



5th conference

Transport Solutions:
from Research to Deployment

Innovate Mobility, Mobilise Innovation!

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An overview of promising and not promising countermeasures

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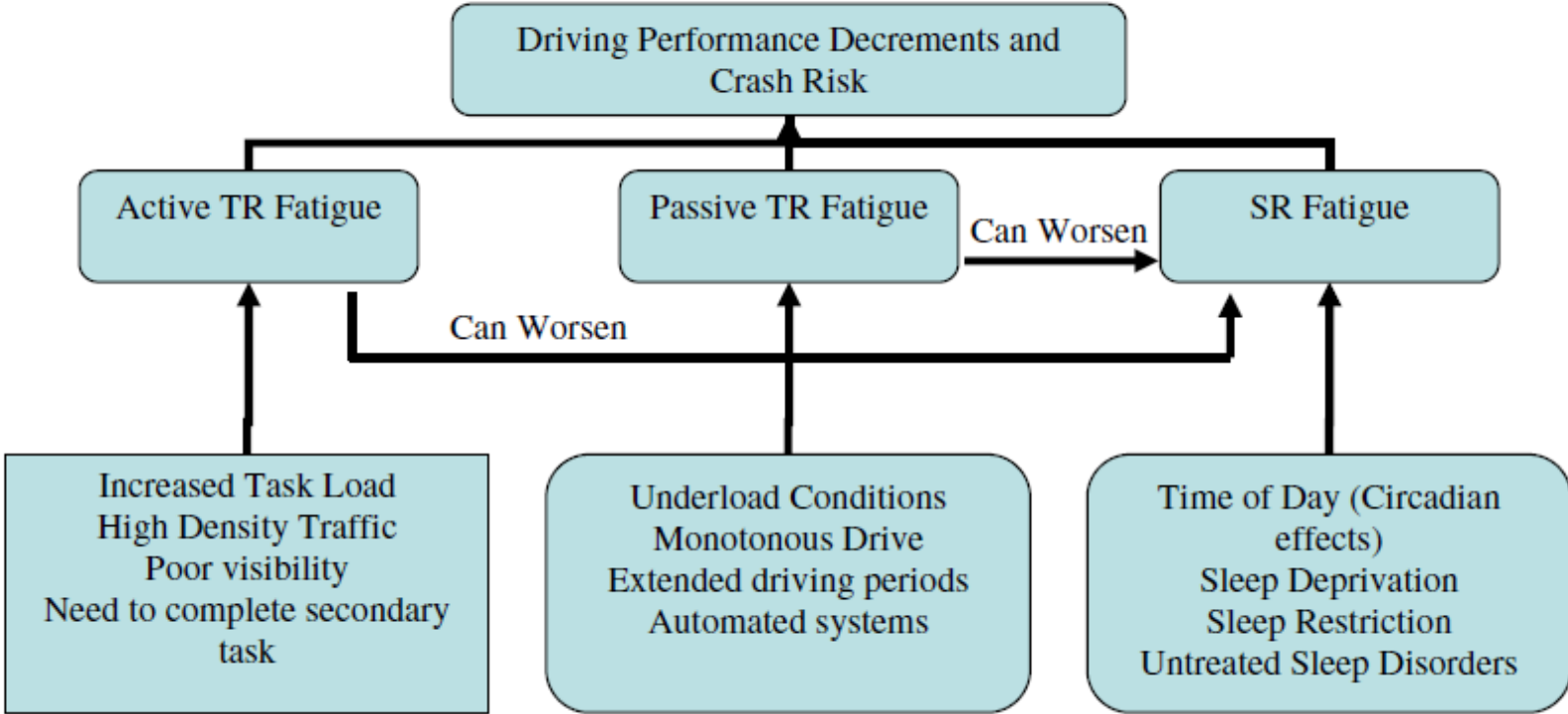
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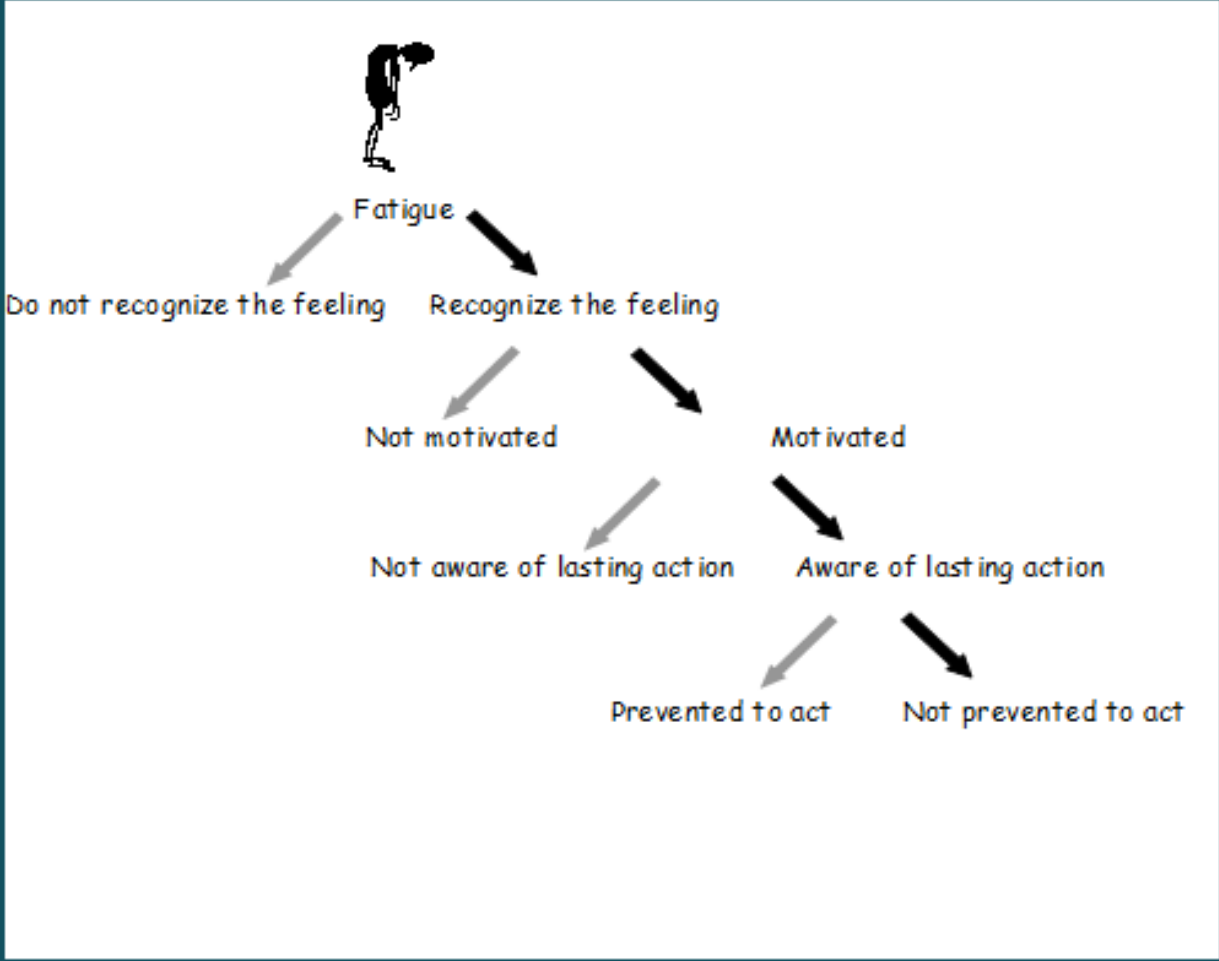
Countermeasures at a pre-crash level

