

Case Study 3: Neck Injury Prevention

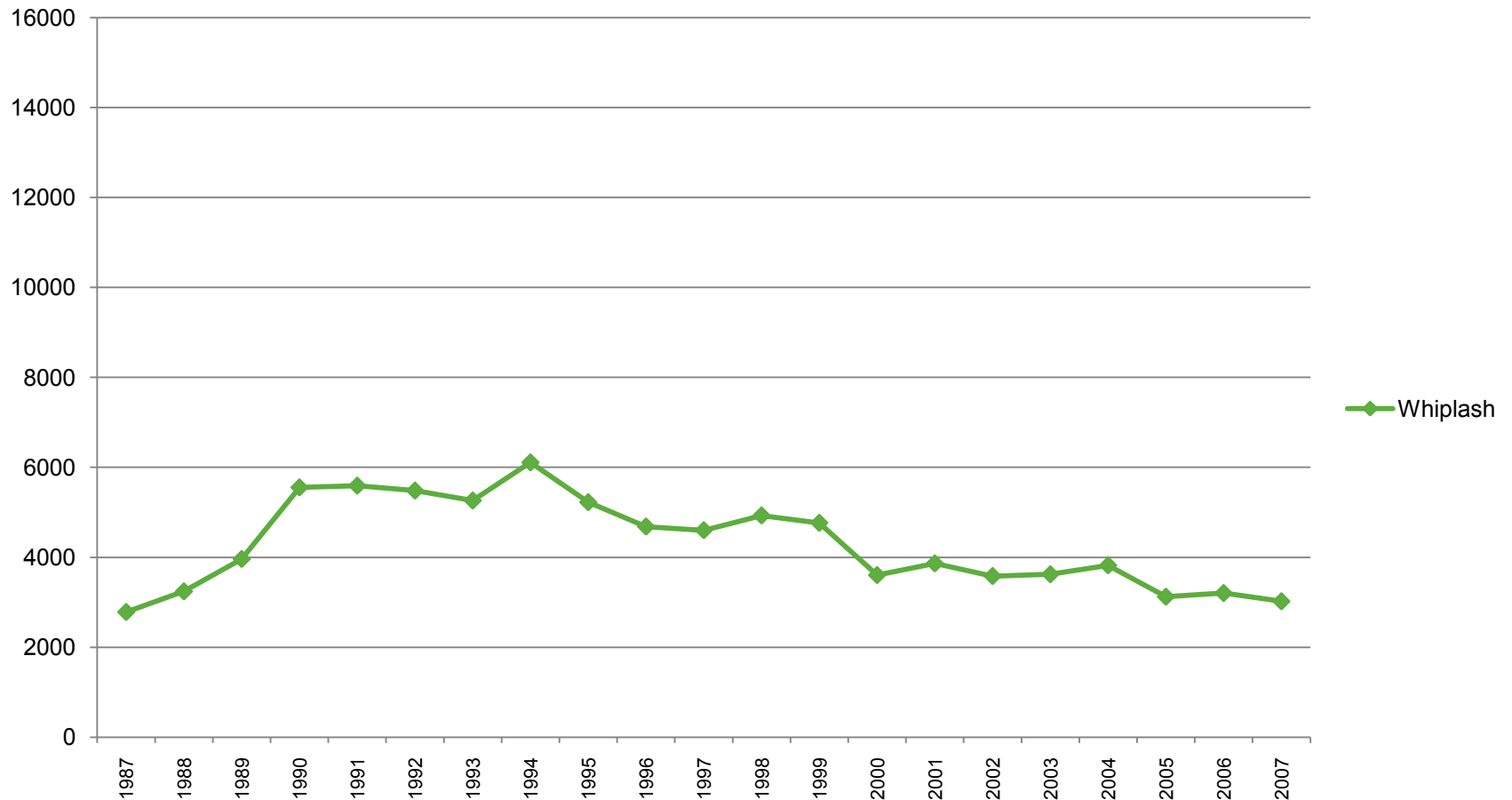
FERSI Training Seminar on Evaluation, 19-21 May 2010, Bern

