Acceptability of hypothetical wearable biosensors as an overdose intervention tool among two samples of people who regularly use illicit drugs in Australia

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Disclosure of interest

The Drug Trends program (including the Illicit Drug Reporting System and Ecstasy and Related Drugs Reporting System), the National Drug and Alcohol Research Centre, and the National Drug Research Institute are supported by funding from the Australian Government Department of Health, Disability and Ageing under the Drug and Alcohol Program.

Amy Peacock and Rachel Sutherland are supported by National Health and Medical Research Council Emerging Leader Fellowships.

The Burnet Institute has received funding from Navamedic to support travel for Paul Dietze[1,2] to an unrelated conference.

Rachel Sutherland has received untied educational funds from Seqirus. Amy Peacock has received untied educational grants from Seqirus and Mundipharma for study of opioid medications. Funding from this organisation has now ceased, funding was for work unrelated to this project, and the funding bodies had no role in study design, analysis and reporting.

Acknowledgements

- **Thank you to the participants** who were interviewed for the EDRS and IDRS.
- **Thank you to NDARC, UNSW Sydney** who coordinate Drug Trends nationally.

We acknowledge the Traditional Custodians of the lands on which this work was conducted, and pay our respects to Elders past, present and emerging. Sovereignty was never ceded.

Background

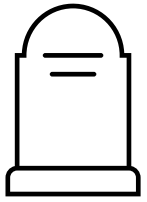
There has been an **increase in drug-related deaths globally.**[1]

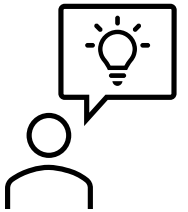
Increase driven by opioids, though **stimulant deaths have also increased.** [1]

Responses typically **rely on bystanders when overdoses often occur alone.**[2]

Further, bystanders **may not recognise overdose** and/or **may not act.**[3,4]

<u>Novel solutions are required.</u>





Background cont.

Wearable biosensors could help overcome limitations of current responses.[5]

Capacity to **detect physiological biomarkers characteristic of overdose** + **facilitate real-time interventions.**[5]

However, the field is **complex and rapidly evolving** and **research is still limited.**

Utility and feasibility as an overdose intervention tool are **not yet fully established**. [5]

Aims

Among two samples of people who use illicit drugs in Australia, we investigated:

1. **Acceptability of specific design features** of a hypothetical wearable biosensor device (e.g., alerts to the wearer/family/emergency services; auto-naloxone); and

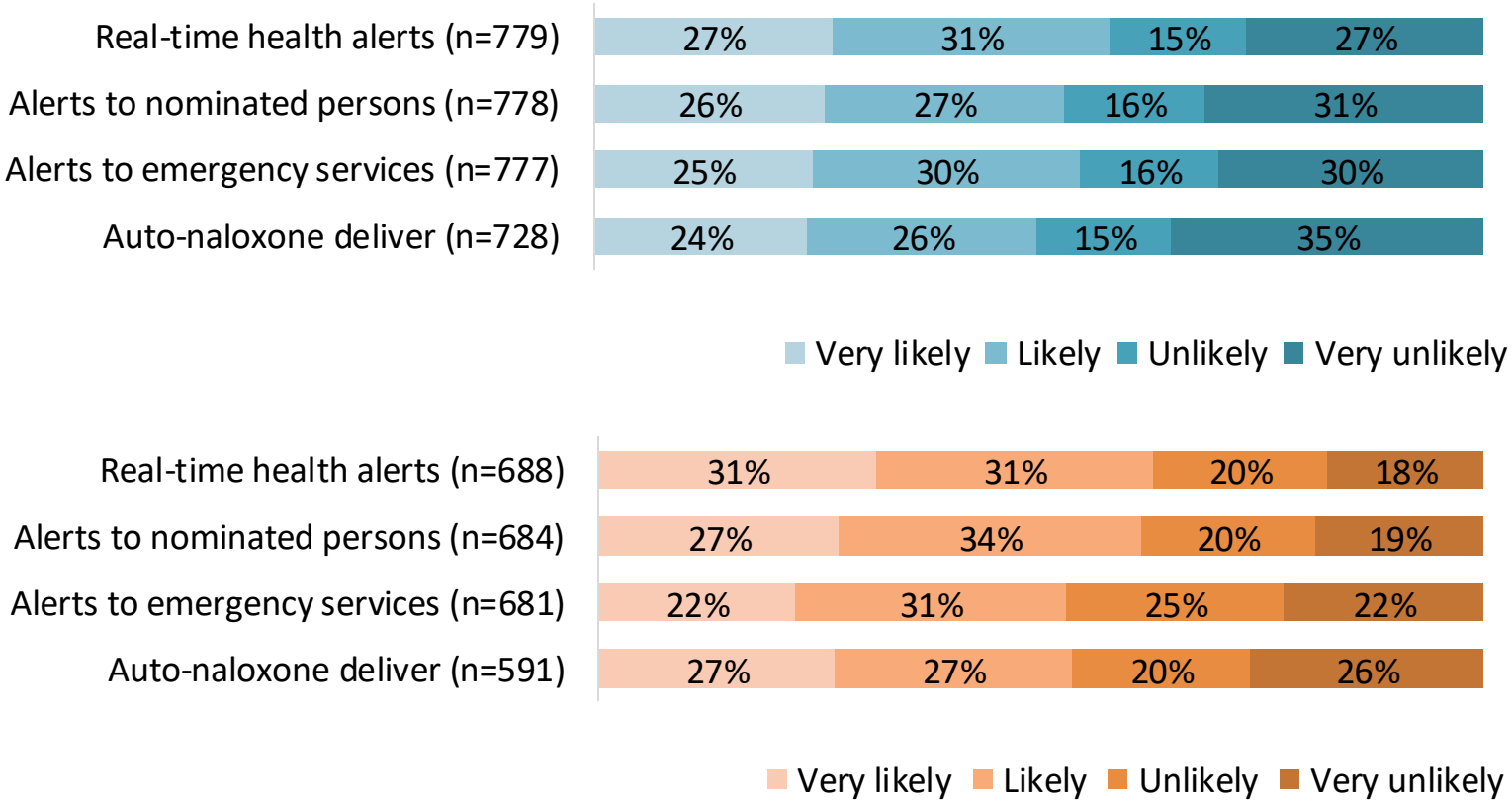
2. **Perceived barriers** to wearing such a device (e.g., a wristband).

