



Where next for WRRS?

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Systematic review

What we did

- Grayson and Helman (2011) – IOSH publication
- Systematic (i.e. unbiased) review of evidence on the effectiveness for different approaches to WRRS (e.g. Training, Incentives, Education, In-vehicle monitoring etc.)
- Key inclusion criterion:
 - Any evaluation of the effectiveness of a WRRS intervention on crash risk

Work-related road safety

A systematic review of the literature on the effectiveness of interventions

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research report

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the heart of
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Why a systematic review?

- "...systematic reviews of empirical evidence...have been accepted as being the best way to establish the level of support for any given intervention or treatment." (Grayson & Helman, 2011)
- 'Grade' evidence for scientific quality
 - Control or comparison groups **to control for confounding factors**
 - Random or 'matched' allocation **to rule out self-selection bias***
 - Reporting of statistical significance **to rule out chance***

* (beyond reasonable doubt)

Note...

- Very early in the review process it became clear that there is almost no evidence from sufficiently high quality evaluations
- Therefore scope of the review was extended to include consideration of our more general understanding of the field



Current knowledge – leadership (process)

Leadership

- It is often said in the literature that leadership in an organisation is critical to the successful management of WRRS
- We should remember though that 'leadership' is a different category of 'thing' to the intervention components being delivered. **Leadership is not the intervention!**
- In classical evaluation, a failure of leadership would be described as a failure of the **process** (e.g. Sentinella 2004) of delivering an intervention; it would not necessarily show that the intervention itself was ineffective

Analogy 1

- There is evidence that antiretroviral drugs can reduce mother-to-child transmission of HIV infection (e.g. Volmink et al., 2007)
- However without an appropriate delivery context (e.g. community distribution) effectiveness is reduced (see e.g. Amuron et al., 2009)
- So here we have an effective treatment rendered ineffective by poor delivery...

Analogy 2

- Traditional driver training and education for new drivers may provide the counter example (Helman, Grayson & Parkes, 2010):
- An abundant delivery capacity and absolute buy-in from public and professionals...but almost no evidence for its effectiveness as a road safety intervention (although there are other benefits...access to a driving license being one)
- Here we have an efficient delivery system being used to deliver the wrong thing...

So...

- I would sum-up the current knowledge in WRRS regarding 'leadership in organisations' like this:

Leadership on WRRS in organisations is a necessary (but not sufficient) pre-condition if improvements in road safety are going to be observed from WRRS interventions.

Current knowledge – risk factors

Risk factors for work related road accidents

- There is a 'fleet driver' effect above and beyond mileage
- A number of researchers, using a number of different approaches, have come to the same conclusions regarding the key risk factors for crashes relating to work driving:
 - Fatigue
 - Distraction
 - Time-pressure
- Salminen and Lähdeniemi (2007), Robb et al. (2008), Fort et al. (2010), Broughton et al. (2003)



So...

- With regard to current knowledge on risk factors, we can sum up thus:

We have a good understanding of what the risk factors are – we know what we need to design interventions to address.

Current knowledge – interventions

The 'no silver bullet' argument

- "Research...suggests that fleet safety intervention strategies would need to be tailored toward each individual organisation focussing on specific issues dependant on industry, organisational, behavioural and cultural requirements" (Rowland, Wishart & Davey, 2005)
- Fair reflection re: process (and perhaps specific risk factors), but possibly pessimistic re: intervention components used?
- Surely we should be able to answer questions like "Which is more effective – training in defensive driving or regular discussion groups around driving style?"

Case studies

- Much of the published WRRS literature consists of case study designs
 - This literature suggests that it is possible to improve WRRS
 - But multifaceted nature of interventions make it impossible to tease apart the different effects
 - Also we KNOW that many case studies (often unpublished) show NO improvements
- Reliance on multifaceted-intervention case studies (especially with publication bias) make it formally impossible to tell which intervention components work best

Properly controlled studies - 1

- Gregersen et al (1996) 'Televerket' study
 - Specific 'insight' driver training
 - Group discussions
 - Incentives
 - Publicity 'campaign'
 - Control group
- The first three of these showed a statistically significant reduction in crash rate compared to the control group
- This work has not been followed up

Properly controlled studies - 2

- Wouters and Bos (2000)
 - In-vehicle data recorders installed in fleets and drivers made aware that their driving was being monitored
 - Matched control group
- Statistically significant drop in accident rates
- This work has not been followed up

Properly controlled studies – lack of...

