Effect of road safety campaigns on behaviour and accidents

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Accidents

Background

- > 40,000 people die on European roads every year
- Large investment in RSCs
- Do RSCs work? If so, why?
- Confusion
  - different RSCs
  - different contexts
  - different evaluation studies
- Meta-analysis can help!

What is meta-analysis?

$$\overline{ES} = e^{(\Sigma \ lnES.w)/ \Sigma \ w}$$

Background

- Meta-analysis used in road safety research
- Focus on accidents
- Meta-analysis on campaign effects
  - Elliot, 93
  - Hagenzieker et al, 97
  - Delhomme et al, 99*
  - Elvik & Vaa, 04*
  - Vaa et al, 04*

*effect on accidents

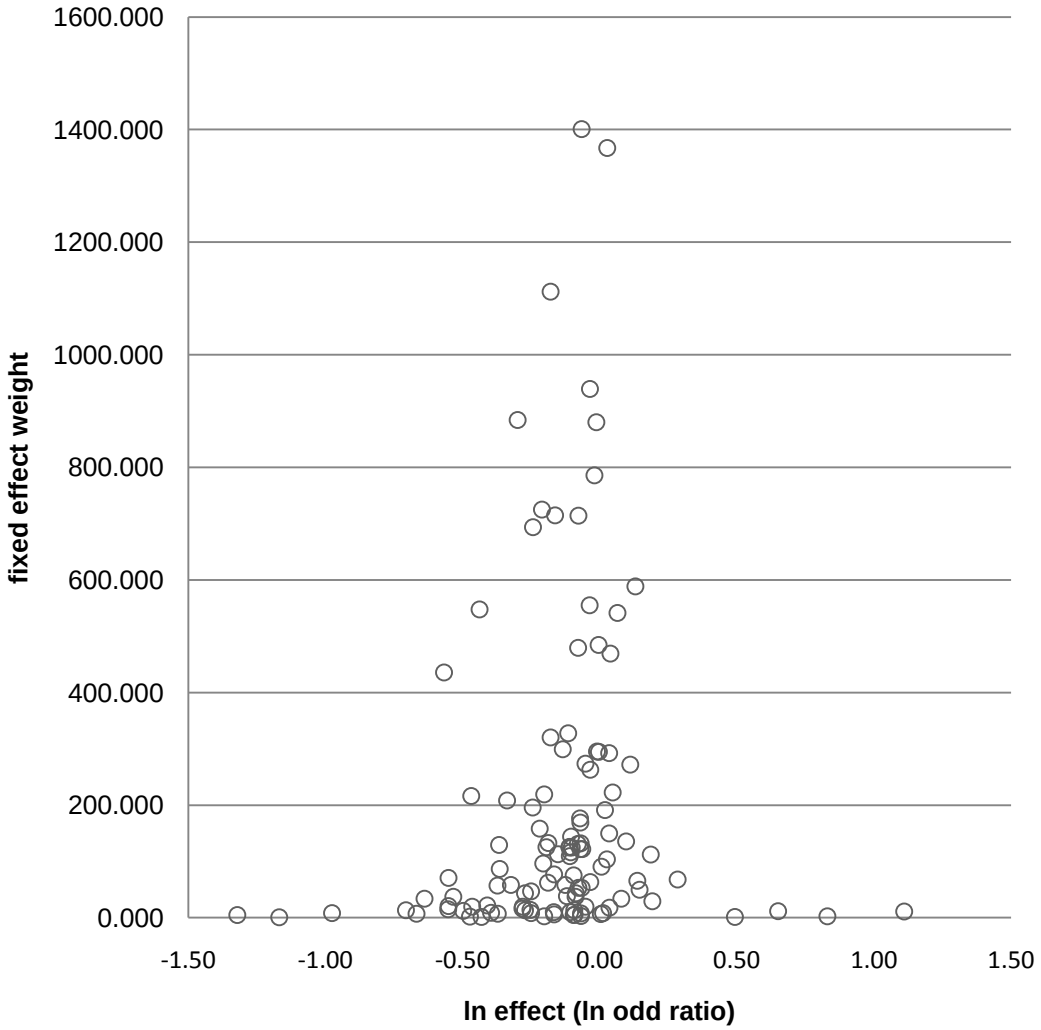
Background

- CAST: Disseminate an expanded, updated analysis of effects of campaigns on accidents
  - Overall, what is the evidence that RSCs reduce accident levels?
  - What is the evidence that certain types of RSC reduce accident levels?
  - What might explain the systematic variation in the size of RSC effect on accident levels?