Methods

- Data were obtained from a **special module in the 2023 EDRS and IDRS surveys.**
  - IDRS: people who regularly inject drugs, recruited mostly via NSPs and other drug outreach services (n=820).
  - EDRS: people who regularly use ecstasy/MDMA and/or other illicit stimulants, mostly recruited via social media (n=708).
- Descriptive and inferential statistics were used to examine: (1) likelihood of wearing certain features; (2) factors associated with likelihood; and (3) barriers to wearing a device.

Results

Figure 1. Likelihood to wear specific wearable biosensor device features



Note. Excludes 'don't know' and 'skip' responses.

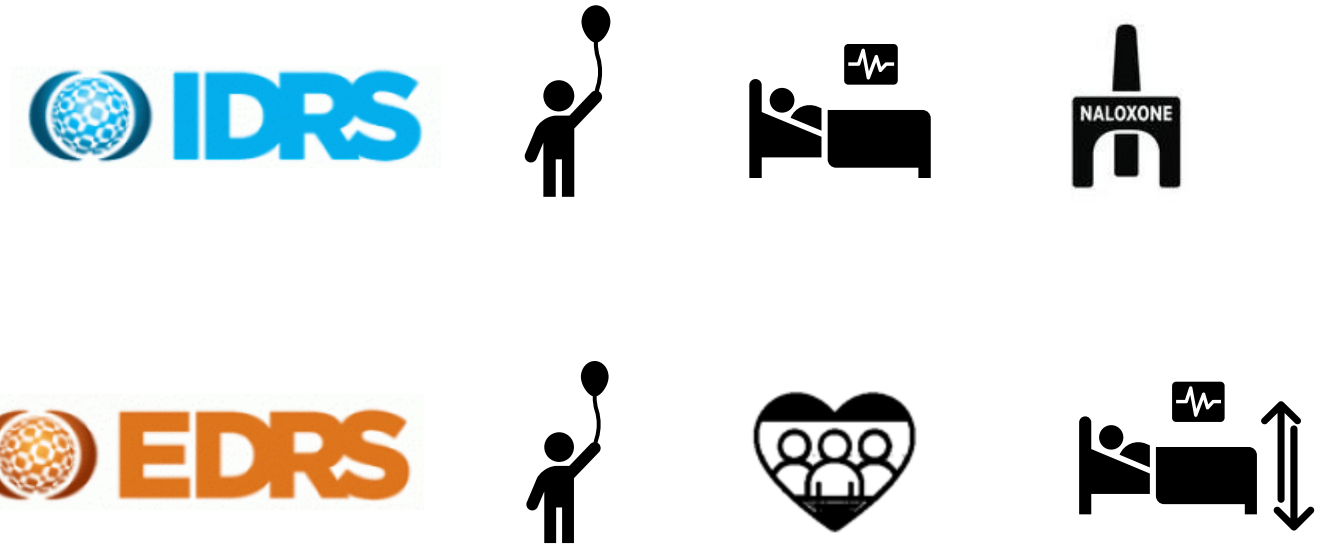
Results

Figure 2. Patterns of feature acceptance (accept ≥1 feature; accepts none)

Note. The 'accepts none' outcome required complete data across all variables. IDRS n=777; 70% accept ≥1 feature; 30% accepts none; EDRS n=673; 76% accept ≥1 feature; 24% accept none.

