td>
<td>2,6</td>
<td>8312</td>
<td>19,7</td>
<td>139</td>
</tr>
<tr>
<td></td>
<td>Not filled out</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>171360</td>
<td>32,2</td>
<td>16469</td>
<td>3,1</td>
<td>114643</td>
<td>21,6</td>
<td>1846</td>
</tr>
</tbody>
</table>
Distribution of hospitalizations by region of hospitalization

Results

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

North

2002 2003 2004 2005 2006 2007 2008 2009 2010 2011

% of hospitalizations

Pedestrian Cyclist Motorcyclist Vehicle occupant Others

2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
Results

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Distribution of hospitalizations by region and type of hospitalization

Northwest

- Pedestrian
- Cyclist
- Motorcyclist
- Vehicle occupant
- Others

%
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Results

Distribution of hospitalizations by region of hospitalization

South

- Pedestrian
- Cyclist
- Motorcyclist
- Vehicle occupant
- Others

%
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Results

Distribution of hospitalizations by region of hospitalization

Southeast

Percentage of hospitalizations for each category:
- Pedestrian
- Cyclist
- Motorcyclist
- Vehicle occupant
- Others

Data for the years 2002 to 2011.
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Results

Distribution of hospitalizations by region of hospitalization

Centre-west

<table>
<thead>
<tr>
<th>Year</th>
<th>Pedestrian</th>
<th>Cyclist</th>
<th>Motorcyclist</th>
<th>Vehicle occupant</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td></td>
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<td>2004</td>
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<td>2006</td>
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<td>2007</td>
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<td>2008</td>
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<td>2009</td>
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<tr>
<td>2010</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Evaluation of the impact of the hospitalization by road traffic accidents

<table>
<thead>
<tr>
<th>Victim’s Characteristic</th>
<th>Nº of hospitalization 2002 - 2011</th>
<th>Total value in Reais 2002 - 2011</th>
<th>Average expense in Reais (^1)</th>
<th>Average days of stay</th>
<th>Average Nº of days in ICU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian</td>
<td>389.436</td>
<td>396.744.009,25</td>
<td>1.018,77</td>
<td>253.403</td>
<td>22.708</td>
</tr>
<tr>
<td>Cyclist</td>
<td>97.331</td>
<td>73.236.890,23</td>
<td>752,45</td>
<td>46.159</td>
<td>3.536</td>
</tr>
<tr>
<td>Motorcyclist</td>
<td>432.254</td>
<td>487.674.415,87</td>
<td>1.128,21</td>
<td>274.098</td>
<td>22.319</td>
</tr>
<tr>
<td>Vehicle Occupant</td>
<td>144.029</td>
<td>184.574.699,78</td>
<td>1.281,51</td>
<td>98.463</td>
<td>13.026</td>
</tr>
<tr>
<td>Others</td>
<td>166.657</td>
<td>175.493.699,07</td>
<td>1.053,02</td>
<td>95.640</td>
<td>9.948</td>
</tr>
<tr>
<td>Total</td>
<td>1.229.707</td>
<td>1.317.723.714,20</td>
<td>1.071,58</td>
<td>767.764</td>
<td>71.537</td>
</tr>
</tbody>
</table>

\(^1\) Average expense in Reais = Total value / nº hospitalization
Results

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Reason for leaving

Discharged
90.1% in 2002
78.3% in 2011

Death
4.4% in 2002
3.1% in 2011
Results
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Analysis of the attributes

Simplicity

- Although a high number of institutions and professionals involved
- Won’t influence by the manage of the data of the SIH for surveillance and for the monitoring of hospital morbidity by road traffic accidents
- The used data are free of charge thru the internet
- The system was considered to be SIMPLE
Results

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Analysis of the attributes

Flexibility

• Variables “reason for leaving/staying” and “character of attendance” - alteration in their variable names in 2008
  • Since the date of the change no field was left without information

• Variables were introduced - race/color in 2008 and ethnicity for indian population in 2010
  • Both presents a tendency to the improvement of its fulfillment

   Race/color: 56,3% in 2008 59,3% in 2011
   Ethnicity: 12,5% in 2010 100% in 2011
Results

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Analysis of the attributes

Flexibility

• These changes didn’t alter the system’s capacity to maintain its functioning and didn’t interrupt the data flow
• The system was considered to be FLEXIBLE
Analysis of the attributes

Data quality

- Age, sex, state of residence, main diagnostic, character of attendance and reason for leaving
  - Completion of 100%
  - Completeness - excellent ( > 90%)

- Race/color
  - Completion of 57,3%
  - Completeness - poor ( < 70%)

- Ethnicity
  - Completion of 56,3%
  - Completeness - poor ( < 70%)
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Results

Data quality

Consistency of the main diagnostic variable

<table>
<thead>
<tr>
<th>Main diagnostic</th>
<th>Total</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Chapter XIX. Eventual lesions or other consequence of external cause</td>
<td>1210323</td>
<td>98,4</td>
</tr>
<tr>
<td>Chapter XX. External causes of morbidity and mortality</td>
<td>332</td>
<td>0,0</td>
</tr>
<tr>
<td>Other Chapters</td>
<td>19052</td>
<td>1,5</td>
</tr>
<tr>
<td>Not filled out</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>1229707</td>
<td>100</td>
</tr>
</tbody>
</table>

- System has **GOOD DATA QUALITY**
Analysis of the attributes

Acceptability

• Data of SIH served as data source
  • Raising the number of hospitalizations by external causes in the “VIVA”
  • Analysis about morbidity by road traffic accidents in studies like Saúde Brasil (an annual publication of the Ministry of Health)
  • Study about the impact of a restrictive legislation on alcohol use in the morbidity of road traffic accidents