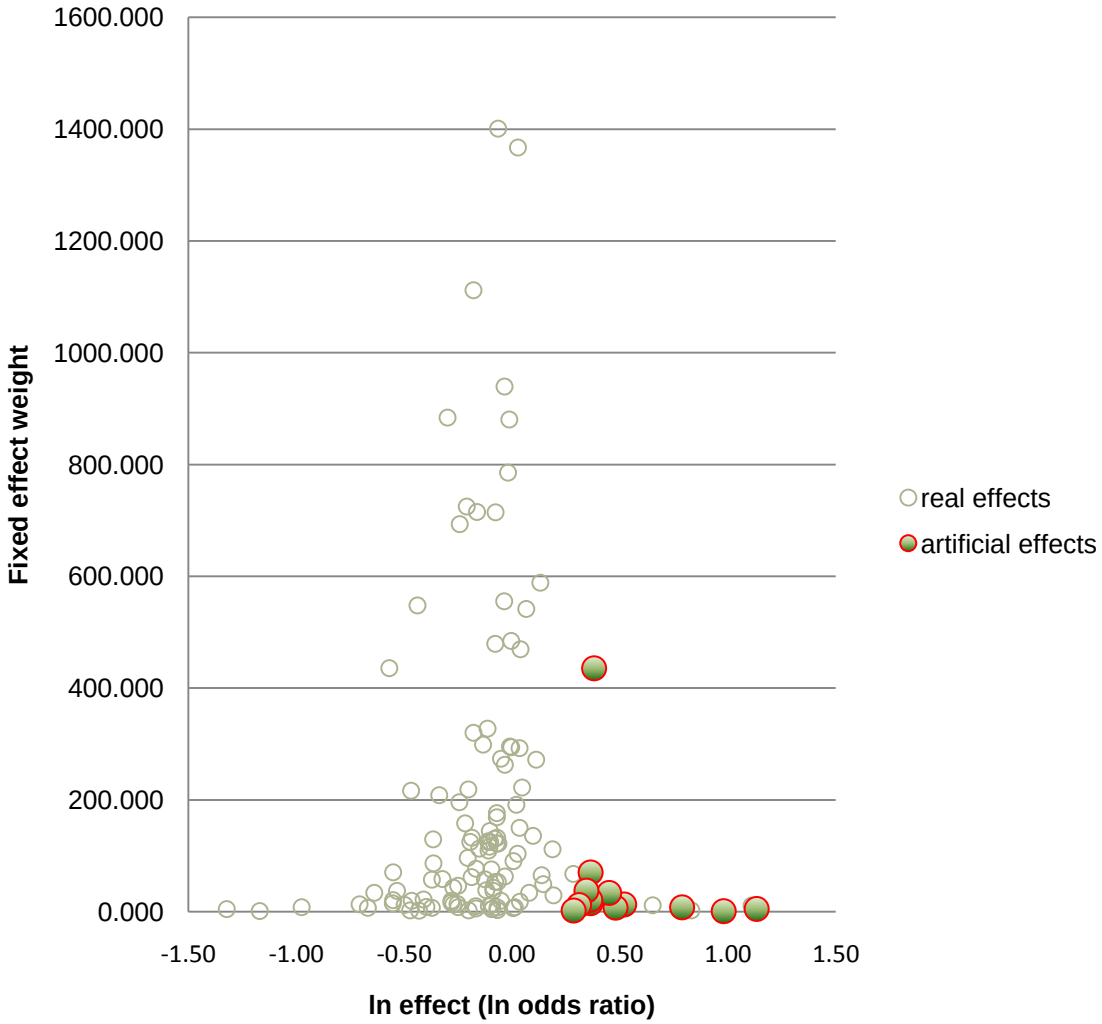
What is an RSC?