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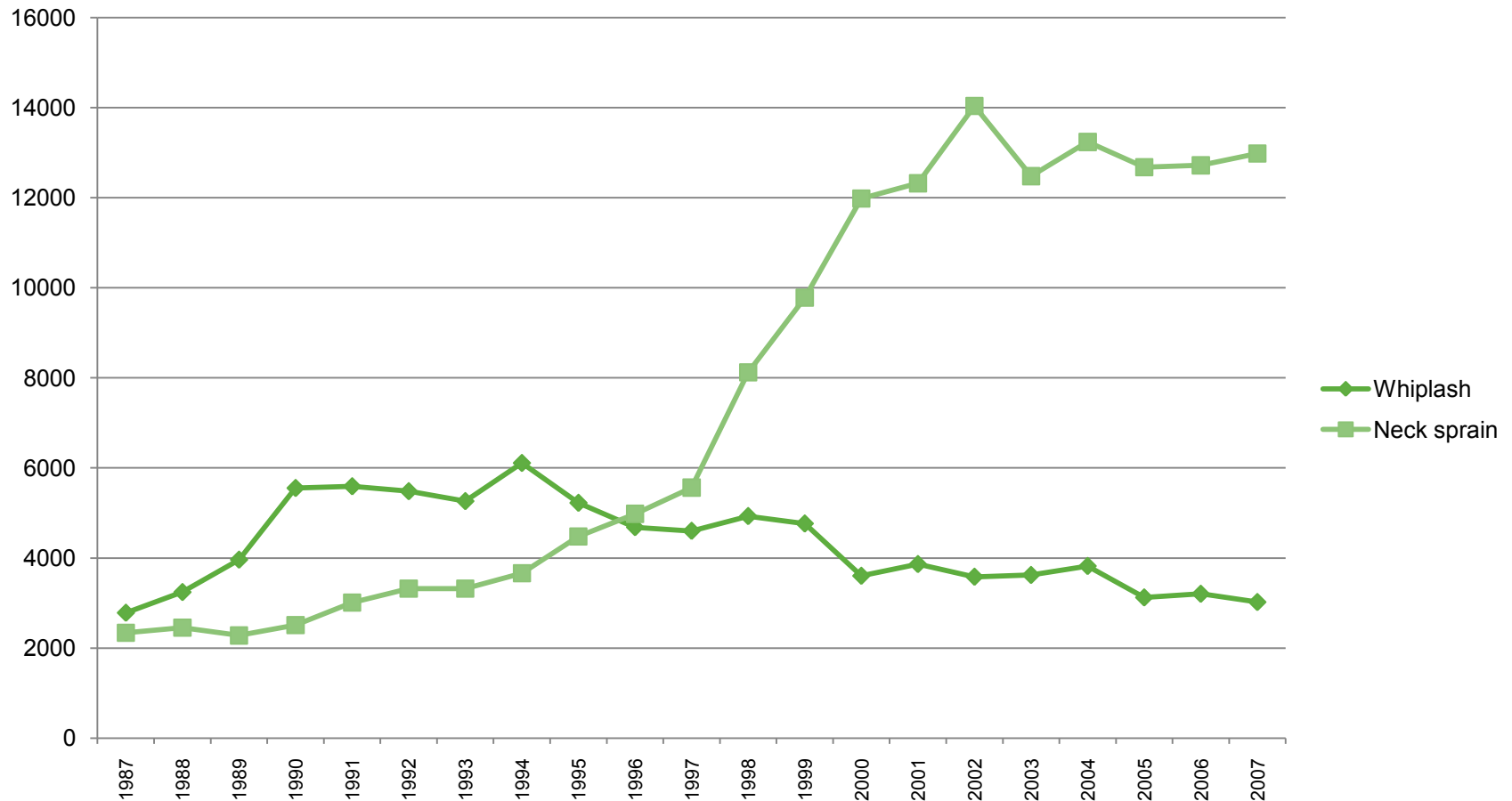
Whiplash injury

- Typical for rear end crashes
- Body moves forward, head remains in original position
- Then head moves forward while body is already stopped (seat belt)
- Frequent injury (depending on country up to 1/3 of all injuries)
- Often no physical damage can be seen
- Usually only mild consequences
- ~10% become chronically ill/disabled
- Very expensive to the insurances

Frequency of neck injuries in Switzerland



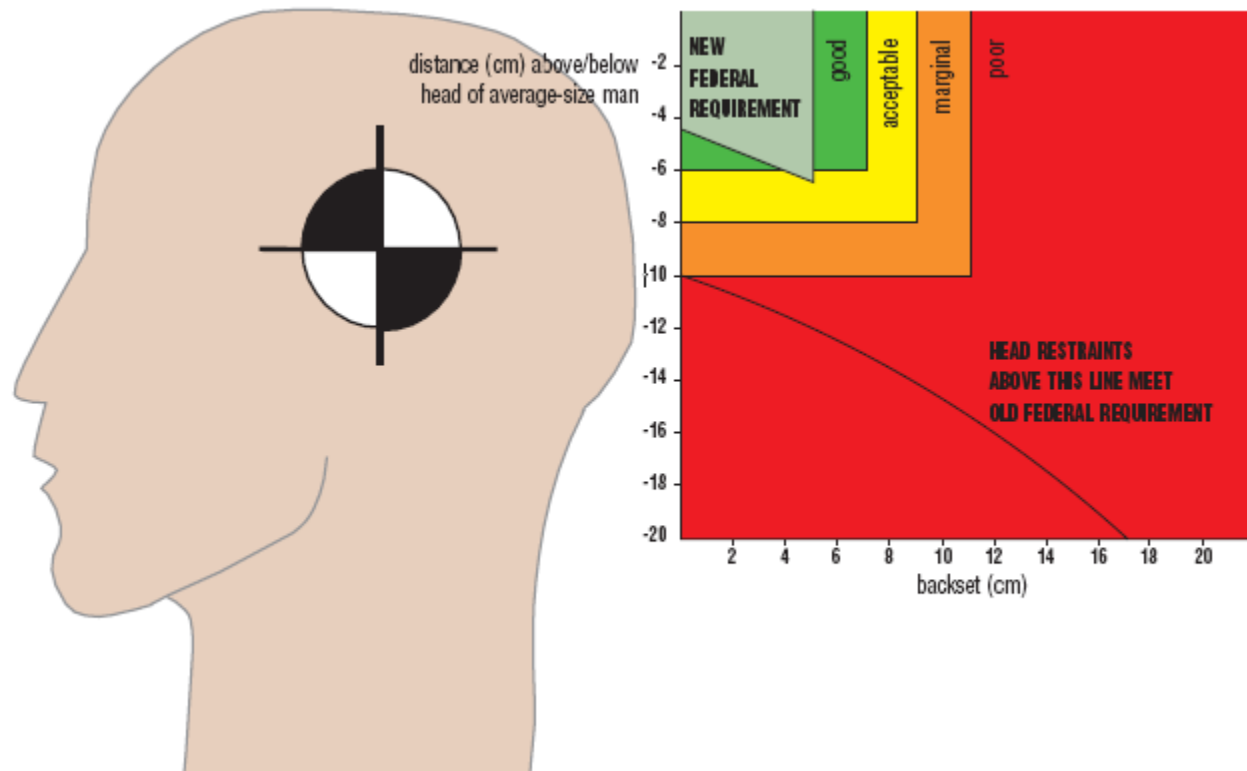
Frequency of neck injuries in Switzerland



How to prevent whiplash injury?

