French accident data
Self-Protection and Partner-Protection involving new vehicles
Summary of the presentation

- Objectives
- French national statistics
- Input data and methodology of the study
- Self protection regarding frontal impact
- Self protection vs partner protection regarding front end collisions
- Safety benefit estimation
Objectives

- French data
- Frontal impact and protection for new vehicles
Car occupant fatalities
All accident types in France
Year 2007, N=2 464 occupants

2007- car occupant fatalities and accident type (N=2464)

- N=1156, 47%
- N=425, 17.7%
- N=738, 29.6%
- N=95, 3.9%
- N=32, 1.8%

- car to car
- car to commercial vehicle
- cars to undetermined vehicle
- car to other
- single vehicle
Car occupant fatalities

Year 2007, N=2,464 occupants

2007 car occupants fatalities and accident type according to impact type (N=2464)

- Single vehicle:
  - N=781, 31.9%
  - N=375, 15.3%

- Car to vehicles:
  - N=503, 20.6%
  - N=787, 32.2%
Input Data and Methodology

- Compatibility:
  - Capacity of 2 vehicles to distribute in a balanced way the energy (proportionally to its mass) of an impact to offer to their occupants the same chances of survival as equal as possible, without degrading the level of protection offered.

- It is characterized by 2 indicators:
  - **Self-protection**: number of injured people (slightly injured, seriously injured or fatal) observed in the considered car model (internal injuries).
  - **Partner-protection**: number of injured people (slightly injured, seriously injured or fatal) observed in the impacted vehicle by the considered car model (external injuries).

- Classify vehicles involved in accidents according to their Self-Protection and to their Partner-Protection.
In each indicator we calculate

- **SR**=Severity Rate indicator (fatalities + serious injuries) internal (frontal protection):

\[
SR(\text{protection}) = \frac{(\text{Fatalities} + \text{Severe } \_ \text{injuries})_{\text{int}}}{(\text{Fatalities} + \text{Severe } \_ \text{inj} + \text{Slight } \_ \text{inj} + \text{Not } \_ \text{inj})_{\text{int}}}
\]

- **MR**=Mortality Rate indicator (fatalities) internal (frontal protection):

\[
MR(\text{protection}) = \frac{(\text{Fatalities})_{\text{int}}}{(\text{Fatalities} + \text{Severe } \_ \text{inj} + \text{Slight } \_ \text{inj} + \text{Not } \_ \text{inj})_{\text{int}}}
\]
Input Data and Methodology

- New french injury definition (year 2005):
  - Severely injured = injured people hospitalized more than 24 hours.
  - Slightly injured = injured people hospitalized less than 24 hours.
- New filter:
  - Car conception > 1999 or model year > 2003
  - Frontal impact against cars or against fixed obstacles (wall, tree,…).
  - A least 1 slightly injured people involved in the accident.
  - Front occupant belted (driver and passenger).
  - Vehicle mass class: [<950], [950-1149], [1150-1349], [1350-1549], [1550-1749], [>1750]
French National data base - Years 2005 to 2008 - All severity

323,431 accidents, 728,429 involved people, All users

Car occupants, in identified vehicles, 181,621 accidents, 299,750 involved people

Frontal impact against cars
- Frontal impact, front seats, belted occupants
  33,327 accidents, 54,137 involved people
- Car conception > 1999 or model year > 2003, identified mass
  1,793 accidents, 2,871 involved people

Frontal impact against wall, tree, pole
- Frontal impact, front seats, belted occupants
  5,661 accidents, 7,414 involved people
- Car conception > 1999 or model year > 2003, identified mass
  861 accidents, 1,126 involved people
Self Protection Regarding Frontal Impact

- BAAC 2005-2008
- Front car occupants belted
- Frontal impact against car (n=2871)
- Severity rate according to mean mass class
- Conception >1999 or model year >2003

![Diagram showing self protection rates for different mass classes and vehicle types.](image-url)
BAAC 2005-2006, car occupants, belted, front seats, head on collisions, car to car (N=1875), according to mean mass classes, conception > 1999 or model year > 2003 for both cars.

**Self Protection vs Partner Protection Regarding Front end Collisions**

- N=70, supermini cars
- N=561, supermini + small family cars
- N=419, large family cars and executive cars
- N=659, small and large family cars
- N=110, large family and executive cars, small and large MPV
- N=56, large MPV, small and large off road cars

![Graph showing self protection vs partner protection in different car categories.](image-url)
BAAC 2005-2008, car occupants, belted, front seats, head on collisions, car to car (N=1875), according to mean mass classes, conception > 1999 or model year > 2003 for both cars.

What R94 amendment introduction could do?

One possible target objective
Safety Benefit Estimation

- **Method:**
  - Estimation of the number of expected victims if all the vehicles had an identical Severity Rate.
  - Choose a group of vehicles whose Severity Rate will be the target to be reached by the other vehicles.
  - New target with new input data is 16.07%.
  - Calculation of the expected number of victims (N1), with this Severity Rate of reference.
  - The difference between the number of victims N observed, and N1 represents the potential benefit for fatalities and severe injuries.
Result (method B1 and B2 explained in the last presentation):

- France 2007 all impacts: 2,464 fatalities and 16,486 severe injuries in cars.

<table>
<thead>
<tr>
<th>Front end collisions</th>
<th>All impacts</th>
</tr>
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<tbody>
<tr>
<td>Victims reduction on pertinent accidents (front occupant, belted, head on collision between two cars of conception &gt; 1999 or model year &gt; 2003)</td>
<td>Victims reduction extrapolated to the whole set of car occupants</td>
</tr>
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</table>

| Reduction in fatalities and severe injuries (SR) | 40.3% | 7.0% |

For France year 2007:
- Reduction in fatalities and severe injuries will represent: 1,327 victims.
Safety Benefit Estimation

BENEFIT OF THE HARMONISATION OF FRONTAL PROTECTION ACCORDING TO THE VALUE OF THE TARGET SEVERITY RATE (SR).

Reduction of the number of fatal and severely injured car passenger. SETRA 2005 2006 2007 2008.
Thank you for your attention