Professional drivers' fitness to drive - what is the state of the art?

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FITNESS TO DRIVE

What is fitness to drive?



AI generated by Adobe Stock "professional driver fitness"

What is fitness to drive?

Drivers in Europe must meet minimum standards of physical and mental fitness to obtain a driving licence.
(European Commission – Mobility & Transport – Road Safety)

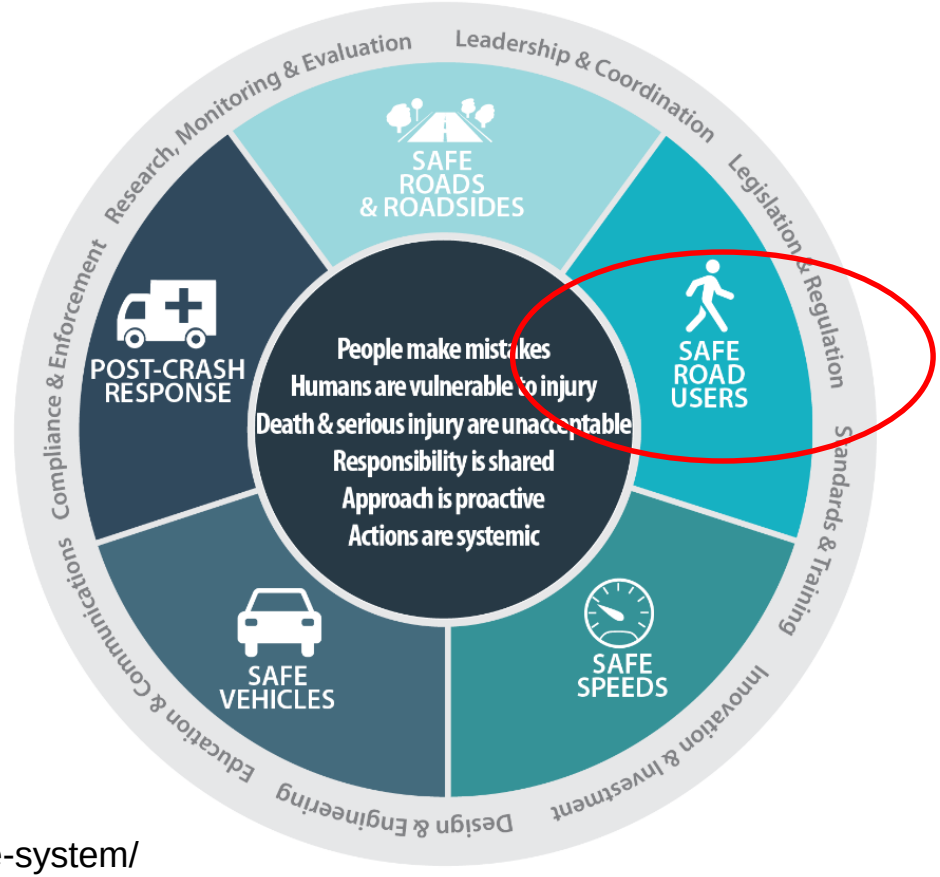
- "fitness to drive" is a term usually associated with medical fitness.
- Information on this topic is often targeted at medical professionals.
- Expectation of off-road screening/assessment.
- Broad topics e.g. vision, disorders, dependency, aging, cognitive ability and physical ability.

What else is fitness to drive?

- Individuals who pass a medical assessment can also experience issues with fitness to drive.
- Impairments which can influence driving:
  - Fatigue
  - Stress
  - Alcohol
  - Drugs
  - Medication

Why does fitness to drive matter?

- Vision Zero. no road user should be killed or seriously injured (Johannsson 2009).
- Eliminate fatalities and severe injuries that are related to dangerous driving while impaired (Lie et al 2024).
- A Safe System takes a holistic outlook, recognising that crash risk reduces if when one element fails another will compensate. (EU Safe System 2018).
- Each element should perform to the best of its ability.



https://www.pacts.org.uk/safe-system/

Professional drivers

- Are overrepresented in crashes (Talbot et al 2016).
- Road freight has the highest death rate of its employees compared to that of other industries (Safe Work Australia, 2018).
- Professional drivers are at high risk of driving impairment (Krueger 2008).