Strategic	Tactical	Operative
Fatigue management systems	Driver support system (feedback – warning)	The infrastructure rumble strips
Hours of service regulations	Road signs	Driver support systems (warning & intervention)
Information/Education	Parking areas	
Strategies for planning	Route guidance to parking areas	
Fit for duty test		
Enforcement/Control		

Fatigue (Active or Passive) - Sleepiness



Human

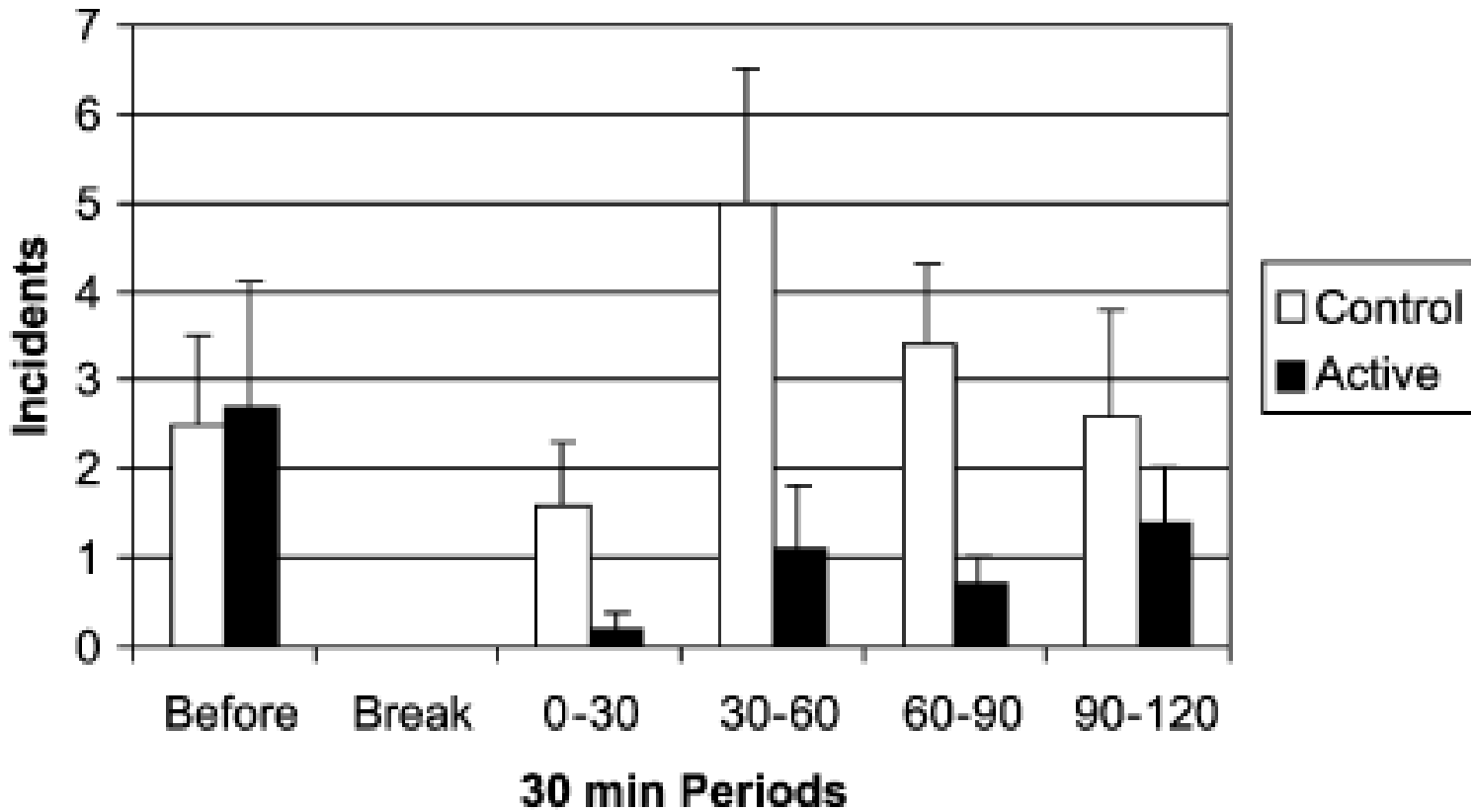


Preference for a nap differ with driver group

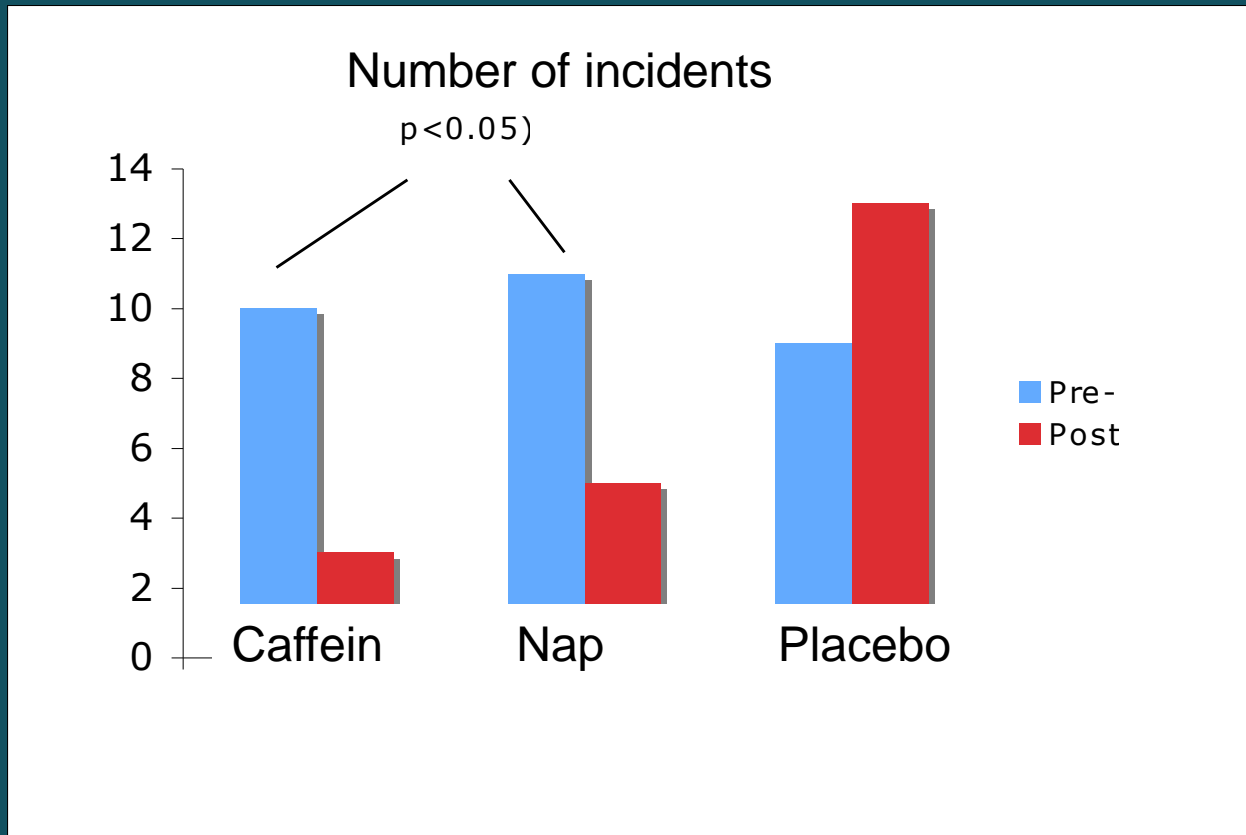
<i>Model with univariate predictors</i>	Efficient = stop for a nap		
	Odds Ratio	95% CI	p
Age			
18–25			
26–45	1.22	0.82-1.83	0.32
46–64	1.86	1.28-2.70	<0.01
65 or older	1.01	0.68-1.50	0.97
Gender – Male vs female	2.83	2.04-3.93	<0.01
Higher education vs lower	1.28	0.98-1.66	0.07
Professional drivers vs non prof	3.43	2.05-5.73	<0.01
Exp of sleepy driving vs not	2.76	2.11-3.60	<0.01
Exp of sleep related crashes vs not	2.80	2.01-7.19	<0.01
Shift workers vs day workers	1.25	0.87-1.81	0.23
Persistent sleepiness vs not	0.87	0.60-1.25	0.45
Snoring vs not	1.70	1.16-2.50	<0.01
Poor sleep quality vs good	1.43	0.88-2.32	0.15
Sleep duration < 6h vs more	1.74	1.30-2.32	<0.01

