

# Validity of self-reports of traffic crashes registered in the emergency room

*Anne Vingaard Olesen, Aalborg University, Denmark*



# Joint work

Katrine Meltofte Møller  
(PhD Thesis) and Harry  
Lahrmann

The Traffic Research  
Group, Aalborg University,  
Denmark



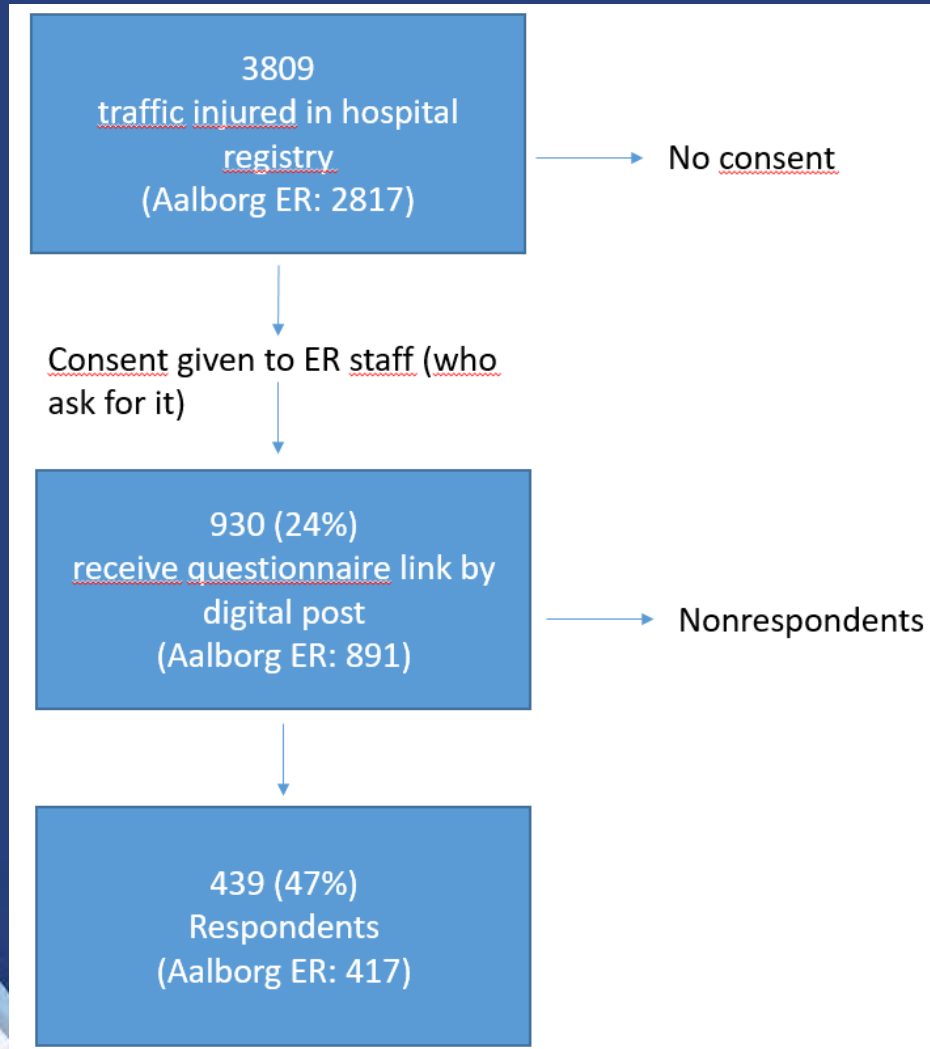
# Study aim



Assess validity of self-reports obtained in the emergency room (ER)

Valid crash coordinates and circumstances for preventive work of road authorities?

# Study design and recruitment



|   | All Region<br>Nord<br>emergency<br>rooms | Aalborg<br>emergency<br>room |
|---|--|------------------------------|
| Consent to questionnaire  | 930                                      | 891                          |
| Consent to questionnaire, but were lacking information from administrative system to comply | 34                                       | 31                           |
| No consent to questionnaire   | 168                                      | 149                          |
| Was not asked about consent   | 2.344                                    | 1.443                        |
| Consent not possible  | 202                                      | 201                          |
| Deemed <i>not relevant</i> by emergency room staff  | 95                                       | 73                           |
| Deemed <i>unknown relevancy</i> by emergency room staff                                     | 36                                       | 29                           |
| <b>Total</b>  | <b>3.809</b>                             | <b>2.817</b>                 |

Table 4: Sampling details from the emergency room in Aalborg as well as for the emergency rooms in Region Nord in total.