The risk is high

- Impaired drivers:
  - More likely to break rules
  - Drive at unsafe speeds
  - Miss or misinterpret key information
  - Make errors
  - Crash!

Alcohol

- A sober driver can drive for approximately 5000 years before s/he is killed, while a driver who is always above 0.1 % BAC when driving can only survive 5 years (Forsman 2013 cited in Lie et al 2024).
- In-vehicle monitoring is increasing accessible with after market devices available (Uzairue et al 2018, Shukla et la 2020) .
- Focus is on preventing a driver from driving e.g. interlock.
- Greater benefits might be expected from assisting problem alcohol use management and mechanisms to inform police.

Licit and illicit drugs

- OTC medication is in the top 10 factors associated with truck crashes (Blower 2002).
- Apprehended drug drivers are most likely single young male cannabis users who score high on risk-taking, sensation-seeking and impulsivity scales (Hasan et al 2022).
- The variety of drugs makes this a complex topic.
- Regulation by "impairment" or "per se" (Marillier & Verstraete, 2019).
- Sensitivity of drug testing with saliva is improving and offering new opportunity (Walsh et al 2010), as blood and urine are more reliable but less suited for roadside testing.

Fatigue

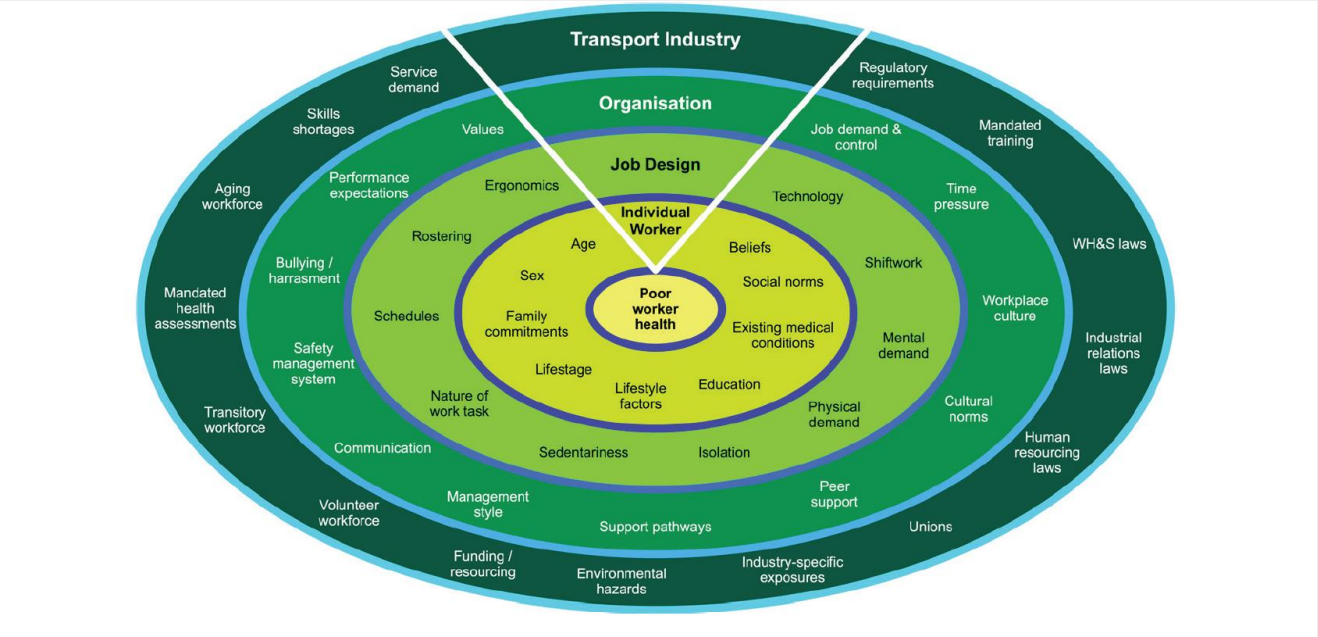
- 15-20% of crashes may be attributable to sleepiness in high income countries (Connor 2009).
- EEG is the most accurate physiological measure indicator of sleepiness, however this is limited use in real world driving. Ocular parameters offer high potential for continuous monitoring of fatigue. (Sparrow et al., 2019).
- Fatigue measurement is likely most accurate using multiple indicators, as a variety of factors contribute to fatigue (Touliou et al., 2017).
- The algorithms which impute from indicators are often private IP.
- Fatigue itself is not binary, it is a progressive experience, but to detect it requires a binary system (Watling et al., 2021).