Functional energy drink = YES

DRIVING INCIDENTS - Active Vs Control Drink



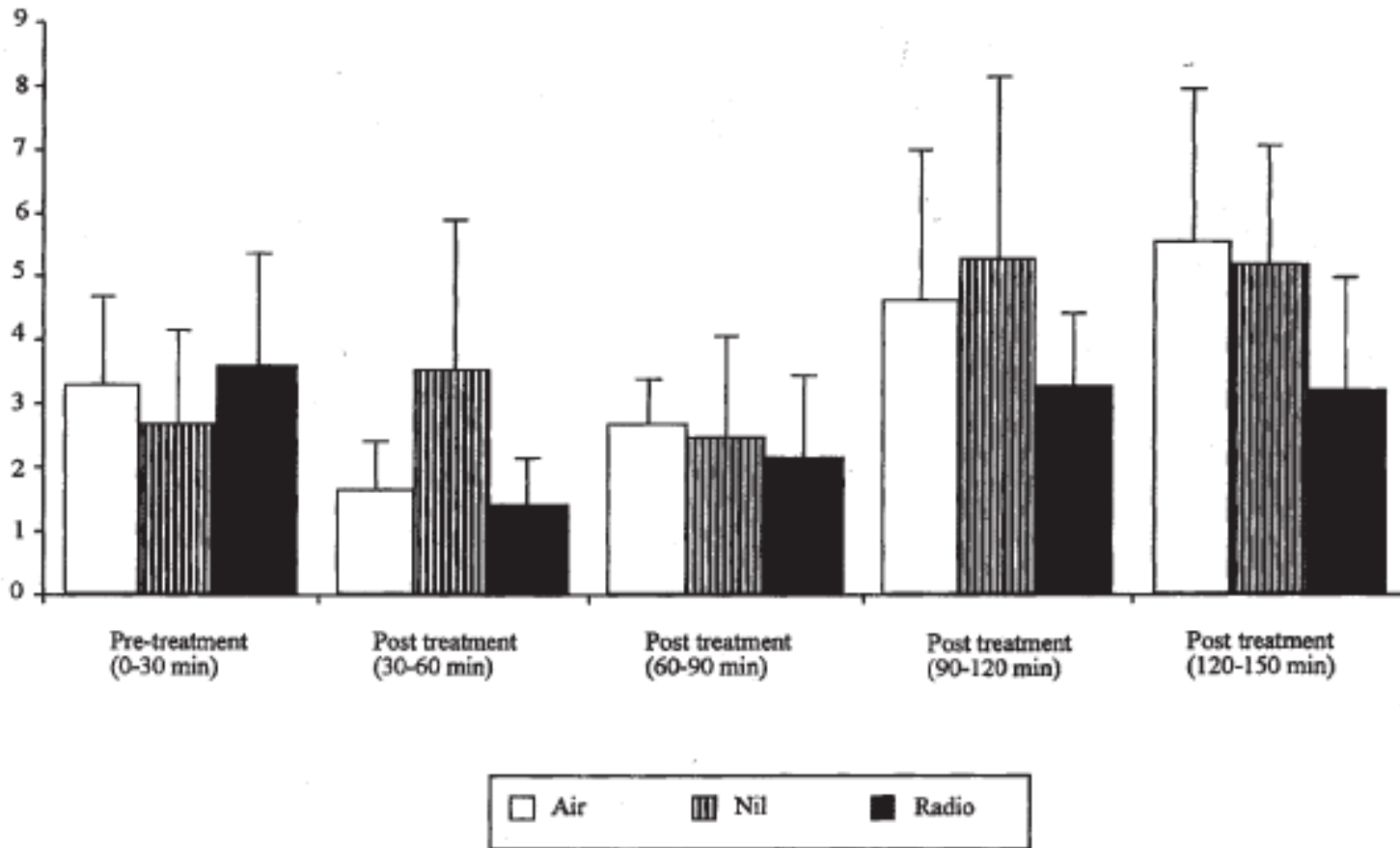
Caffeine = YES
Nap = YES
Caffeine & Nap=YES (even better)



