



## Assessing the Impact of Real-world Countermeasure Trials – an example from the PANACEA project

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### Introduction

Assessing the potential impact of road safety interventions is important in determining whether they should form part of wider road safety policy. Efforts to reduce driver impairment fall under the intermediate outcome targets within the EU Safe Systems results hierarchy (EC 2020<sup>1</sup>). The PANACEA project is an interdisciplinary H2020 project\*<sup>2</sup> that aimed to create a holistic monitoring and assessment system to support professional drivers' fitness to drive. Fitness to drive was addressed in relation to combating the driver impairments of alcohol, licit drugs (medicines), fatigue and stress. An element of the project was to develop countermeasures and trial them in two eight-week real-world pilots and a simulator pilot. An impact assessment framework was developed to guide the process of evaluating impact of the monitoring and assessment fitness to drive system. The countermeasure elements of the PANACEA impact assessment framework focus on behaviour change, user acceptance and fit for purpose. The evidence for these aspects will be examined for two of the developed countermeasures.

### Research Methodology

PANACEA developed ten countermeasures, using a systems-based approach, that addressed the operator (employer) and enforcement (police) as well as the drivers (Talbot et al., 2023<sup>3</sup>). This paper will focus on the two countermeasures that were aimed at the driver and were tested in all three pilots: Relaxation tool (offered to drivers when stress detected as high) and Fatigue Report (% time fatigued during shift). The countermeasures were assessed during two 8-week real-world pilots in Sweden with 8 automatic shuttle operators (bus drivers trained in the shuttles operation) and in Spain with 22 bus/coach drivers. A simulator pilot was conducted in Greece and involved 20 taxi drivers.

In-vehicle cameras (fatigue) and start of shift tests (stress) were used to detect impairment. Countermeasures were delivered to the driver via an app following each shift (Fatigue report) or when high levels of stress were detected (Relaxation tool). Countermeasure evaluation data

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<sup>1</sup> European Commission (2020). Next steps towards Vision Zero: EU Road Safety Policy Framework 2021-2030.

<sup>2</sup> PANACEA has received funding from the European Union H2020 research and innovation programme under grant agreement number 953426

<sup>3</sup> Talbot, R., Pilkington-Cheney, F., Filtness, A., Quigley, C., Motnikar, L., Larsen, R. S., . . . Vicente, E. G. S. (2023). Developing countermeasures to improve fitness to drive in professional drivers [Extended Abstract]. In 8th Humanist Conference 2023; Proceedings of the 8th Humanist Conference (pp. 26-27). Berlin, Germany: Humanist.



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was collected via questionnaires (post-intervention) and focus groups with a sample of drivers. Not all drivers received the countermeasures via the app; countermeasures were demonstrated during focus groups. Questionnaire responses and focus group discussions were analysed for evidence relating to ‘behaviour change’, ‘user acceptance’ and ‘fit for purpose’.

## Results

Data collection and analysis is ongoing (April 24). Questionnaire data was available for all 8 shuttle operators, 7 of which took part in two focus groups. Focus group data was available for 5 taxi drivers. Table 1 provides a brief overview of results.

Table 1: Summary of Results

Relaxation Tool	Behaviour change	User acceptance	Fit for purpose
Shuttle driver Questionnaire (n=8)	* 2/8 = 4; 2/8 = 3	Only 1 driver used tool. Thought it was beneficial.	
Shuttle driver focus groups (n=7)		1 driver used system, others skeptical	Concern over time taken to take test
Taxi driver focus group (n=5)	Potential to reduce stress in short term – unsure of long-term benefits	Thought to be helpful and would use in future	Useful for “on the go”. Need opportunity and time to use tool.
<b>Fatigue Report</b>			
Shuttle driver Questionnaire (n=8)	* 1/8 = 4; 3/8 = 3	3 drivers received a report. Mixed opinion about its usefulness.	
Shuttle driver focus groups (n=7)		Potential to support fatigue management, current form not ideal	Needs improvements (fatigue detection did not work in shuttle)
Taxi driver focus group (n=5)	Has potential but not sufficient without operator facilitation	Information would help driver and operator manage fatigue	App easy to navigate; aids self-monitoring

\* “Since using PANACEA I have changed my behaviour to reduce [stress]/[fatigue]” 1-5 Likert scale, 1= not at all, 5= a lot

## Discussion and Conclusions

**Behaviour change** data was challenging to collect and the effectiveness of the countermeasures remains unclear. It would be necessary to conduct further research to make conclusions about the impact on behaviour change. Focus group data revealed that the shuttle drivers thought less positively about the countermeasures than the taxi drivers. There was some support, but results suggest that the countermeasures may have greater impact on some groups of drivers than others in terms of **user acceptance**. The principle of the countermeasures was generally supported but it was clear that there would be a need for design improvement of the countermeasures and data collection systems that feed them for future successful implementation (**fit for purpose**).

It was possible to identify data from questionnaires and focus groups relating to behaviour change, user acceptance and fit for purpose that could indicate impact. However, in future, more objective data collection methods should be utilised.