- *“[An RSC is] a purposeful attempt to inform, persuade and motivate behavioural changes in a relatively well-defined and larger audience in order to improve road safety, typically within a given time period, by means of organised communication activities involving specific media channels often complemented by interpersonal support and/or other supportive activities, such as enforcement, education, legislation, commitment or rewards.”*

Scatterplot



Accounting for publication bias



Meta-analysis

- Based on 119 effects from 65 studies
- 9 % reduction in accidents (95% CI: -12%; -6%)
- Subgroup analyses e.g. tv vs. no tv
  - tells us about effect size for campaign types
  - but must be careful when comparing values
  - informs meta-regression

e.g. subgroup analyses

Content variable	Variable level		No. effects	Test of heterogeneity		Proportion of statistical weight[a]	% change in accidents		
				Cochrane's Q	*p*		Lower 95%	**Estimate**	Upper 95%
Basis	**Stated basis?**	**yes**	50	348	<.001	0.56	-14	**-9**	-4
		no	66	224	<.001	0.44	-18	**-14**	-9
Theme	**General-mixed**		9	120	<.001	0.19	-25	**-14**	-1
	Speeding		26	55	<.001	0.21	-10	**-4**	+1
	Drink-driving		41	234	<.001	0.40	-23	**-18**	-12
	Other		35	73	<.001	0.20	-12	**-7**	-1
General content	**Emotional**		4	--	--	0.07	--	**--**	--
	Rational		52	203		0.50	-14	**-10**	-5
	Emotional+ rational		29	282	<.001	0.35	-21	**-15**	-7
	Incentive		3	--	--	0.07	--	**--**	--
Risk (harm)	**Risk of harm highlighted**	**yes**	22	64	<.001	0.17	-14	**-8**	-2
		no	92	493	<.001	0.83	-16	**-13**	-9
Risk (detection)	**Risk of detection highlighted**	**yes**	52	353	<.001	0.68	-17	**-13**	-8
		no	62	209	<.001	0.32	-16	**-11**	-6

- The effect **on accidents** of speed campaigns (-4%) is significantly poorer than that of drink-drive campaigns (-18%)

