NSW GOVERNMENT

Work health and safety of food delivery workers in the gig economy

Centre for WHS

THE BEHAVIOURAL INSIGHTS TEAM

MACQUARIE University

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Executive Summary

Background and method

Food delivery workers (FDWs) in the platform-based gig economy are at risk of illness or injury while working. While the number of incidents involving FDWs that have been reported to SafeWork NSW is low, there has been an exponential increase over the past three years, from one incident reported in 2017 to 19 in the first half of 2020 alone. The majority of these incidents are road and traffic related, but previous research has highlighted additional harms that FDWs risk on the job, including physical assault, intimidation, and verbal abuse.

The bulk of research into the work health and safety (WHS) of those engaged in insecure work has, to date, focused on people who are self-employed, work casually, or are on temporary contracts. While the trends identified among these populations may be broadly applicable to FDWs in the gig economy, it is unknown to what extent this is true, or whether FDWs face unique WHS risks on the job. The global COVID-19 pandemic poses an additional and complex challenge to WHS in the gig economy. FDWs cannot work from home and in some cases are putting their own health at risk by delivering to those in self-isolation. As more inexperienced workers become FDWs in response to a widespread rise in unemployment, the risk of WHS harms may increase. Focused research into the WHS of FDWs is therefore needed to address this critical gap in both research and practice.

The Behavioural Insights Team, in collaboration with Macquarie University and the Centre for Work Health and Safety, is undertaking a four-phase project that aims to improve the WHS of FDWs in the gig economy. The objective of Phase 1 was to describe the characteristics of FDWs and their WHS behaviours, knowledge, and concerns. Phase 2 focuses on exploring the WHS behaviours, knowledge and concerns of app-based food delivery platforms (FDPs) who engage FDWs. In Phase 3, the findings of Phases 1 and 2 will inform the development of proactive, risk prevention activities to improve FDWs' WHS, which will be co-designed with relevant stakeholders. In Phase 4, the outcomes of these prevention activities will be evaluated in the field.

This report details the results of Phase 1, in which we undertook five concurrent streams of data collection:

- An online survey of FDWs
- Semi-structured interviews with FDWs
- A textual analysis of WHS-related posts on social media
- A service safari, in which members of the project team signed up to the major FDPs, went through onboarding, and worked a shift as a FDW
- Field observations of FDWs in restaurant hotspots

The data from each stream were then synthesised into the key insights, ideas and opportunities that will inform the subsequent phases of the project, in which proactive, risk prevention activities to improve the WHS of FDWs will be co-designed with stakeholders and trialled in the field.

Discussion

Characteristics of FDWs

FDWs as a group are typically under 30, male, and in Australia on student visas, who choose food delivery work for its flexibility and to supplement existing income streams. While the existing evidence for the physical and mental health effects of gig work is mixed, we found that our survey respondents and interview participants reported better physical health than, and comparable mental health to, the Australian population as a whole.

FDWs tend to cluster in densely populated areas and have typically been in their job for less than a year, which accords with the preponderance of student visa holders, as well as a reported influx of workers due to COVID-19 (e.g. Keoghan, 2020). However, there is a significant minority of FDWs working in suburban areas and regional centres. The most common mode of transport differs on this basis, with urban FDWs more likely to use bicycles and e-bikes, and regional FDWs more likely to use cars and motorcycles. This suggests that these two populations may face slightly different WHS risks on the road and may thus require different and more tailored approaches to improving their road safety.

Health and safety behaviours of FDWs

FDWs engage in a range of behaviours that influence their WHS risk. Given that the overarching focus of this project is on developing proactive, risk prevention activities, we focused primarily on identifying the behaviours that FDWs engage in that both exacerbate and mitigate risk (i.e. proactive behaviours). Common risk exacerbation behaviours include using mobile phones while riding or driving, working while fatigued, wearing dark clothing at night, cycling on footpaths and in other pedestrian-only areas, failing to follow COVID-safe guidelines on social distancing and mask-wearing, and speeding or rushing. These behaviours are driven largely by the desire to work quickly and to maximise income. Common risk mitigation behaviours include riding or driving more cautiously and wearing brightly coloured or reflective clothing during inclement weather, wearing helmets, and having delivery vehicles serviced regularly. However, we also identified aspects of risk mitigation behaviours that pose risks in and of themselves, most notably FDWs' frequent use of second-hand parts to self-service and repair their own vehicles.

There was a sizeable gap between self-reported risk exacerbation and risk mitigation behaviour (identified in the survey) and actual behaviour (observed in the field). This highlights the need to make WHS risks more salient and to encourage FDWs to think about and act upon these risks more consciously.

Health and safety knowledge of FDWs

Although FDWs believe that they are primarily responsible for managing their own WHS risks, the knowledge necessary for successful risk management tends to be acquired in a piecemeal fashion through a combination of the limited (and often optional) WHS information provided by FDPs, experience on the job, and advice from peers. Each of these learning channels has its own drawbacks. FDP information is most likely to be accurate and appropriately vetted, but the fact that it is typically not compulsory means that engagement with this information is likely to be low. The need for experiential WHS learning to reach a baseline level of risk awareness means that new, inexperienced FDWs are at greater risk of causing or incurring a WHS incident, and peer discussion forums can become fertile ground for misleading and even dangerous advice to flourish and spread. Overall, FDWs have a relatively low level of WHS knowledge, particularly in relation to Australian road rules and bicycle safety. This is likely due, at least in part, to demographic factors and the temporary, short-term tenure of most FDWs. Since knowing about WHS risks is a critical first step in taking appropriate action to reduce the likelihood of a WHS incident, improving WHS knowledge among FDWs is of key importance in improving overall WHS in this population.

Health and safety concerns of FDWs

The main WHS concerns we identified were traffic accidents, verbal abuse and robbery or vandalism of delivery equipment. We also found that WHS *concerns* and WHS *experiences* do not necessarily align: several of the WHS incidents about which FDWs are most concerned (e.g. traffic accidents, robbery) are among the most rarely experienced. This is likely attributable to the fact that high-impact, low-frequency events, such as a serious traffic accident or assault, tend to be more salient and thus more memorable than low-impact, high-frequency events. For the same reason, high-impact, low-frequency events are also more likely to become the subject of social media posts, which serves to both distort their likelihood and further magnify their impact on the FDW community. Verbal abuse, however, is unique in this regard: it is both frequently experienced by FDWs and ranks highly as a WHS concern, making it an ideal potential target for a proactive, risk prevention activity.

Opportunities and Ideas

Based on the insights of the research and a review of successful interventions from other policy areas, we identified eight ideas to take forward to the co-design and trial phases of this project. The ideas are aimed specifically at changing behaviour in order to improve WHS and are all underpinned by behavioural science. Each idea was rated in terms of its impact and feasibility. Impact was estimated by assessing the approximate number of people the idea would directly affect and the extent to which the idea would directly or indirectly improve WHS. Feasibility was estimated by identifying the range of stakeholders who would need to "buy in" to the idea, assessing potential obstacles, and estimating costs.

We note that the ideas represent opportunities only, rather than firm recommendations. That is, the focus of the co-design and trial phases of this project is not limited to the ideas we have presented in this report, which are summarised in the following table.

Table 1: Summary of ideas for risk prevention activities.

Idea	Risks addressed	Impact	Feasibility
creasing participation in safety training at onboarding through making it mandatory or using better choice architecture	*Lack of familiarity with Australian road rules and understanding of WHS obligations*	*High*	*High*
Alter the order acceptance process to minimise the risk of phone distraction	*Distractions on the road*	*High*	*Medium*
Benchmark the time that FDPs are allowed to give FDWs for each delivery using map APIs	*Rushing behaviours; stress due to perceived threat of robbery*	*High*	*Medium*
Reduce abuse by humanising FDWs to potential abusers	*Abuse from businesses, customers, and members of the public*	*Medium*	*High*
Use a rating system to alter restaurant behaviour	*Abuse from businesses, customers, and members of the public; COVID-unsafe waiting behaviours; stress due to perceived threat of robbery*	*Medium*	*High*
Facilitate mentor schemes or buddy systems	*Lack of familiarity with location-specific WHS risks*	*Medium*	*Medium*
Send targeted and triaged safety prompts and reminders at critical points	*COVID-19 risks; weather-related risks; abuse*	*High*	*Low*
Prompt FDWs to anonymously report near-miss and abuse hotspots and map them	*Abuse from businesses, customers, and members of the public; environmental risks like poorly lit roads*	*Medium*	*Medium*

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Introduction

Background and objectives

Food delivery workers (FDWs) in the platform-based gig economy are at risk of illness or injury while working. For example, in a survey conducted by the Transport Workers Union, almost half of the 145 FDWs surveyed reported that they or someone they knew had been injured while working (Bright & Fitzgerald, 2019). Data from SafeWork NSW shows that while the number of reported incidents involving FDWs is low, there has been an exponential increase over the past 3 years, from one incident reported in 2017 to 19 in the first half of 2020 alone. The majority of these incidents are road and traffic related, but previous research has highlighted additional harms that FDWs risk on the job, including physical assault, intimidation, and verbal abuse (e.g. Bright & Fitzgerald, 2019; Keoghan, 2020).

The global COVID-19 pandemic poses an additional and complex challenge to food delivery WHS in the gig economy. FDWs cannot work from home, and in some cases are putting their own health at risk by delivering to those in self-isolation (Amin, 2020). As more inexperienced workers become FDWs in response to a widespread rise in unemployment, the risk of WHS harms may increase.

There is limited research on the WHS risks and harms that FDWs face in the platform-based gig economy. The bulk of work to date has focused on other forms of insecure work, such as temporary contracts, self-employment, and casual employees. While these findings may be broadly applicable to FDWs in the gig economy - for example, those working multiple jobs or acting as subcontractors are known to be at higher risk of WHS incidents (Koranyi, Jonsson, Rönnblad, Stockfelt & Bodin, 2018) - it is unknown to what extent this is true for FDWs, or whether FDWs face unique WHS risks on the job. Focused research into the WHS of FDWs is therefore needed to address this critical gap in the literature.

The Behavioural Insights Team, in collaboration with Macquarie University and the Centre for Work Health and Safety, is undertaking a four-phase project that aims to improve the WHS of FDWs in the gig economy. The objective of Phase 1 was to describe the characteristics of FDWs and their WHS behaviours, knowledge, and concerns. Phase 2 focuses on exploring the WHS knowledge and concerns of app-based food delivery platforms (FDPs) such as Uber Eats, Deliveroo, and Menulog. In Phase 3, the findings of Phases 1 and 2 will inform the development of proactive, risk prevention activities to improve FDWs' WHS, which will be co-designed with relevant stakeholders. In Phase 4, the outcomes of these prevention activities will be evaluated in the field.

This report outlines our insights and ideas and opportunities from Phase 1 of the project. We first provide an overview of existing literature. We then outline our research methods, which includes

an online survey of FDWs and multiple streams of qualitative research. We present and discuss our synthesised findings under the following subheadings:

1. Characteristics of FDWs
2. Health and safety behaviours of FDWs
3. Health and safety knowledge of FDWs
4. Health and safety concerns of FDWs

Based on these insights, we close with a series of opportunities and intervention ideas to explore and trial in subsequent phases of the project.

Literature review

The key findings of our literature review suggest that the demographics, working environment, and ways in which FDPs operate contribute to increased WHS risks for FDWs. Each factor is explored in more detail in the sections below.

FDW demographics

Young, male workers are at increased risk of certain types of workplace harms

FDWs in the gig economy are often young and male. For example, men are more than twice as likely to have worked on a digital platform relative to women (McDonald, Williams, Stewart, Oliver, & Mayes, 2019). Transport and delivery workers[1] working for digital platforms are also significantly younger (aged 18-34) than the average Australian who has worked for a digital platform. This is especially relevant as those who have worked for digital platforms – online companies that not only provide food delivery services, but that connect on-demand workers with people seeking their services on a 'gig' basis – who tend to be younger than the Australian population as a whole (McDonald et al., 2019).

Young male FDWs may be especially at risk of road accidents. For Australians aged 17-25, injury is the single leading cause of death, with 45% of these injuries related to road and traffic accidents (The George Institute for Global Health, 2020). Men are especially at risk, with 80% of those killed being male (The George Institute for Global Health, 2020). Incident reporting data from SafeWork NSW shows the same trend. Of the incidents involving FDWs that have been reported to SafeWork NSW, 82% of the FDWs involved are male. Gender differences in risk profile may be due to a combination of a lack of previous experience in driving compounded by brain development processes leading to an increased propensity for risk-taking (Senserrick, 2015).

For WHS risk more broadly, young workers have been identified as an at-risk group by SafeWork NSW. Through a series of forums, face-to-face engagement, and surveys with young people,

[1] We note that 'transport and delivery workers' include rideshare services (e.g. Uber, Lyft) as well as FDWs.

SafeWork NSW has identified inadequate supervision and training, a limited understanding of WHS rights and obligations, inexperience in the workplace, and a high incidence of mental health issues as key risk factors for young workers (SafeWork NSW, 2019).

Migrant and CALD workers face greater WHS risks

Even among those working for digital platforms, transport and FDWs are significantly more likely to have temporary residency status, and to speak a language other than English at home (McDonald et al., 2019). Another study found that, of 58 FDWs based in Perth and Melbourne, 47 were temporary migrants (Veen, Barratt & Goods, 2019). A study of digital platform work in Australia found that language spoken at home and residency status do not predict reliance on platform work for income (McDonald et al., 2019), but culturally and linguistically diverse (CALD) Australians face more WHS risks when they choose this work.

CALD and migrant workers have been identified as a high-risk group by SafeWork NSW. SafeWork NSW identified risk factors for these groups by engaging stakeholders such as Multicultural NSW, Unions NSW and affiliates, and people from CALD backgrounds. The risk factors identified included language barriers (which compromised understanding of WHS rights and obligations, as well as access to safety information), a reluctance to speak up and 'make waves', and a limited understanding of safe work practices (SafeWork NSW, 2019).

Experiencing racism is also likely an issue in this population. For example, a 2015-16 survey of 6,001 Australians found that the most common places participants reported experiencing racism are also places that FDWs frequent. This includes on the street, in the workplace, and in shops and restaurants. Verbal slurs were particularly prominent, with 61% of participants who spoke a language other than English reporting that they had experienced name-calling or other insults (Blair, Dunn, Kamp, & Alam, 2017).

FDWs are more reliant on their platform-based income

A study of platform-based work in Australia found that the majority of those doing work on digital platforms considered the income 'nice to have.' However, those working in transport and delivery work were more likely to report that their income was 'essential' in meeting their basic needs and generated 100% of their income (McDonald et al., 2019).

When combined with the dangerous nature of their work (see The working environment, below), this may place FDWs at higher risk of WHS incidents. Relative to those working in digital platforms more broadly, transport and delivery workers were more likely to work across multiple platforms, work more frequently, and work more than 35 hours per week (McDonald et al., 2019). In a survey of 160 FDWs conducted by the Transport Workers Union, over a quarter (26%) of FDWs reported working over 40 hours a week (Bright & Fitzgerald, 2019).

The food delivery sector

The global food delivery sector was valued at $600,000 in 2017 and is expected to grow to $2.4 billion by 2025 (Morgan Stanley, 2018). In Australia, the sector dates back to 1985 when Suppertime launched in Sydney as a courier service for restaurants. The major FDPs currently operating in Australia are Menulog, Deliveroo, EASI, Uber Eats, and DoorDash. Menulog commenced app-based food delivery services in 2009, followed by Deliveroo and EASI in 2015, Uber Eats in 2016, and DoorDash in 2019. However, the sector is in a state of constant change, with FDPs continually entering the Australian market, merging with or acquiring existing FDPs, and/or ceasing Australian operations altogether. For example, Suppertime was acquired by the German FDP Foodora in 2015, which had been acquired by another German FDP, Delivery Hero, earlier in the same year. After operating in Australia for three years, Foodora abruptly exited the Australian market in 2018. More recently, the sector has also seen an influx of new start-ups with unique business models, such as the driver-owned FDP Ride On Australia.

The working environment

Workers in industries involving riding or driving are more likely to be injured at work

The work that FDWs undertake is inherently risky. Work involving driving or riding a bike or motorcycle is inherently dangerous as workers are exposed to the risk of traffic incidents; vehicle collision was the leading cause of work-related fatality in Australia in 2018-19 (Safework Australia, 2019). This is particularly problematic for FDWs because the highest demand for food delivery is at peak times when there is more traffic on the road. The transport industry has the highest work-related fatality rate averaged over the last five years, and the highest frequency of serious claims.

A survey of FDWs in Australia revealed that in addition to road and traffic incidents, the key WHS incidents that FDWs risk are verbal abuse, intimidation, robbery, and assault (Bright & Fitzgerald, 2019). A European review of delivery and despatch riders' WHS largely corroborated the Australian findings, identifying time pressure, poorly maintained vehicles and equipment, air pollution, working alone and at night, physical strain (e.g. problems with joints), and inappropriate protective gear (e.g. lack of helmet or high visibility vests) as additional factors increasing those risks (Copsey, Kudasz, Liddle, Makowski, & Schmitz-Felten, 2010).

Evidence on the effects of gig work on the mental health of FDWs is limited and mixed

Reflecting the tension between the benefits of flexibility and the disadvantages of insecurity, research into the effects of gig work on mental health is mixed. For example, correlational research conducted in Canada suggests that those in the gig economy are lonelier and more distressed than their non-gig counterparts (Glavin, Bierman, & Schieman, 2019). Conversely, longitudinal research conducted in the UK utilised the roll-out of Uber to assess the mental health impacts of moving from a non-gig driving job to a driving job with Uber (Apouey & Stabile, 2020). They found that taking a job with Uber was associated with improved mental health but increased

anxiety levels over time as measured by the General Health Questionnaire. Interestingly, they also reported a dramatic reduction in the amount of money workers spent on alcohol, which the authors speculated may be due to the fact that FDWs are typically working at times of the day when others are most likely to be drinking alcohol.

In-app prompts pose a risk to FDW safety

FDWs are required to check their phone regularly while working. This includes accepting or declining deliveries through the FDP app, using their phones as a navigation device, and responding to calls and messages from customers. Checking a mobile phone while driving increases the risk of accidents occurring (Simmons, Hicks, & Caird, 2016), including for professional drivers (Choudhary & Velaga, 2018; Queensland Centre for Accident Research & Road Safety, 2015) and when the phone is used for navigational purposes (Dong et al., 2019). In Christie and Ward's (2019) study, drivers and cyclists acknowledged that their phones were a distraction, with some reporting that they actively tried not to use it. However, they also reported that despite trying to drive safely, the notifications from the FDP app remained a distraction, and that they felt pressure from the app to check their phones. In a qualitative study of 58 FDWs working in Perth and Melbourne for Uber Eats and Deliveroo, 24% engaged in 'multi-apping,' meaning they worked for multiple FDPs concurrently within the same shift (Veen, Barratt, & Goods, 2019). If FDWs are using multiple apps concurrently, this may increase the number of notifications they are receiving.

In addition to notifications that provide information, some FDPs have (or have had, at some point, if not currently) an 'auto-accept' feature, meaning that unless FDWs decline the order within 10 seconds, they automatically accept the next order (Veen, Barratt, & Goods, 2019). This feature increases the supply of FDWs available and thus the likelihood that FDPs can meet demand. However, it takes control away from the FDW: it requires the FDW to check and interact with their phone within 10 seconds, potentially placing them at risk of WHS incidents due to checking their phone while driving or cycling, or through unintentionally accepting orders while fatigued.

Algorithmic management can affect health and safety

FDWs (and many other platform-based gig economy workers) work within a system of 'algorithmic management', in which variables in an algorithm determine work assignments and performance metrics for workers. Performance criteria for FDWs by major FDPs in Australia primarily consist of customer satisfaction ratings, the proportion of deliveries accepted by the FDW, and travel time between restaurants and customers (Veen et al., 2019).

Not meeting these performance metrics can lead to FDWs' work being terminated. Although the proportion of riders who are terminated each year is extremely low, *perceived* risk of termination may be high among FDWs (Chau, 2020). In interviews conducted in 2017, Australian FDWs reported that there seemed to be a lack of transparency in the performance rating system and that their customer rating could be impacted by errors outside of their control (e.g. leaky

containers from the restaurant), leading to feelings of frustration and uncertainty (Veen et al., 2019).

Payment structures for FDWs may incentivise risk-taking

FDWs are typically paid per delivery, not an hourly wage, which incentivises speeding and other risky behaviours. In a mixed-methods study conducted with drivers in the European gig economy, the authors found that many interviewees reported feeling that a pressure to complete more deliveries directly led them to take risks, such as speeding, running red lights, and ignoring road signs (Christie & Ward, 2019). In the survey component of the same study, these behaviours were frequently reported. Almost half of the survey respondents admitted to speeding, and approximately a third had driven or ridden through a red light. This finding has also been reported in news articles in Australia (e.g. Ross, 2019).

Some FDPs use 'surge pricing,' where customers are charged more and FDWs paid more during periods of high demand (Woolley, 2019). Surge pricing can increase the risks to FDWs as it may be correlated with more dangerous environmental conditions (e.g. when it is applied during adverse weather conditions, which discourage people from going out for food). In addition to more obvious hazards, such as wet roads and poor visibility, poor weather conditions can make it more difficult for FDWs to use their phone. For example, in Christie and Ward's (2019) study, one FDW reported that since their phone was a touchscreen, using it safely while cycling was almost impossible during wet weather conditions.

Taken as a whole, our review of the existing literature underscores the complexity and ambiguity of the landscape in which FDWs and FDPs operate, and highlights the need for focused research to better understand and address WHS risks and harms in this sector. In subsequent sections of this report, we describe the methods we used to gather data from and about FDWs, our finding and insights, and our ideas and opportunities for risk prevention activities to consider in the co-design and trial phases of this project.

Method

In this section of the report, we describe in detail the five concurrent streams of data collection we undertook to meet the objective of Phase 1. These were:

- An online survey of FDWs
- Semi-structured interviews with FDWs
- A textual analysis of WHS-related posts on social media
- A service safari, in which members of the project team signed up to the major FDPs, went through onboarding, and worked a shift as a FDW
- Field observation of FDWs in restaurant hotspots

Survey and interview methodologies were selected to yield both breadth and depth of knowledge about FDWs and their WHS behaviours, knowledge, and concerns. The textual analysis provided an opportunity to examine unprompted, candid writing by FDWs about their personal experience of WHS. The service safari gave us an "insider's view" of food delivery work, allowing us to more fully understand the nuance of FDWs' choice architecture, i.e. the way in which they are presented with choices and the impact of that presentation on their decision-making. Field observation enabled us to expose the difference between self-reported and actual behaviour among FDWs, which is particularly important when the behaviour of interest is undesirable (e.g. speeding).

The interviews and survey were approved by the ethics committee of Bellberry Limited (Application No. 2020-06-505) and conformed in all respects to the National Statement on Ethical Conduct in Human Research (National Health and Medical Research Council, 2018).

Survey

We conducted an online survey to gather demographic and work characteristics of FDWs across Australia and to identify broad trends in their WHS behaviours, knowledge, and concerns. The survey was designed in English and then translated into Mandarin, Spanish, and Hindi, the most common languages spoken among FDWs after English (Bright & Fitzgerald, 2019). Translations were undertaken by employees of the Behavioural Insights Team (Mandarin, Spanish) and Centre for WHS (Hindi). All versions of the survey were composed of 40 questions. The survey was administered on the SurveyMonkey platform. The complete list of survey questions is shown in English in Appendix A.

The inclusion criteria for the survey were: (1) aged 18 years or older; and (2) currently work for a FDP in Australia, or have done so within the past 12 months. Recruitment of participants who met these criteria was conducted through a combination of paid Facebook and Instagram advertising and print advertising in areas frequented by FDWs, such as bicycle repair shops and restaurants. This was supplemented with snowball recruitment, in which participants in the semi-structured interviews were asked to share a link to the survey with other FDWs. We were not able to link the

recruitment mode to individual survey responses. Upon completion of the survey, participants were offered a lottery-style incentive that gave them the chance to win one of 10 $50 Giftpay vouchers. The size of this incentive was chosen as its value is approximately double what many FDWs would get paid during an equivalent time after accounting for vehicle expenses (Karp, 2020).

The survey was open from 7-31 August 2020 and we recorded 167 former and current FDWs who initiated the survey. Since many questions were optional, the sample sizes for each question vary and are noted in the presentation of individual question results. Survey respondents took approximately 10-15 minutes to complete the survey, with a median completion time of 11.6 minutes. Apart from being based in Australia, there were no geographical restrictions on respondents, and the final distribution of states in which respondents worked covered Victoria (n=60), New South Wales (n=46), Queensland (n=21), South Australia (n=4), Western Australia (n=4), and the Northern Territory (n=1). The survey results were analysed and converted to descriptive graphics and statistics to provide a broad overview of the WHS landscape of FDWs across Australia. Because of the relative scarcity of motorcycles and scooters (with scooters defined as two-wheeled, petrol-powered vehicles, as opposed to e-scooters) as transport methods in our responses and their functional similarities, we frequently combined these and referred to them as 'mopeds' for some aspects of the analysis.

For comparison of self-reported physical and mental health to population-level ratings, we compared our survey responses to the 'self-assessed health status'[2] data collected in the 2018 National Health Survey by the Australian Bureau of Statistics (ABS). We constrained the ABS data to individuals between the ages of 15 and 54 in order to more closely reflect our survey respondents, resulting in a sample size of around 10,000 Australians. Notably, the response scale for this survey was a 5-point scale ranging from poor to excellent, meaning that the response options have been shifted to enable comparison to the scale we used in our survey. Caution is therefore warranted in interpretation of these analyses.

Interviews

We conducted semi-structured interviews with 14 current or former FDWs (13 current, one former FDW) from across Australia. The interviews were conducted between 3 and 31 August 2020 via teleconference using the Google Meet platform. Participants were recruited via social media posts in FDW-themed forums and channels (e.g. Facebook, Reddit), email invitations to survey participants who opted in to participating in future research, researchers' professional and social connections, and snowball sampling. Candidates were selected for interviews on a first-come basis. Interviews lasted approximately one hour, and participants were reimbursed for their time

[2] Defined by the Australian Institute of Health and Welfare as a "general measure of health status, combining physical, social, emotional and mental health and wellbeing."

with a $40 Giftpay voucher. Interview questions focused on typical WHS behaviours and experiences, WHS incidents, WHS concerns, and ideas for improvement of WHS conditions, with the intention that this would provide in-depth, personal perspectives on WHS. Findings from the interviews were analysed inductively and grouped into common themes, then compared to the survey responses. The complete interview guide is shown in Appendix B.

Field observations

We conducted field observations of FDWs at 16 sites in 6 locations across Sydney: Randwick, Potts Point, Chatswood, Newtown, Manly, and Ultimo (Figure 1).

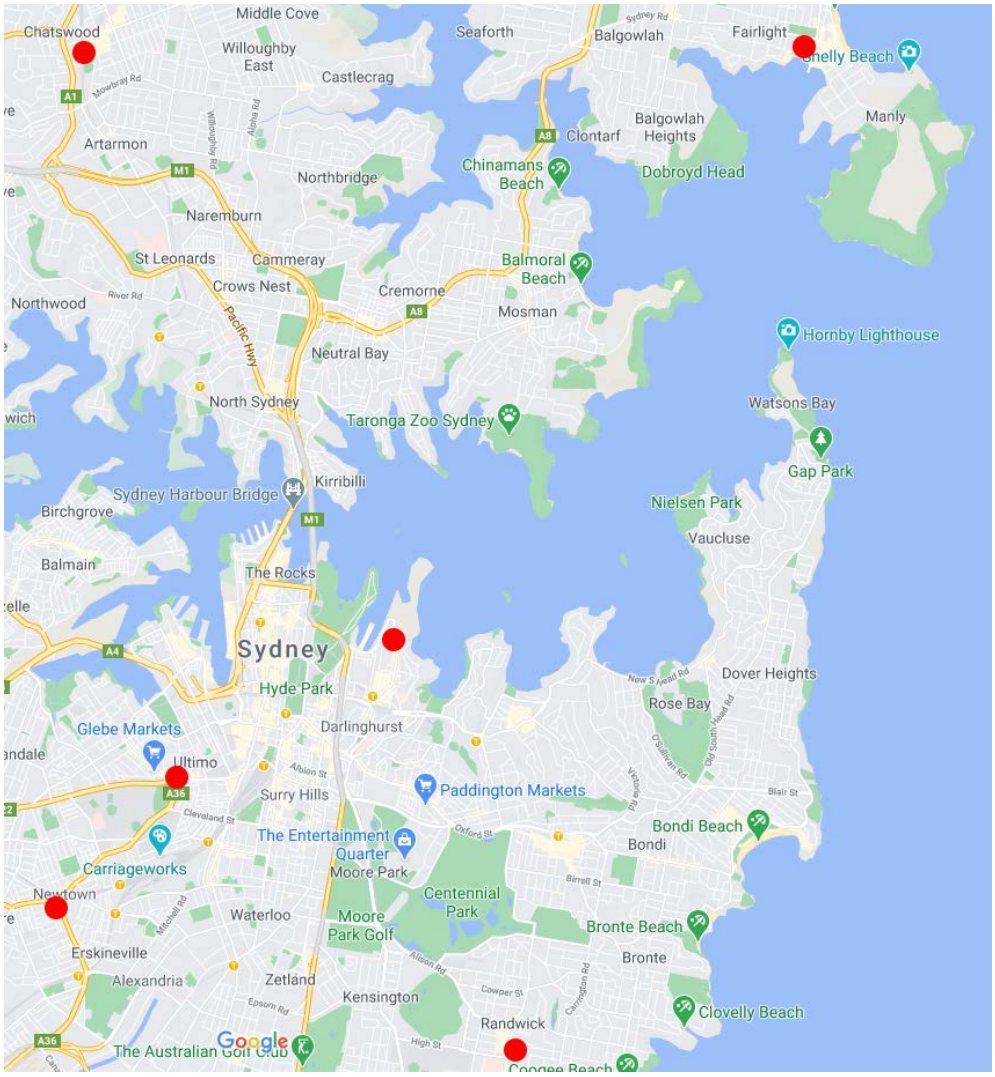

Figure 1: Map of field observation locations in metropolitan Sydney

We chose observation sites near busy restaurant strips (9 sites), rest areas where FDWs congregate (2 sites), and road intersections where FDWs navigate traffic lights, roundabouts, and pedestrian crossings (5 sites). We visited each location once between 4 and 25 July 2020 for a 1.5-2.5-hour period. Ultimo was visited twice to explore the impact of weather (clear vs. rainy conditions) on FDWs' safety behaviours.

We carried out observations at Chatswood and Potts Point during lunchtime hours (11:30 AM-1:30 PM); Randwick, Newtown, Manly, and Ultimo were visited during dinnertime hours (5:30-9:00

PM). Since all observations occurred in July, the weather was relatively cool (13-18°C). Evening observations were conducted under clear (6 sites), overcast (2 sites), and rainy (4 sites) conditions, while daytime observations were conducted only during clear (2 sites) and overcast (5 sites) conditions. The number of FDWs observed per location ranged from 15 (Manly) to 300 (Newtown). The full field observation protocol is shown in Appendix C.

The intent of the observational approach was to observe the environmental conditions that may increase or decrease WHS risks for FDWs, demographics of FDWs, interactions with members of the public and restaurant workers, and the behaviours of FDWs. An observational approach was chosen in part due to a lack of existing research in the area (i.e. using a 'bottom-up' approach to identify risks and develop an in-depth understanding of the environment) and to complement our other research streams through using a different sampling frame than the survey and interviews to reduce sampling bias. As noted above, the value of field observation lies in its ability to document actual versus self-reported behaviour. This is particularly important for WHS research, since there is robust evidence in the psychology literature that most people tend to rate themselves as safer and more skilled than the average person, even though this is statistically impossible (Svenson, 1981). Self-report measures alone are therefore likely to underestimate the prevalence of unsafe behaviours, which can, in turn, lead to an underestimation of the size and impact of the problem.

Textual analysis

We conducted a textual analysis of 7 Australian FDW Facebook groups that ranged in size from approximately 1,100 to 14,300 members (mean group size = 4,800 members). We focused only on posts that were: (1) explicitly relevant to WHS, and (2) made between July and September 2020. A deductive approach to analysis was taken, with two researchers independently coding posts according to five pre-specified themes:

1. Knowledge: What do FDWs know or not know about WHS?
2. Behaviours: What do FDWs do to increase or decrease WHS risk?
3. Environment: What characteristics of the environment (including people, vehicles, and the built environment) increase or decrease WHS risk?
4. Experiences: What WHS incidents do FDWs post about?
5. Emotions: What feelings / tone are expressed in the post?

Service safari

To gain first-hand experience as FDWs, six team members undertook a service safari. A *service safari* is an immersive research method in which researchers assume a role within the community of interest to better understand real-world decisions, risks, and behaviours (Design Council UK, 2019). In this project, this involved three stages: (1) signing up to a FDP, (2) onboarding, and (3) working a shift as a FDW. In the sign-up and onboarding phases, the primary purpose was to

identify what WHS information was provided by the FDP and how that was delivered and/or tested, as well as any other instructions on how the food delivery work was to be performed. In the working phase of the service safari, the primary purpose was to identify WHS risks (and any incidents, if they occurred) along with barriers and facilitators to mitigating those risks directly from the perspective of a FDW. Only three team members were able to work shifts. This was due to the major FDPs restricting the number of FDWs they were onboarding at the time the research was conducted, which may have been due to an influx of workers during the COVID-19 pandemic. Team members attempted sign-up and onboarding to 5 FDPs and completed shifts with 2 FDPs. They worked across a range of weather conditions and urban and suburban locations. One team member used a car to work a Tuesday dinner shift (3-hour shift in north Sydney) , one used an e-bike to work a Wednesday dinner shift (3-hour shift in east Sydney), and one used a bicycle to work a Thursday lunch shift (3-hour shift in central Sydney) and a Thursday dinner shift (4-hour shift in central Sydney), equalling a total of four shifts worked. Each team member who worked a shift was paired with an observer to take notes and photographs and to provide support as needed. For the car driver FDW, the observer rode in the passenger seat during the shift. For the e-bike and bicycle FDWs, the observer was positioned in an agreed-upon location within the delivery zone. The full service safari protocol is shown in Appendix D.

In this part of the report, we discuss the key findings and insights that emerged from our five data collection streams about the characteristics of FDWs and their WHS behaviours, knowledge, and concerns.

Characteristics of FDWs

In this section, we report on the demographic characteristics of FDWs, including age, gender, visa status, self-reported health, and motivations for taking up food delivery work. We also report on the working environment of FDWs, including geographic location, FDP affiliation, and common transport modes.

Who are FDWs?

FDWs tend to be young

Of the 146 survey respondents who reported their age, the majority of FDWs were under 30, with comparatively fewer over 40 (Figure 2). This finding is corroborated by our field observations, in which approximately 600 FDWs were observed across a range of locations in Sydney. All FDWs we observed were estimated to be between 20 and 30 years of age, with the exception of one FDW in Chatswood who appeared to be in his late 40s or early 50s.

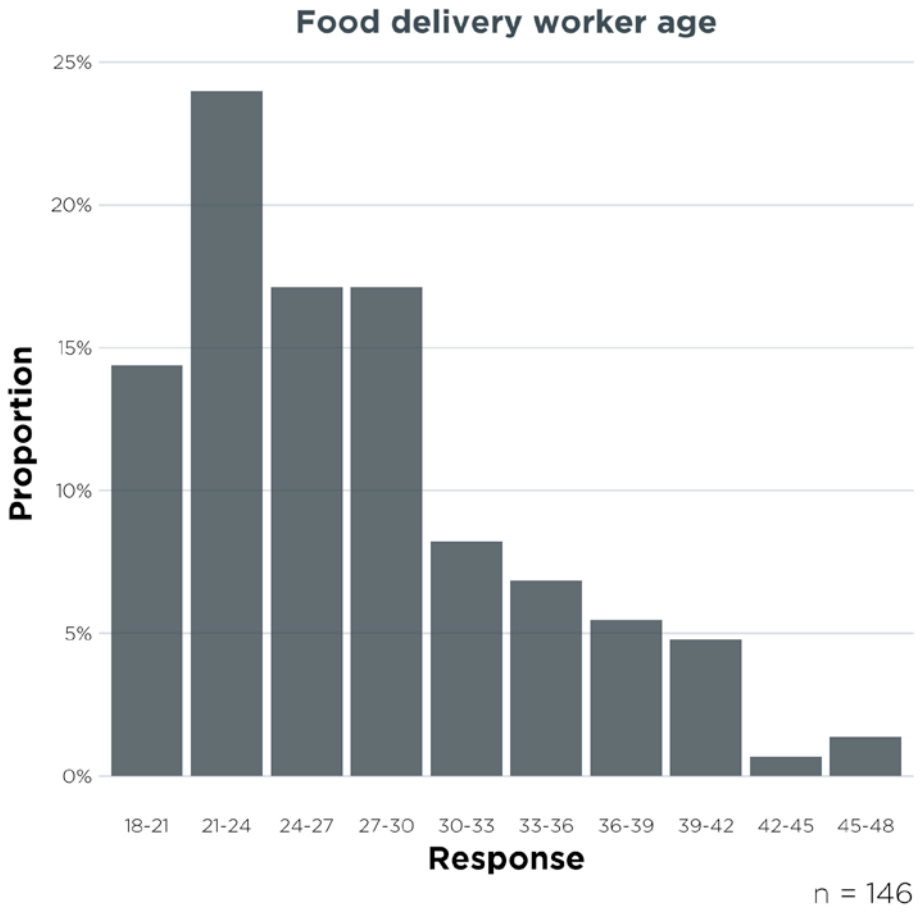

Figure 2: Age distribution of the food delivery workers who responded to our survey.

FDWs tend to be male

The FDWs observed in the field were predominantly male, accounting for 90% (Potts Point) to 98% (Newtown) of FDWs across the six observation locations. In contrast, only 76% of the FDWs who responded to the survey were male (n = 156). This discrepancy may be due to sampling frame differences (i.e., survey respondents were drawn from across Australia, while field observations were solely conducted in Sydney) and difficulties reliably determining gender or ethnicity from observation alone. Moreover, 39% of survey participants drove cars whereas the vast majority of FDWs observed in the field used bicycles, e-bikes, motorcycles, or scooters, since those in cars were not readily identifiable as FDWs.

FDWs tend to be foreign students

The majority (75%) of survey respondents were born outside Australia (n = 156). The five most commonly reported countries of birth were, in order of frequency, India, Malaysia, Colombia, China, and Indonesia. While country of birth cannot be reliably determined from observation alone, the most common ethnicities observed in the field were Asian (e.g. Chinese), followed by South Asian (e.g. Indian) and South American (e.g. Brazilian). Nationality differences between the survey and field observations may be due to sampling frame differences and the languages (i.e., English, Chinese, Spanish, and Hindi) in which the survey was made available. The majority (54%) of survey respondents identified themselves as student visa holders (n = 136).

The FDWs in our survey sample have better physical health and similar mental health compared to the Australian population

In the survey, we asked FDWs to rate their perceived physical and mental health (Figure 3) and compared their ratings to population-level health data (see the Methods section above). Overall, our sample reported greater levels of physical health and similar levels of mental health relative to national data. It may be the case that the relatively young age of our sample and the need for a baseline level of physical stamina to successfully undertake food delivery work at least partially explain the differences in self-reported physical health between the two data sets.

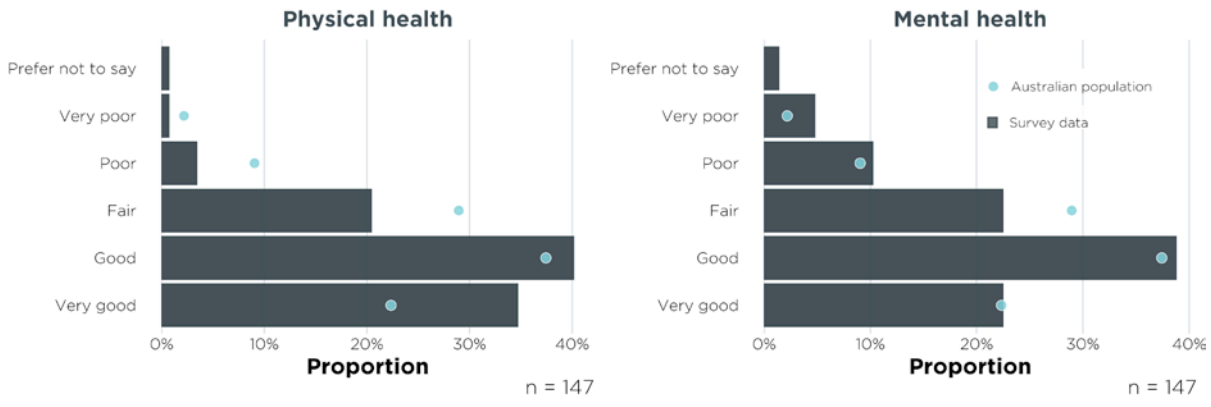

Figure 3: Self-reported physical (left) and mental (right) health among our survey respondents relative to the Australian population (black dots).

FDWs are motivated by flexibility and the desire to supplement existing sources of income

We asked survey respondents about their motivation for becoming a FDW. The most commonly selected reason was flexible work hours, followed by the desire to supplement existing income (Figure 4). The majority (60%) of survey respondents reported that food delivery work yielded the majority of their income (n = 147). Of those who reported receiving income from multiple streams (n = 92), casual work (38%) and part-time work (35%) were the most commonly reported additional sources. Several FDWs who were interviewed for this project said that food delivery work is best thought of as a "side gig."

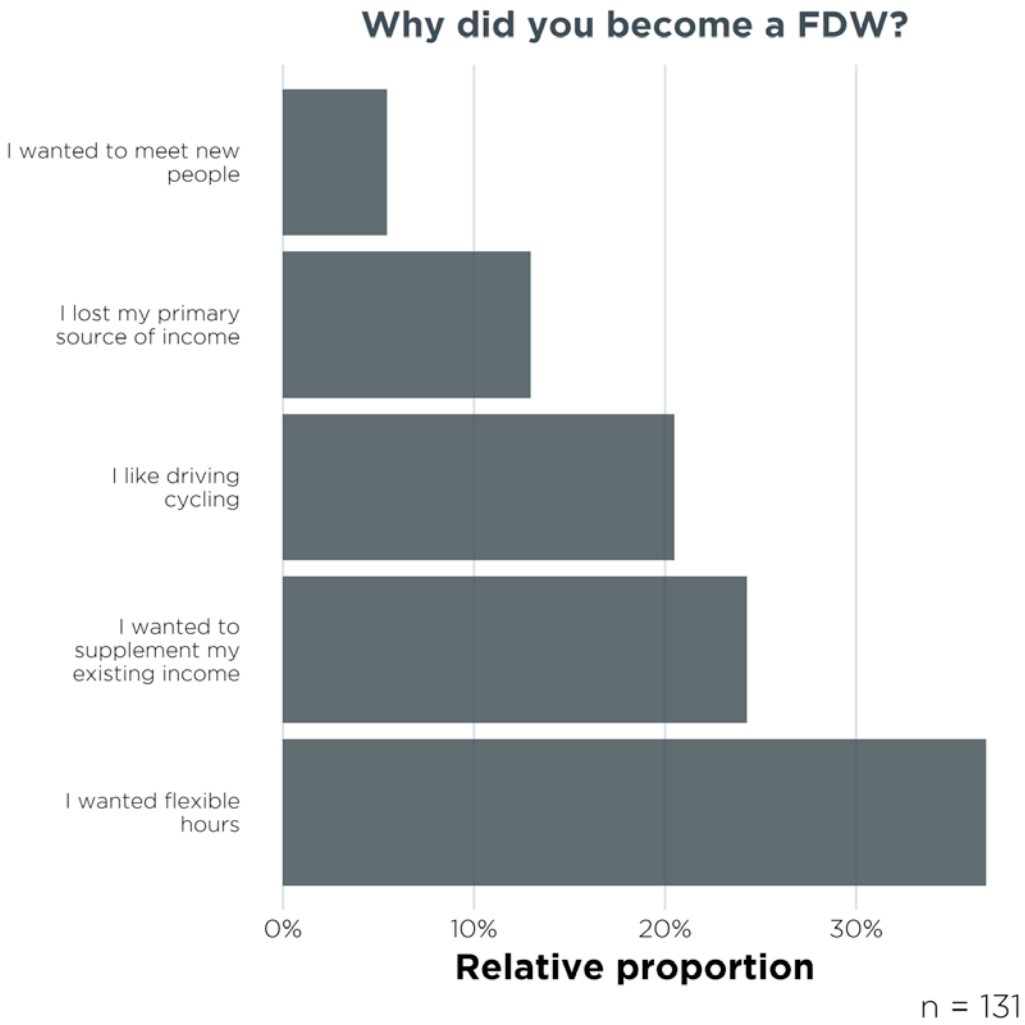

Figure 4: Reasons for becoming a FDW as reported by our survey respondents. Respondents could choose more than one reason.

What are the job characteristics and work environments of FDWs?

The FDWs in our survey sample tend to work in densely populated areas

The majority of survey respondents (n = 136) work in Victoria (44%) or New South Wales (34%). As shown in Figure 5, the FDWs in our survey sample tended to be concentrated in the CBD and inner suburbs of the capital cities. A proportion of our survey respondents reported working in the outer suburbs, and a small minority reported working in regional centres (the plots below omit some outer suburbs and regional areas).

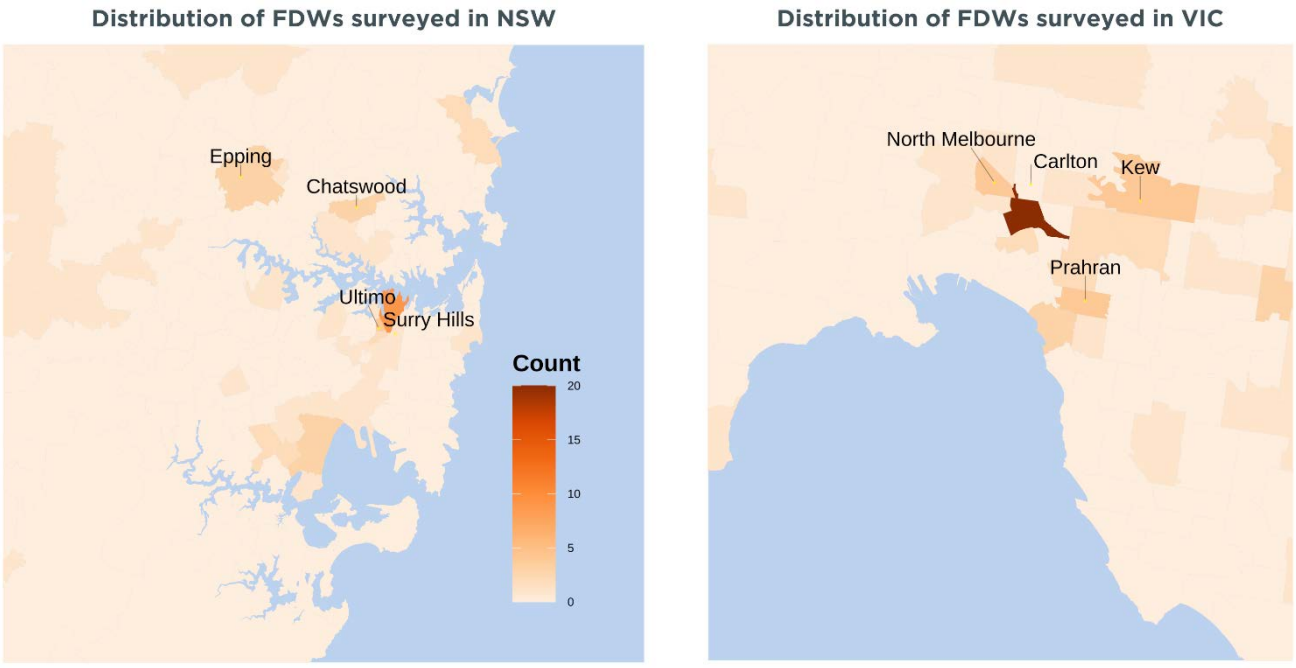

Figure 5: Heat map of the geographic areas in which our survey respondents work in Sydney (left) and Melbourne (right) and surrounding areas.

The most commonly reported FDP in the survey was Uber Eats

The largest proportion of survey respondents (44%) reported that they currently deliver, or delivered in the past, for Uber Eats (n = 143). Some respondents worked for smaller or less common platforms, such as Yello, HungryPanda, Zomato, and Sherpa. In contrast, FDP affiliation was more challenging to determine during field observations. Few FDWs were observed using branded gear and we could not identify those FDWs who work for multiple FDPs simultaneously. A notable exception was EASI, whose FDWs typically ride distinctive yellow e-bikes and carry yellow EASI-branded thermal bags, and who were observed in four field locations (Chatswood, Ultimo, Newtown, and Potts Point).

Most of our survey sample have been FDWs for less than 1 year

The majority of survey respondents (61%) have worked as a FDW for less than 1 year. This is no doubt influenced by the relatively short period during which FDPs have operated in Australia. However, our data suggest that demographic factors are also likely to contribute, such as the preponderance of student visa holders among our sample. Our interviews with FDWs also revealed that students are particularly drawn to food delivery work because its flexibility combines well with their variable study demands.

Mode of transport varies geographically

The survey and field observations revealed conflicting information about transport mode. Cars were the most common transport mode (39%) reported by survey respondents, followed by e-bikes (24%), bicycles (16%), motorcycles (12%) and scooters (9%; n = 130). In contrast, we observed more e-bikes and bicycles in the field than any other transport mode. This is likely due,

at least in part, to carrying out several observations in pedestrian-only areas or areas with very limited street parking, and to a lack of FDP branding visible on cars, making it virtually impossible to identify FDWs' cars in traffic.

The distribution of different transport modes differed geographically, with heavily motorised vehicles (cars, scooters, motorcycles) tending to deliver in regional areas and outer suburbs, and bicycles and e-bikes in urban centres (Figure 6).

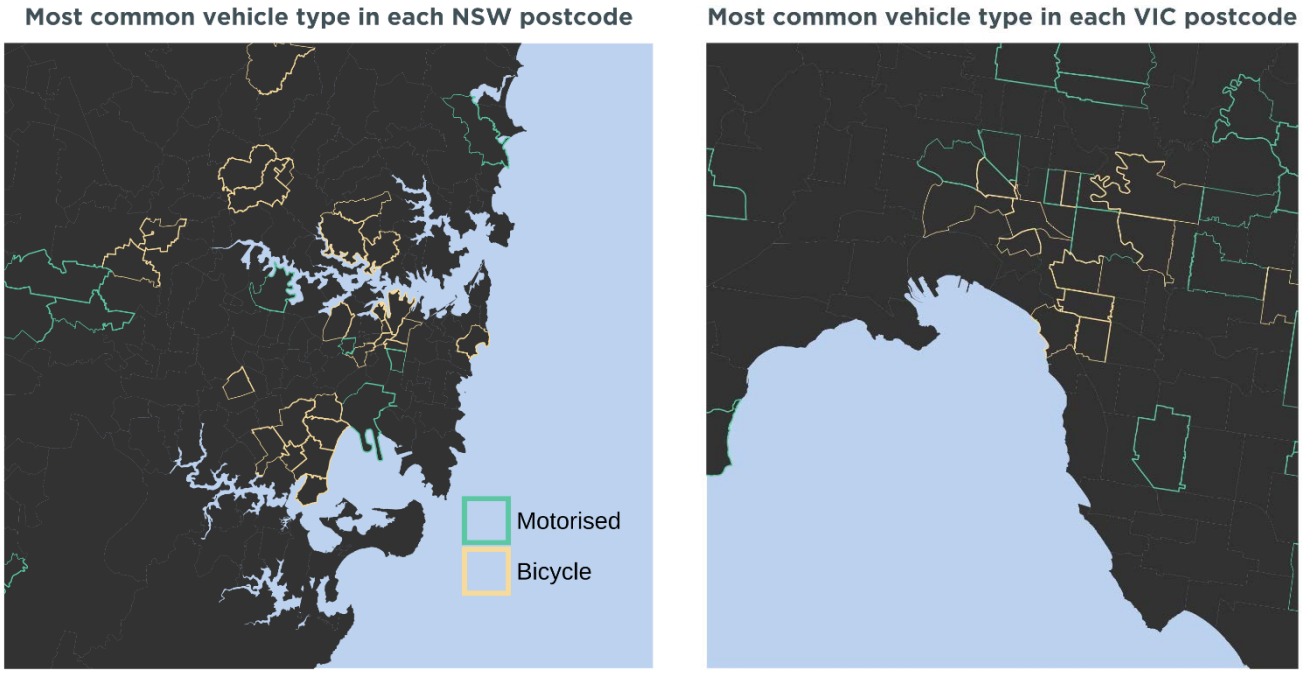

Figure 6: Distribution of vehicle types in Sydney (left) and Melbourne (right) and surrounding areas.

Summary of FDW characteristics

FDWs as a group are typically under 30, male, and in Australia on student visas, who choose food delivery work for its flexibility and to supplement existing income streams. While the existing evidence for the physical and mental health effects of gig work is mixed, we found that our survey respondents and interview participants reported better physical health than, and comparable mental health to, the Australian population as a whole.

FDWs tend to cluster in densely populated areas and have typically been in their job for less than a year, which accords with the preponderance of student visa holders. However, there is a significant minority of FDWs working in suburban areas and regional centres. The most common mode of transport differs on this basis, with urban FDWs more likely to use bicycles and e-bikes, and regional FDWs more likely to use cars and motorcycles. This suggests that these two populations may face slightly different WHS risks on the road and thus may require different and more tailored approaches to improving their road safety.

Health and safety behaviours of FDWs

In this section, we discuss the *proactive* behaviours (those that FDWs engage in to manage risk, including those that exacerbate risk and those that mitigate risk) and *reactive* behaviours (those that FDWs engage in after a WHS incident has already occurred) that were reported and observed during data collection. We note that some survey items are likely to reflect the impact of COVID-19 and its associated health guidelines, such as "I stop work if I feel tired or sick."

Figure 7 and Figure 8 provide an overview of the risk management behaviours that FDWs engage in and their reasons for doing so.

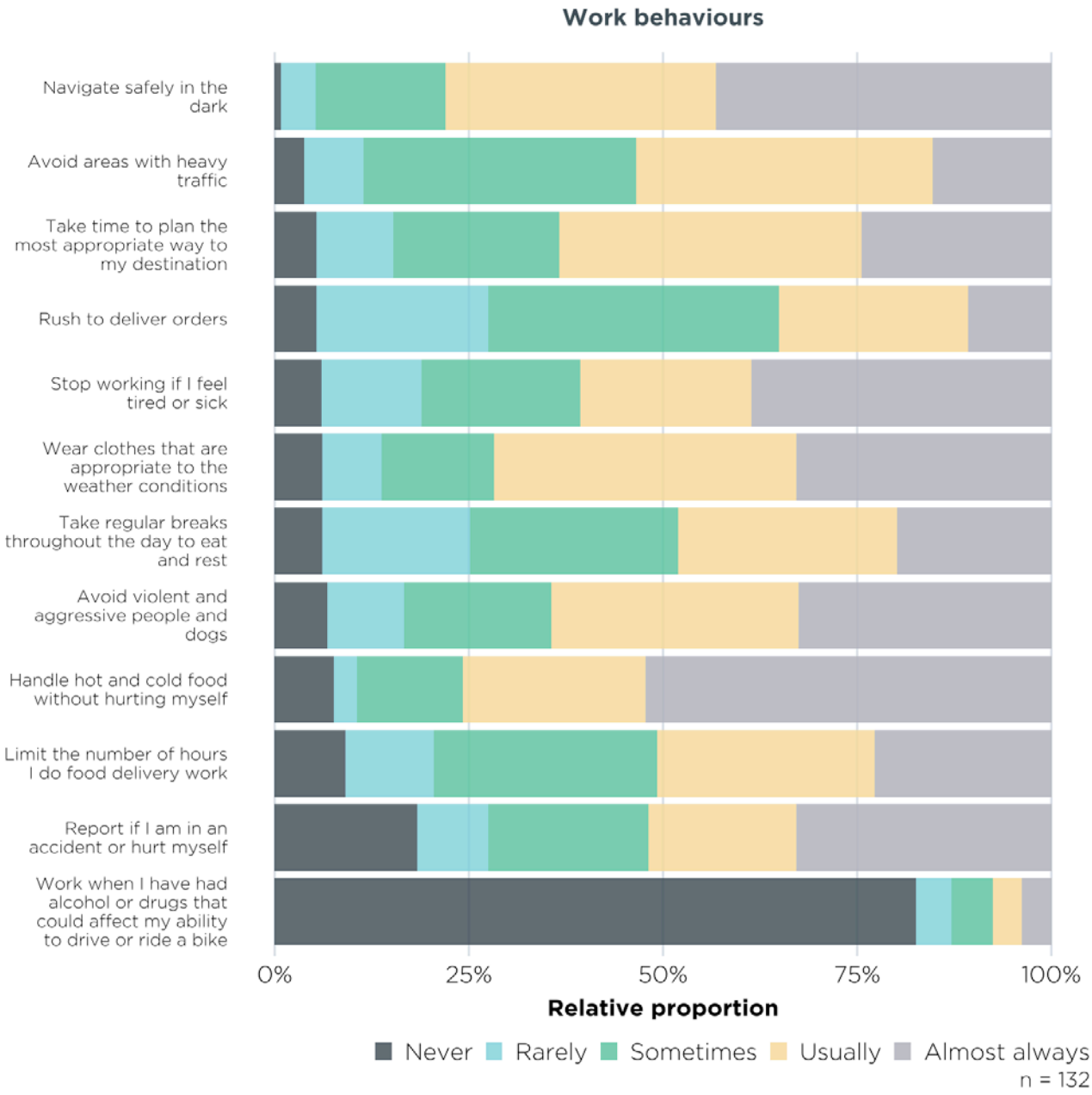

Figure 7. Relative proportion of survey respondents who reported engaging in risk exacerbation and risk mitigation behaviours.

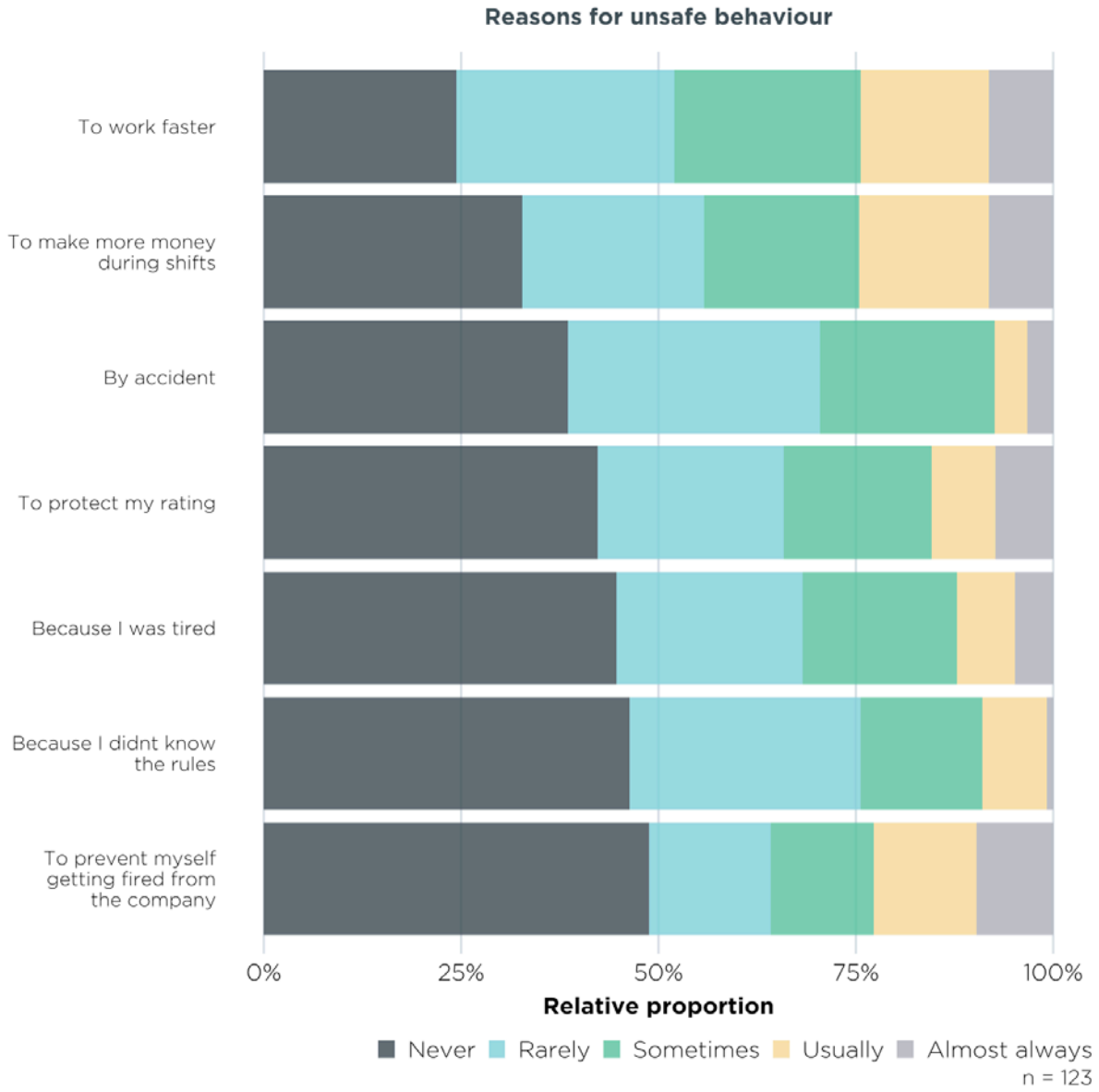

Figure 8: Reasons why FDWs engage in unsafe behaviours as reported in our survey.

What do FDWs do that exacerbates risk?

The majority of risky behaviours that were reported in the interviews and observed in the field relate to phone use, fatigue, breaking traffic laws, and failing to wear masks or use hand sanitiser to protect against COVID-19. However, these findings were not corroborated by the survey data: the majority of our survey respondents reported that they do not engage in behaviours that exacerbate risk (see Figure 7). As noted above in the Method section, this difference between self-reported and actual behaviour is often observed when studying behaviours that are undesirable. In this case, the difference may also be partially attributable to the fact that the members of the project team who conducted the field observations were looking specifically for risky behaviours, which may have made them more salient.

FDWs check their phone while riding or driving

One of the most consistent findings across our streams of data collection was that FDWs check their phone while riding or driving. Sixty-seven percent of our survey respondents reported engaging in this behaviour at least some of the time. One interviewee reported that he looks at his phone almost constantly while driving and estimated that he accepts 80-90% of orders while the car is in motion. Mobile phone use was also noted at all observation sites, including while riding on the road, riding on the footpath, waiting to cross the road, and while riding across a pedestrian crossing. Occasionally, the observer was physically close enough to the FDWs to see their phone screens. In those cases, FDWs were observed using the FDP app as well as navigation and social media apps. For example, a FDW was observed stopped on a busy road for 2 minutes while engaging with a navigation app (Figure 9).

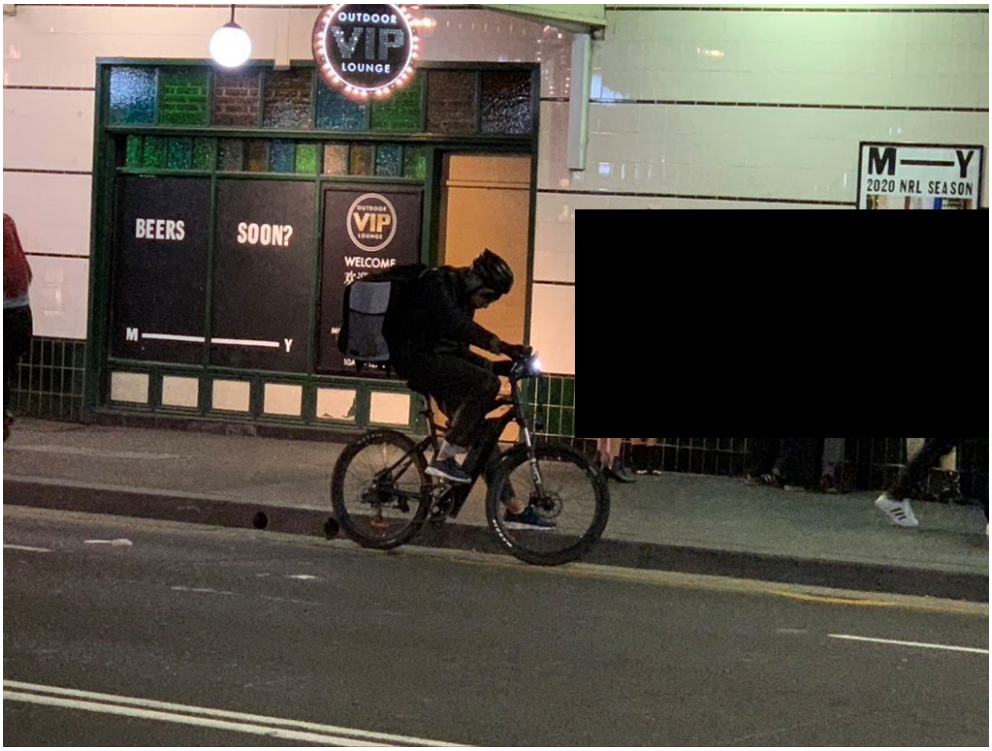

Figure 9: FDW using a navigation app while stopped on a busy road.

'Multi-apping' can increase WHS risks

More than 40% of FDWs who responded to our survey reported 'multi-apping,' i.e. working for more than one platform concurrently in the same shift. Multi-apping requires FDWs to look at their phones more often and can allow them to circumvent WHS risk mitigation policies, such as one FDPs requirement to log out for 8 hours after a maximum 12-hour shift. Our textual analysis indicated some FDWs use multiple phones to facilitate multi-apping.

Cyclist FDWs commonly ride on footpaths and across pedestrian crossings

Observers noted FDWs on bicycles and e-bikes commonly switching between riding on the road and riding on the footpath, meaning that they are also switching between following and breaking

road rules, since riding a bicycle on a footpath is illegal for adults in New South Wales. Riding on the footpath was observed across observation sites to be consistent behaviour regardless of pedestrian density (Figure 10). We also observed cyclists failing to give way to cars and riding, rather than walking, their bicycles across pedestrian crossings.

Figure 10: FDW riding on a footpath with many pedestrians in the vicinity.

We regularly observed cyclists and e-bike riders running red lights at low speeds, particularly when turning left, and making illegal U-turns. As noted by one interviewee:

"On bicycles, most of us drive on footpaths and we drive very fast."

The interviewee attributed this to poor cycling infrastructure and lighting. The interviewee acknowledged the risk to pedestrians but perceived the risk to be low at night in residential areas. Conversely, we observed motorcycle riders obeying road and traffic signals. Only one observer noted risky motorcycle riding (the FDW was riding with legs crossed).

Speeding and rushing encourage significant risk-taking behaviour

In our survey, the majority of FDWs, regardless of transport mode, reported that they do not exceed speed limits. However, only 5% of FDWs reported 'never' rushing to deliver orders, and more than a third (35%) reported 'usually' or 'almost always' rushing to deliver orders.

Corroborating these figures, we observed many FDWs traveling very fast, including in pedestrian areas. One interviewee reported falling on a slippery footpath after running from his car to a restaurant where no parking was available. The pressure to rush can be exacerbated by the FDP recording the time taken to collect orders without taking into account factors such as parking or traffic. For example, screenshots from the service safari (Figure 11) illustrate that the researcher was expected to collect food from a restaurant faster than Google Maps indicated was possible. This image shows that in order to meet the collection time of 7:01 PM, the FDW only had 4 minutes to reach the restaurant. Google Maps indicated that the journey on its own would have taken 5 minutes. While a one-minute difference does not seem large, this does not include the time that FDWs need to lock up their bicycle to avoid the risk of bicycle theft or vandalism. This may incentivise behaviours that pose WHS risks, such as rushing or speeding, and increase the likelihood of WHS incidents such as traffic accidents, slips, trips, and falls.

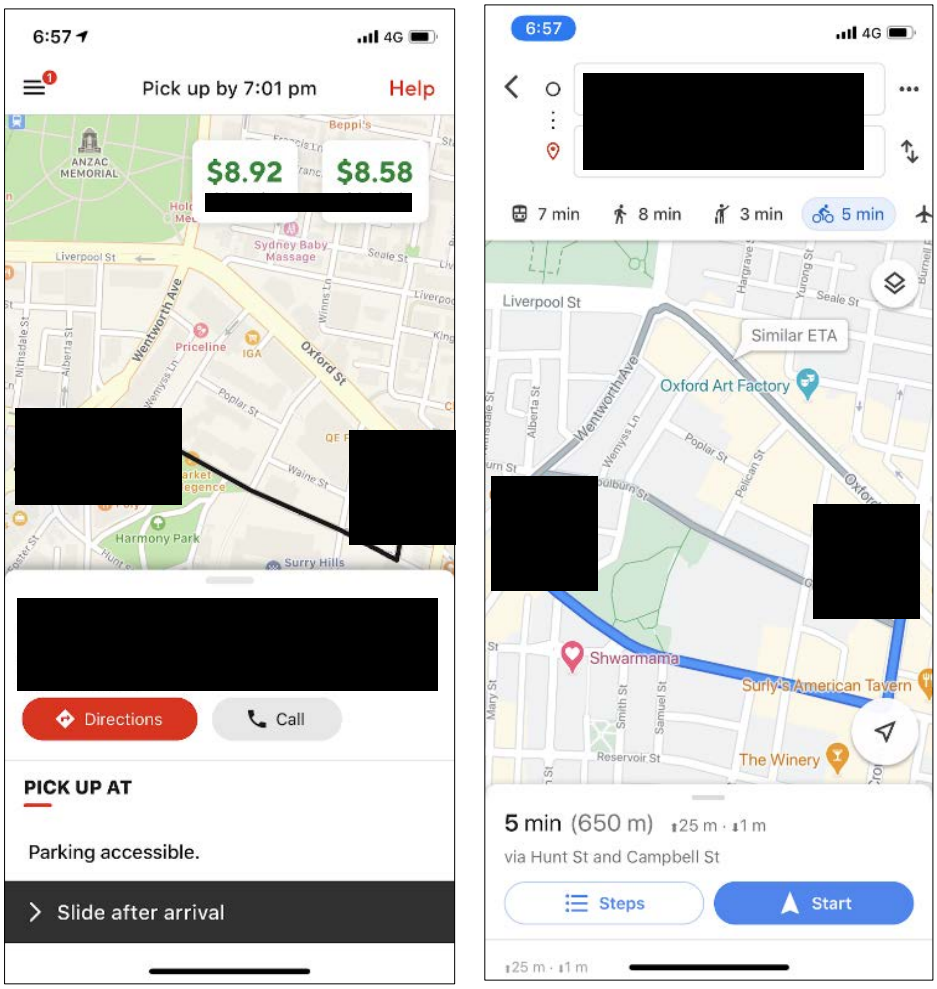

Figure 11: Screenshot of a FDP app (left) and Google Maps (right) showing a discrepancy between the time the order was to be collected from the restaurant and the time it would take to reach the restaurant by bicycle.

FDWs are motivated to rush to make the customer happy and to protect their ratings

Almost 40% of the FDWs who responded to our survey reported that they 'sometimes' rush to deliver orders. FDWs told us that they were motivated to deliver food fast to make the customer

happy, by the internal pressure of wanting to do a good job, and by not wanting to compromise their in-app ratings. Information asymmetry (i.e. not understanding the restaurant perspective and the customer perspective) can exacerbate this pressure. In the service safari, our researcher noted that a delay in being able to see customer ratings in the app meant that a FDW would not be able to gauge real-time performance, an ambiguity that potentially incentivises greater risk-taking behaviour.

In the Literature review section above, we reported that many FDP apps are designed using prompts, incentives, and gamification to increase the number and speed of deliveries. One FDP app explicitly displays the FDWs performance metrics alongside the consequences of those metrics. For example, Figure 12 illustrates how FDWs working for this FDP are told that if they deliver on time, they are likely to be offered more delivery opportunities.

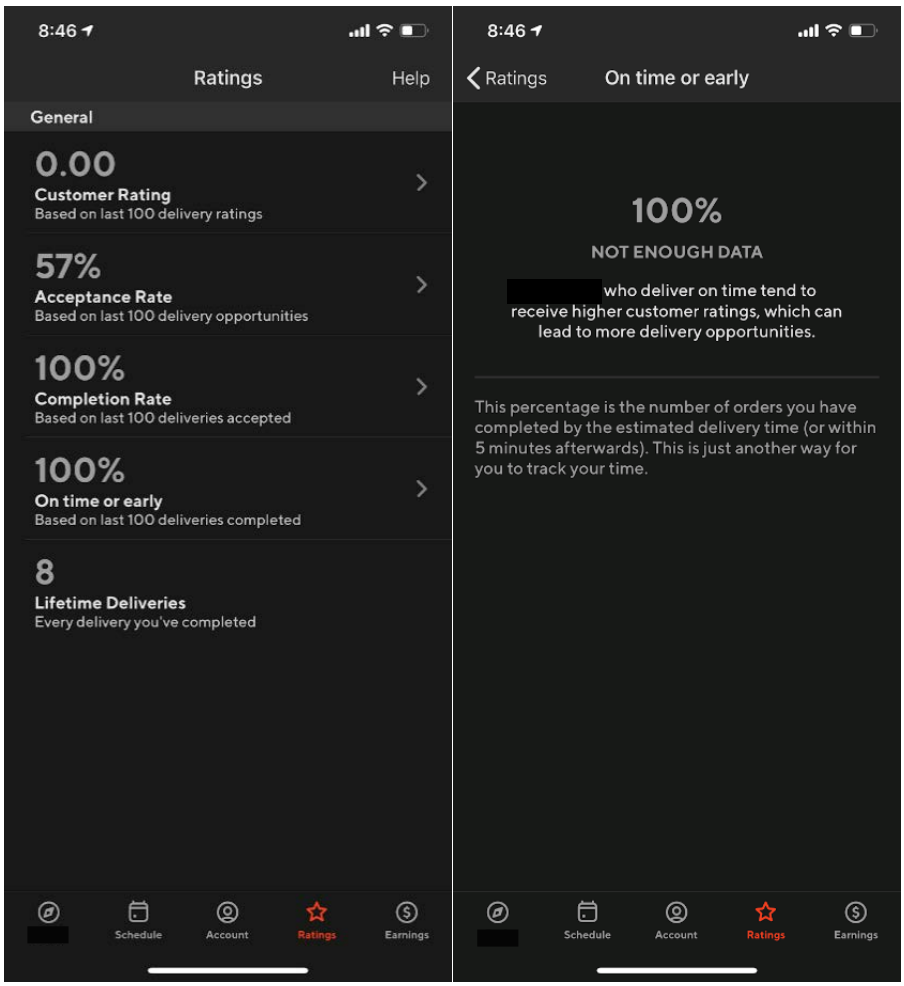

Figure 12: In one FDP app, metrics including ratings, acceptance rates, completion rates, and on-time or early rates have a direct impact on subsequent delivery opportunities.

FDWs can take preventive COVID-19 precautions, but many do not

Social distancing: The majority of FDWs report engaging in social distancing while working. However, we observed FDWs congregating at collection points and thus failing to follow social distancing protocols. The parking behaviour of cyclists also prevented pedestrians from practising social distancing protocols and created additional physical hazards at the same time (Figure 13).

Figure 13: Example of improvised bike parking on the footpath creating pedestrian bottlenecks.

Hand sanitising: While the majority of FDWs report being able to wash their hands while working, one in four report times when they were unable to. This was corroborated by the experiences of the project team members who conducted the service safari, who found limited opportunities to wash their hands.

Mask wearing: We observed the vast majority of FDWs without face masks. Photos and videos capturing members of the public corroborate that they also largely failed to comply with mask wearing. This was the case across observation sites, time of day, and level of pedestrian traffic. Five out of 30 FDWs observed in Chatswood wore face masks, whereas approximately 25% of the general public in that area was estimated by the observer to be wearing masks. In Manly, neither FDWs nor the general public wore masks, and only one FDW was observed wearing a mask in Randwick. This may be driven in part by inconsistent COVID-19-related messaging and support provided by the different FDPs, which is explored in further detail in the Health and safety knowledge of FDWs section below.

FDWs overwhelmingly wear dark clothes at night

Some FDWs were observed wearing reflective clothing at night. This varied by geographic location (FDWs were observed in Newtown wearing silver reflective jackets and carrying reflective thermal bags), FDP affiliation (some FDPs have more colourful branding than others and there is variation in the extent to which FDPs encourage or require FDWs to wear branded clothing and use branded gear), and weather conditions (we observed a higher proportion of FDWs wearing reflective clothing during field observations undertaken in the rain). However, most FDWs dressed in black with limited or no reflective surfaces (Figure 14).

Figure 14: FDW working at night in dark clothing, with no high-visibility or reflective gear.

Some FDWs work while fatigued

Many interviewees who use cars to undertake food delivery work reported that fatigue was their primary concern. In our survey, one in seven FDWs reported working more than 40 hours a week. One in five FDWs reported that they would not limit their hours, one in four reported 'never' or 'rarely' taking breaks, and almost one in five said they would not (or would rarely) stop working if they felt tired or sick. Again, we note that these responses may be influenced by the COVID-19 health guidelines that were in place at the time of the survey. FDWs reported that the primary reason for working while fatigued was money, and our survey found that all FDWs who worked more than 31 hours a week relied on food delivery as a primary source of income.

What do FDWs do to mitigate risk?

There are a number of behaviours FDWs already take to reduce risk, but many of these can be improved and should be more widely adopted. These preventive behaviours primarily relate the use of protective gear and active decisions about when and where to work (see Figure 7).

Cyclists and motorcycle riders almost always wear helmets, but they are not always properly fitted

The vast majority of cyclists, e-bike riders and motorcycle riders who responded to our survey reported 'always' wearing a helmet, a finding that was supported by our field observations, in which no FDWs were observed working without a helmet. However, when observations were carried out during cooler weather, we observed FDWs wearing beanies or knit caps under their helmets with slightly loosened chin straps. Helmets worn over the top of other headgear can compromise the fit, and loosely fastened straps can mean that the helmet does not protect the head during a fall (e.g. Hagel et al., 2010).

The majority of FDWs have lights on their vehicles, though some do not use them

The vast majority of cyclists, e-bike riders, motorcyclists, scooter riders, and drivers reported in the survey that they 'always' have functioning lights. Posts in our textual analysis also found cyclist FDWs asking for advice about reliable brands, sources, and costs of front and back lights. However, we observed instances of FDWs riding at night with their lights missing or not turned on (Figure 15).

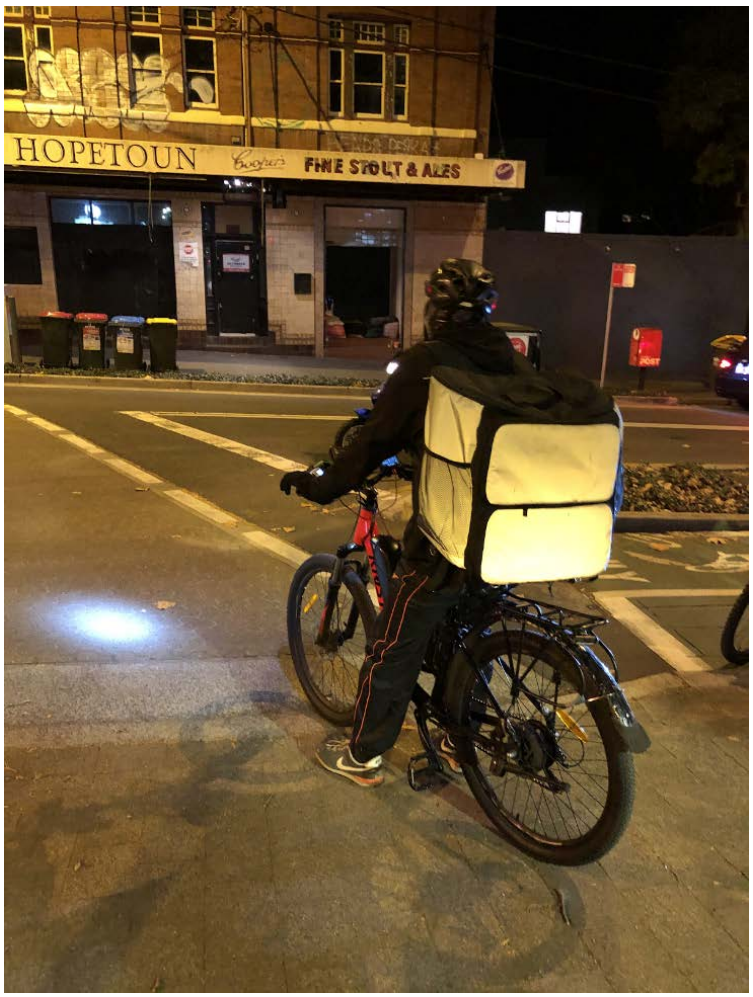

Figure 15: A FDW riding at night with a missing rear light.

The majority of FDWs have serviced their vehicle recently, but often do so with second-hand parts

Approximately 60% of FDWs who responded to our survey reported servicing their vehicle in the previous 3 months. Similarly, no vehicles were observed to be in disrepair during the field observations. However, our textual analysis indicated that many FDWs, especially e-bike riders and cyclists, service their bicycles themselves, often using second-hand parts. In these cases, FDWs may believe they are acting appropriately to minimise risk but are inadvertently increasing their risk by conducting repairs without the requisite skill level or with substandard or worn parts.

FDWs actively minimise risk in adverse weather by working less, riding and driving more cautiously, or wearing high-visibility clothing

One of the most common risky behaviours reported by FDWs in our survey was working in inclement weather. This accords with data indicating that of the road and traffic incidents involving FDWs that were reported to SafeWork NSW between 2017 and July 2020, wet weather was one of the most common causes. In our survey, 80% of FDWs report working in inclement weather at least some of the time. Cyclists and e-bike riders are incentivised to work in these conditions because the combination of greater customer demand and fewer FDWs willing to work means that they are likely to receive more delivery opportunities and thus earn more money. Despite this incentive, the majority of FDWs, especially those on motorcycles, scooters, e-bikes and bicycles, report that they choose to work less in inclement weather. This finding was supported by our interviews, textual analysis, and observational research. For example, one interviewee reported:

> *"When it's raining, I don't like to go working… I know the risks of riding a motorcycle on the wet [road]… I can decide whether I go or not."*

When we revisited three observation sites in Ultimo to explore the impacts of differing weather conditions on FDW behaviours, we found fewer FDWs working on the rainy evening relative to the clear evening. We also observed more risk mitigation behaviours on the rainy evening. A higher proportion of FDWs wore reflective clothing when it was raining and were observed to ride and drive more slowly. It is possible that this higher proportion was, in part, driven by waterproof clothing tending to be more visible (e.g. fluorescent or brightly coloured) than typical clothing (Figure 16), meaning that the observer was more likely to notice FDWs wearing this sort of attire.

FDWs try to avoid areas they perceive as unsafe, but can inadvertently increase other risks

To avoid being abused by customers, some FDWs avoid areas they perceive as unsafe and multiple FDWs report working in areas they know well. One interviewee reported:

> *"I usually do all my riding in those areas [that I know very well]… so you get to know where the no-go zones are, you basically stay where there's people around."*

Another FDW refused a “suspicious” request to enter a dark housing commission block late at night, and reported the incident to the platform. However, strategies to reduce risk can increase other risks. For example, one interviewee reported cycling as fast as possible to avoid poorly lit areas. This interviewee acknowledged the increased risk of accidents but was more afraid of physical or verbal abuse.

Figure 16: FDW wearing high-visibility, weather-appropriate clothing.

What do FDWs do if they experience a WHS incident?

While the focus of our research is on identifying opportunities to increase proactive WHS behaviours, i.e., behaviours that reduce the risk of a WHS incident occurring in the first place, we also identified important information about reactive WHS behaviours. These emerged almost exclusively in the context of reporting road and traffic incidents, particularly those that are of a high-impact, low-frequency nature.

Only a minority of FDWs say they would report an incident to the FDP

Our survey indicated that a substantial proportion of FDWs would not report incidents. Almost one in five (18%) reported that they would ‘never’ report an accident or injury to their FDP. Fewer than one in three (33%) reported that they would ‘always’ report an incident (see Figure 7).

FDWs are often unsure how or whether to report incidents to FDPs

In our textual analysis, a substantial proportion of posts were seeking information about how to report WHS incidents to a FDP. Many posts said that the FDP was not contactable, either because the in-app reporting system had failed or because helplines and offices were closed. Several FDWs we interviewed reported a perception that reporting incidents to FDPs is difficult and not necessarily effective. For example, one former FDW reported:[3]

> *"There's no face to the company… you might need to prove they're liable at the time… they might have loopholes… I can't think of anything more exhausting."*

FDWs are reluctant to involve police and ambulance services in accidents

Our research indicated that FDWs face various barriers to reporting incidents to police. For example, one interview participant reported that following a minor car accident, she did not involve police or ambulance services because she wanted to ensure the customer's food arrived on time:

> *"One car dashed me and they ran away, I couldn't call police or anything like that… it was not a major accident. [I was] in a hurry… I have to go, but I delivered it on time."*

Cost was also a barrier to accessing ambulance services. For example, one person in our interviews indicated that they would not call an ambulance because the cost of an ambulance bill would be equivalent to a week's worth of income.

Our textual analysis also indicated a substantial mistrust of police among FDWs. This was often driven by fear of having a temporary visa revoked. For example, some FDWs on student visas were concerned they may be accused of violating the maximum of 40 hours per fortnight of work permitted under the conditions of their visa. In another post, one FDW described having been in an accident that required hospitalisation. The FDW had been asked to attend a police station to provide a statement but expressed concerns in the post that interaction with police could jeopardise their student visa and result in deportation.

Summary of health and safety behaviours of FDWs

FDWs engage in a range of behaviours that influence their WHS risk. Given that the overarching focus of this project is on developing proactive, risk prevention activities to reduce WHS risk, we focused primarily on identifying the behaviours that FDWs engage in that both exacerbate and mitigate risk (i.e. proactive behaviours). Common risk exacerbation behaviours include using mobile phones while riding or driving, working while fatigued, wearing dark clothing at night,

[3] We note that this interviewee had successfully reported an incomplete delivery due to safety concerns using the in-app reporting system. He described this process as a series of FAQ prompts until there is a 'type out your inquiry' box. He felt that his inquiry was never answered, but also acknowledged that there were no ramifications for not finishing the delivery.

cycling on footpaths and in other pedestrian-only areas, failing to follow COVID-19 safety guidelines on social distancing and mask-wearing, and speeding or rushing. These behaviours are driven largely by the desire to work quickly and to maximise income. Common risk mitigation behaviours include riding or driving more cautiously and wearing brightly coloured or reflective clothing during inclement weather, wearing helmets, and having delivery vehicles serviced regularly. However, we also identified aspects of risk mitigation behaviours that pose risks in and of themselves, most notably FDWs' frequent use of second-hand parts to self-service and repair their own vehicles.

There was a sizeable gap between self-reported risk exacerbation and risk mitigation behaviour (identified in the survey) and actual behaviour (observed in the field). This highlights the need to make WHS risks more salient, and to encourage FDWs to think about and act upon these risks more consciously.

Health and safety knowledge of FDWs

This section focuses on the level of WHS knowledge that FDWs have, the ways in which they acquire this knowledge, and their beliefs about WHS responsibilities.

What do FDWs know about WHS?

Many FDWs have insufficient road knowledge to perform the job safely

Our interviews, field observations, and textual analysis demonstrated that many FDWs lack basic knowledge of Australian road rules. The post below was made by a FDW who received a fine that was more than the value of his day's earnings due to his lack of knowledge of Australian road rules (Figure 17).

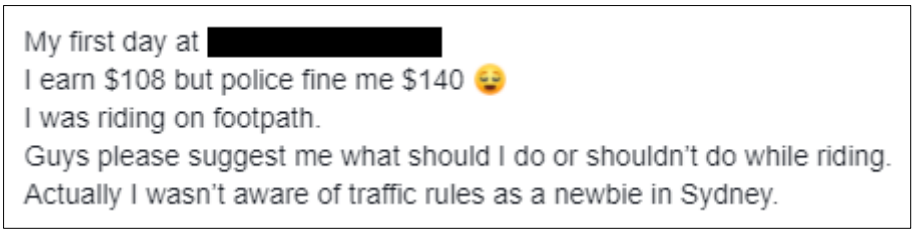

Figure 17: Social media post illustrating lack of knowledge about New South Wales bicycle laws.

Lack of knowledge about Australian road rules may underpin many of the risky behaviours we observed in the field, most notably cyclists riding on footpaths, crossing double lines, making illegal U-turns, and running red lights during left-hand turns (Figure 18).

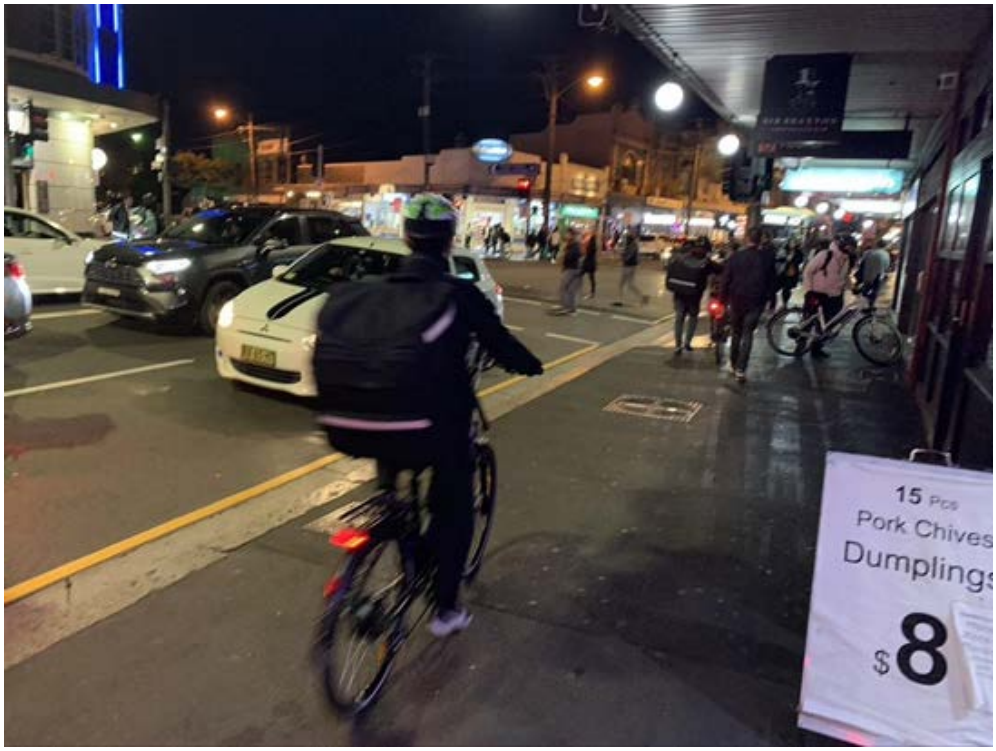

Figure 18: FDWs riding on the footpath in a densely populated part of Sydney.

Poor knowledge of Australian road rules could be particularly problematic for FDWs who ride bicycles or e-bikes, since they face no screening or licensing requirements when they sign up to the FDPs. One FDW we interviewed said:

> *"I came from another country, the background is very different, we can ride our bikes without the helmet, we can ride on the freeways… the app was showing just the ways a motorcycle could go, and I entered a freeway, it was a very, very bad situation… the police stopped me."*

There were frequent posts in the FDW Facebook groups about whether car drivers could deliver on an international driver licence. Responses to such posts are typically inconsistent, with commenters variously posting that it is possible, that it is possible only with particular FDPs, and that it is not possible under any circumstances. This inconsistent and potentially erroneous advice enhances WHS risks, since the information is not moderated or vetted for accuracy and any FDW who reads the post may unwittingly decide to act in accordance with incorrect or even dangerous advice.

When we asked FDWs in the survey whether they understood Australian road rules, 89% 'agreed' or 'strongly agreed' that they do (and none 'disagreed' or 'strongly disagreed'). This could mean that the only FDWs who responded to our survey are workers who do in fact know and understand Australian road rules, or that FDWs believe they understand the road rules until they are penalised for violating them, as was the case for the person who made the post in Figure 17.

FDWs believe it is their responsibility to manage their own WHS risk, but are uncertain who is responsible when a WHS incident occurs

Eighty-nine percent of FDWs we surveyed 'agreed' or 'strongly agreed' that safety was their own personal responsibility (Figure 19).

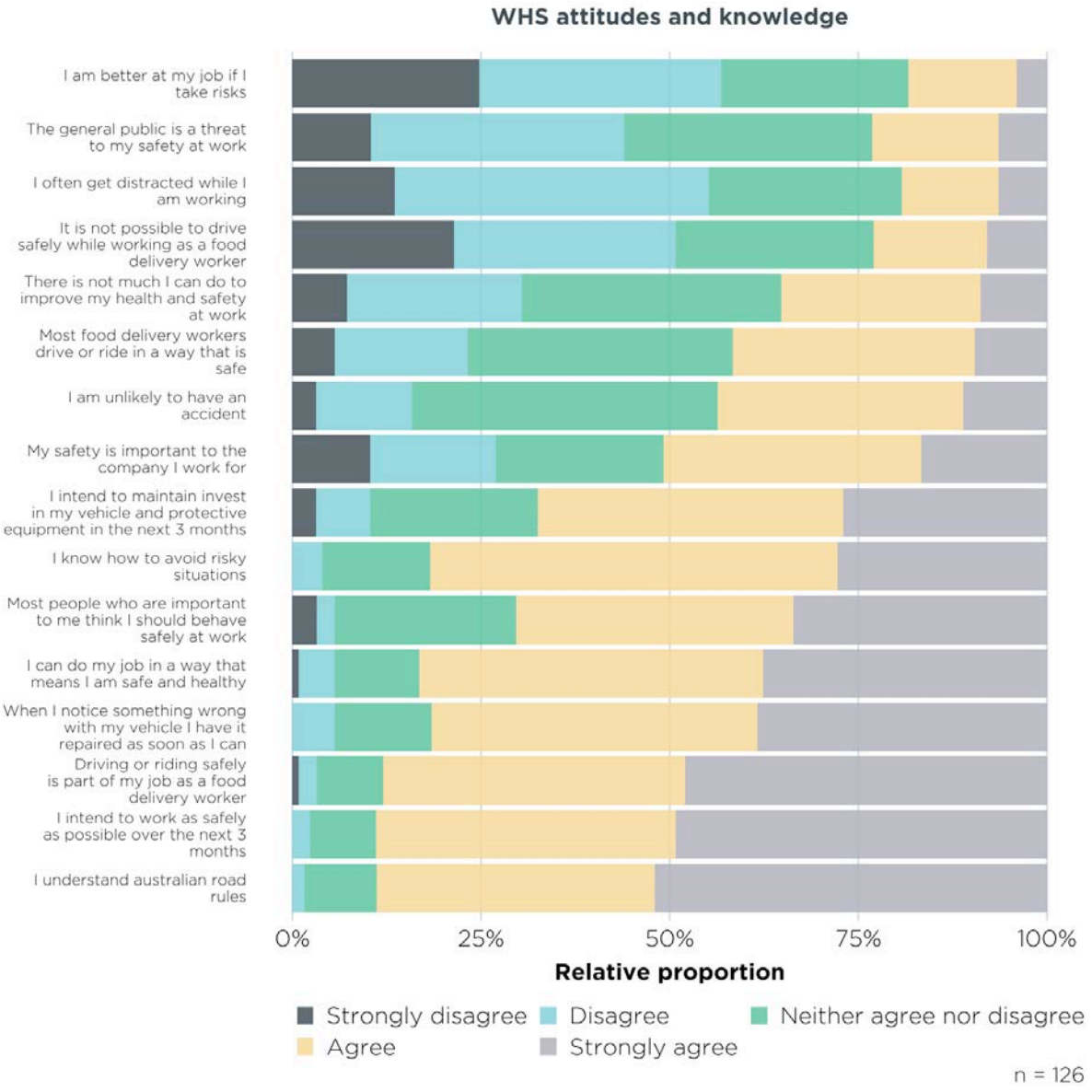

Figure 19: Relative proportions of FDWs who agreed or disagreed with statements about WHS attitudes and knowledge.

This finding was supported by the interviews we conducted with FDWs. Several interviewees expressed the belief that it was their own responsibility to know and be familiar with Australian road rules, with another highlighting the importance of having access to safety equipment like a well-maintained bicycle and a properly fitted helmet.

While survey respondents and interviewees were largely consistent in their belief that responsibility for managing WHS risks lies with themselves, several interviewees said that when something goes wrong, they felt FDPs should be there to support them, although they are

uncertain about their duty to report and the obligations of FDPs and FDWs when an incident does occur. This highlights an interesting and important dichotomy between who FDWs perceive to be responsible for WHS *risk* (i.e. themselves) versus who they perceive to be responsible for WHS *incidents* (i.e. the FDP). As illustrated in Figure 20, this seems to be particularly the case for high-impact, low-frequency incidents such as road and traffic accidents that causes significant injury:

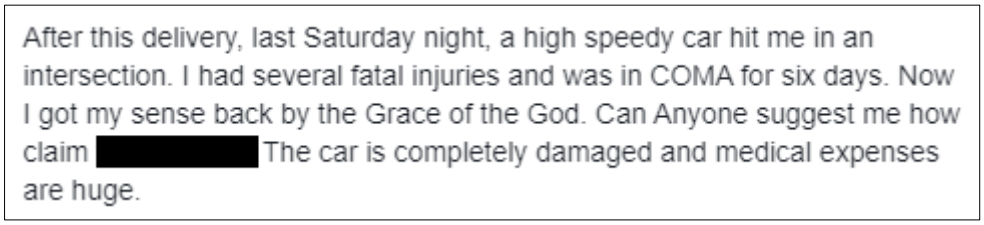
After this delivery, last Saturday night, a high speedy car hit me in an intersection. I had several fatal injuries and was in COMA for six days. Now I got my sense back by the Grace of the God. Can Anyone suggest me how claim [redacted] The car is completely damaged and medical expenses are huge.

Figure 20: Social media post in which a FDW asks how to claim expenses arising from a car accident from the FDP.

How is WHS knowledge learnt?

FDWs gain a heightened awareness of risk through first-hand experiences

Both the surveys and textual analysis revealed that many FDWs learn about WHS as they go. This means that FDWs who have just started delivering food may be a particularly vulnerable subpopulation with regard to WHS risks. Several FDWs we interviewed expressed that they frequently witness inexperienced road users delivering food and that they perceive this as a risk for other FDWs and the community as a whole. One interviewee said:

> *"Because they're so inexperienced in their ability to ride a bike… or road sense… it's such high risk… when you get onboard, they don't ask you about your riding experience."*

Experiencing or witnessing other WHS incidents can be a trigger for FDWs to learn about and adopt safer habits. For example, one FDW we interviewed studied Australian road rules after experiencing several minor falls when first starting food delivery work:

> *"Now I learn a lot about the traffic and signals… keep my eye everywhere on the four ways so I don't meet any accidents now."*

Another interviewee shared his experience of learning from the behaviour of other FDWs after witnessing another FDW on a bicycle get hit by a taxi, stating that it heightened his awareness of his surroundings and other riders and drivers on the road.

Several of the FDWs we interviewed speculated that FDWs may be more willing to take risks when they first start delivering food because they are motivated to increase their earnings. More experienced FDWs, however, learnt experientially that the risk was not worth any potential increase in earnings. One FDW we interviewed analysed his pay records and concluded that shifts in which he rode fast averaged out to the same income as those in which he rode at a more measured pace.

FDWs learn about WHS from peers

While knowledge about WHS is gained experientially on the job, there is also evidence for substantial community transfer of information between FDWs, both in person and online. Several interviewees indicated that FDWs frequently discuss information about traffic incidents and abusive restaurant workers during breaks and while waiting for deliveries. In our field observations, we frequently saw FDWs talking to each other between deliveries (Figure 21). While we do not know what they were talking about, it suggests the possibility of peer-to-peer learning.

Figure 21: FDWs smoking and talking on public seating.

The volume of WHS-related social media posts identified in the textual analysis reveals the extent to which this population relies on each other to crowdsource valuable WHS information. We encountered posts asking for information about bicycle maintenance, safety equipment, COVID-19 protective requirements, weather conditions, and sexual advances from a customer. The volume of responses to social media posts also indicates that the online FDW community is active and willing to share helpful information. For example, one post detailing the experiences of a FDW with an abusive restaurant owner received over 30 comments of advice and support.

The quality and quantity of safety information that FDPs provide is perceived by FDWs as variable

One reason that FDWs express uncertainty about WHS may be due to the amount and quality of information provided by FDPs to FDWs. Our researchers who undertook the service safari perceived the quality of this information as low and highly variable from platform to platform. This is corroborated by the 61% of FDWs surveyed who stated that they received little to no safety training (Figure 22).

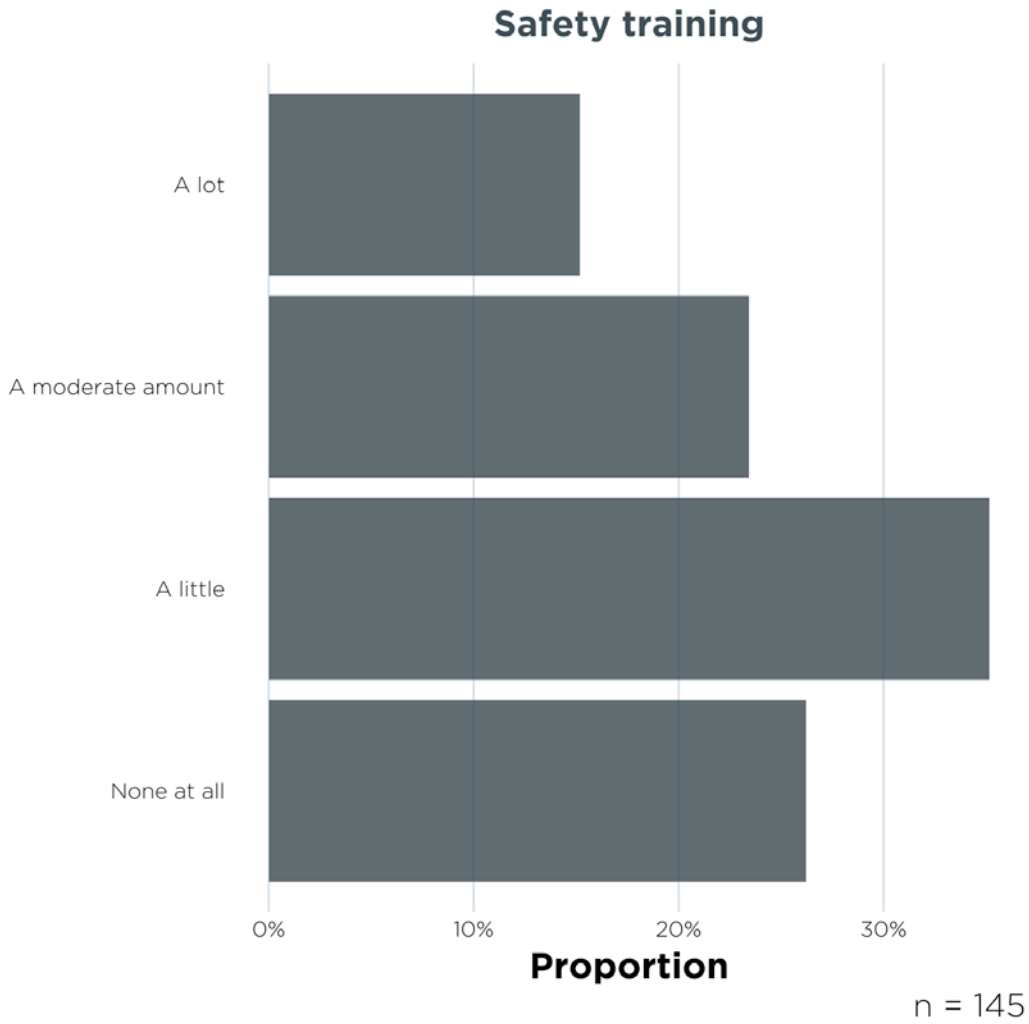

Figure 22: Perception of safety training adequacy among the FDWs who responded to our survey.

We also encountered variable training standards between platforms when participating in the service safari. Two of the FDPs required us to complete and pass a quiz about work processes or bicycle safety laws. One FDW we interviewed described the bicycle safety quiz as being so rudimentary as to be easily passed using common sense:

"I didn't know squat about road rules in Australia and I aced all of the questions."

The interviewee's comment was corroborated by our own experiences onboarding to this FDP in the service safari. The answers could easily be found online, and any incorrect answers could be modified prior to submission.

The other FDPs directed the team members who participated in the service safari to web pages and YouTube videos with WHS information about road rules and safety equipment. However, viewing these pages was not mandatory, nor were we tested on the information provided. The expectation that these resources will be viewed, understood, and applied on the job rests on the assumption that FDWs will take the necessary time to actively digest complicated and important information when they have a competing motivation to start work as soon as possible.

The variability in the WHS information provided to FDWs has implications for the large proportion of people who work for multiple platforms. Forty-three percent of our survey respondents reported logging in to two or more platforms in one shift, a finding which was also supported by the accounts of several FDWs interviewed. While WHS information would be largely the same for all FDWs, specific protocols and reporting mechanisms are likely to differ across FDPs, which is a potential barrier to acquiring the WHS knowledge necessary to safely perform food delivery work. This may be contributing to the uncertainty many FDPs experience in knowing who is responsible in the case of a WHS incident and how to access that support.

Summary of health and safety knowledge of FDWs

Although FDWs believe that they are primarily responsible for managing their own WHS risks, the knowledge necessary for successful risk management tends to be acquired in a piecemeal fashion through a combination of the limited (and often optional) WHS information provided by FDPs, experience on the job, and advice from peers. Each of these learning channels has its own drawbacks. FDP information is most likely to be accurate and appropriately vetted, but the fact that it is typically not compulsory means that engagement with this information is likely to be low. The need for experiential WHS learning to reach a baseline level of risk awareness means that new, inexperienced FDWs are at even greater risk of causing or incurring a WHS incident, and peer discussion forums can become fertile ground for misleading and even dangerous advice to flourish and spread. Overall, FDWs have a relatively low level of WHS knowledge, particularly in relation to Australian road rules and bicycle safety. This is likely due, at least in part, to demographic factors and the temporary, short-term tenure of most FDWs. Since knowing about WHS risks is a critical first step in taking appropriate action to reduce the likelihood of a WHS incident, improving WHS knowledge among FDWs is of key importance in improving overall WHS in this population.

Health and safety concerns of FDWs

This section focuses on the primary WHS concerns of FDWs, how FDWs perceive their own safety relative to the safety of others, and the effect of transport mode on WHS risk awareness.

FDWs' primary WHS concerns are traffic accidents, verbal abuse from customers, and experiencing robbery or vandalism

As shown in Figure 23, the FDWs who responded to our survey have three primary WHS concerns: traffic accidents, verbal abuse by customers, and being robbed or having their delivery equipment vandalised. It should also be noted that the fourth most important concern also relates to verbal abuse, in this case from members of the public.

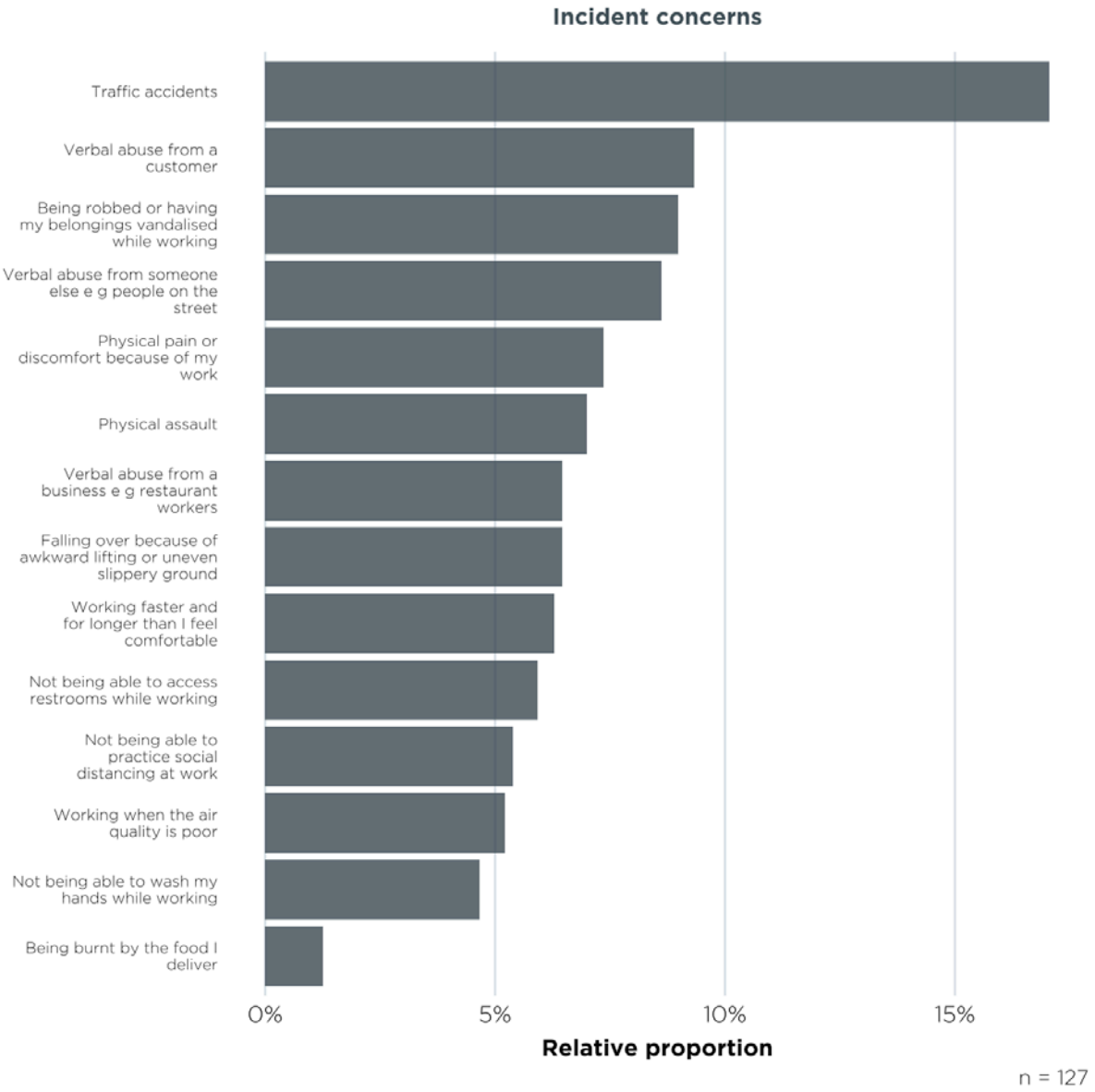

Figure 23: The relative proportion of WHS incident concerns nominated by the FDWs who responded to our survey. Respondents could choose more than one concern.

In contrast to our survey responses on WHS *concerns*, being robbed and having a traffic accident were the third and fourth least commonly experienced WHS *incidents* (Figure 24). This difference is explored in more detail later in this section.

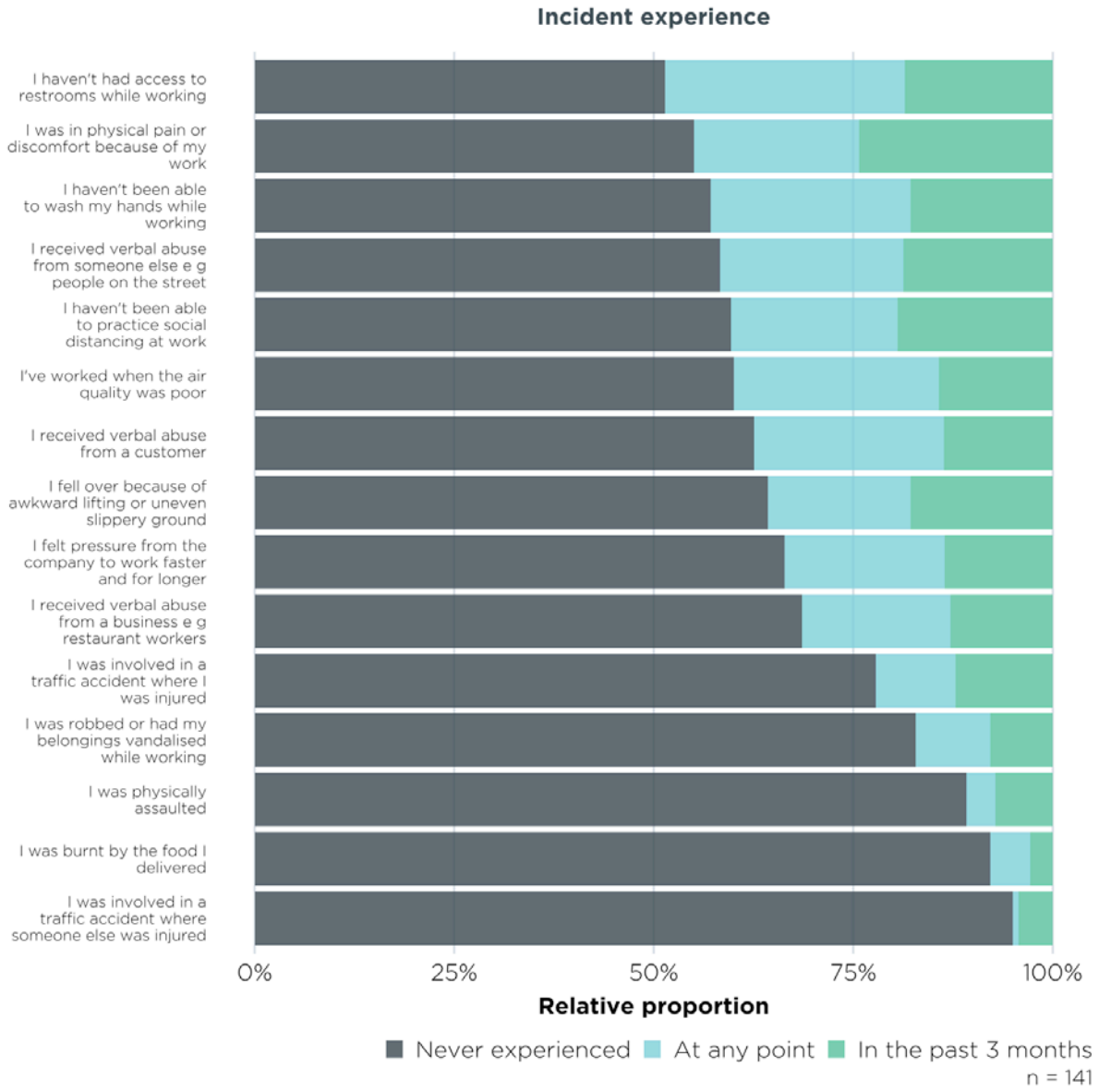

Figure 24: The relative proportion of WHS incident experiences nominated by the FDWs who responded to our survey. Respondents could choose more than one incident.

FDWs' concerns about traffic accidents stem from both personal and observed experiences

The FDWs we interviewed expressed concerns about cyclists and scooter/motorcycle riders navigating traffic. These concerns are not unfounded: many of our interviewees who ride bicycles, e-bikes, scooters, and motorcycles have experienced or witnessed accidents. One FDW told us that he is frequently forced off the road by drivers multiple times while working:

> *"Not many motorists respect the one-metre rule... they just don't care... often I clip their rear-view mirror."*

Some FDWs also seek advice from social media forums about the legality of strategies to avoid riding in traffic and thus mitigate their WHS risk (Figure 25):

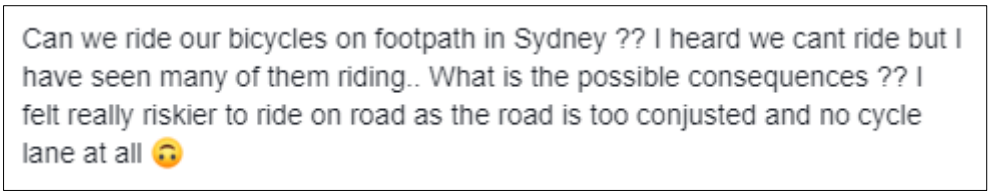

Figure 25: Social media post made by a FDW about the relative risk of riding on the road versus the footpath.

FDWs' concerns about accidents extend beyond riding in traffic. We interviewed one cyclist who is very concerned about being "doored" (someone in a parked car opening their door into a passing cyclist). Cyclists rely on people exiting parked cars to notice them, with our interviewees perceiving that there is little a cyclist can do to prevent these occurrences. We also identified several reports of doorings in our textual analysis.

FDWs report strong concerns about verbal abuse from customers, and may engage in risky behaviours to avoid it

In all of our analyses, we found that FDWs are more concerned about verbal abuse from customers than about abuse from restaurant workers/owners and the general public. FDWs in our interviews expressed concerns about being verbally abused by customers for delivering food late. Fear of delivering food late (and being verbally abused for it) can lead to FDWs taking more risks while working:

"If I'm suspicious that the order was handed to me late, I feel a bit more pressured... I probably drive less safely."

We found that some FDWs turn to social media groups for help with reporting verbally abusive customers (Figure 26):

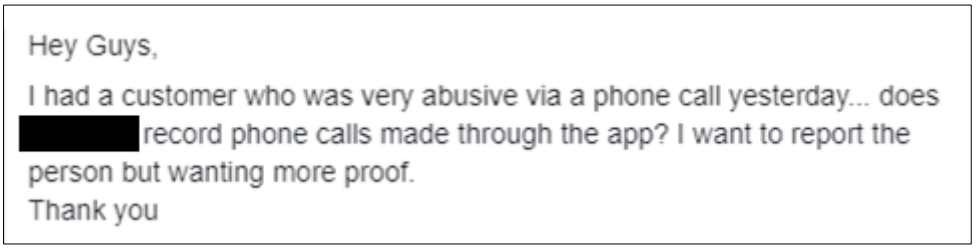

Figure 26: Social media post made by a FDW asking for advice on reporting an incident of abuse from a customer.

Fears of being robbed or having gear vandalised are largely driven by the second-hand experiences of other FDWs

Our survey analysis showed that being robbed is the third most common fear for FDWs. Despite the prevalence of this fear, none of our interviewees had experienced this themselves. Hearing salient stories about FDWs being robbed while working may filter through FDW groups and increase their subconscious estimation of its prevalence. One FDW we interviewed told us about another FDW he knew who had been lured to an industrial area with an order and robbed:

"I know one person it happened to him, according to police it happens all the time… when he arrived there he was accosted by three youths… they took his wallet and his mobile."

To mitigate this risk, one of the FDWs we interviewed said that he avoids orders that send him to areas of the city with a reputation for being unsafe. He also reported that information about safe versus unsafe areas is frequently shared within online FDW communities.

FDWs' WHS concerns to do not necessarily align with their experiences

As shown in Figure 27, WHS concerns and WHS experiences do not necessarily align. This is likely attributable to the fact that high-impact, low-frequency events, such as a serious traffic accident or assault, tend to be more salient and thus more memorable than low-impact, high-frequency events like a lack of public restrooms and hand-washing facilities. For the same reason, high-impact, low-frequency events are also more likely to become the subject of social media posts, which serves to further magnify their impact on the FDW community.

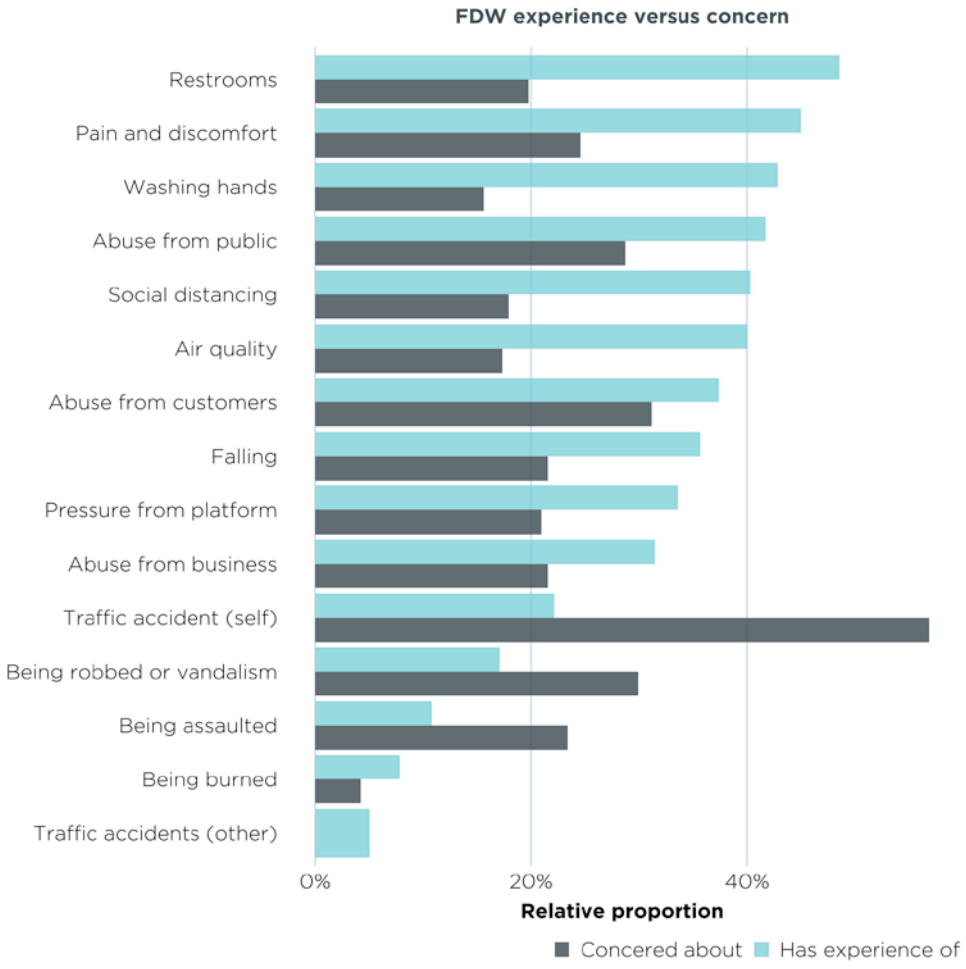

Figure 27: Comparison of WHS concerns versus WHS experiences among the FDWs who responded to our survey.

FDWs see themselves as safer than other FDWs

As previously discussed in the Health and safety knowledge of FDWs section, FDWs believe that safety is an important part of their job and that WHS is their personal responsibility. In our survey,

the majority of FDWs told us that they 'agree' or 'strongly agree' that they are responsible for their safety, and that they avoid risks (see Figure 19). In our textual analysis, we identified an informal poll on a FDW social media page (i.e. a poll created by a member of the FDW social media page, not by our research team) showing a similar result. This poll showed that the majority of respondents indicating that safety is their primary focus when working in the transport industry (Figure 28).

Figure 28: Informal social media poll suggesting that safety is of primary importance among FDWs.

Our analyses also show that FDWs believe that they are safer than *other* FDWs. In our survey, FDWs had mixed responses to the statement 'Food delivery workers behave safely,' with equal numbers agreeing or taking a neutral stance (see Figure 19). One interviewee also told us:

> *"When I'm riding I try to stay on the road with the cars, but I see a lot of [other FDWs] going on the pedestrian way, they're going very fast... it's very risky to do that. I try to be very careful."*

This finding is well-supported by the psychology literature, with a seminal study finding that the majority of people regard themselves as being more skilled and taking fewer risks than the person they perceived as the 'average' driver, even though this is statistically impossible (Svenson, 1981).

Motorcycle riders and car drivers seem more aware of WHS risks than cyclists and e-bike riders

Vehicle type may influence FDWs' WHS awareness and concerns, simply because the barriers to starting work on a bicycle or e-bike are much lower than for a motorcycle, scooter, or car. One interviewee who uses an e-bike reported that:

> *"In the start it was too hard for me... I used to fall down and accident and many things happened [because I had] never used electric bikes before."*

Another interviewee who uses a bicycle noted that there was no evaluation of his cycling skills before being permitted to sign up as a FDW and suggested that FDPs should build more barriers into the sign-up process to mitigate risk for inexperienced cyclists.

In contrast to bicycle and e-bike riders, the motorcycle riders we interviewed think more carefully about their safety. Motorcycle and scooter riders that want to work as FDWs have to demonstrate that they are licenced to operate their vehicle of choice, whereas bicycle and e-bike riders do not.

Summary of the WHS concerns of FDWs

The main WHS concerns we identified were traffic accidents, verbal abuse by customers and members of the public, and robbery or vandalism of delivery equipment. We also found that WHS *concerns* and WHS *experiences* do not necessarily align: several of the WHS incidents about which FDWs are most concerned (e.g. traffic accidents, robbery) are among the most rarely experienced. This is likely attributable to the fact that high-impact, low-frequency events, such as a serious traffic accident or assault, tend to be more salient and thus more memorable than low-impact, high-frequency events. For the same reason, high-impact, low-frequency events are also more likely to become the subject of social media posts, which serves to both distort their likelihood and further magnify their impact on the FDW community. Verbal abuse, however, is unique in this regard: it is both frequently experienced by FDWs and ranks highly as a WHS concern, making it an ideal potential target for a proactive, risk prevention activity.

Opportunities and Ideas

Based on the insights of the research and a review of successful interventions from other policy areas, we identified eight potential ideas to take forward to the co-design and trial phases of this project. The ideas are aimed specifically at changing behaviour in order to improve WHS and are all underpinned by behavioural science. We highlight which risks are being addressed, what the risk control strategies are, the supporting behavioural evidence, and some implementation considerations. Each idea was also rated in terms of its impact and feasibility. Impact was estimated by assessing the approximate number of people the idea would directly affect and the extent to which the idea would directly or indirectly improve WHS. Feasibility was estimated by identifying the range of stakeholders who would need to "buy in" to the idea, assessing potential obstacles, and estimating costs.

We note that the ideas we have proposed represent opportunities only, rather than firm recommendations. That is, the focus of the co-design and trial phases of this project is not limited to the ideas we have presented in this report, which are summarised in Table 2 below.

Table 2: Summary of ideas for risk prevention activities.

Idea	Risks addressed	Impact	Feasibility
Increasing participation in safety training at onboarding through making it mandatory or using better choice architecture	*Lack of familiarity with Australian road rules and understanding of WHS obligations*	*High*	*High*
Alter the order acceptance process to minimise the risk of phone distraction	*Distractions on the road*	*High*	*Medium*
Benchmark the time that FDPs are allowed to give FDWs for each delivery using map APIs	*Rushing behaviours; stress due to perceived threat of robbery*	*High*	*Medium*
Reduce abuse by humanising FDWs to potential abusers	*Abuse from businesses, customers, and members of the public*	*Medium*	*High*
Use a rating system to alter restaurant behaviour	*Abuse from businesses, customers, and members of the public; COVID-unsafe waiting behaviours; stress due to perceived threat of robbery*	*Medium*	*High*
Facilitate mentor schemes or buddy systems	*Lack of familiarity with location-specific WHS risks*	*Medium*	*Medium*
Send targeted and triaged safety prompts and reminders at critical points	*COVID-19 risks; weather-related risks; abuse*	*High*	*Low*
Prompt FDWs to anonymously report near-miss and abuse hotspots and map them	*Abuse from businesses, customers, and members of the public; environmental risks like poorly lit roads*	*Medium*	*Medium*

Detailed opportunities and ideas

1 / Encourage participation in simple work health and safety training at onboarding

Risks: The project showed that while the majority of FDWs cared about safety, and believed that WHS was their responsibility, many demonstrated a lack of understanding and skills implementing standard safety information and practice.

Risk control strategy: This can be addressed by ensuring that FDWs receive adequate training during the onboarding process. The exploratory research detailed in this report showed that the best-placed provider of this information may be the FDP. This is because FDWs can receive conflicting information from their peers, use modes of transport that do not require testing or licensing (e.g. bicycles and e-bikes), and/or may have initially learnt to drive or ride in countries with substantially different WHS and road rules. One way of increasing safety training would be to make it mandatory for FDWs during the FDP's onboarding process. A more 'light touch' way of encouraging the uptake of voluntary training is through more effective design.

Potential implementation strategies: While some FDPs provided WHS information and training to FDWs, it was typically not mandatory nor tested, meaning that it was unlikely to be accessed by the majority of FDWs. The seminal book *Nudge* (Thaler & Sunstein, 2009) popularised the concept of 'choice architecture': the design process of how choices are presented to users of a product or service. The choice architecture of FDPs' websites and onboarding experience does not currently encourage the uptake of WHS training. This could be modified in multiple ways. The simplest is that FDWs are directed to WHS information during the onboarding process, as standard. In its most extreme, the onboarding process could be designed so that FDWs will only be allowed to advance to the next stage once they have watched a series of safety videos or passed a short, mandatory test. A lighter version of this would not be mandatory, but might require a FDW to click a button which says "9 out of 10 FDWs believe it is important to drive safely. This short video can help you do this"[4] or the more extreme "I do not need to complete this safety training since I don't care about my safety."[5] In the behavioural literature, this is referred to as an 'active choice' design.

The advice to take up WHS training can also be more targeted. For example, we observed that many FDWs may be using international driver licences or are using bicycles, which are unlicensed. FDWs could be asked whether or not they hold an Australian driver licence when they commence the onboarding process. At the final stage of the process, they could be presented with the following: "Australian road rules are different to some other countries' rules. As an international

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[4] This number is taken from the number of our survey respondents who responded that they 'agreed' or 'strongly agreed' with the statement: 'Driving or riding safely is part of my job as a food delivery worker'.
[5] While we do not expect any FDP to implement this, we have included this phrase to show that even within a small piece of design, radical changes can be made that can have outsized impacts on decision making.

driver licence holder, we can provide you with some quick training to keep you safe." This promotes the training as a helpful and supportive process, rather than as a mandatory box-ticking exercise.

The design of the training itself will also be important. Long text should be broken up into smaller, digestible chunks, with video demonstrations illustrating complex concepts and behaviours. This would also overcome language barriers. Short summaries could be provided at the beginning of each page so that FDWs are prompted to focus on the most important information. It is important to note that we found that the quality and quantity of WHS information varied substantially from one FDP to another, and that some FDPs were already adopting many of the above approaches. In practice, this intervention could take the shape of a best-practice guide for how to present WHS information to FDWs, which would be co-designed with FDWs, FDPs, and other stakeholders. This best-practice guide could also be warehoused and managed by WHS regulators as guidance to support FDPs.

Behavioural evidence underpinning this insight: There is a vast literature on how choice architecture can impact behaviour. The literature on defaults clearly demonstrates how design choices can fall on a spectrum from mandatory processes through to opt-out defaults, smart defaults (e.g. the targeted driver licence example above; see Johnson & Goldstein, 2012), active choice (e.g. the requirement for the FDW to say that they do not want to do the training), and opt-in choice (e.g. the current system; see Smith, Goldstein, & Johnson, 2013).

Considerations: The design of the choice architecture of the sign-up process will require careful consideration. However, we believe that this is one of the simplest and most effective ways of increasing the road safety knowledge of FDWs. Many of the following ideas in this section would be vastly improved if the FDWs begin with a basic knowledge of the Australian road rules, as well as other aspects of WHS such as legal obligations and reporting requirements.

2 / Alter the order accepting process to minimise the risk of phone distraction

Risks: Checking phones while riding or driving was a clear threat to FDWs. The people we interviewed, and one researcher taking part in the service safari, stated that the need to accept orders meant that they checked their phone while riding or driving and wore in-ear headphones in order to hear notifications while cycling on the road. This distracted them from monitoring the surrounding road and traffic conditions.

Risk control strategy: The process by which orders are accepted is a critical reason why FDWs check their phones. By altering this process, we can substantially reduce their exposure to hazards.

Potential implementation strategies: There are two ways this process could be made safer: first, by increasing the duration of time FDWs have to accept an order, or second, by making it

impossible to accept orders while moving. Increasing the duration of time FDWs have to accept an order is a 'lighter touch' strategy than not providing any notifications while FDWs are moving. It means that FDWs may have time to arrive at a safer place and may feel less stress or pressure to check their phone constantly.

Behavioural evidence: The evidence that notifications affect driving performance is well-established (e.g. Lee & Strayer, 2004). It therefore stands to reason that this intervention would be an effective strategy to reduce risky behaviours. Trialling this recommendation would also help us establish how important the reduction of notifications would be.

Considerations: Not offering orders to FDWs who are moving substantially reduces the need for them to interact with their phones while riding or driving. However, this strategy also has multiple downsides. For example, it may increase the amount of time FDWs spend waiting or decrease their earnings. Similarly, from an FDP perspective, it may make it more difficult to match FDWs with upcoming orders.

3 / Benchmark the time that FDPs are allowed to give FDWs for each delivery using maps APIs

Risks: The service safari highlighted that the time given to FDWs to complete trips does not consider the time it takes to lock up a bicycle or park a car. In some cases, the allotted time was not enough to actually make the trip according to Google Maps. This encouraged rushing behaviours, which could lead to FDWs ignoring road rules. Moreover, if a FDW leaves the road to ride on the footpath to save time by avoiding a red light, this behaviour is likely to aggravate pedestrians and leave the FDWs open to greater risk of verbal abuse.

Risk control strategy: A benchmarking process in which FDPs cannot ask FDWs to complete a trip within a time period that is a set amount less than Google Maps predicts.

Potential implementation strategies: This additional time could either involve a fixed amount of time (e.g. 3 minutes to lock up a bicycle) or a percentage (e.g. FDPs have to give FDWs 110% of the time estimated by Google Maps).

Behavioural evidence: While it stands to reason that giving FDWs enough time to complete their orders will reduce rushing behaviours and any flow-on risks, this should still be tested to make sure that the extra time does actually lead to safer driving and cycling behaviour.

Considerations: The proposed intervention may provide a market disadvantage for FDPs opting in to the scheme (i.e., because food may be delivered more slowly by those using this intervention relative to competitors). This means that successful implementation requires substantial buy-in (e.g. all FDPs operating in Australia take part).

4 / Reduce abuse by humanising FDWs to potential abusers

Risks: Verbal abuse, particularly from customers and members of the public, was identified as a clear hazard for FDWs. This should not be considered part of the job. Stopping this abuse is clearly the responsibility of the abuser, rather than the abused.

Risk Control Strategy: Increasing the salience of the fact that FDWs are human beings has the potential to reduce abuse against them.

Potential implementation strategies: There are numerous ways in which this strategy can be implemented. Some strategies would involve user interface changes to the FDPs, such as giving customers more information about the FDWs when they order their food, in the same way that Uber shares information about its drivers' home country, languages spoken, and feedback received from passengers. Another strategy might involve a social marketing approach similar to those used by various transport authorities (Figure 29).

Figure 29: Campaign poster developed for the London Underground to reduce abuse of their staff by members of the public (Transport for London, 2012).

Behavioural evidence: The 'identifiable victim' effect is a well-established psychological phenomenon (Jenni & Loewenstein, 1997). It shows that people are more likely to help others if they are identifiable. Therefore, it stands to reason that people are also less likely to abuse people if they are more identifiable. There is also a separate literature that indicates that dehumanisation increases the risk of violence, therefore it is possible that increasing humanisation may decrease

violence (Rai, Valdesolo, & Graham, 2017). However, being able to test this would allow us to definitively understand whether this is the case.

Considerations: There is a risk that such a campaign may come across as trite, in the same way that "R U OK day" has recently received some public backlash (e.g. Walker, 2019). This could be avoided by designing the campaign with FDWs to ensure that it is seen as authentic. It is also important that a social marketing campaign does not commit what Cialdini et al. (2006) call the "big mistake": using a social norm that highlights the fact that an undesirable incident is common, therefore inadvertently increasing its incidence.

5 / Use a rating system to influence restaurant behaviour

Risks: In our observations, we saw that the environment where FDWs pick up their deliveries is largely controlled by restaurants. These are also locations where many COVID-19 physical distancing guidelines are breached. The interviews with FDWs highlighted that some customers may abuse FDWs because of issues with their order that were due to the restaurant, rather than the FDW (e.g. using leaky food containers). Although the leakiest of containers could never excuse abuse, having a mechanism to hold restaurants accountable would mitigate this risk to FDWs.

Risk control strategy: FDPs require engagement from three key stakeholders to function: their workforce of FDWs, customers, and restaurants. Rating-based systems allow customers to regulate the behaviours and quality of service offered by FDWs and restaurants, prompting competition for high quality service and food delivered to the customer. However, there is currently no clear mechanism for FDWs to regulate the behaviours of restaurants. Introducing a rating-based system *by* FDWs may help control the behaviour of restaurants.

Potential implementation strategies: FDWs could be asked to rate the safety and quality of the order pick-up (and FDWs can in turn be rated by restaurants to maintain a level of accountability). Restaurants' average ratings would be shown to FDWs when they choose to accept the job. This would create pressure on restaurants to improve their pick-up experience, such as restaurant worker friendliness and speed, parking access, and COVID-19 safety measures). FDPs can also choose whether they allow customers to see the ratings that FDWs give restaurants. This would signal to customers that the FDPs care about the safety of their FDWs. There would be a substantial first-mover advantage for the first FDP to implement this. It also highlights the importance of FDW safety more generally.

Behavioural evidence: Rating systems are widely used in the gig economy and have been shown to have a large effect on behaviour. For example, Luca (2016) found that a one-star increase in Yelp rating leads to a 5-9% increase in revenue.

Considerations: While ratings can be effective, they have also been shown to introduce bias, which have been observed on platforms (Rosenblat et al., 2017). As many FDPs rely on the use of rating systems to power their accountability mechanisms for FDWs through ratings from customers, we assume that FDPs would be best placed to use their own mechanisms to reduce bias against FDWs to ensure a similar lack of bias against restaurants.

6 / Facilitate mentor schemes or buddy systems to disseminate local risk information

Risks: Inexperienced FDWs appeared to have the poorest level of WHS knowledge and were more likely than experienced FDWs to engage in risky behaviours. When they did look for information, the majority of WHS information was found on informal channels, such as social media. FDWs could generally find the correct information, but these sites often contained information that was only relevant for some FDPs or geographic locations, or outright misinformation. Like any other user-posted information on social media, there are few, if any, processes in place to vet, contextualise, or correct inaccurate or misleading advice.

Risk control strategy: Rather than seeking to shut down informal peer-to-peer learning, FDPs have the opportunity to target it more effectively through the use of an internal mentorship scheme. This would likely be in the interest of FDPs, who could publicise this as a service they offer FDWs and could help them position themselves as a community-driven FDP to customers.

Potential implementation strategies: It will be critical to make sure that the 'mentor' drivers have a basic level of WHS information (see Opportunity and Idea 1). Therefore, the implementation of a mentorship program could be a two-stage process:

> Stage 1: Provide (paid) WHS training to experienced FDWs
>
> This could involve providing more intensive WHS training to a small number of experienced FDWs (e.g. through paid workshops) once they had reached a specific milestone (e.g. 500 trips). Those who participate in the training could then be rewarded based on the quality and quantity of mentorship they provide.
>
> Stage 2: Match mentors and mentees
>
> Newly recruited FDWs could be paired with an experienced FDW buddy who is prompted to maintain contact with the new recruit during their initial tenure. They will be encouraged to check in and answer questions about the demands and realities of the job and provide WHS information that would otherwise be more difficult to access.

Buddies and mentees could be incentivised financially, or by adapting the behaviour change strategies already used in the app. For example, our textual analysis found that some FDPs use elements of gamification (e.g. 'levels' to reward behaviours such as order completion and acceptance; see Figure 30). Incentivising mentors based on reporting structures and ratings by

mentees could improve the quality of mentorship. However, it may be the case that FDWs have an intrinsic motivation to become a mentor, which would reduce the risk of people attempting to game the system.

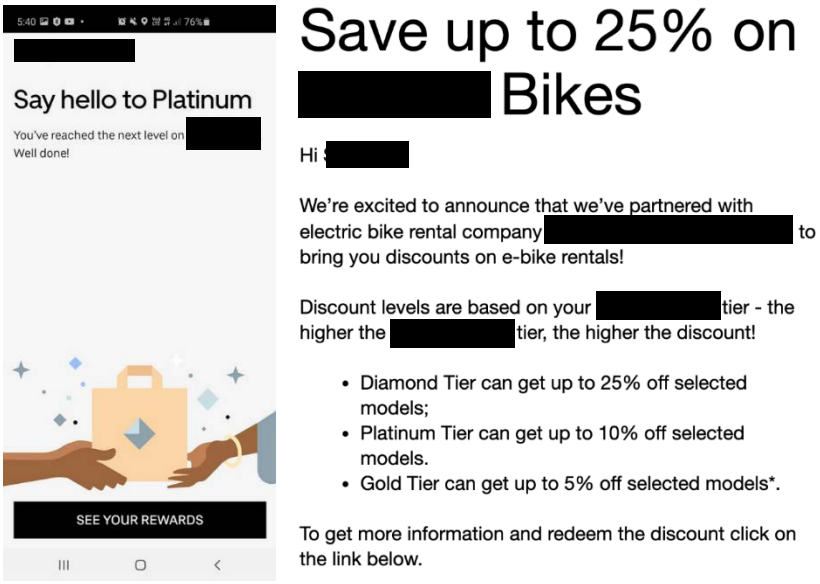

Figure 30: Examples of the gamification system used by one of the FDPs.

Behavioural evidence: We are not aware of any academic work that looks directly at the impact of mentoring on safety behaviours. Most of the literature here is conducted with children and young people (e.g. DuBois, Holloway, Valentine & Cooper, 2002) or in the corporate world (Underhill, 2006). However, since FDWs operate like sole traders, evidence from the mentoring literature from corporate settings may be applicable, since the mentoring model could therefore be framed as "business-to-business" rather than peer-to-peer. The evidence for the effectiveness of mentoring programs is by no means definitive, but suggests that it has a modest impact on the mentee, and that the mentors also enjoy benefits (Abdullah et al., 2014).

Considerations: If the financial benefits of mentorship are too high, then it might be possible for FDWs to game the system and subvert its intended purpose. We therefore suggest offering modest rewards for being a mentor and limiting mentorship programs to a short period (e.g. 1-3 months).

Other risks include getting a poor mentor – for example, one that passes on anecdotal and incorrect advice, or is abusive. For this reason, we propose that some accountability mechanism would be necessary. This could include, for example, a rating system by mentees, as well as regular auditing of WHS knowledge.

7 / Send targeted and triaged safety prompts and reminders at critical points

Risks: Some of the risks FDWs face can be mitigated by engaging in single, one-off behaviours. This might include putting on a fluorescent jacket at the beginning of a shift or wearing a mask to protect against COVID-19. Other risks, such as the presence of a group of abusive, drunk

individuals congregating near a restaurant, may be short-lived and immediate and could be dealt with by some simple avoidance behaviours. Other risks require many 'micro-behaviours,' such as remembering to take breaks throughout the shift. The volume of risks means that even the most vigilant FDWs might forget some of these risk mitigation behaviours at some point. To address these different types of risks, we will need to use reminder strategies that are specifically targeted.

Risk control strategy: Ensuring FDWs are prepared to behave safely upon signing in to the FDP app may improve safety behaviour for one-off behaviours. In practice, this could include a simple checklist, reminders about protective behaviours (e.g. ensuring they have adequate, functioning vehicle lights, and are wearing brightly coloured clothing). Immediate prompts will need to be used to address risks which are short-lived and immediate. Persistent risks require reminders at regular intervals.

Potential implementation strategies: The service safari revealed that the FDPs are already using in-app prompts to remind FDWs about other important information. For example, before starting each shift with one FDP, our project team members were sent prompts asking whether our phones were fully charged. In order to sign into the shift, we had to respond that we had a fully charged phone. Extending these prompts to include safety reminders should therefore be possible for FDPs to implement. In order to increase accountability, FDWs could be asked to upload photos to demonstrate that they have the appropriate clothing and safety equipment.

If we want to integrate peer-based reporting into the system, this might be more challenging. FDWs would need to be prompted to provide specific pieces of WHS advice to other FDWs. There are two options here: one high-tech and one low-tech.

The hi-tech option could be implemented through the FDP system (i.e. FDWs would be asked to report an issue, which is then disseminated through the platform). This would require a central checking process to ensure that the risk information propagated is accurate and meaningful. The low-tech option would simply require a prompt to encourage FDWs to speak to one another during any downtime. Our observational research suggests that FDWs have the opportunity to speak to other FDWs during specific time periods (e.g. while waiting for food), but many choose to spend this time on their phone. This indicates that a low-tech solution that nudges FDWs to look up and speak to their peers may be as effective as the high-tech solution, but much cheaper to implement.

Behavioural evidence: Checklists are now relied upon to reduce errors in clinical and aviation settings (Gawande, 2010) and lessons can be learnt from the academic research that has gone into their creation in these sectors. Small adjustments to both checklists and forms can dramatically increase their effectiveness (Whitenton, 2015). Three factors matter in checklist design: 1) purpose, 2) flow, and 3) feedback. To ensure *purpose*, checklists need to outline why the behaviours on the list matter (e.g. drivers cannot see you in the rain when you wear black)

and should have no duplication or redundancy (Conley et al., 1993; Degani & Wiener, 1993). To ensure *flow*, the checklist should minimise the effort needed to complete the form and put crucial aspects up front. Finally, the FDWs should receive *feedback* using peer comparisons to show that others are adhering to the checklists. The World Health Organisation (2009) designed a standardised checklist template for use in surgical settings. As the Figure 31 shows, it incorporates the design principles of Purpose – Flow – Feedback.

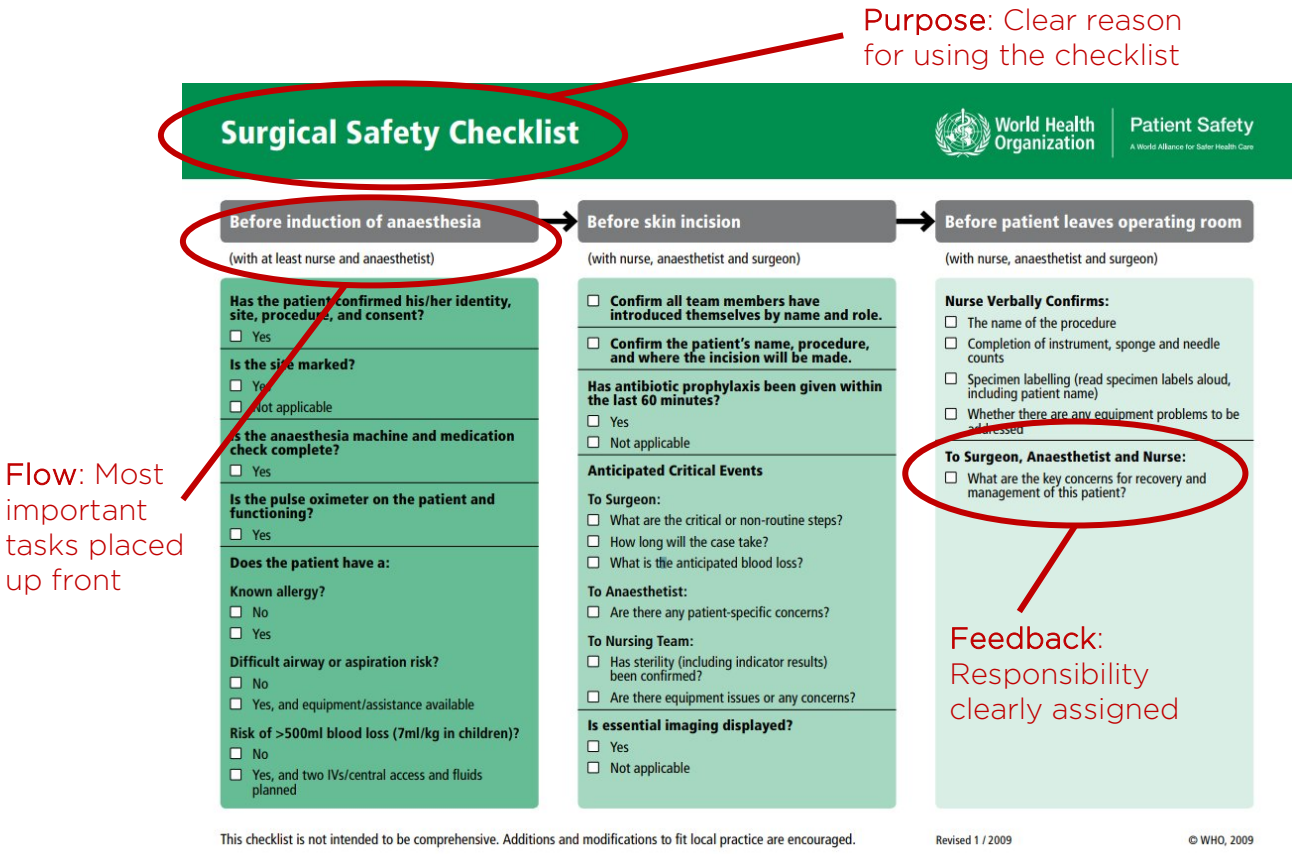

Figure 31: The World Health Organisation's best-practice guide to checklists.

With respect to prompts that encourage FDWs to engage with their peers, there is evidence to show that this can also increase psychological wellbeing. Epley and Schroeder (2014) found that instructing commuters on trains and buses to connect with a stranger near them led to them reporting much higher wellbeing than their comparison groups. This was despite commuters expecting to prefer peace and quiet to having conversations with others around them. This mistaken preference for solitude stems partly from underestimating others' interest in connecting, which in turn keeps people from experiencing the actual, positive consequences of social interaction. Interestingly, the pleasure of connection seemed to be contagious: people who were on the 'receiving' end of the conversation had equally positive experiences to those on the 'initiating' end of the conversation.

Considerations: Checklists are always best designed with the end users' input, so we would suggest designing them along with FDWs to identify which behaviours they are most likely to forget and when the most critical time points are for them to be prompted.

8 / Prompt workers to anonymously report near miss and abuse hotspots and map them

Risks: Our interviews and observations suggested that some WHS risks are location-based. This might be due to environmental reasons (e.g. poor lighting), social reasons (e.g. drunken abuse), or an interaction between the two (e.g. drunken and unpredictable crowds pushing cyclists into a busy street causing abuse from drivers).

Risk control strategy: FDWs could be asked to report the geographic locations of these risks. Location-based risks could then be visualised on a map which would allow FDWs to see the location of risk hotspots. This would then allow them to take appropriate precautionary, preventive, or avoidance behaviours.

Such data intelligence would be beneficial for various stakeholders, including FDPs and policymakers. For example, if there are a number of near misses due to a poorly lit street, local governments could use this information to identify areas that need more lighting. If there are a large number of abusive people in a specific area, this might drive more community-based solutions. The data could then feed into council planning. Similarly, an Australian start-up company may be able to use the data to build an open application programming interface (API) for navigation apps or FDPs, which will alert FDWs (or the broader cyclist market) when they are driving through a risk hotspot. Mazda currently does this, as shown in the following images from their user manual in Figure 32.

10	Alert Point Warning	It shows the type of the alert points when approaching a road safety camera or other Alert Points like school zones or railroad crossings. You must make sure that using this feature is legal in the country where you intend to use it. See page 41.

Figure 32: Excerpt from Mazda user manual.

Potential implementation strategies: The way in which the data are visualised will matter. If the complaints are public, then FDWs will perceive that using the system would put them at risk of losing their job, which was highlighted as a concern in our surveys and interviews. This specific issue has been addressed by Callisto, an organisation working to reduce sexual harassment. Callisto has developed a reporting system in which complaints can be made anonymously but held in escrow for a period of time until a number of similar complaints are gathered (Callisto, 2020).

Behavioural evidence: While this idea has less behavioural evidence underpinning it, it has been adopted by other organisations. For example, Plan International, an Australian NGO working to empower women, has developed FreeToBe, a map to track sexual harassment in a number of cities, including Sydney (Plan International, 2020). As shown in Figure 33, each of the dots represents a safety report made by a FreeToBe user. Orange dots indicate areas that have been rated as unsafe for women, whereas purple dots represent areas that have been rated as safe for women. App users can click on each dot to read more detail about potential risks in the area.

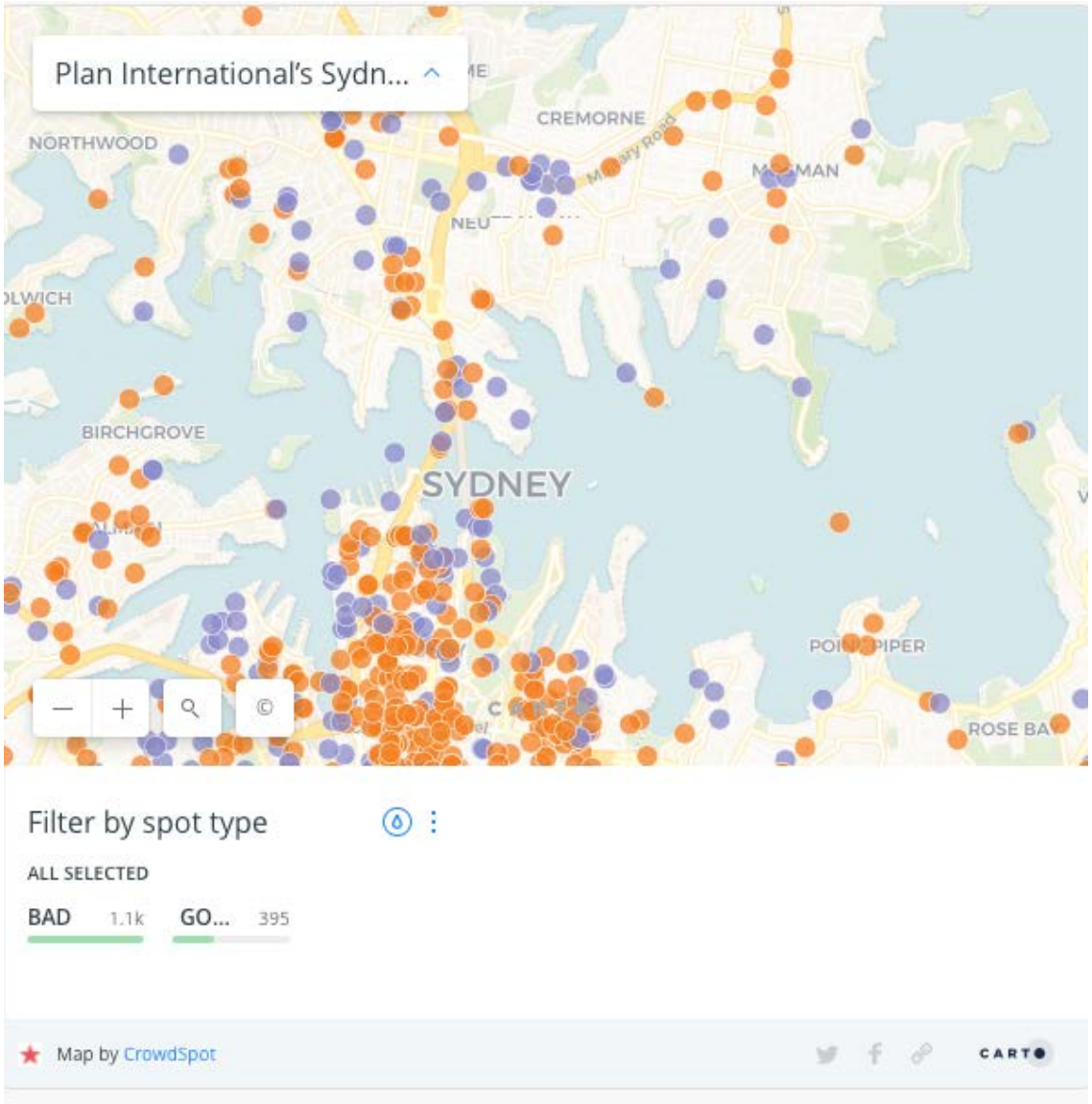

Figure 33: Plan International's map of Sydney showing sexual harassment risk hotspots.

Considerations: It will be important to identify how best to notify FDWs about any live risks in their local area. If this system is poorly designed, it has the potential to distract FDWs on the job, thus causing a greater risk to WHS.

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Appendices

A: Online survey

IMPORTANT INFORMATION BEFORE YOU START THE SURVEY

You are invited to participate in a study by the Behavioural Insights Team and the Centre for Work Health and Safety. We are interested in understanding your experiences surrounding work health and safety in your profession. We are doing this to better understand how food delivery workers' safety and health is affected during their work, and their understanding of WHS legal requirements. We are surveying you as part of a larger project to help improve food delivery worker health and safety.

What you will be asked to do: We would like to ask you some questions about your experiences and attitudes about work health and safety. We will also ask some basic demographic questions. Your participation in this survey is anonymous and voluntary and the information collected will be kept confidential.

How much time will it take? The survey should take approximately 15 minutes.

What are the benefits? You will have the opportunity to win one of 10 x $50 Giftpay vouchers. A list of stores that Giftpay can be used at can be found here. The information you give us may also help improve health and safety for food delivery workers in the future.

What risks are involved: Answering questions about health and safety in the food delivery profession could cause distress or discomfort for you. You do not need to answer any questions you do not want to, and you can close the survey at any point. If you become upset or distressed, please contact Lifeline on 13 11 14 or see Beyond Blue for further resources. Any information or personal details gathered in the course of the study are confidential, except as required by law. If you become identified for this reason, the risks to you include risks to your future employment and legal consequences should the employer choose to make details known to the authorities. Participants should note that some data derived from your participation in this study will be stored on servers located overseas; the regulatory regimes governing data access and use in other countries may not be the same as those that are in place in Australia. If you have any questions about this, please direct them to [redacted].

How will the information be used? The results from the study will be published on the websites of the Centre for Work Health and Safety and the Behavioural Insights Team. We will also publish the results in an academic journal. In any publication or presentation, information will be provided in such a way that no participant can be identified. Only the researchers will have access to the raw data you provide and that your data will not be used in any other projects. Data will be stored for seven years and then securely disposed of.

Can I withdraw from the study? You can withdraw from participating in this survey at any time, and this will have absolutely no repercussions for you. If you would like to withdraw your data after completion, please contact [redacted].

Can I tell others about the study? Yes, you can tell other people about the study. If you think they would be interested in participating, you can ask them to send us an email.

What if I need more information? If you would like to contact someone about the project with questions, or to withdraw your data after you complete the survey, please contact [redacted].

What if I have a complaint? If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee by emailing the Bellberry Ethics Committee at bellberry@bellberry.com.au. Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Consent to be contacted for future research: In the survey you will be asked if you are happy to be contacted for future research. You are free to answer 'no', and you will still be able to participate in this survey.

By continuing, I confirm that I have read and understood the information sheet and in particular:

- I understand that my involvement in this research will include completion of a short survey
- I have had any questions answered to my satisfaction
- I understand the risks involved
- I understand that my participation in this research is voluntary
- I understand that if I have any additional questions I can contact the research team
- I understand that I am free to withdraw at any time, without explanation or penalty
- I understand that my name and other personal information that could identify me will be removed or de-identified in publications or presentations resulting from this research
- I understand that I can contact the Bellberry Ethics Committee at bellberry@bellberry.com.au if I have any concerns about the ethical conduct of the project
- I am aged 18 years or older
- I currently live in Australia
- I currently work as a food delivery worker, or have worked as a food delivery worker, in Australia in the last 12 months
- I agree to participate in the project

Question Number	Question	Response
1	What is the first letter of your mother's name? (If not applicable, please enter 'N/A')	Free text response
2	What is the first letter of your father's name? (If not applicable, please enter 'N/A')	
3	What day of the month were you born? (e.g. for 30th of April, please enter '30')	
4	What is the first letter of the place where you were born?	
5a	Which of the following companies do you **currently** work for?	Select all that apply: • Uber Eats • Deliveroo • Menulog • EASI • DoorDash • Other (please specify)
5b	Which of the following companies have you **previously** worked for?	Select all that apply: • Uber Eats • Deliveroo • Menulog • EASI • DoorDash • Other (please specify)
6	When did you stop working for [each company selected in Q5b]?	Dropdown menu (year)
7	Please select your age	Dropdown menu (years)
8	Please select your gender	Male Female Non-Binary Other Prefer not to say
9	What country were you born in?	Australia Other (please specify)
10	How long have you lived in Australia?	Less than 3 months 3-6 months 6 months-1 year 1-2 years 2-5 years More than 5 years
11	What is your Australian visa status?	Australian citizen Australian permanent resident Student visa Family or partner visa Work and holiday visa Prefer not to say Other (please specify)
12	Why did you decide to become a food delivery worker?	Select all that apply • I wanted flexible hours • I wanted to supplement my existing income • I wanted to meet new people

		• I like driving/cycling • There are legal (e.g. visa) restrictions that mean I can't work in other types of jobs • I lost my primary source of income • I couldn't find any other employment • Other (please specify)
13	How long have you been a food delivery worker?	Less than 3 months 3-6 months 6 months-1 year 1-2 years 2-5 years More than 5 years
14	What are the postcodes or suburbs where you work the most?	Free text
15	Do you make most of your money through food delivery work?	Yes No
16	Besides the money you make from food delivery work, do you also get money from any of the following? Select all that apply.	Select all that apply • Part time work • Full time work • Casual work • Other gig or contract work • Welfare payments (e.g. Youth Allowance, pension, JobSeeker) • Other (please specify)
17	How much safety training did you get from the food delivery company (or companies) you work for?	A lot A moderate amount A little None at all Comments (free text)
18	How would you rate your overall physical health?	Very good Good Fair Poor Very poor Prefer not to say
19	How would you rate your overall mental health?	Very good Good Fair Poor Very poor Prefer not to say
20	Which of the following have you experienced while working as a food delivery worker?	In the past 3 months / at any point / never experienced: • I was involved in a traffic accident where I was injured • I was involved in a traffic accident where someone else was injured • I received verbal abuse from a customer • I received verbal abuse from a business (e.g. restaurant workers) • I received verbal abuse from someone else (e.g. people on the street) • I was physically assaulted • I was in physical pain or discomfort because of my work • I was wearing inappropriate clothing for the weather conditions • Work caused stress that has negatively impacted other areas of my life

		• I felt pressure from the app to work faster and for longer • I've worked when the air quality was poor • I haven't been able to practice social distancing at work • I haven't been able to wash my hands while working • I haven't had access to restrooms while working • I was robbed or had my belongings vandalised while working • I fell over because of awkward lifting or uneven/slippery ground • I was burnt by the food I delivered
21	If you would like to, can you please tell us more about a time when one of these incidents happened? Please do not include any identifying details such as locations, dates, or names of people or restaurants.	Free text
22	Which of the following are you concerned about? Select all that apply.	• Traffic accidents • Verbal abuse from a customer • Verbal abuse from a business (e.g. restaurant workers) • Verbal abuse from someone else (e.g. people on the street) • Physical assault • Physical pain or discomfort because of my work • Work causing stress that negatively impacts other areas of my life • Working faster and for longer than I feel comfortable • Working when the air quality is poor • Not being able to practice social distancing at work • Not being able to wash my hands while working • Not being able to access restrooms while working • Being robbed or having my belongings vandalised while working • Falling over because of awkward lifting or uneven/slippery ground • Working alone • Being burnt by the food I deliver
23	How concerned are you about [each item selected in Q22]?	A lot A moderate amount A little
24	How often do you do the following things while doing food delivery work?	Never / rarely / sometimes / usually / almost always • Take time to plan the most appropriate way to my destination • Rush to deliver orders • Avoid areas with heavy traffic • Work when I have had alcohol or drugs that could affect my ability to drive or ride a bike • Wear clothes that are appropriate to the weather conditions • Take regular breaks throughout the day to eat and rest • Limit the number of hours I do food delivery work • Stop working if I feel tired or sick • Avoid violent and aggressive people and dogs • Navigate safely in the dark • Handle hot and cold food without hurting myself • Report if I am in an accident or hurt myself

25	How many hours per week do you typically work as a food delivery worker?	Dropdown menu (hours)
26	During each shift, how many companies do you typically work for?	1, 2, 3, 4, 5, 5+
27	How many years old is the vehicle you primarily use while working?	Dropdown menu (years)
28	When did you last have your vehicle serviced or repaired?	Less than 3 months ago 3-6 months ago 6 months-1 year ago 1-2 years ago 2-5 years ago More than 5 years ago I don't remember
29	What type of vehicle do you use for food delivery work?	Car Electric bicycle (e-bike) Bicycle (bike or pushbike) Scooter Motorcycle
30	How often do you do the following while working as a food delivery worker? *(Q30 shown only to respondents who selected "electric bicycle" or "bicycle" in Q29)*	Always / usually / sometimes / rarely / never • Zigzagging between vehicles or lane splitting (i.e. riding between lanes of cars • Using your phone or other distracting objects while riding • Riding at a higher speed than I should be going at given traffic and/or weather conditions • Following other vehicles too closely (i.e. tailgating) • Going through a red light or stop sign • Riding without a helmet • Riding at night without functioning front and rear lights • Not using signals (e.g. hand signals) to indicate lane changes or turns • Riding when the weather is very bad • Riding when using a pedestrian crossing to cross the road • Riding on the footpath and/or in other pedestrian-only areas • Not paying attention to road and traffic conditions (e.g. pedestrians crossing the road, speed humps, potholes)
31	How often do you do the following while working as a food delivery worker? *(Q31 shown only to respondents who selected "motorcycle" or "scooter" in Q29)*	Always / usually / sometimes / rarely / never • Zigzagging between vehicles or lane splitting (i.e. riding between lanes of cars • Using your phone or other distracting objects while riding • Deliberately exceeding the speed limit when travelling to pick up or drop off an order • Following other vehicles too closely (i.e. tailgating) • Going through a red light or stop sign • Riding without a helmet • Riding at night without functioning front and rear lights • Not using indicators to signal lane changes or turns • Riding when the weather is very bad • Not paying attention to road and traffic conditions (e.g. pedestrians crossing the road, speed humps, potholes)

32	How often do you do the following while working as a food delivery worker? *(Q32 shown only to respondents who selected "car" in Q29)*	Always / usually / sometimes / rarely / never • Using your phone or other distracting objects while riding • Deliberately exceeding the speed limit when travelling to pick up or drop off an order • Following other vehicles too closely (i.e. tailgating) • Going through a red light or stop sign • Driving at night without functioning front and rear lights • Not using indicators to signal lane changes or turns • Driving when the weather is very bad • Not paying attention to road and traffic conditions (e.g. pedestrians crossing the road, speed humps, potholes)
33	How much do you agree or disagree with the following?	Strongly agree / agree / Neither agree nor disagree / disagree / strongly disagree • I understand Australian road rules • I know how to avoid risky situations • When I notice something wrong with my vehicle, I have it repaired as soon as I can • I am unlikely to have an accident • I can do my job in a way that means I am safe and healthy • I am better at my job if I take risks • My safety is important to the company I work for • Most people who are important to me think I should behave safely at work • Safety is important to other food delivery workers • Most food delivery workers drive or ride in a way that is safe • Driving or riding safely is part of my job as a food delivery worker • The general public is a threat to my safety at work • Other drivers/vehicles are a threat to my safety at work • I often get distracted while I am working • It is not possible to drive safely while working as a food delivery worker • There is not much I can do to improve my health and safety at work • It's the company's responsibility to protect the safety of myself and others while working • It's my responsibility to behave in a way that protects the safety of myself and others while working • I intend to work as safely as possible over the next 3 months • I intend to maintain/invest in my vehicle and protective equipment in the next 3 months
34	How important to you is each of the following?	Not at all / slightly / somewhat / very / extremely • Enjoying my job • Getting good ratings from customers • Getting tips • Earning as much money as I can, as fast as I can • Earning enough money, no matter how long I need to work • Not getting in trouble for breaking the rules while working • Avoiding traffic accidents while working • Avoiding getting sick while working
35	I have done things that are unsafe while working…	Never / rarely / sometimes / usually / almost always • To protect my rating • To prevent myself getting fired from the company • To make more money during shifts • To work faster • Because I didn't know the rules • Because I was tired • By accident

36	When I am working, I am often…	Never / rarely / sometimes / usually / almost always • Thinking about how to get to my destination • Thinking about my next order or customer • Thinking about problems related to work • Thinking about problems that are not related to work • Having difficulty cycling or driving because of tiredness or fatigue
37	Do you have comments or other things you would like to tell us?	Free text
56	If you know anyone else who does food delivery work, here are links to the survey you can share: English: [link] Chinese: [link] Spanish: [link] Hindi: [link] For the chance to be one of the 10 winners of a $50 Giftpay voucher, please click [link]. You will be taken to an online form where you can enter your email address. Your email address will be stored separately to your answers to this survey. If you would like to withdraw your survey answers at any point, please contact [redacted] at [redacted].	

B: Semi-structured interview guide

Section	Research aims
1. Introductions, background & warm-up	**10 mins**
Hi, my name is [name]. I'm from the Behavioural Insights Team, an independent research organisation. Thank you for agreeing to participate in an interview. We are interested in understanding your experiences of work health and safety for workers like you. We are doing this to better understand how food delivery workers' safety and health is affected by their work. This is part of a larger project to help make sure workers like you are safe. I'll ask you some questions about your experiences and attitudes about work health and safety. I will also ask some basic demographic questions. Your participation in this interview is anonymous and voluntary. This means you will not be identified in any reports, and no one except the research team will know how you respond. While we will generally not disclose that information without your consent, there may be circumstances where we have to do so for legal reasons. If you reveal something that is a serious threat of harm to yourself or others, I will give you numbers you can call to get help. If it becomes clear to me that you will not seek help on your own, I may need to step in on your behalf to make sure you get help. I will speak to you before we do this. The interview should take about 1 hour. You will be paid $40 as a thank you for your time. The findings will contribute to a project with the Centre for Work Health and Safety, as well as research projects conducted by Macquarie University. You do not need to answer any questions you do not want to answer, and you can stop the interview at any time. If it's OK, I'd like to record the interview. If you say yes, the recording will be professionally transcribed by a company with processes to safeguard what you tell me. Nothing that identifies you will be retained. Does that all sound OK to you? Do you have any questions for me? **First of all, can you tell me a bit about your role as a delivery worker?** • What company(ies) do you work for? • What sort of vehicle do you use? **Why did you start working as a delivery worker?** • Where did you hear about the opportunity? • What motivated you to take the step to apply to be a delivery worker? **What does a typical shift look like?** • What time would you typically start work? Why? • Where would you typically work? Why do you work here? • Do you work for more than one company? Why? How? • So, after you start work, what happens next? *[repeat as appropriate]* • When would you finish? Why? For former FDWs only: **Why did you stop working for [company name]?** • How do you feel about it now?	Obtain informed consent Establish rapport Understand the experiences of those entering the gig economy Understand the day-to-day working experience of FDWs
2. Perceptions of WHS risks and responses to incidents	**15 mins**
Now, we're interested in your views on "Work Health and Safety". This means we're interested in things that might cause physical injury or illness, or affect your mental health and wellbeing, while you're working. Remember that you do not need to answer anything you do not want to. Does that sound OK? **Is there anything you're afraid might happen to you while working?** • What sort of things? *[Aim for an exhaustive list]*	Understand what FDWs perceive as threats to their safety Understand FDWs first-hand experiences of WHS incidents

- *How often do you think about things that might happen?*
- *[Aim to understand whether they have a healthy concern and awareness of the risks, no awareness at all, or whether their concerns impact their mental health and wellbeing?]*

- *If they say there is nothing they're afraid of:*
    - What sort of things makes you not want to go to work?
    - What sort of things do you think other drivers might be afraid of?
    - *Prompts: traffic accidents, abuse, contracting COVID-19, time pressure, long working hours*

Based on your experience, what types of things might cause injury or illness or affect your mental health and wellbeing while working?

- Can you describe to me why you think this?

Have you ever been injured while working?

If yes:

- Can you describe to me what happened?
    - *[Aim for a detailed description of the incident from the workers point of view. This should include things like the environment (e.g. type of road), what they were doing before the incident (e.g. delivering an order), their perceived cause of the incident, and the type of injury they sustained]*
- What happened immediately after you were injured?
    - *For example, did anyone call the police or an ambulance? Who? Did they keep working? Did they contact the platform? What did the platform do?*
- What happened in the days and weeks that followed?
    - Did you report the incident to anyone? Who?
    - Did you need long term medical care?
- Can you describe how it has impacted you or changed your behaviour?
    - Has it changed your behaviour while working?
    - Has it changed the way you think about risks at work?

Have you ever witnessed another delivery worker get injured while working?

If yes:

- Can you describe to me what happened?
    - *[Aim for a detailed description of the incident from their point of view]*
- Can you describe how it's impacted you or changed your behaviour?
    - Has it changed your behaviour while working?
    - Has it changed the way you think about risks at work?

Have you ever heard about other delivery workers getting injured while working?

If yes:

- Can you describe to me what you've heard?
    - What sort of injuries are common?
    - What do you think causes the injuries?
- Can you describe how it's impacted you or changed your behaviour?
    - Has it changed your behaviour while working?
    - Has it changed the way you think about risks at work?

Has your work ever impacted your mental health and wellbeing?

If yes:

- Can you describe to me what happened?
    - *[Aim for a detailed description from the workers point of view. This should include things like the environment, what they were doing, their perceived causes, and the type of mental injury they sustained]*
    - *Prompts: stress, long working hours, working for multiple platforms, anxiety, depression, violence, aggression, bullying*

If you were to get injured, sick or unwell while working, what do you think you would do?

- How do you think this would impact you?
- Would you report it to anyone?
- How often do you think about the risk of getting injured, sick or unwell?

Understand FDWs responses to these incidents

Understand FDWs perceptions on the types of injuries that occur

Understand how work impacts FDWs mental health and wellbeing

Understand FDWs intended responses to WHS incidents

Are you comfortable with these questions?	
3. FDWs' desired prevention activities	
I'm interested in what you think would need to change to make your work safer more broadly. This includes things like the environment you're working in, the platform(s) you work for, and all of the businesses you come into contact with. **Can you describe to me anything platforms have done to make your job safer?** • Can you describe these to me? • What did you think of them? • Do you think they worked? • How would you improve them? • Do these make you think the platform cares about your health and safety? • If working across multiple platforms, how do the platforms differ? **What do you think would need to change to make your work safer?** • *Prompts: What would make your job easier/more enjoyable?* **What could [food delivery platform name] do to make your work safer?** • *Prompts:* Is the platform doing all it can to make sure you are safe and healthy at work? **[If not already answered] Did any of the things your organisation has done relate to COVID-19 specifically?** • Can you describe these to me? • What did you think of them? • Do you think they worked? • How would you improve them? • *Prompt if necessary:* For example, some platforms have introduced contactless delivery	Understand FDWs perceptions of organisations attempts at improving WHS Understand perceptions of what is necessary to ensure health and safety at work Understand FDWs perceptions of organisations attempts at improving WHS (pre- and post- COVID-19)
4. FDWs' perceptions of risky and protective behaviours	**15 minutes**
Now I'm going to ask about some of the things you and other workers do to try to protect yourselves, as well as things that workers do that might make the job more dangerous. Anything you tell me will be confidential, and we're not judging you or any other workers. **Are there things that you've seen other delivery workers do that might mean they're more likely to get injured while working?** • What sort of behaviours are these? *[Aim for an exhaustive list]* • Why do you think people do these things? **Have you done any of these things yourself?** *If yes:* • Can you describe why you've done this? • What would need to change for you to do things differently? **Is there anything you do to stop yourself getting injured while working?** *If yes:* • What sort of things? *[Aim for an exhaustive list]* • Can you describe why you do these things? • What would need to change for you to do this more often? **Is there anything other workers do to protect themselves against injury?** *If yes:* • Why do you think people do these things? • Why don't you do these things? • What would need to change for you to start doing these things? • What would need to change for more delivery workers to start doing these things?	Understand FDWs perceptions of others' risky behaviour (injury) Understand FDWs own reported risky behaviour (injury) Understand FDWs own reported protective behaviour (injury) Understand FDWs perceptions of others protective behaviour (injury) Understand FDWs perceptions of others' risky behaviour (illness) Understand FDWs own reported risky behaviour (illness) Understand FDWs perceptions of others protective behaviour (illness) Understand FDWs perceptions of others protective behaviour (mental health and wellbeing)

Are there things you've seen other riders do that might make them more likely to get sick? *If yes:* • What sort of behaviours are these? *[Aim for an exhaustive list]* • Why do you think people do these things? Have you done any of these things yourself? *If yes:* • Can you describe why you've done this? • What would need to change for you to do things differently? Is there anything other workers do to stop themselves getting sick? *If yes:* • What sort of things? • Why do you think people do these things? • What would need to change for you to start doing these things? Are there things you've seen other riders do that might affect their mental health and wellbeing? *If yes:* • What sort of behaviours are these? *[Aim for an exhaustive list]* • Why do you think people do these things? Have you done any of these things yourself? *If yes:* • Can you describe why you've done this? • What would need to change for you to do things differently? Is there anything other workers do to protect their mental health and wellbeing? *If yes:* • What sort of things? • Why do you think people do these things? • What would need to change for you to start doing these things? Can you think of anything else you would like to do to protect yourself, but don't? • What would need to change for you to start doing these things?	
5. Demographic characteristics and wrap-up	
Is there anything else you'd like to say that you feel like you haven't had the chance to say? Do you have any questions for me? Now we're pretty close to being finished. I'm just going to ask a couple of questions about you. • How old are you? • What country were you born in? • How long have you been in Australia (or how long were you in Australia if you have now left the country)? Thank you so much for your time. As a thank you, we'd like to send you a $40 Giftpay voucher. To do that, I need your email address. • What is your email address? • Would you like to receive a copy of the findings?	Provide the interviewee the opportunity to share any other thoughts Collect basic demographic characteristics Collect email for remuneration purposes

C: Field observation protocol

You will visit your nominated location for a period of 1.5-2.5 hours and take detailed notes on your observations, focusing on the topics listed below. Notes may be in the form of written, typed, and/or voice notes; photos; video clips; screenshots; and/or sketches.

Time and location of observation: Date, time, specific location of hotspot, specific location of observer if different (e.g. across the street), weather conditions

Description of setting: Characteristics of the hotspot (e.g. undercover vs out in the open, on the footpath vs in an alley), availability and type of seating (e.g. milk crates, boxes), where FDWs bikes/cars are parked (e.g. in footpath, in no-parking zones), restaurants in the area (e.g. approximate number, type), extent of foot and road traffic (note upon arrival at/departure from the observation site, and every 15 minutes during the observation period), estimated number and demographics of non-FDWs in the area

FDW characteristics: Estimated demographics (e.g. age, gender, ethnicity), modes of transport used, company branding on gear, how many FDWs are present (count upon arrival at/departure from the observation site, and every 15 minutes during the observation period)

FDW activities: While at the hotspot (e.g. using mobile phone, talking/not talking to other FDWs, length of time waiting, sitting/standing, eating, smoking), upon arrival (do they wait at the hotspot, go directly to the restaurant, etc.), when they go to the restaurant (who do they interact with, what activities and tasks do they perform), when they depart (how do they load their vehicles, what direction do they go in, etc.)

Behaviours of others that pose WHS risks or contribute to incidents: e.g. physical abuse, verbal abuse (including racial abuse, sexual harassment), COVID-19 precautions not followed by people around the FDW (especially physical distancing), driving/riding/parking behaviour by others

Features of the environment that pose WHS risks or contribute to incidents: e.g. weather conditions, uneven footpath/roads

Behaviours of FDWs that increase or mitigate risk to self: e.g. driving/riding/parking behaviour, COVID-19 precautions by the FDW (masks, gloves, use of hand sanitiser, physical distancing), ergonomics, condition of vehicle, use of safety gear (bike helmets, high-vis vests, seatbelts), mobile phone use, earphone/headset use, weather-appropriate clothing, food handling

D: Service safari protocol

You will sign up for your assigned food delivery platform, participate in any induction / training that is required by the platform, and ride as a FDW for one 4-hour shift. You will take detailed notes on your experiences and observations, focusing on the research questions that correspond to each of these three activities. Notes may be in the form of written, typed, and / or voice notes; photos; video clips; screenshots; sketches; and/or helmet- or bike-mounted video footage (optional).

Research question	Operationalised questions	Activity
What is it like to be a FDW?	• Are FDWs pressured to take risks to keep up with the pace of deliveries? • Do food delivery apps automatically accept new jobs during deliveries? • Are in-app prompts distracting during deliveries? • Are FDWs instructed on how long a delivery should take? How realistic is this instruction? • Do FDWs get to decide their preferred route to the destination? • Do customer reviews incentivise risk-taking behaviour?	Delivery work
Are FDWs abused while working?	• Did the team member experience any hostile behaviour or abuse from customers, restaurant workers, road users or pedestrians? • Did the team member witness any hostile behaviour or abuse from customers, restaurant workers, road users or pedestrians? • How was the team member treated by customers, other FDWs, restaurants, pedestrians, other non-FDWs?	Delivery work
What is the process to become a FDW?	• What is required to apply for food delivery work? • Do FDWs have control over when they work and how long their shifts are? Does this change as they complete more shifts/deliveries? • What is the process for purchasing/renting necessary equipment for food delivery work?	Platform onboarding Delivery work
To what extent are FDWs given safety training before they start working?	• What training is given before FDWs start their first shift on how to do the job? • To what extent do they instruct FDWs on how to carry out the work? • Are FDWs required to complete safety training before they can start their first shift? • How comprehensive is FDW safety training? • Does this process differ by state (NSW vs. Victoria)?	Platform onboarding
What is the process for reporting safety concerns to food delivery platforms?	• How easy is it to report safety concerns to food delivery platforms? • How are safety concerns dealt with after reporting?	Platform onboarding
What risks are FDWs concerned about?	• What aspects of the work made the team member uncomfortable?	Delivery work
What risks are FDPs concerned about?	• Was there any ongoing communication regarding WHS risk and how to manage it from the FDPs?	Delivery work