- Upright position of the seat (more than 60 degrees)
- Correct positioning of head restraint
- But what is correct?

Correct positioning of head restraint



Mass media campaign

- Goal: Reduce whiplash injuries by 10%
- Objective: Improve correctly positioned head restraints by 10%
- Media: mostly television, posters, internet

<http://www.kopfstuetzen.ch/>

<http://www.appuis-tete.ch/>

<http://www.poggiatesta.ch/>

bfu did the evaluation

Formative evaluation

- Not done

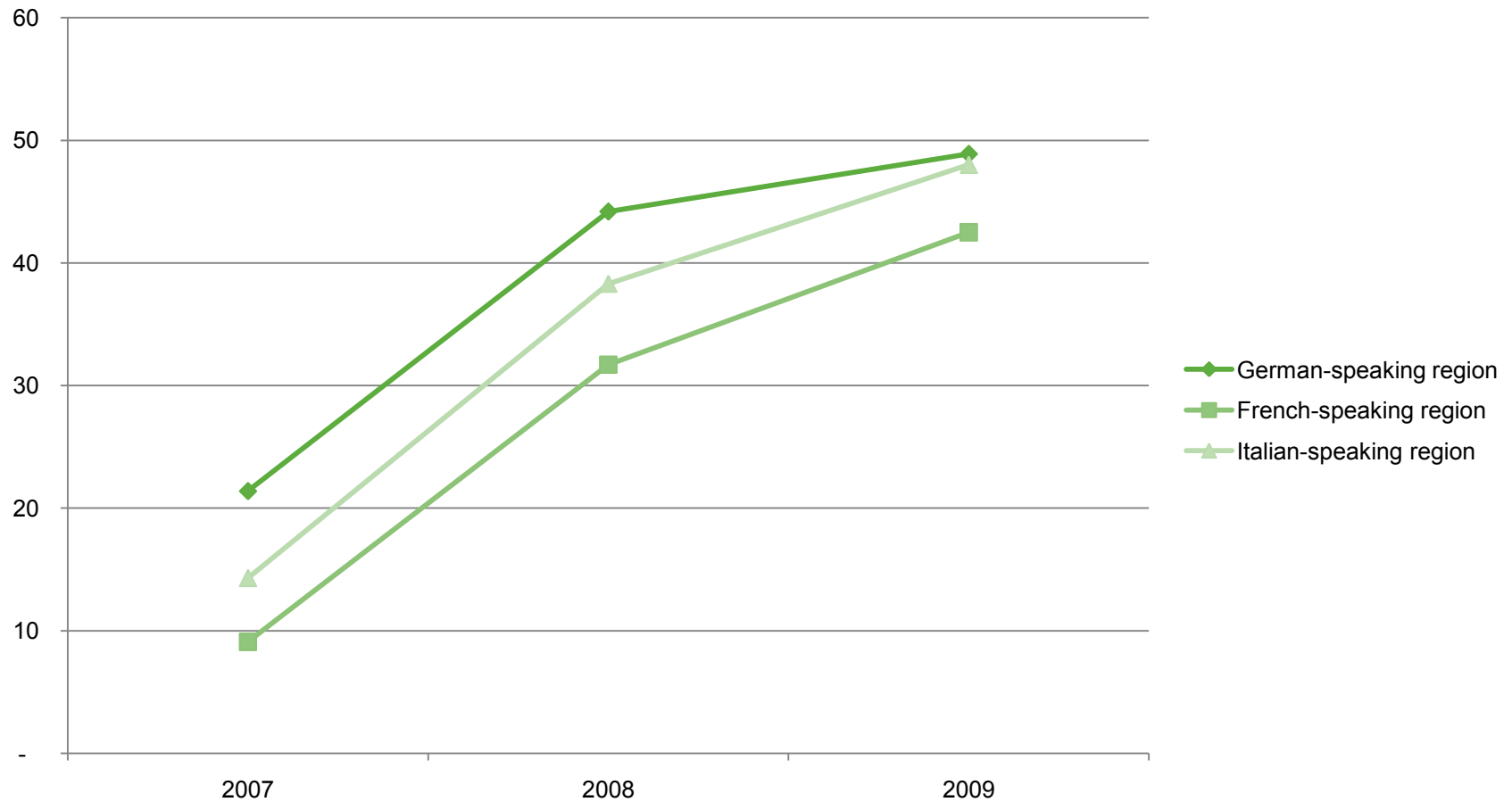
Process evaluation: Items distributed

- Campaign lasted from September 2007 to September 2009
- 5 waves (spring and fall)
- Per wave about 200 to 300 TV spots
- Per wave about 1,000 posters
- 1,550,000 brochures printed and distributed (to insurances, driving schools, car repair services)

Process evaluation: Contacts

- Direct contacts:
 - 2007: 18% (before the beginning of the campaign!)
 - 2008: 41%
 - 2009: 47%
- Indirect contacts: not analyzed