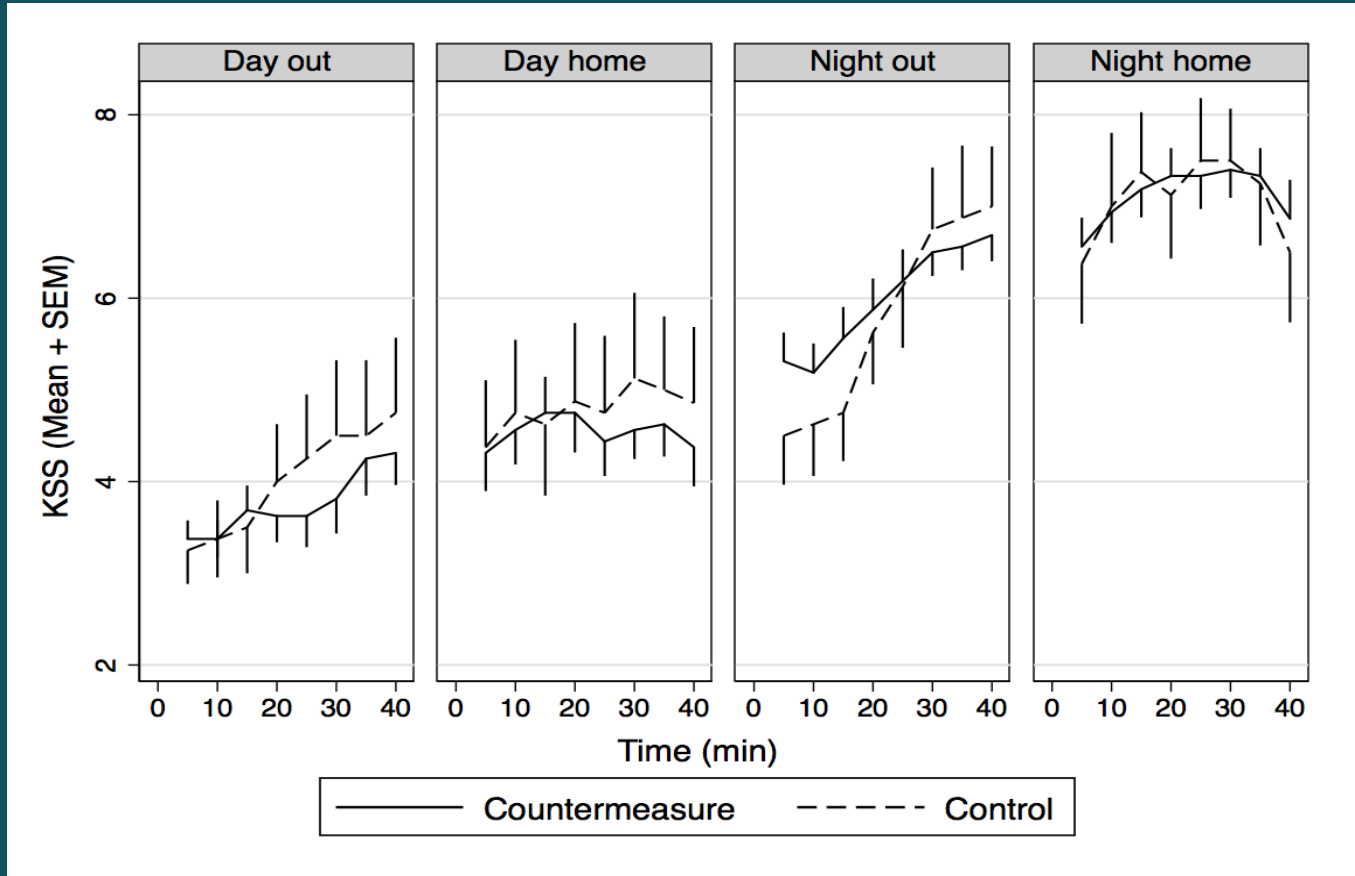
(Horne et al, 1996; Reyner et al. 1997; Philip et al. 2006)

Cold air = NO
 Radio = NO (tendency)