Stress

- Stress from the traffic environment, general mental health and daily hassles impact on driving errors, lapses and violations (Rowden et al 2011).
- A variety of physiological indicators of stress can be used, however, many of these are also used in other state indication e.g. HRV (Lohani et al., 2019).
- Stress is often an intrusive measure as sensors need to be in contact with the driver (Rastgoo et al., 2018).
- There can be large individual differences in the physical manifestation of stress and the strength of signal from physiological measures to detect stress (Němcová et al., 2021).

Who is responsible for fitness to drive?

- Being fit to drive is not always easy to achieve.
- Drivers might not be aware of risks or appropriate mitigation strategies.
  - E.g. residual effects of alcohol (Verster et al 2014).
- Individual drivers should manage their own health and turn up fit for work but there is also shared responsibility of the employer to support in this (Newnam et al 2022) .



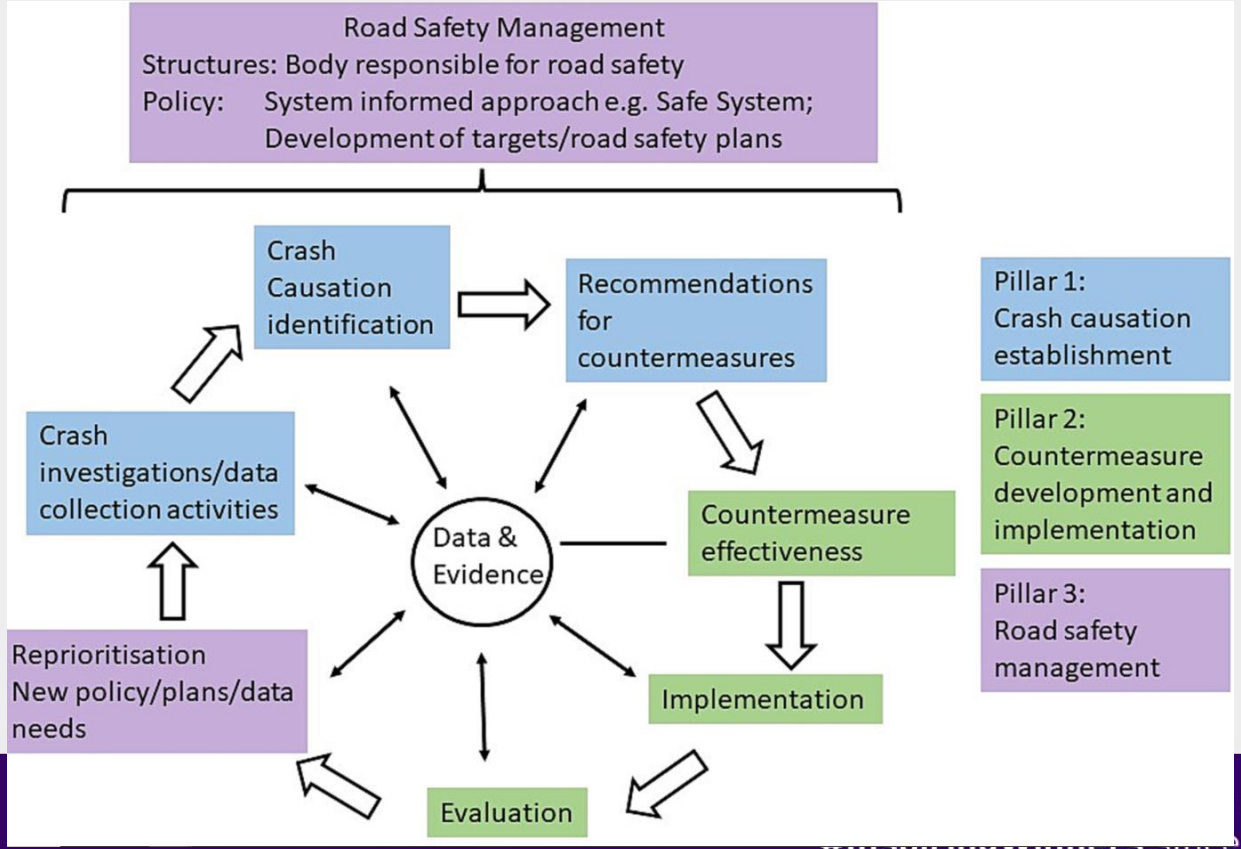
Conceptual overview of factors at various system levels that may directly and/ or indirectly impact poor health and related impairment (Naweed et al 2023)

