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# Impacts of an automatic emergency call system on accident consequences

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## Aims of the study

- To estimate the annual number of the fatalities that could be avoided in Finland by the eCall system.
- To estimate the effects of the eCall on emergency response times.
- To estimate the effects of real-time information about the vehicle location and accident type on the consequences of the accident.
- To estimate other impacts of the eCall.

# Method 1/3

Analysis of the case reports of the Road Accident Investigation Teams from years 2001-2003 (case study)

## Aim:

- To estimate the annual number of the fatalities that could be avoided
- To estimate rescue process delays.

## Data:

- Total of 929 fatalities involving a fatally injured occupant in motor vehicle.
- Data included accidents of all vehicle types, divided to
  - vehicles in which eCall could be installed
  - vehicles in which the current eCall could not be installed (e.g. motorcycles)

## Method 2/3

Interviews of all actors that are involved in rescue activities

### Aim:

- Information about the operations of public authorities in traffic accident situations
- Information about rescue process delays

### Data:

- The sample covered several actors around Finland
- All actors that are involved in rescue operations
  - emergency response centres
  - rescue stations
  - traffic police
  - Finnish Road Administration's Traffic Management Centre
  - A police officer from a road accident investigation team



## Method 3/3

Questionnaire to Operators at each of 20 Emergency Response Centres in Finland

Aim:

- Information about rescue time delays
- Information about location identification (inexact location)

Data:

- Answers received from 18 Centres, total 181 answers

# Fatalities

- Estimates based on the case reports of the Road Accident Investigation Teams
  - Procedure:
    - First excluding patients with fatal injuries
    - Final categorisation done by the medical doctors
  - Categories:
    - Cases where eCall could probably have helped
    - Cases where eCall would probably not have had influence on accident consequences
    - Unclear cases (not enough data)

# Preliminary Results – Fatalities 1/2

Influence on traffic accidents' consequences	Fatalities in 4-wheel accidents		Fatalities in single 2-wheel accidents		Total	
	n	%	n	%	n	%
eCall could probably have helped	39	4,4	4	10,0	43	4,6
eCall would probably not have helped	831	93,5	32	80,0	863	92,9
Insufficient data	12	1,3	1	2,5	13	1,4
Excluded	7	0,8	3	7,5	10	1,1
<b>Total</b>	<b>889</b>	<b>100</b>	<b>40</b>	<b>100</b>	<b>929</b>	<b>100</b>

## Preliminary Results – Fatalities 2/2

Features of the accidents where eCall could have prevented the fatality

- Hypoxia
- Alcoholic abuse
- Severe attacks
- Submersion

# Delays

## Emergency call delays

- Estimates based on investigating the case reports of the Road Accident Investigation Teams (case study)
- Road Accident Investigation Teams' estimated time of the incident compared to time, when Emergency Response Centre has received the emergency call (case study + phone log of the ERC operators)
- Estimates done by the Operators of Emergency Response Centres (questionnaire)

## Rescue process delays

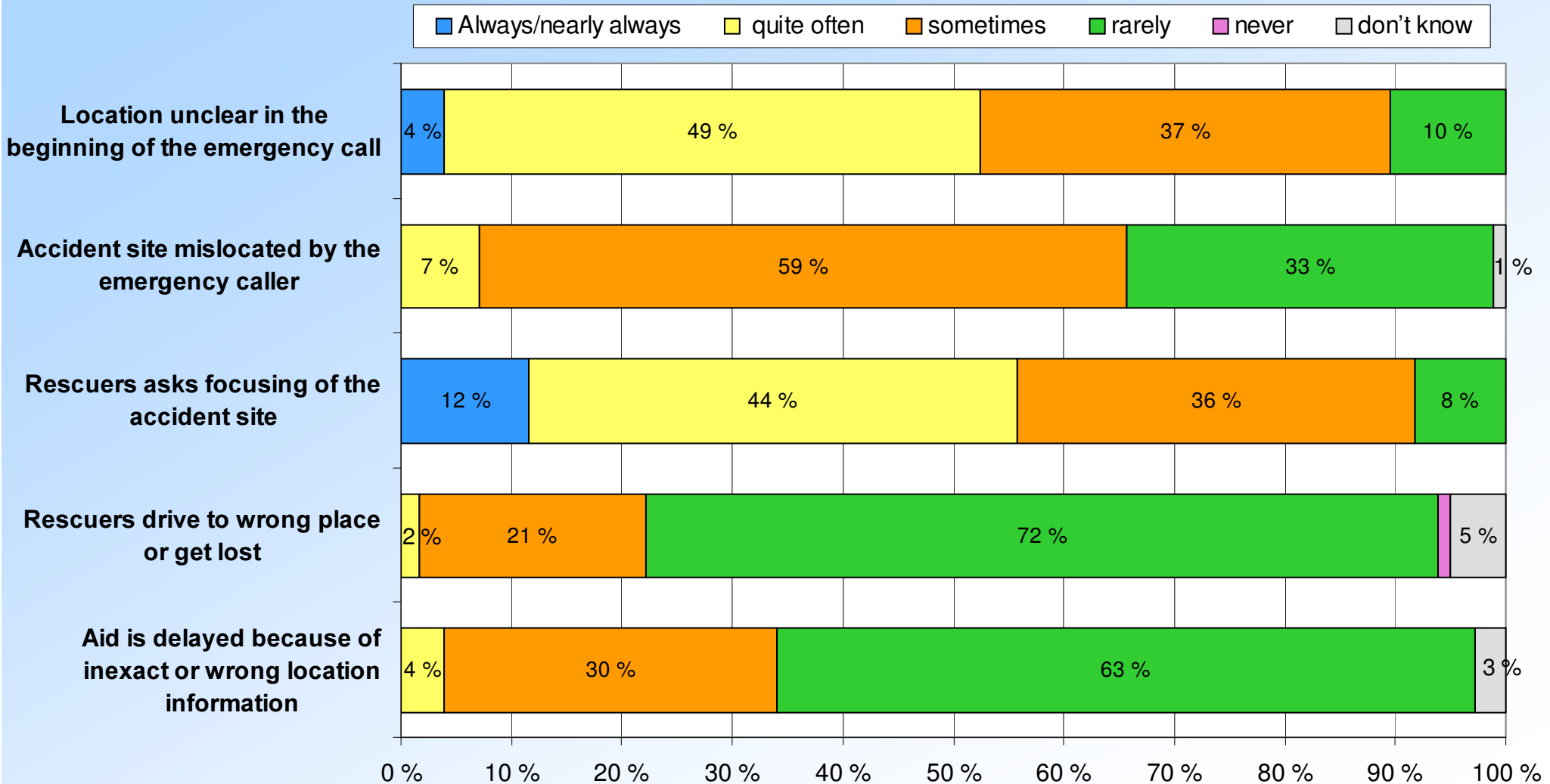
- Estimates done by the Operators of Emergency Response Centres (questionnaire)

# Preliminary Results - Emergency call delays

	Case Study			Case Study + Phone Log			Questionnaire
	Fatalities in 4-wheel accidents (n=888)	Fatalities in single 2-wheel accidents (n=39)	Total (n=927)	Fatalities in 4-wheel accidents (n=889)	Fatalities in single 2-wheel accidents (n=40)	Total (n=929)	All fatalities (average of 180 answers)
	%	%	%	%	%	%	%
ERC has received emergency call before estimated time of the incident				38,7	17,5	37,8	
No mention about the emergency call, but at least one eyewitness	8,3	2,6	8,1				
Less than 5 min	68,8	48,7	68,0	37,0	27,5	36,6	81,2
5-30 min	7,2	23,1	7,9	16,3	2,5	15,7	15,3
More than 30 min	3,6	17,9	4,2	2,9	17,5	3,6	3,5
Not enough data	8,6	2,6	8,3	5,1	35,0	6,4	
No eyewitness; first who arrived, has made the emergency call	3,3	5,1	3,3				
No emergency call	0,2	0,0	0,2				
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

# Preliminary Results – Rescue chain delays

Summary - All Emergency Response Centres (181 answers)



## Discussion and conclusions

- eCall could have the greatest potential of saving lives in cases where the emergency call was done more than 5 minutes after the accident
- eCall could prevent about 17 fatalities per year (4.6%)
- eCall has greater impact than many other traffic safety measures =

Traffic safety measure	Fatalities prevented per year
Renewing of the vehicle population	35
Penalty point system	35
Reduction of speed limit from 50 km/h to 40 km/h in urban areas	31
Halve the number of persons not wearing a seat belt	21

Reference: Peltola & al. 2005. Evaluation of road safety measures and experience of preparing a traffic safety programme. LINTU Research Programme.



## Discussion and conclusions

- As the questionnaire showed the accident location is sometimes mislocated by the emergency caller and quite often the rescuers ask focusing of the location
- -> eCall could enable accurate accident location
- -> number of prevented fatalities could be even higher than in our study showed.
  
- eCall could give more accurate knowledge about the accident (time, location...). This would improve the case studies done by the Road Accident Investigation teams.