Results

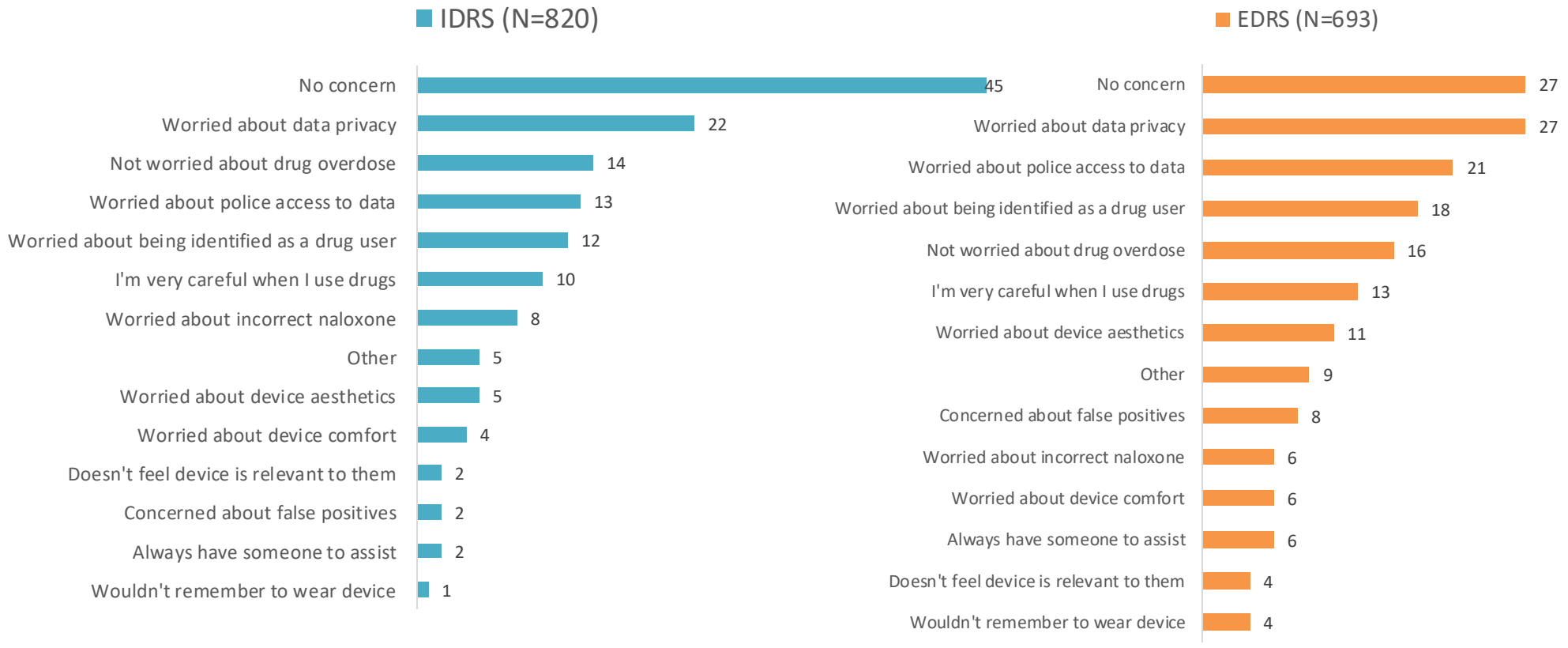
Figure 3. Factors significantly associated with being likely to wear ≥1 feature



Note. Significance based on χ^2 tests (categorical variables) and Mann–Whitney U tests (continuous).
IDRS: Age**; Recent opioid OD**; Obtained naloxone***; **EDRS**: Age*** sexual identity* recent depressant OD* recent stimulant OD*

Results

Figure 4. Concerns or reasons for not wearing a hypothetical biosensor device



Note. Excludes 'don't know' and 'skip' responses.

Discussion

- **Findings suggest broad acceptability of wearables.**
- Unsurprising that those reporting recent opioid OD were more likely to endorse, but opioids are infiltrating other drug markets[6,7] — and wearables could detect other physiological risks (e.g., tachycardia) — so their potential application is broader.
- Some features may be harder to "sell" (e.g., auto-naloxone; alerts to emergency services). Addressing key concerns (e.g., data privacy, accuracy, stigma) and raising awareness of emerging risks may increase interest/uptake.
- **Co-design with people who use drugs** and **clinical validation** is critical.

Conclusion

- **Wearable biosensors have the potential to expand harm reduction solutions.**

- **Investment in technology tracking and co-designed R&D is warranted** — especially given rising overdose deaths and the increasing lethality of the drug supply.[1,5]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Press release

Virtual reality and wearable technology pilot to cut drug deaths

The government will fund research into wearable technology, virtual reality and artificial intelligence in a bid to support people with drug addictions.

From: Department of Health and Social Care, Office for Life Sciences, Department for Science, Innovation and Technology, Andrew Gwynne MP and Lord Vallance

Published 18 October 2024


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"Saving SAM": System for the Detection and Alert of Potential Overdoses

Nazarpour, Kia (Principal Investigator), Mozaffar, Hajar (Co-investigator)

School of Informatics, Business School

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