- Individual worker makes decisions.
- Job design creates barriers/opportunities e.g. shift schedules.
- Organisations influence e.g. through cultural norms.
- Industry/enforcement regulates through legal limits.

Evidence-based road safety policy making

- Impaired fitness to drive increases crash risk.
- Countermeasures are being developed and trialled.
- Next step – enhanced policy making

(Talbot et al 2024)



How can support for fitness to drive be improved? Example: fatigue

European Rules Regulation (EC) No 561/2006 sets driving hours.

- 45min break in every 4h driving. Minimum 11h overnight rest.
- Prescriptive limits aimed at reducing fatigue.

HOWEVER

- These apply to those driving vehicles > 3.5 tonnes. Or passenger vehicles (more than 9 passengers), driving on routes > 50km.
- They do not take into account that someone may be compliant with the rules and still experience fatigue. e.g. no consideration of time of day.
- Often managed within staffing/business operations rather than as part of safety.
- Can be subject to violation/falsification (Goldenbeld et al 2023).

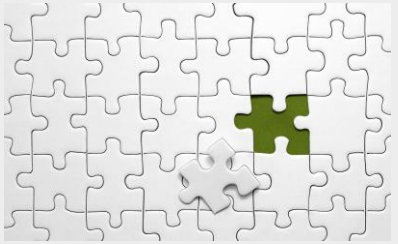
How can support fitness to drive be improved? Example: fatigue

Increasing acceptance of monitoring technology EU regulation C/2021/2639 DDAW and EuroNCAP testing requirements.

HOWEVER

- Onus is on the OEM
- Limits are open to interpretation.
- There is no reference value for fatigue
- It is vital that DDAW must not intrude on safe vehicle operation (Francois and Wertz 2023).
- Detection of the fatigue does not remove it!

Gaps in knowledge and practice



- Holistic support mechanism. Regulator, enforcer, employer and employee teamwork.
- All professional drivers. Taxi and gig economy. High potential for stress and long hours, limited regulation protection.
- Integrated approach. General health impacts driver safety. Impairments can co-exist.
- Technology advancements. Shared knowledge. Validation.
- Work-place safety culture. Open to discussion.
- Evidenced-based policy making.

Thank you

Questions?

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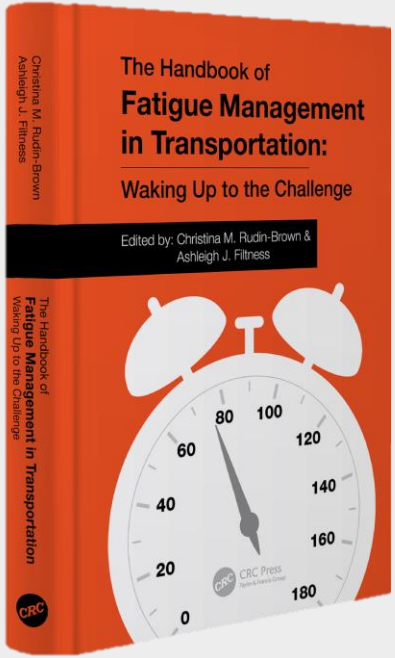

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https://www.routledge.com/The-Handbook-of-Fatigue-Management-in-Transportation-Waking-Up-to-the-Challenge/Rudin-Brown-Filtness/p/book/9781032081397#

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