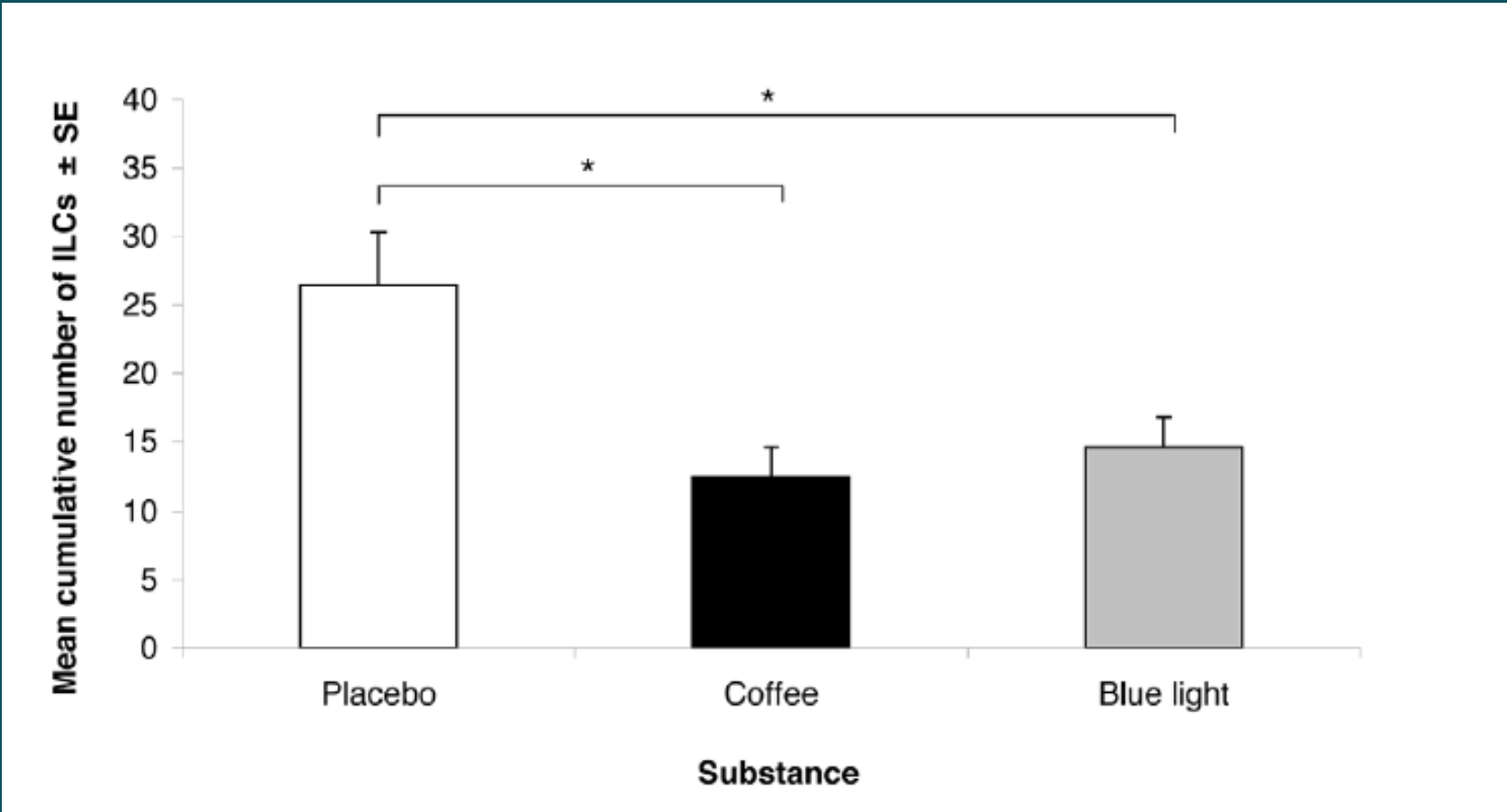
Mean and se of incidents for AIR, NIL and RADIO conditions



Radio or open window – not for sleepiness



Blue light = YES



Driver support = YES

- Detection – popular but most drivers already know
- Warning – not so popular – but what is needed to convince a sleepy driver to stop?



- Independent evaluations is needed

Infrastructure rumble strips = YES



110 km/h - mv

Single
killed or sever injured - **30 %**

(correcting for regression effects)



90 km/h - 1+1
Normal (8-10m)
Killed and severe injured - **7%**

Narrow (<8m)
Killed and severe injured - **30%**

(If we adjust for the regression effect those figures increase)

- Countermeasures are available and needed
- Awareness and knowledge of not promising countermeasures are important
- Parking areas attractive to stop at is necessary
- Rumble strips are effective
- Driver support system is promising but the reason behind needs to be considered
- More focus on the warning concept is needed
- Fatigue management is coming....
- Do not forget those that reduce the sleepiness development like sound, road environment etc.

Thank you for listening!

Questions:

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