• System has a GOOD ACCEPTABILITY
Results

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Analysis of the attributes

Utility

• System can meet its goals to capture information from the hospitalization and process them
• Promote estimates of magnitude and trends of hospital morbidity due to road traffic accidents
• Describe the epidemiological profile of the hospitalization cases by road traffic accidents even though it doesn’t give the data to identify risk factors associated with the event
• Capacity to show trends of changes in the rates of hospitalizations by road traffic accidents according to region of residence
Results
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Analysis of the attributes

Utility

• Characterize what type of victim is more prevalent

• Shows what type of hospitalized victim is in a movement of increase or decrease over the years, by region, what allows the assess and provide measures to prevent and control road traffic accidents according to the type of victim

• Allows to program the offer of procedures in the health units, follow up, asses and control production

• Evaluate performance of the services, in terms of effectives, adequacy, access and efficiency
Results

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Analysis of the attributes

Utility

• As source of information about road traffic accidents in scientific publications in period (2002 – 2011)
  • Were found 107 complete articles
    • Only 11 used SIH as a data source
      • Local level (municipal)
      • Associated with other data sources
        • Police reports
        • Information System of Mortality – “SIM”

• The system was considered **USEFUL**
Limitations

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

- Can’t demonstrate the real magnitude of the hospitalizations by RTA - underestimated the analyzed data in this study
- Registries were captured with the road traffic accidents as a secondary diagnostic, excluded those where the secondary diagnostic was ignored or undetermined - underestimation of the number of hospitalizations for this reason
- System presents coverage only for public and private hospitals, excluding private
- Possibility of underreporting
- Inaccurate information about injuries and traumas
Conclusion

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Among the traffic accidents, the road traffic accidents were responsible for the most number of hospitalizations in the period.

There was an increase in the number of admissions where the cause of hospitalizations were non-specific traffic accidents - might be a difficulty in identifying the cause of an accident among the hospitalizations.
Among the road traffic accidents, those where the victim is a motorcyclist presented higher proportions, with an increase over the years.

Brazil - Increase in the number of motorcycles, and consequently motorcyclists, what results in a higher number of susceptible subjects to accidents.

Data from the Brazilian Nation Department of Traffic (Denatran) - Increase in the number of motorcycle fleet of 315% in the time studied (5,705,297 in 2002 to 18,342,831 in 2011).

In the last few years, there was a noticeable increase use the use of motorcycle for work and for private use.
Most hospitalizations by road traffic accidents occurred among male individuals, regardless of the type of victim.

This appears to be a global trend, as data from the World Health Organization (WHO) indicate that 3 among 4 deaths by traffic accidents involving motorcyclists occurs among men.

The hospitalizations involving motorcyclists generate a huge impact in the public health service, because they cost more and present more time of permanency in the hospital and also in the ICU.
Most part of the individuals hospitalized due to road traffic accidents left the hospital after discharge

This may have occurred due to the availability of emergency services and pre-hospital attendance in the country, what can explain the least proportion of deaths (opportune time of attendance)

We don’t now if the number of deaths is under or overestimated because we didn’t link the data to the data of the information system of mortality.
Conclusion

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

The system was considered

Simple
Flexible
Good data quality
Good acceptability
Useful
Recommendations
Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

- Reinforce the need to fill up the variable race/color and ethnicity

- Increase the use of the system for epidemiological studies of road traffic accidents

- Disseminate the system among the offices and institutions that work and research road traffic accidents

- Encourage the use of the SIH by municipal and state levels in order to recognize the magnitude of the problem and implement prevention and control actions for road traffic accidents.
Acknowledgements

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

- Secretariat of Health Surveillance - Ministry of Health
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- FETP Brazil - EPISUS
- Márcio Mascarenhas
- Lenildo de Moura
- Silvania Caribé
Thanks!

www.saude.gov.br/svs
episus@saude.gov.br
camila.bahia@saude.gov.br

Obrigada!
Surveillance

“Vigilância de Violências e Acidentes” – “VIVA”

- Component I
  - Violence
  - Healthcare
  - Continuous collection

- Component II
  - Violence and accidents
  - Sampling of emergency services
  - Data collection for 30 days
## Division of external causes

<table>
<thead>
<tr>
<th>External causes</th>
<th>ICD 10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accidental events</strong></td>
<td></td>
</tr>
<tr>
<td>Traffic accidents</td>
<td>V01 a V89</td>
</tr>
<tr>
<td>Fall</td>
<td>W00 a W19</td>
</tr>
<tr>
<td>Burn</td>
<td>W85 a W99 / X10 a X19</td>
</tr>
<tr>
<td>Other accidental events</td>
<td>W20 a W84/ X00 a X09/ X20 a X59</td>
</tr>
<tr>
<td><strong>Violent events</strong></td>
<td></td>
</tr>
<tr>
<td>Self-harm lesion/ suicide attempt</td>
<td>X60 a X84</td>
</tr>
<tr>
<td>Aggression</td>
<td>X85 a Y09</td>
</tr>
<tr>
<td>Maltreatment</td>
<td>Y05 a Y07</td>
</tr>
<tr>
<td>Legal intervention</td>
<td>Y35</td>
</tr>
</tbody>
</table>
Results

Utility of Brazilian Hospital Information System as a tool for monitoring morbidity by traffic accident in Brazil, 2002-2011

Other attributes

- **Sensitivity**
  Not calculated because there isn’t, among the sources of information, an exact number of how many traffic accidents that occur in the country

- **Positive Predictive Value for death**
  Not calculated because we did not have access to nominal data base of deaths in the country

- **Representativeness**
  Not calculated because is known in the literature that the system represents 80% of admissions in the country

- **SIH was considered timely and stable because it’s processing and delivery of information occurs in predetermined time**