Journal of Transport & Health 14 (2019) 100571

Contents lists available at ScienceDirect

Journal of Transport & Health

journal homepage: www.elsevier.com/locate/jth

Stressful by design: Exploring health risks of ride-share work

Emma Bartel[a], Ellen MacEachen[a], Emily Reid-Musson[a,*], Samantha B. Meyer[a], Ron Saunders[b], Philip Bigelow[a], Agnieszka Kosny[b,c], Sharanya Varatharajan[a]

[a] School of Public Health and Health Systems, University of Waterloo, Waterloo, Canada (200 Waterloo Ave. W. Waterloo, ON, N2J 3G1, Canada)
[b] Institute for Work & Health, Toronto, Canada
[c] School of Public Health, University of Toronto, Toronto, Canada

ARTICLE INFO

Keywords:
Ride-share
Occupational health
Digital work
Qualitative research
Taxi

ABSTRACT

Introduction: For-hire driving work, such as taxi driving, is characterized by long hours of sedentary behaviour, passenger assault, lack of benefits or support, and isolating working conditions that jeopardize good health. The for-hire driving industry has recently expanded to include a new group of ride-share drivers from digital platforms such as Uber and Lyft; this has substantially increased the number of people engaged in for-hire driving. However, there is very little existing research on ride-share drivers' health and safety in relation to their work, and no research on the Canadian context.

Methods: This paper draws from a qualitative study consisting of in-depth interviews and focus groups with ride-share drivers and passengers, taxi drivers, taxi and ride-share managers, and other industry key informants in a large Canadian city. This paper focuses on ride-share drivers' health risks on the job.

Results: This study finds that ride-share drivers face physical and mental health risks resulting from ride-sharing work that are distinct to ride-share work, as well as ones similar to taxi driving and other transportation work. We find that the nature of the work is stressful by design: ride-share drivers face regular stressors and pressures from passengers, such as to speed and drive young children without proper booster seats. They also describe weight gain and muscle pain.

Conclusion: As greater numbers of passengers opt for ride-share transportation and more people take up ride-share work, understanding potential short- and long-term health implications is an important area of inquiry. Understanding the working conditions of ride-share drivers can support the development of appropriate policy and practice tools to improve ride-share drivers' health and safety.

1. Introduction

For-hire driving services in Canada, such as taxis and limousines, have recently expanded with the introduction of new, app-based ride-sharing options. Ride-sharing companies market themselves as safe, easy, and convenient ways to get around or earn extra income (Khosrowshahi, 2018). The introduction of cash-free transactions and passenger profiles are two features touted as increasing safety, compared to the traditional taxi industry (Feeney, 2015). This new form of transportation has grown rapidly. For instance,

* Corresponding author.
E-mail addresses: embartel@uwaterloo.ca (E. Bartel), ellen.maceachen@uwaterloo.ca (E. MacEachen), ereidmusson@uwaterloo.ca (E. Reid-Musson), samantha.meyer@uwaterloo.ca (S.B. Meyer), rsaunders@iwh.on.ca (R. Saunders), pbigelow@uwaterloo.ca (P. Bigelow), Agnieszka.kosny@utoronto.ca (A. Kosny), s5varatharajan@uwaterloo.ca (S. Varatharajan).

https://doi.org/10.1016/j.jth.2019.100571
Received 13 March 2019; Received in revised form 22 May 2019; Accepted 29 May 2019
Available online 20 June 2019

since 2016 the City of Toronto has issued over 67,000 ride-share licenses (Lucs, 2018) while New York City has issued over 100,000 (Fitzsimmons, 2018).

Existing research has identified a number of health risks and conditions that taxi drivers face. Taxi drivers typically drive long days and have significant sedentary behaviour accompanied by low levels of physical activity (Elshatarat and Burgel, 2016). Long working hours can result in fatigue and sleep deprivation (Murray et al., 2017). Many taxi drivers rely upon fast food, and cite low availability of healthy food options available to-go (Facey, 2003). The combination of low exercise, high sedentary behaviour, and poor diet can result in weight gain (Murray et al., 2017). Taxi drivers cite reducing liquid intake to avoid the need for frequent bathroom breaks. Taxi drivers face fare evasion, daily competition with other drivers for limited fares, and verbal abuse and physical assault from passengers (Burgel et al., 2012).

These working conditions can lead to experiences of stress and anxiety (Burgel et al., 2012; Davidson et al., 2017; Wang and Delp, 2014), and contribute to taxi driving work being one of the most dangerous occupations in Canada (Mirpuri et al., 2018). The stress and anxiety of taxi driving work can be exacerbated when the long hours of work reduce drivers' ability to maintain relationships and seek social support (Facey, 2010). The vast majority of taxi drivers in Canada are classified as independent contractors and do not benefit from employment standards like overtime or minimum wage. While independent contractors in Canada can choose to opt-in to worker's compensation, retirement plans, and unemployment insurance on an individual basis, most taxi drivers do not (Facey, 2010).

While touted as a ‘safer’ option than taxi driving due to GPS capabilities, peer-to-peer ratings, and cashless transactions, to date there is no existing research on the health and safety risks that ride-share drivers (such as Uber and Lyft drivers) encounter in their work. This analysis sought to understand both physical and mental health risks of ride-sharing work within the new for-hire market in a large metropolitan area in Ontario, Canada.

2. Literature review

Previous literature on the for-hire driving industry identified a number of health risks inherent in driving work, as noted in the introduction. Taxi drivers typically drive long days with significant amounts of the day engaged in sedentary behaviour accompanied by low levels of physical activity. Long working hours can result in fatigue and subsequent sleep deprivation. Many taxi drivers rely upon fast food available to-go, and cite limited healthy options available in this format. The combination of low exercise, high sedentary behaviour, and poor diet can result in weight gain (Davidson et al., 2017; Elshatarat and Burgel, 2016; Facey, 2003; Mirpuri et al., 2018; Murray et al., 2017; Wang and Delp, 2014).

The working environment of taxi drivers also contains a number of health risks. The taxi workplace is a mobile workplace and taxi drivers spend their days exposed to traffic hazards. Finding bathrooms and taking the time for toilet breaks can be difficult for drivers. Taxi drivers describe reducing liquid intake to avoid the need for frequent bathroom breaks (Facey, 2003; Murray et al., 2017). In addition, drivers face exposure to second hand smoke from members of the public who enter their vehicle (Facey, 2003).

For-hire driving work is also stressful. Taxi drivers face the possibility of fare evasion, verbal abuse or physical assault from passengers, and daily competition with other taxi or other for-hire drivers for a limited number of fares. These work features contribute to experiences of stress and anxiety (Burgel et al., 2012; Davidson et al., 2017; Elshatarat and Burgel, 2016; Wang and Delp, 2014). Some drivers have noted that long hours of work reduce their ability to maintain relationships, and a reduction in social supports that exacerbates feelings of stress (Facey, 2010).

These health risks have contributed to the development of both physical and mental health conditions among taxi drivers. Previous literature has noted the development of diabetes, hypertension, chronic pain, kidney stones, compromised immune function, musculoskeletal problems, vision loss, high levels of psychological distress, cancer, and an elevated risk for cardiovascular disease among taxi drivers (Burgel et al., 2012; Davidson et al., 2017; Elshatarat and Burgel, 2016; Mirpuri et al., 2018; Murray et al., 2017; Wang and Delp, 2014).

Research with truck drivers, another driving population, has found significant levels of untreated psychological distress related to long hours, sleep disruption, and low job control (Lemke et al., 2017; Shattell et al., 2012). Further, health promotion has been found to be low in this population (Apostolopoulos et al., 2013; Lemke and Apostolopoulos, 2015).

Many taxi drivers come from immigrant populations, with a low socioeconomic status. Research has also noted that these health risks are affected by discrimination within and outside of their work. Economic uncertainty can increase the likelihood of risk taking behaviour such as picking up risky clients in order to maximize income making opportunities (Facey, 2003).

There is very little academic literature to date on health risks or conditions among for-hire drivers working platform jobs, such as Uber or Lyft. However, one study has suggested that many of the working conditions are similar, and therefore certain conditions like psychological distress may also be found among ride-share drivers (Davidson et al., 2017). Within this context, where the literature indicates that poor working conditions and poor health exist widely for taxi drivers, this study examined experiences of ride-share and taxi drivers in a large Canadian city.

3. Methods

The findings presented here are part of a larger qualitative study that focused on health and safety of for-hire drivers and public risks related to ride-sharing. There is little existing research in this area, and none on the Canadian context. The health and safety conditions of ride-share drivers is a complex area impacted by multiple factors including traffic, digital app design, Uber's terms and conditions (or Lyft's) for drivers and passengers, municipal and provincial licensing, car insurance, etc. The study adopted a context-

sensitive qualitative research methods approach to address this complexity. The overall research design involved an iterative process of data gathering, data analysis, and knowledge exchange. This allowed insights gained at one phase of the study to inform questions posed to other participants and allowed the study team to consider ride-share health and safety from multiple vantage points.

The research took place in a large Canadian city between December of 2016 and August of 2018. Focus groups and in-depth, semi-structured interviews were held with 75 participants in total, including app-based ride-share drivers, (n = 27), taxi drivers (n = 8), ride-share passengers (n = 17), ride-share and taxi managers (n = 8), and government, legal, tax, and insurance key informants (n = 15)[1]. During our data collection period, Uber was the only major ride-share provider in Canada. Therefore, none of our participants drove for Lyft at the time of the study. Participants were recruited through informational flyers, posts on online forums, snowball referrals, and through direct contact. Focus groups with drivers and passengers lasted 2 h, while in-depth interviews were normally 1 h in length (the shortest interview was 30 min and the longest was 2 h). All interviews and focus groups were recorded and transcribed verbatim. Analysis consisted of dual coding for inter-coder reliability, followed by in-depth thematic analysis supported by NVIVO software.

Ride-share drivers who participated in the study included individuals with full-time employment who opt to drive on evenings, overnight, and weekends for additional income (41% of drivers in the sample), and those who make an income solely through Uber (59%). Ride-share drivers in the sample reportied driving part-time hours and full-time hours, and this could fluctuate week-to-week and month-to-month. In this article, the analysis relies mainly on focus groups with Uber drivers and interviews with taxi drivers, but is informed by the broader research data and analysis.

Ethical considerations of informed consent, anonymity, confidentiality and data security were followed. The University of Waterloo Office of Research Ethics provided formal ethical clearance for this study. Care was taken to ensure the confidentiality of participants.

4. Results

Results from this study describe how ride-share drivers experience health risks in their work. Participants highlighted health concerns that were physical and mental.

4.1. Physical health

Drivers described repetitive motions necessary for work that resulted in back, foot, knee and leg pain during and after their shifts. They noted sedentary behaviour resulting from driving for many hours without exiting a vehicle. Because drivers are paid on a per-ride basis, during high demand periods they are wary to stop and take breaks or rest. Earnings incentives such as Uber's 'surge pricing' can intensify the pressure that drivers experience to keep driving without stops.

"You start driving more … I started to feel some pain here in the leg and it kind of scared me because it was very strong pain. I couldn't walk … I went to see the doctor and at the end of the day it was a tendon inflammation." (Paco, ride-share driver)

"Umm, I think, for me, it was ten hours just driving, not even stepping outside to get gas or stretch, and by the time – and because I only drive at night, so by the time I got home and I get out of the car, it's exactly how they describe it [dizzy] …. It's the surge – the surge makes you sit there." (Vera and Nina, ride-share drivers)

Ride-share drivers noted the difficulty of finding temporary vehicle parking in large metropolitan areas where they could exit their vehicle to stretch without paying: ride-share drivers did not have options to use taxi-stands. This contributed to some drivers limiting fluid intake to the point of dehydration in an effort to reduce the need for bathroom breaks:

"I don't really drink water and so then I'm completely dehydrated by the time I get home … I'm not drinking anything because I'm not going into the washrooms … the washrooms are impossible." (Carolina, ride-share driver)

High amounts of sedentary behaviour were often combined with unhealthy eating. Drivers noted that finding healthy food to-go was both more difficult than traditional fast food options, and more expensive. Further, some ride-share passengers would offer to purchase drive-thru food for their driver, in exchange for the extra stop. These factors resulted in some drivers experiencing weight gain:

"Nobody else can really say it, so I just open it up and be like 'yeah, I got this [ride-share] belly I got to get rid of! I got this muffin happening at the back!'" (Nina, ride-share driver)

One ride-share driver with a pre-existing diagnosis of diabetes noted his condition worsened as a result of conditions faced on the road:

"I think it's because … it's the driving. Maybe it can be a factor because I work night hours too. I flex my hours. You know, I try to see when it's best to be out there, you know, so I'm out there night time; I'm out there sometime day times. Night time, it's worse out there, you know,

[1] The original research design included focus groups with both driver groups – taxi and Uber. However, taxi driver recruitment for focus groups proved nearly impossible. We believe that the study focus on Uber was triggering for taxi drivers at the time of our data collection. Recruitment vis interviews with individual drivers was the only means available to us to include this group.

so it can be contributory." (Fredrik, ride-share driver)

Another physical health risk noted by ride-share drivers was exposure to second hand smoke. While the Smoke Free Ontario Act does prohibit passengers from smoking in a ride-share vehicle, drivers had little recourse except to refuse the ride, which would result in loss of income and a potential poor customer rating.

4.2. Mental health

In addition to physical health risks, ride-share drivers identified a number of risks in their work related to mental health. Ride-share drivers described how the daily realities of their work were *stressful by design* – these stresses related to the unique features of ride-share work itself, mediated by peer-to-peer ratings, and automated navigation and dispatching. Other stresses were more broadly characteristic of taxi work, such as carrying passengers in a confined, mobile space, and earning very little, creating financial insecurity.

First, the ride-share application provided navigational and dispatching instructions that were inherently distracting. While driving, the app sent requests to the driver for their next possible passenger. Drivers had to interact with the app while driving in order to respond to this request, as drivers described a 20-second time limit to decide before the ride would be offered to another driver.

Passengers themselves were a source of distraction. Drivers described passenger requests for certain navigational routes or for drivers to speed. Passengers sometimes requested auxiliary cords to play music, or asked for food or water. Drivers dealt with passengers making demanding requests to drive faster, passengers slamming doors, and passengers aggressively talking back to drivers. Passenger distraction was amplified in ride-share carpool rides, such as UberPool, where multiple passengers were in a vehicle at the same time, all heading to different destinations. This is an option provided by ride-share companies for passengers who want a lower fare. In the case of carpool rides, drivers sometimes had to manage distractions from the ride-share app, requests from a passenger to the driver, and disagreements between passengers all while navigating complex driving conditions in a major metropolitan area. Drivers recounted occasions where passengers broke out into fights:

"I always find I'm a little bit nervous when you're doing the [Uber carpool], right, 'cause you never know how … the patrons might interact with each other …. if they're not going to get along." (Larry, ride-share driver)

Underlying these driver-passenger relations is the added complication of a rating system. Poor ratings can result in a driver being removed from the Uber app. While taxi drivers do have ways of having a taxi license revoked, these are often not based on the personal preferences of their passengers.

"Oh absolutely, absolutely [ratings are] a major stress factor …. because you know they're not only worried about navigation and not missing turns and having dialogue with the riders who can sometimes be very judgmental, they've got a lot going on …" (Tabitha, Uber driver)

Interacting with members of the public brought additional stressors and introduced risks to passengers that unsettled drivers. Drivers talked about pressures from passengers to drive young children without proper booster seats, and passengers who refused to wear seatbelts. Some passengers would take a ride with a driver, and after the fact, report to the app that the ride did not happen. In these cases, the driver would not be paid for the trip unless he or she could somehow prove that the passenger was, in fact, in the vehicle.

Especially at night, drivers encountered inebriated passengers who screamed, fought, and vomited while in the vehicle. Drivers could be sent anywhere for a passenger request, and some drivers described being sent to parts of the city where they didn't feel comfortable. Drivers have some recourse to not accept these rides:

"If I'm taken to a place where I know there's a lot of drugs or rehab places, I will keep driving and politely decline the call. If I'm taken down a dark alley, which happens many times on a Saturday night … I feel unsafe, I'm not picking anybody up in a laneway." (Tabitha, ride-share driver).

Drivers also described assessing the situation before deciding whether to accept a passenger:

"I will drive there and I will lock my doors. I have tinted windows so you can't really – you can't see from outside to inside. And so I'll wait there, and I will see someone, and I will call them, and I'll see them answer their phone, and I'll have to judge things on that." (Vera, ride-share driver.)

Refusing to pick up a passenger is within the rights of ride-share drivers, but there are penalties imposed by ride-share companies onto drivers for cancelling too often or having low passenger acceptance rates. Penalties included being locked out of the app for a period of time, resulting in a loss of potential income. This represented a reverse incentive for drivers having to choose between income and their own safety and wellbeing (MacEachen et al., 2018).

There was also a sense of financial insecurity that connected to emotional lack of wellbeing. Many participants described choosing ride-share work as a way to earn extra income. After they started this work, they found that their net income after expenses was very low. Financial pressures added to the stress experienced by ride-share drivers. Drivers who took up the work in a particular moment of financial need felt pressured to 'keep driving' and this had impacts on physical health. As self-employed independent contractors, they have no social security (unemployment insurance, retirement benefits), workers compensation if they are injured or sick, or

employment and wage protections. They can be removed from the app at any time and do not have recourse or independent representation. The longer-term insecurity of ride-share work in a context of rapid technological change and automation also weighed emotionally on drivers. They felt anxiety over the fact they were, in some ways, working themselves out of a job: their driving data is contributing to the development of future autonomous vehicles.

"There is not a feeling of safety knowing, okay, I'm making money now, but there is not going to be benefits or pension or retirement." (Rabih, ride-share driver).

"I feel the pressure. As a single mom I have a lot of financial pressure, so I feel really pressured to just keep on driving … and I feel like I'm deteriorating because my neck really hurts, my back really hurts." (Tabitha, ride-share driver)

Elements of financial and employment insecurity indicate how this type of non-standard 'gig' work negatively affects mental health, not only in the workplace but for the individual and his/her family and arenas beyond direct work hours and spaces.

5. Discussion

This study finds that ride-share drivers face physical and mental health risks resulting from ride-sharing work that are distinct to ride-share work, as well as ones similar to taxi driving and other transportation work. Working conditions and the design of the ride-share application in many ways promote poor health. Physical risks included long hours of sedentary behaviour, repetitive movement, and poor nutrition and hydration. Mental health risks included stress of managing road conditions, navigation, financial and work insecurity, and passenger demands while responding to requests from the app for future passengers. Passengers pressured drivers to take risks when they asked drivers to transport young children without booster seats or when they refused to wear seatbelts. The nature of ride-share work is isolating, and many drivers described feeling nervous driving at night or in certain neighbourhoods in the city.

Uber drivers work from an app, meaning they have very little if any contact with other colleagues. They do not benefit from collective representation, either from a union or other organization. Unlike taxi drivers, ride-share drivers do not have physical spaces like taxi stands where they can connect with other colleagues. Uber drivers have to find other places to stop, and sometimes pay for parking in order to take these breaks. The rating system component creates an additional means of removal from access to work, and is a source of unique stress to Uber and other rideshare drivers.

With cashless transactions, ride-share drivers do not face the risk of robbery or fare evasion which is a common source of stress for taxi drivers (Burgel et al., 2012). Taxi drivers also have additional costs associated with dispatch and licensing fees, meaning financial pressures may be felt to a higher degree as competition for fares increases (Abraham et al., 2008).

Some modification to working conditions could be made to promote better health, including caps on driving hours or mandatory breaks, but these would likely be unpopular due to the fact that they would jeopardize drivers' earnings, which are already very low. In the case of ride-share drivers, these could be implemented through the app. Drivers in the study suggested that benefits programs or complimentary gym memberships is another way that good health could be encouraged in the for-hire driving market.

Training on healthy behaviours could also be implemented. Previous mandatory taxi driver training in some Canadian cities included training on cultivating healthy behaviours while driving. Some research on health training in the trucking industry has suggested that simply providing information about healthy behaviours is unlikely to be sufficient in changing behaviours, particularly when structural barriers persist (Lemke and Apostolopoulos, 2015). Training, therefore, while part of the solution, could be more dynamic in responding to needs experienced by drivers. Interventions that do not address the underlying wage structure and organization of ride-share work are likely to have unintended negative consequences for ride-share drivers. Beyond improving the health of the drivers, health promotion interventions are important for public safety. Previous research has linked mental health symptoms to impaired concentration and reaction times (Hilton et al., 2009), meaning individuals could be at a higher risk of accidents.

There is a paucity of scientific literature reporting on experiences of health for ride-share drivers in Canada. The results from this study indicated that most physical health risks described by ride-share drivers are similar to what is described in the literature for taxi-drivers. However, the conditions and design of ride-share work are not identical to the taxi industry: the introduction of an app-based service with strict app rules made for unique pressures and risks related to mental health for ride-share drivers, including the possibility of lost income for low ratings, high cancellation rates, or low acceptance rates. Ride-share drivers have to use a distracting phone device in a motor vehicle on public roads, in order to receive and manage rides. Ride-share drivers who perform carpool rides (UberPool and UberPoolExpress) also have to manage different passengers in their vehicle and multiple different destinations along a dynamic route.

Limitations of this study include that the health risks noted were self-reported. The development of physical health conditions was ascribed by participants themselves to their involvement in ride-share work. In addition, at the time of this research some of the participants had been ride-share driving for only a short time. It is possible the health risks could continue to develop or change over time.

Future research could examine the longer-term health impacts of ride-sharing on drivers, particularly as the prevalence of ride-share as a mode of transportation appears to be increasing. Studies could additionally examine the prevalence of certain health conditions within ride-share driving populations. Our research also suggests an impact of ride-share driving on mental health; future research could continue to examine mental health impacts of ride-share driving on drivers, their families and communities as a whole.

6. Conclusion

Health concerns for drivers included stress, fatigue, musculoskeletal disorders, and urinary disorders. The occupational health, public health and public safety impacts of ride-share may include hazards related to inexperienced and distracted driving on public roads with hazards for drivers, passengers, and other road-users such as pedestrians, cyclists, and those using public transit. Ride-share work is transportation work involving a mobile workplace carrying passengers. Drivers and passengers are exposed to traffic hazards. The number of ride-share licenses being issued by cities is not capped or controlled. This suggests that a large number of people are interested in or need this kind of work; some participants in this study fully relied on their income from ride-share driving. It also suggests that policymakers need to better evaluate and intervene in the quantity and quality of ride-share licenses issued.

Ride-share and other gig economy work is increasingly becoming a part of the employment landscape in Canada. Work in the ride-share sector does not come with any guarantees of income or employment security, nor does it come with benefits for or many protections from inherent physical and mental health risks. As the number of individuals earning an income in the 'gig economy' grows, a greater number of individuals are likely to fall through the cracks of employment-based health and social safety nets in Canada. The consequences of this changing landscape of work and transportation for individual health, public health and safety, and occupational health and safety merit further consideration. The promotion of ride-share among policy-makers merits greater awareness about the health implications of this work for those who provide rides as much as the health and safety needs of customers and the broader public.

Financial disclosure

The research was funded by the Canadian Institutes of Health Research Project Grant Scheme.

Acknowledgements

The research was funded by the Canadian Institutes of Health Research Project Grant Scheme. We are grateful to the advisors who provided valuable feedback on the research: Kevin Brown, Tracey Cook, Deena Ladd, Carol Sackville-Duyvelshoff, and Michael Zacks. We thank additional team members who contributed to the study: Julia Goyal, Meghan Crouch, and Thivja Sribaskaran. Finally, we are grateful to all study participants.

References

Abraham, S., Sundar, A., Whitmore, D., 2008. Toronto Taxi Drivers ;: Ambassadors of the City A Report on Working Conditions.

Apostolopoulos, Y., Sönmez, S., Shattell, M.M., Gonzales, C., Fehrenbacher, C., 2013. Health survey of U.S. long-haul truck drivers: work environment, physical health, and healthcare access. Work 46 (1). https://doi.org/10.3233/WOR-121553.

Burgel, B.J., Gillen, M., White, M.C., 2012. Health and safety strategies of urban taxi drivers. J. Urban Health: Bull. N. Y. Acad. Med. 89 (4), 717–722. https://doi.org/10.1007/s11524-012-9685-7.

Davidson, S., Wadley, G., Reavley, N., Gunn, J., Fletcher, S., 2017. Psychological distress and unmet mental health needs among urban taxi drivers: a cross-sectional survey. Aust. N. Z. J. Psychiatr. 00 (0) 4867417741556. https://dx.doi.org/10.1177/0004867417741556.

Elshatarat, R.A., Burgel, B.J., 2016. Cardiovascular risk factors of taxi drivers. J. Urban Health Bull. N. Y. Acad. Med. 93 (3), 589–606. https://doi.org/10.1007/s11524-016-0045-x.

Facey, M., 2003. The health effects of taxi driving: the case of visible minority drivers in Toronto. Can. J. Public Health (July-August), 254–257.

Facey, M., 2010. "Maintaining Talk" among taxi drivers: accomplishing health-protective behaviour in precarious workplaces. Health Place 16 (6), 1259–1267. https://doi.org/10.1016/j.healthplace.2010.08.014.

Feeney, M., 2015. Is Ridesharing Safe? Cato Institute Policy Analysis, pp. 767.

Fitzsimmons, E.G., 2018. A Taxi Driver Took His Own Life; His Family Blames Uber's Influence. May 1. New York Times, New York Retrieved from. https://www.nytimes.com/2018/05/01/nyregion/a-taxi-driver-took-his-own-life-his-family-blames-ubers-influence.html.

Hilton, M.F., Staddon, Z., Sheridan, J., Whiteford, H.A., 2009. The impact of mental health symptoms on heavy goods vehicle drivers' performance. Accid. Anal. Prev. 41 (3), 453–461. https://doi.org/10.1016/j.aap.2009.01.012.

Khosrowshahi, D., 2018. Raising the Bar on Safety. Retrieved from. https://www.uber.com/newsroom/raisingthebar/.

Lemke, M., Apostolopoulos, Y., 2015. Health and wellness programs for commercial motor-vehicle drivers: organizational assessment and new research directions. Workplace Health & Saf. 63 (2), 71–80. https://doi.org/10.1177/2165079915569740.

Lemke, M., Hege, A., Apostolopoulos, Y., Wideman, L., Sönmez, S., 2017. Work and sleep among transport operators: disparities and implications for safety. J. Transport Health 7, 298–309. https://doi.org/10.1016/j.jth.2017.08.006.

Lucs, I., 2018, September 17. Toronto's Vehicle-For-Hire Bylaw under Review in Wake of "Astronomical" Growth of Uber, Lyft. CBC News, Toronto, pp. 1–7. Retrieved from. https://www.cbc.ca/news/canada/toronto/uber-lyft-bylaw-consultations-1.4827565.

MacEachen, E., Reid-Musson, E., Meyer, S., Saunders, R., Bigelow, P., Kosny, A., Bartel, E., Varatharajan, S., 2018. