

Impacts of an automatic emergency call system on accident consequences

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eCall system - what and why

- eCall is an automatic in-vehicle emergency call service developed in the European Union.
- The benefits of the eCall system are mainly based on the faster relaying of important accident information
 - Precise location, time and type of the accident
- The system itself will not reduce the number of accidents.
- The main objective is to **improve response times** in the case of traffic accident and save lives by faster help.

Aims of the study

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

Road Accident Investigation Teams

- In Finland all fatal accidents are investigated by Road Accident Investigation Teams.
 - In 2004 a total of 331 fatal accidents were investigated
- Teams consist of a police officer, a road specialist, a vehicle specialist, a physician, a psychologist and other experts.
- The teams investigate what happened, why the accident happened, which factors affected the risk of the accident and what were the reasons for the consequences of the accident.

Analyses of the fatalities (1/2)

Case reports of the Road Accident Investigation Teams from years 2001-2003

- Total of 797 accidents involving a fatally injured occupant (n=929)
- Data included accidents of all vehicle types, divided to
 - accidents, where there was at least one vehicle in which eCall system could be installed, and
 - accidents, where there were no vehicles in which the current eCall system could be installed (e.g. single motorcycle and snowmobile accidents).

Analyses of the fatalities (2/2)

- Procedure:
 - First, exclusion of the patients with most fatal injuries
 - Final categorisation done by the medical doctors
- Categories:
 - eCall could very probably have prevented the death of the victim
 - eCall would probably not have prevented the death of the victim
 - Unclear cases (not enough data)

Results – Fatalities (1/2)

Influence on traffic accidents' consequences	Fatalities with eCall possibility		Fatalities without eCall possibility		Total	
	n	%	n	%	n	%
eCall could probably have prevented death of the victim	39	4.4	4	10.0	43	4.6
eCall would probably not have prevented death of the victim	831	93.5	32	80.0	863	92.9
Unclear cases (not enough data)	19	2.1	4	10.0	23	2.5
Total	889	100	40	100	929	100

In addition to the 4.6%,
a similar amount of the fatalities may have prevented

Results – Fatalities (2/2)

Fatalities that could probably have been prevented by eCall included for instance

- Hypoxia
- Alcoholic abuse
- Severe attacks
- Submersion

Analyses of the delays

Emergency call delays

- Case reports of the Road Accident Investigation Teams
 - a police report of the accident, eye-witness interviews...
- Case study + phone log of the Emergency Response Centres (ERC)
 - estimated time of the accident vs. time of the phone call
- Questionnaire to the Operators of ERC
 - 154 answers

Rescue process delays

- Questionnaire to the Operators of ERC
 - 181 answers

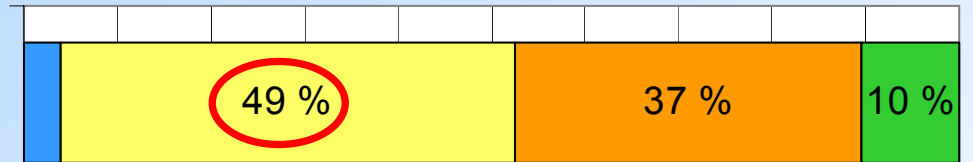
Results - Emergency call delays

Emergency call delays	Case Study			Case Study + Phone Log			Questionnaire
	accidents with eCall possibility (n=758)	accidents without eCall possibility (n=37)	Total (n=795)	accidents with eCall possibility (n=759)	accidents without eCall possibility (n=38)	Total (n=797)	All fatality accidents (average of 157 answers)
	%	%	%	%	%	%	%
Less than 5 min	87.5	56.9	86.1	79.8	70.8	79.5	81.2
5-30 min	8.6	26.9	9.5	17.0	4.2	16.6	15.3
More than 30 min	3.8	16.2	4.4	3.2	25.0	3.9	3.5
Total	100	100	100	100	100	100	100

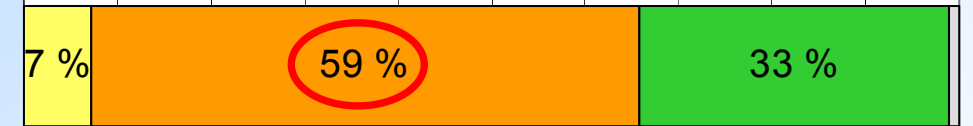
Results – Rescue chain delays

■ Always/nearly always
 ■ quite often
 ■ sometimes
 ■ rarely
 ■ never
 ■ don't know

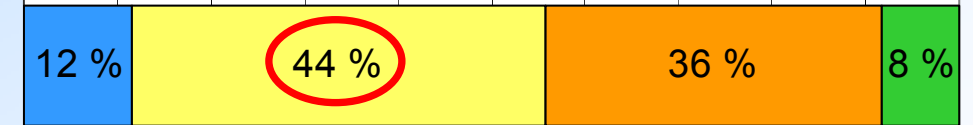
How often is the emergency caller not able to tell the exact location of the accident at the beginning of the call?



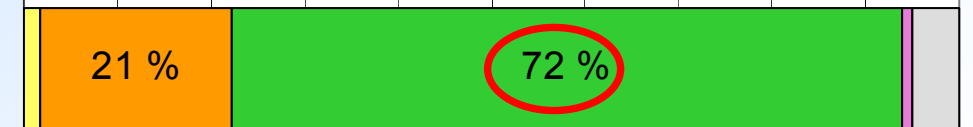
How often does the emergency caller give a wrong location?



How often does the rescue unit or police ask for correction of the accident site location?



How often does the rescue unit or police go to a wrong place or get lost?



How often is the arrival of the rescue unit delayed because of inexact or wrong location information?



0 % 10 % 20 % 30 % 40 % 50 % 60 % 70 % 80 % 90 % 100 %

Conclusions

- eCall could prevent 5 - 10% of the fatalities in Finland
 - The percentage was higher in accidents, where there was no vehicle on which the current eCall system could be installed.
 - + accurate accident location produced by the eCall would probably reduce the rescue response time
 - eCall system would not be installed in every vehicle
 - Insufficient functionality of the system
- eCall has greater impact than many other traffic safety measures.
- Biggest effect expected on minor rural roads, at night time, in off-peak traffic

Recommendations

- eCall system is recommended to be implemented in short order and to so many vehicles as possible in Finland.
- There is a need for a eCall system, that could be installed in two-wheel vehicles. Situation could also be improved by ruling a positioning device as compulsory equipment for motorcyclists and drivers of the snowmobile.
- Compiling of statistics of severely injured is recommended to be developed.

THANK YOU!

Further information

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