13 months of follow-up in 3 regional ERs

# Study design and recruitment



439 self-reports:

411 consented to linkage  
with hospital records

49 matched with police  
reports

8 respondent interviews

Validity of self-reports  
assessed as agreement with  
information found in the  
other sources



# Questionnaire

Time and date

Crash location on map point-and-click

Crash situation by choice of illustration

Own and counterpart mode of transport

Lighting, road surface and weather conditions

Authorities contacted

Physical injuries

Crash causation factors

Text field for prose crash description

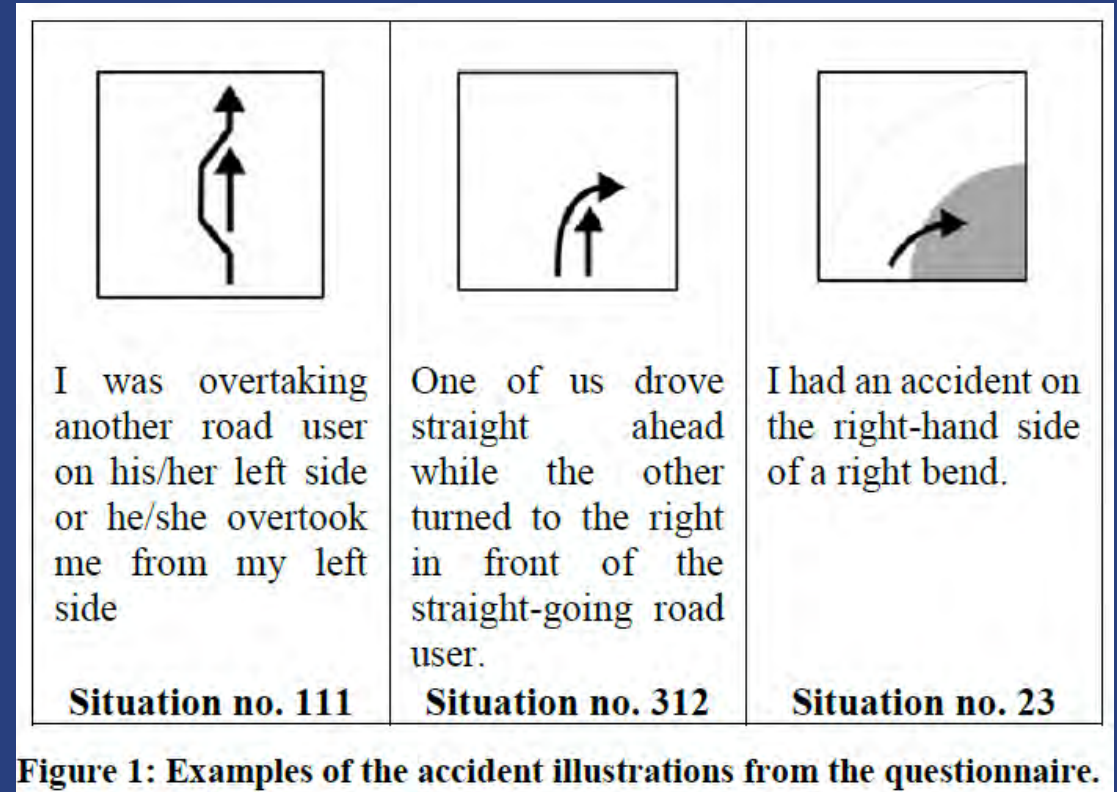


Figure 1: Examples of the accident illustrations from the questionnaire.

# Sex and age distribution

**Table 2: Demographic information of respondents**

*Responded to self-report questionnaire*

|               | Men      |       | Women    |       | Total    |        |
|---------------|----------|-------|----------|-------|----------|--------|
|               | <i>n</i> | %     | <i>n</i> | %     | <i>n</i> | %      |
| Below 18      | 8        | 1.95  | 15       | 3.65  | 23       | 5.60   |
| 18-24         | 37       | 9.00  | 45       | 10.95 | 82       | 19.95  |
| 25-34*        | 19       | 4.62  | 29       | 7.06  | 49       | 11.92  |
| 35-44         | 20       | 4.87  | 27       | 6.57  | 47       | 11.44  |
| 45-54         | 29       | 7.06  | 46       | 11.19 | 75       | 18.25  |
| 55-64         | 29       | 7.06  | 36       | 8.76  | 65       | 15.82  |
| 65 and above  | 26       | 6.33  | 42       | 10.22 | 68       | 16.55  |
| Will not tell | 1        | 0.24  | 1        | 0.24  | 2        | 0.49   |
| Total         | 169      | 41.12 | 241      | 58.64 | 411      | 100.00 |

*\* One respondent did not state their gender*

Few below 18 and more women than in all traffic injured in an ER

# Mode of transport compared with hospital records

87 pedestrians (all falls)

117 car drivers

174 cyclists

9 moped drivers

6 motorcyclists

6 van or truck drivers

Total of 399 for analysis of agreement – some had missing transport mode of the 411