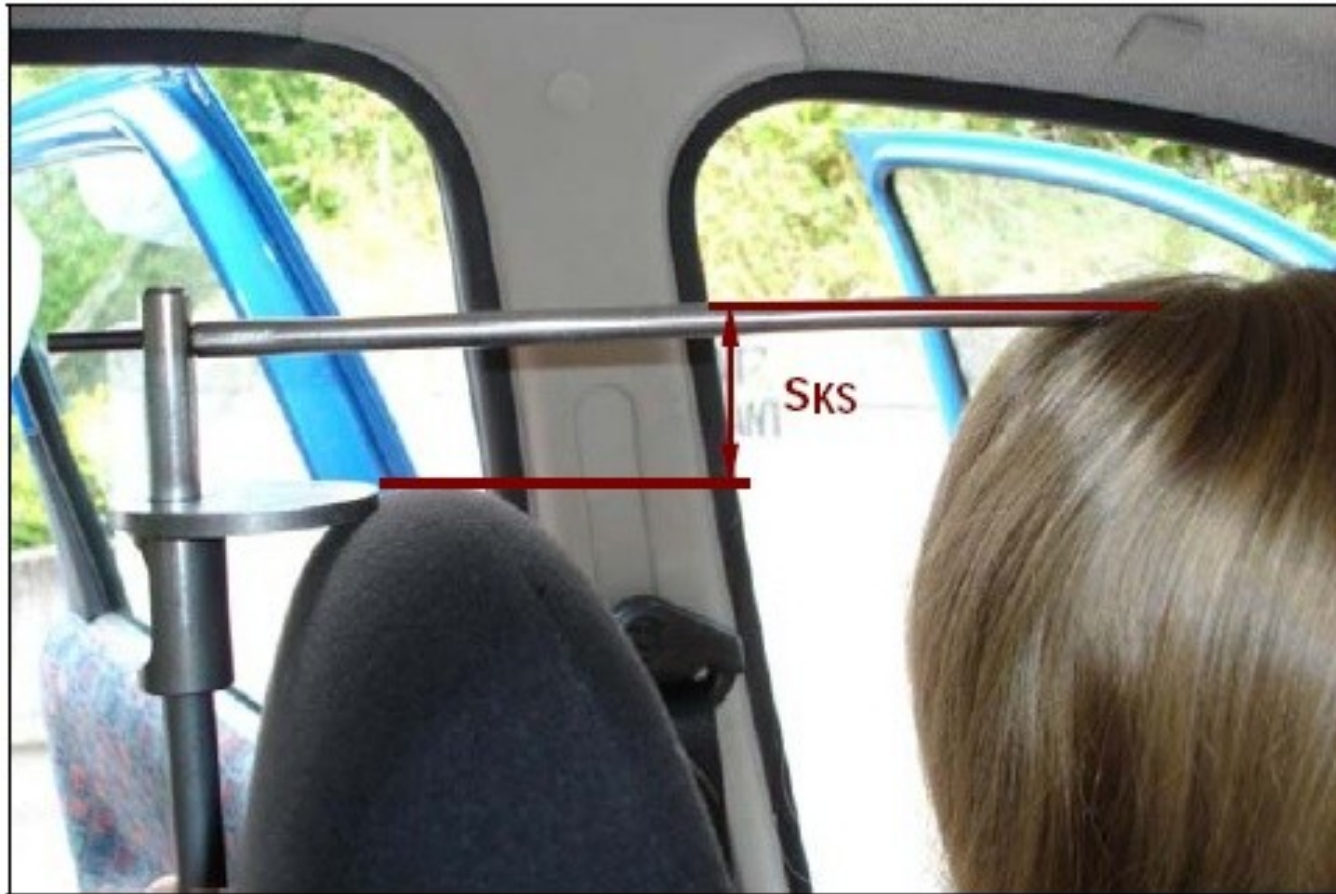
Process evaluation: Contacts



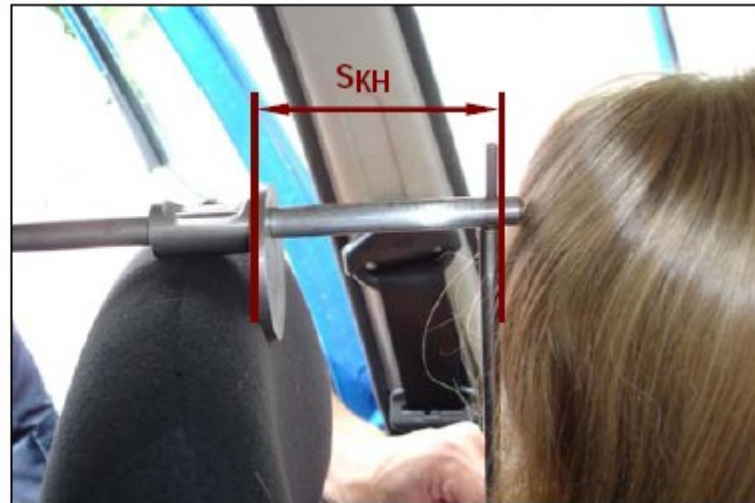
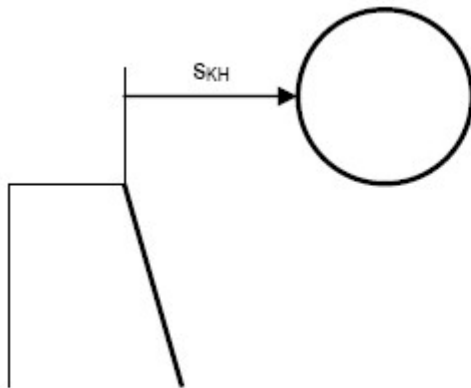
Impact evaluation

- 3 times ascertained (before, during and after campaign)
- 2 different ways of ascertainment
Measurement of 440 persons at 11 locations
Survey of about 1,000 active drivers