- Other than these two studies we could find none in the literature that provide a credible level of scientific control, i.e. studies that can:
 - Control confounding factors
 - Rule out self-selection and rule out chance

- Some interesting recent and ongoing work in WRRS, but often it lacks scientific rigour – possibly through difficulty of having businesses commit to:
 - Perceived 'unproven' interventions
 - Withholding interventions from control groups

Based on literature as a whole

- With regard to current knowledge on interventions, we can summarise:

There is very little evidence from scientifically sound evaluations to provide us with an understanding of which components of interventions for WRRS actually reduce crash risk, by how much, and through which causal mechanisms.

Conclusions

Conclusions

- WRRS field is to be applauded for making road safety 'mainstream' within business and within H&S
- We know that leadership is critical to ensure delivery of intervention components
- We know which risk factors need to be targeted
- We do not know which intervention components and approaches work (or are likely to work) best
 - Case studies cannot tell us this
 - At best, WRRS is proceeding on a less-than-efficient basis without evaluation based on sound scientific principles

Next steps

- Continue the battle to 'win leadership buy-in' to WRRS in businesses – this is necessary (but not sufficient)
- Improve understanding about effectiveness of different intervention components by insisting on evaluations of high scientific quality
- The future success of WRRS is likely to be proportional to its reliance on good quality evidence, as well as its outreach



**Do You
Have Any
Questions?**

Thank you

Where next for WRRRS?

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References

- Amuron et al. (2009). Mortality and loss-to-follow-up during the pre-treatment period in an antiretroviral therapy programme under normal health service conditions in Uganda .*BMC Public Health* 2009, 9:290doi:10.1186/1471-2458-9-290
- Broughton J., Baughan C, Pearce L, Smith L and Buckle G. *Work-related road accidents*. TRL Report 582. Crowthorne: Transport Research Laboratory, 2003.
- Fort E, Pourcel L, Davezies P, Renaux C, Chiron M and Charbotel B. Road accidents, and occupational risk. *Safety Science* 2010: 48, 1412-1420.
- Grayson, G. B. & Helman, S. (2011). Work related road safety: a systematic review of the literature on the effectiveness of interventions. Institute of Occupational Safety and Health Research Report 11.3
- Gregersen N P, Brehmer B and Morén B. Road safety improvement in large companies. An experimental comparison of different measures. *Accident Analysis & Prevention* 1996; 28: 297–306.
- Helman, S., Grayson, G., and Parkes, A. M. (2010). How can we produce safer new drivers? A review of the effects of experience, training, and limiting exposure on the collision risk of new drivers. TRL Insight Report (INS005). Crowthorne: Transport Research Laboratory.

References

- Robb G, Sultana S, Ameratunga S and Jackson R. A systematic review of epidemiological studies investigating risk factors for work-related road traffic crashes and injuries. *Injury Prevention* 2008: 14, 51-58.
- Rowland B, Wishart D and Davey J. Occupational fleet safety research: a case study approach. *Proceedings of 13th Annual Occupational Health and Safety Conference, Cairns, 2005*.
<http://eprints.qut.edu.au/9847/1/9847.pdf>
- Salminen S and Lähdeniemi. Risk factors in work-related traffic. *Transportation Research Part F* 2007: 77-86.
- Sentinella J (2004). Guidelines for evaluating road safety education interventions. Department for Transport: London.
- Volmink J, Siegfried N, van der Merwe L, Brocklehurst P. Antiretrovirals for reducing the risk of mother-to-child transmission of HIV infection. *Cochrane Database of Systematic Reviews* 2007, Issue 1. Art. No.: CD003510. DOI: 10.1002/14651858.CD003510.pub2
- Wouters P and Bos J M. Traffic accident reduction by monitoring driver behaviour with in-car data recorders. *Accident Analysis & Prevention* 2000; 32: 643-650.