Similarly, 366 for the counterpart mode of transport

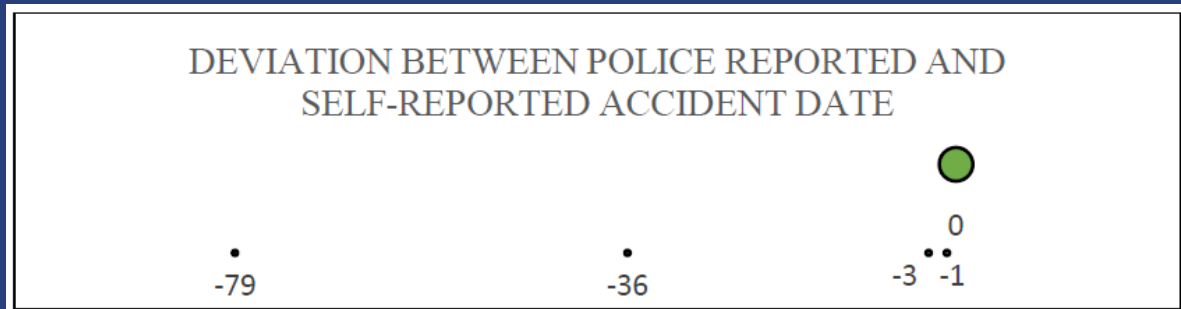
Table 3: Congruency between LPR and self-reports

|                               | Total used to classify | Agreement |       |                      |                     |
|-------------------------------|------------------------|-----------|-------|----------------------|---------------------|
|                               |                        | <i>n</i>  | %     | <i>Cohen's Kappa</i> | <i>95% CI Kappa</i> |
| Own mode of transport         | 399                    | 384       | 96.24 | 0.94                 | 0.92–0.97           |
| Counterpart mode of transport | 366                    | 320       | 87.43 | 0.77                 | 0.69–0.82           |

Our qualitative interpretation of the kappa values followed Landis and Koch (1997): 0–0.20 = slight agreement, 0.21–0.40 = fair agreement, 0.41–0.60 = moderate agreement, 0.61–0.80 = substantial agreement and 0.81–1.00 = almost perfect agreement.



# Crash date compared with police records



**Figure 3: Number of days the self-reported accident date deviated from the police-recorded accident date.** The area of the bubbles represents the number of observations and the offset on the X-axis corresponds to the number of days. The offset on the Y-axis is trivial and made to improve viewability of data.

91% exact agreement between self-reports and police records



# Crash circumstances compared with police records

**Table 5: Congruency of police reports and self-reports**

|                                 | Total used to classify | Agreement |        |                      |                     |
|---------------------------------|------------------------|-----------|--------|----------------------|---------------------|
|                                 |                        | <i>n</i>  | %      | <i>Cohen's Kappa</i> | <i>95% CI Kappa</i> |
| Counterparts' mode of transport | 37                     | 37        | 100%   | 1                    | –**                 |
| Own mode of transport           | 49                     | 49        | 95.92% | 0.93                 | 0.83–1.03           |
| Date of accident                | 44                     | 40        | 90.91% | 0.88*                | 0.79–0.94           |
| Accident situation              | 25                     | 21        | 84.00% | 0.82                 | 0.66–0.98           |
| Daylight conditions             | 39                     | 34        | 87.18% | 0.74                 | 0.55–0.93           |
| Road surface conditions         | 36                     | 32        | 88.89% | 0.68                 | 0.41–0.96           |
| Weather conditions              | 41                     | 34        | 82.93% | 0.51                 | 0.24–0.79           |

\* ICC value, not Kappa, due to continuous data.

\*\* Cannot be calculated due to perfect agreement

# Crash location and crash situation

**Table 7: Matching of information from coordinates and descriptive fields**

|                                      | Congruency of respondents' pinpoint on the map and their written description |       |             |
|--------------------------------------|--|-------|-------------|
|                                      | <i>n</i>   | %     | 95% CI      |
| Location as both GPS and description | 71   |       |             |
| Matching information                 | 62   | 87.32 | 79.58–95.06 |
| GPS-coordinates not a match          | 9  | 12.68 | 4.94–20.42  |

92% managed to point-and-click at location on map  
Interviewees said it was easy because crash typically took place in familiar location

**Table 8: Congruency of applied illustrations with textual description**

|  | Congruency of respondents' illustration choice and their written description |       |               |
|--|--|-------|---------------|
|  | <i>n</i>   | %     | 95% CI        |
| Accident situation in both descriptive and multiple choice | 117  | 100   | -             |
| Matching situation   | 99   | 84.62 | 81.28–87.95   |
| Situation not a match                                      | 18   | 15.38 | 12.05 – 18.72 |

Only 80% were able to choose a crash situation among illustrations  
Interviewees were able to draw and describe their crash...

# Conclusion

Relatively high response rate (47%)

Skewness with regard to age and sex

Trustworthy crash location and crash situation for those who were able to choose the latter

Other self-reported circumstances also in good agreement with hospital and police records

Study design vulnerable to staff commitment in the asking for consent

Questionnaire for self-reporting should be improved with regards to crash situation

Interviews showed great willingness to help prevent new crashes

Data useful for road authorities





# Thank you for your attention

Contact: [avo@build.aau.dk](mailto:avo@build.aau.dk)