Measurement: Height



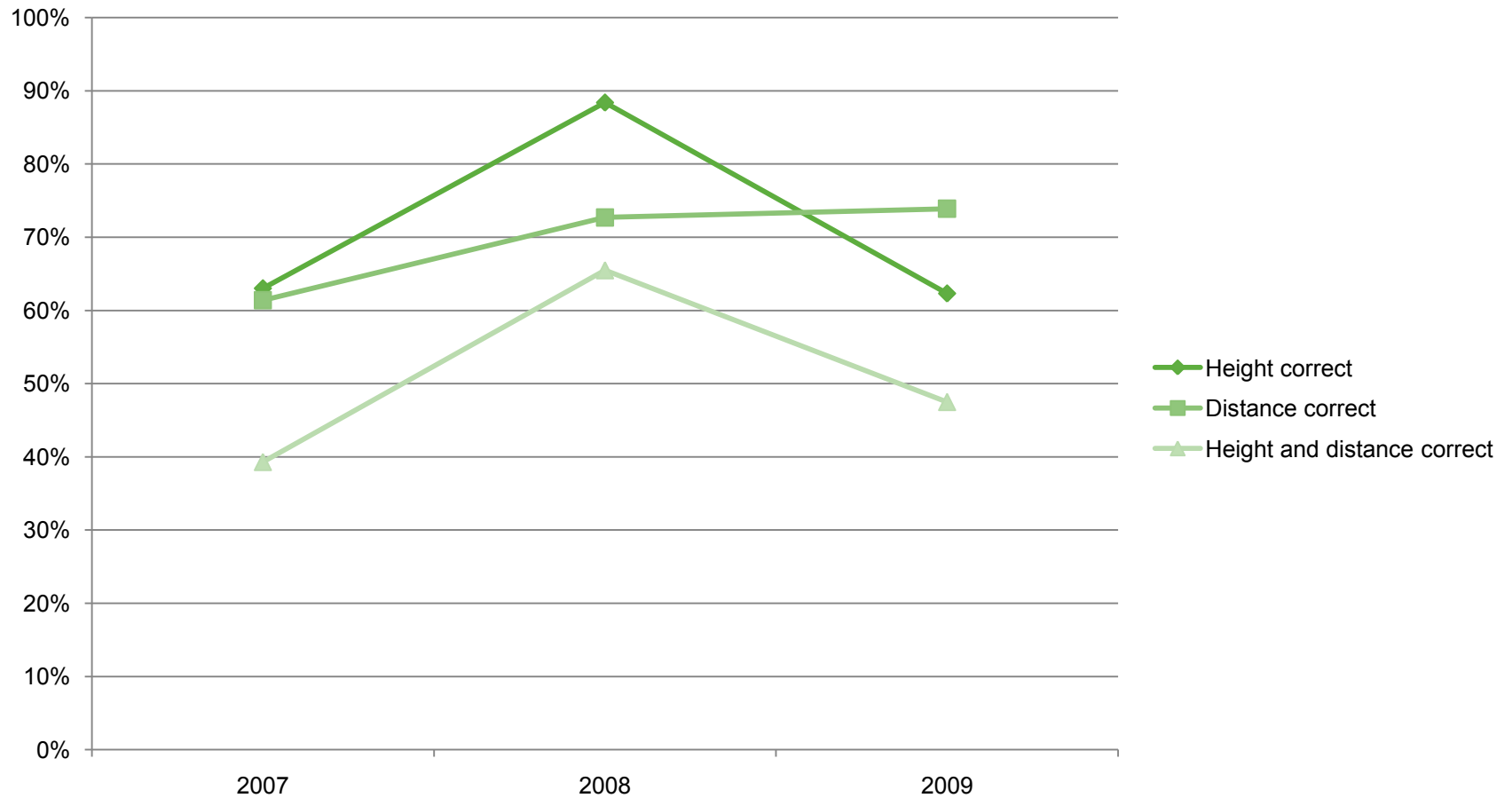
Measurement: Distance



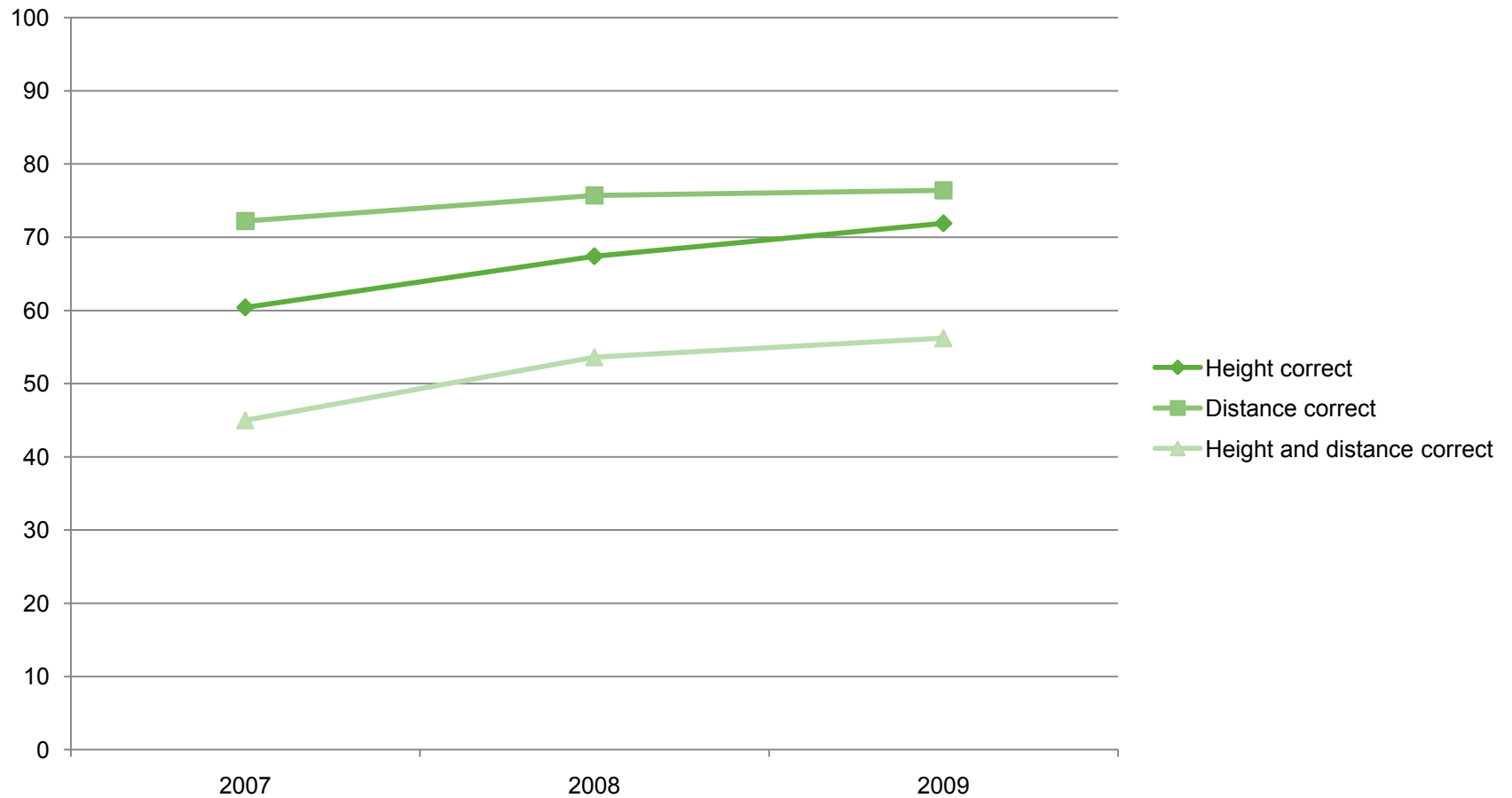
Measurement: Position of seat



Measurement: Results



Survey: Results



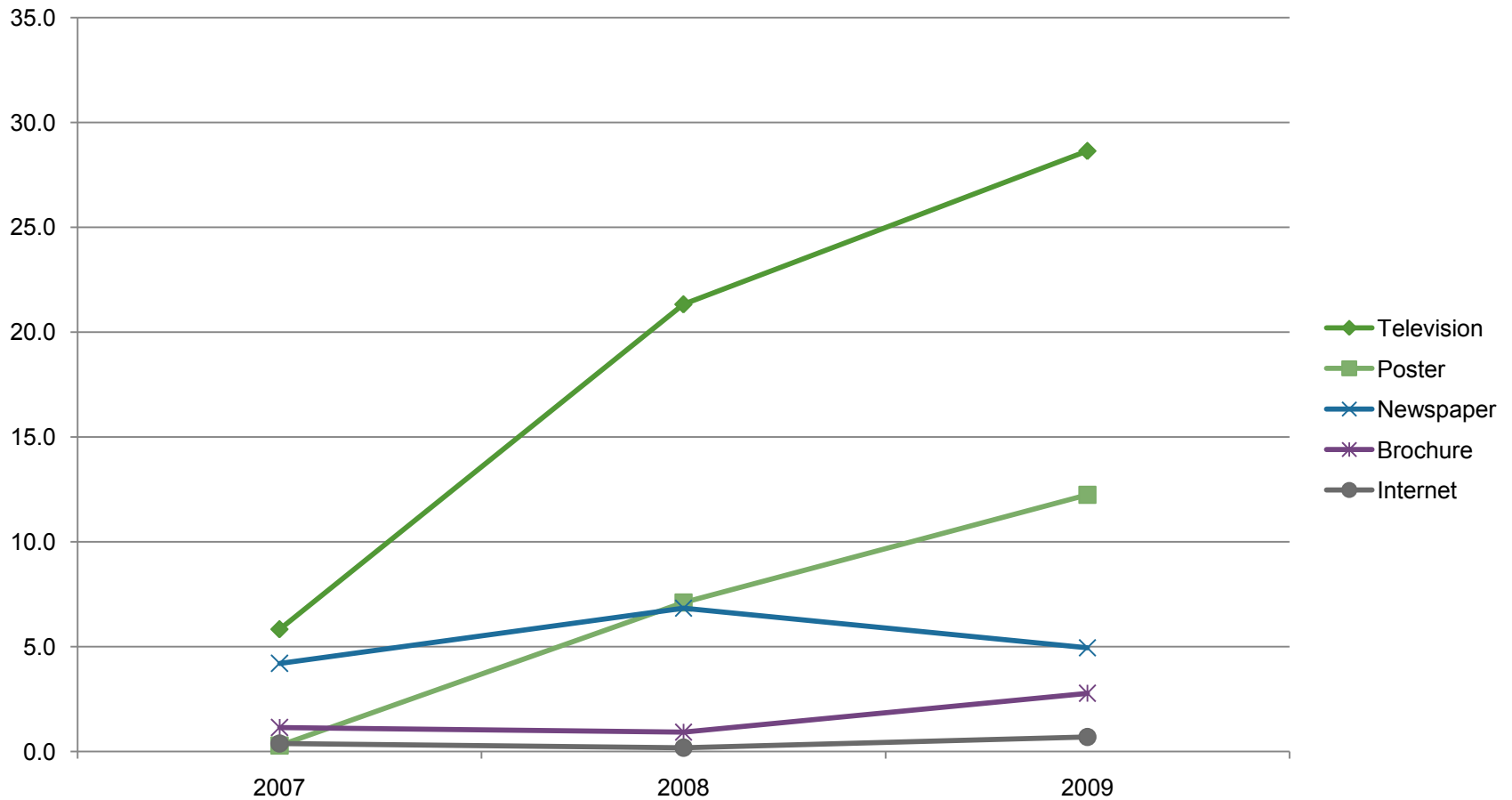
Conclusion

Discussion ...

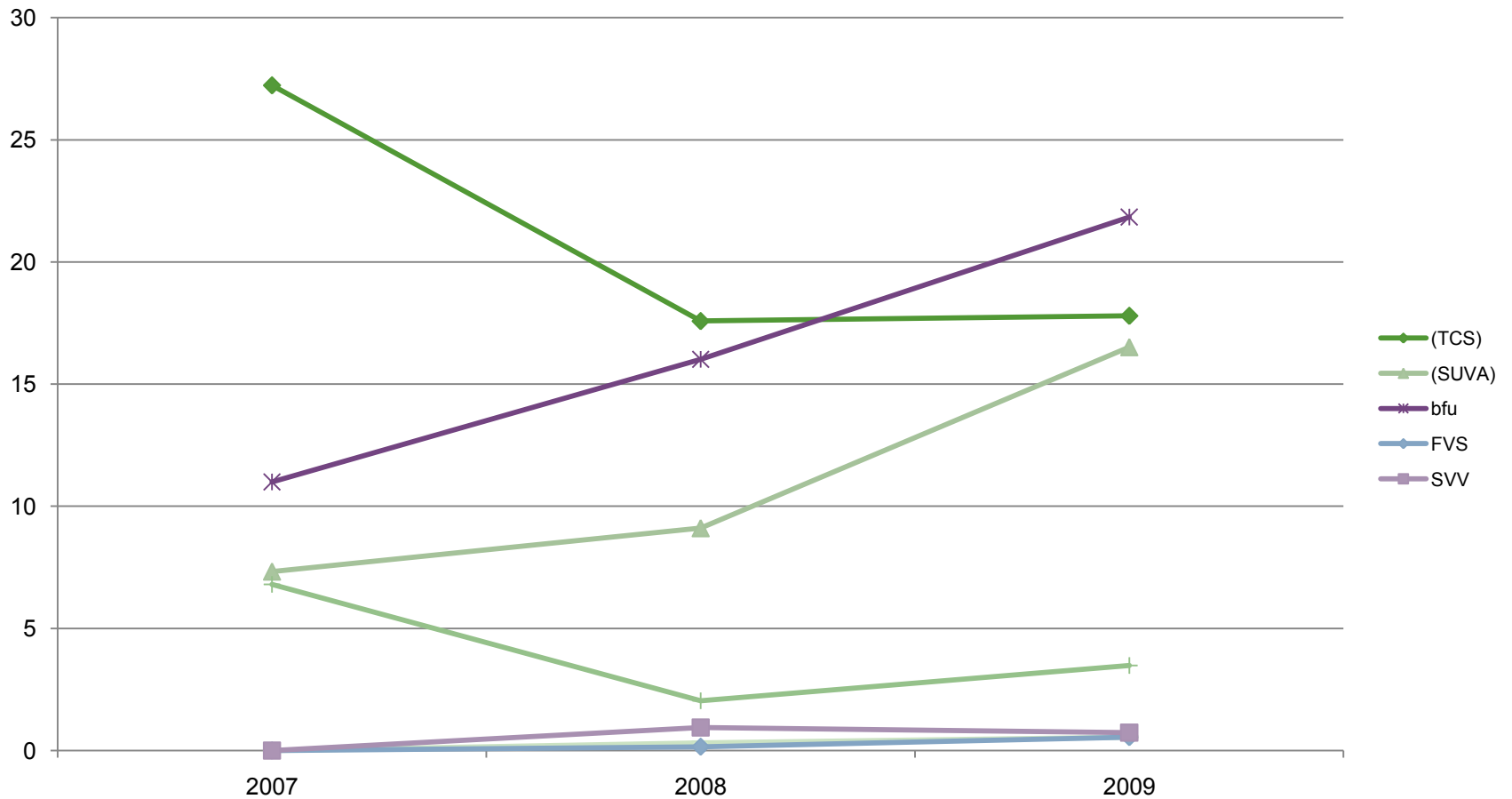
The results of the measurements with regard to height were considered as not reliable enough.

Further analyses conducted on the basis of the survey

Survey: Results



Survey: Results



Outcome evaluation

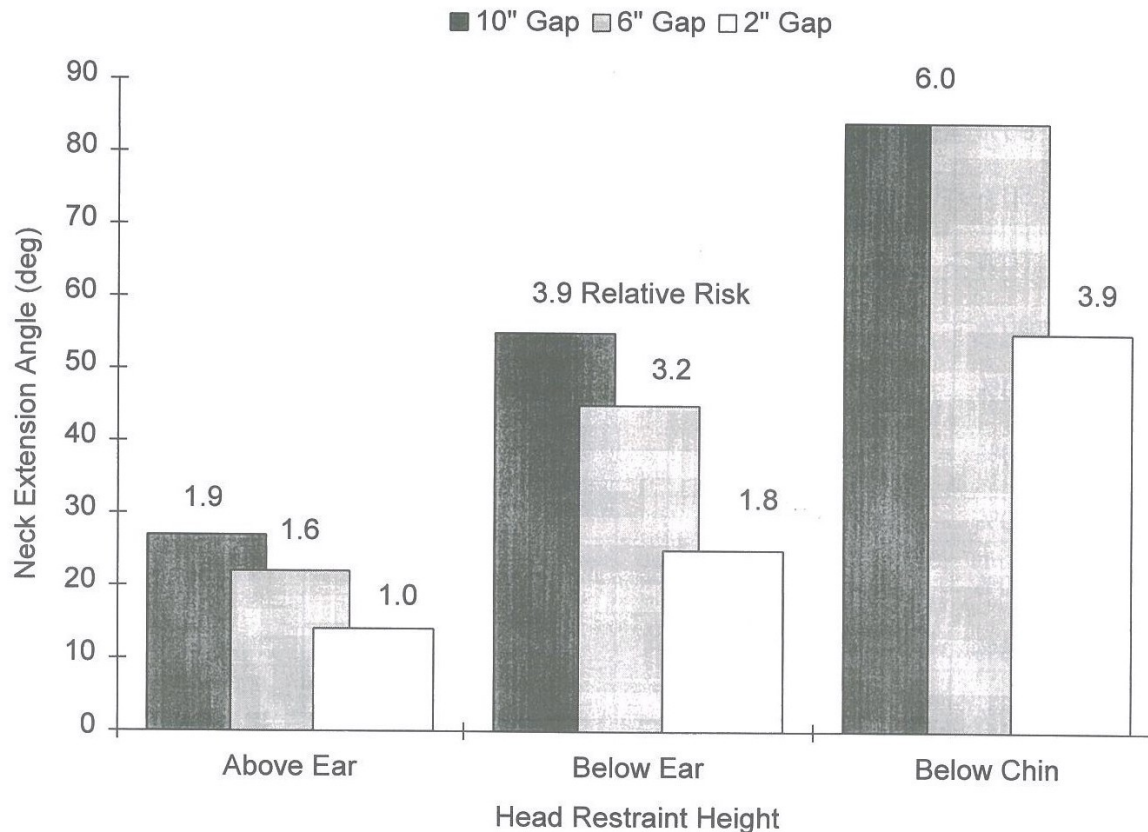
No data from the official registries available yet (only 2007)

What can we do?

Remember the „possible shortcut“ from Wednesday

EXERCISE: 25 minutes

Material 1: Relative risk of neck extensions depending on head rest position



Material 2: Survey results on position

2007	Distance correct	Distance wrong
Height correct	471	127
Height wrong	193	48

2009	Distance correct	Distance wrong
Height correct	649	140
Height wrong	180	39

Further information

Assume: Risk of neck extension = risk of whiplash

Whiplash cases per year in Switzerland: 4'5000

Campaign accounts for 70% of the changes in head rest position

Cost of the campaign: 3,000,000 CHF (about 2,000,000 €)

Cost per whiplash in Switzerland to insurances: 35,000 CHF
(about 25'000 €)

Not required:

- Confidence intervals
- Discounting

Questions, calculations and answers

Questions to answer	Calculations	Results
What was the relative risk in the Swiss population before the campaign began (2007)?		
What was the relative risk in the Swiss population in 2009?		
How did the risk change? In percentage points? In percent?		

Questions, calculations and answers

Questions to answer	Calculations	Results
How many whiplash injuries were prevented by the campaign per year? In total?		
What was the benefit-cost ratio?		

Questions, calculations and answers

Questions to answer	Calculations	Results
What was the relative risk in the Swiss population before the campaign began (2007)?	$(471 \cdot 1.0 + 127 \cdot 1.6 + 193 \cdot 1.8 + 48 \cdot 3.2) / 839$	
What was the relative risk in the Swiss population in 2009?		
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Questions, calculations and answers

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What was the relative risk in the Swiss population in 2009?	$(649 \cdot 1.0 + 140 \cdot 1.6 + 180 \cdot 1.8 + 39 \cdot 3.2) / 846$	
How did the risk change? In percentage points? In percent?		

Questions, calculations and answers

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What was the relative risk in the Swiss population in 2009?	$(649 \cdot 1.0 + 140 \cdot 1.6 + 180 \cdot 1.8 + 39 \cdot 3.2) / 846$	1.31
How did the risk change? In percentage points? In percent?		

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How did the risk change? In percentage points? In percent?	$1.40 - 1.31$	9 percent points

Questions, calculations and answers

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How did the risk change? In percentage points? In percent?	1.40 - 1.31 9 / 1.40	9 percent points 6.4 %

Questions, calculations and answers

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How many whiplash injuries were prevented by the campaign per year? In total?	$6.4\% * 0.7 *$ 4,500	
What was the benefit-cost ratio?		

Questions, calculations and answers

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How many whiplash injuries were prevented by the campaign per year? In total?	$6.4\% * 0.7 *$ 4,500 $202 * 2 \text{ years}$	202 404
What was the benefit-cost ratio?		

Questions, calculations and answers

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How many whiplash injuries were prevented by the campaign per year? In total?	$6.4\% * 0.7 *$ 4,500 $202 * 2 \text{ years}$	202 404
What was the benefit-cost ratio?	$(404 * 35,000) /$ 3,000,000	

Questions, calculations and answers

Questions to answer	Calculations	Results
How many whiplash injuries were prevented by the campaign per year? In total?	$6.4\% * 0.7 *$ 4,500 $202 * 2 \text{ years}$	202 404
What was the benefit-cost ratio?	$(404 * 35,000) /$ 3,000,000	4.7