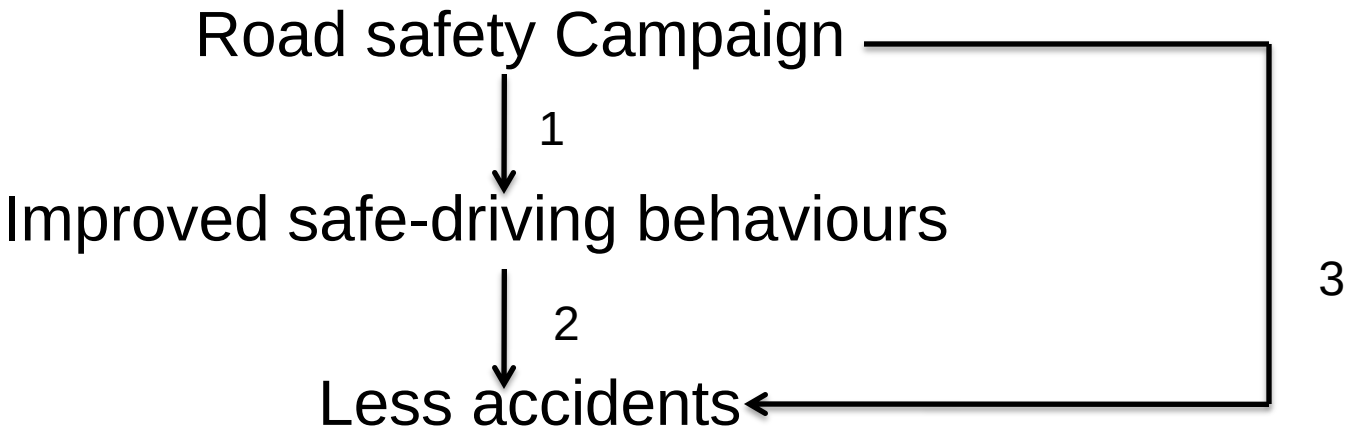
Meta-regression

	Fixed effects model		Random effects model	
	b	*p-value*	*b*	*p-value*
(Constant)	-.04	.054	-.04	.358
[Duration – 0 to 29 days]	-.15	<.001	-.13	.062
[After 2000]	.12	<.001	.12	.019
[Theme-drink-driving]	-.10	<.001	-.09	.022
[Personal communication]	-.07	<.001	-.09	.026
[Roadside]	-.10	<.001	-.10	.007
[Enforcement]	-.08	<.001	-.07	.113
[Combined mass-media]	.09	<.001	.06	.088
R^2	.38	<.001	.25	<.001
Q (model) (df = 7)	160.4	<.001	28.1	<.001
Q (residual) (df = 66)	267.5	<.001	83.3	.074

- RSCs often coincide with a reduction in accidents
- Effect sizes given for certain types of campaign
- **Roadside delivery** and **personal communication** important factors?
- Based on accessible evaluations that purport to assess isolated and often shorter term effects

Behaviour

What about behaviour?



Evidence for step 2. well established in case of speeding.

Evidence for step 1. is poorly established, both in road safety and generally.

Road safety campaigns → behaviour?

- Phillips et al. (2009) -- 182 studies evaluating RSC effect
  - 25% increase in seatbelt use (n = 133; CI +18%; +31%)
  - 16% reduction in speeding (n = 28; CI -25%; -6%)
  - 17% reduction in drink-driving (n = 23; CI -46%; +28%)

Road safety campaigns → seatbelt use?

- Phillips et al. (2009) – beneficial campaign factors
  - Enforcement
  - Roadside delivery
  - Limited area
- Humour not beneficial

Health campaigns ⟶ behaviour?

- Vaa et al. (2004) INFOEFFEKT studied 99 effects of campaigns on health behaviours

- Beneficial factors
  - Larger campaigns
  - Enforcement
  - Targeting
  - Shorter (< 1 y)
  - Campaigns with personal influence more effective than those using only mass communication

Conclusions

- Campaigns **can** reduce accidents and improve road safety behaviours

- An analysis of effects of accidents & behaviour suggests that:

  - ***Intimate*** messages are best -- target must feel message is about them

  - ***Immediately*** delivered messages are best -- deliver a salient message in a way close in time and space to the target behaviour (shorter-term effects)

(Note: enforcement is both intimate and immediate)

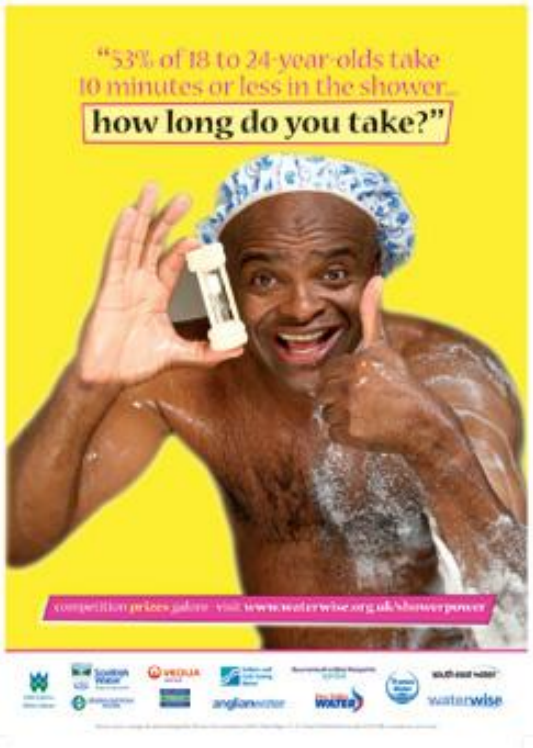
Conclusions

- Societal-level change achieved through mass-media probably important in longer-term / in campaign programmes

- This based on available evaluation studies -- some factors not considered due to lack of research e.g. accounting for descriptive social norms

Descriptive social norms (R.Caldini)

- ”Most others speed so it’s ok if I do”
- Recently accounted for in UK water-use campaign



References

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- Caldini, R.B. (2007). Descriptive social norms as underappreciated sources of social control. Psykometrika 72(2), 263-268.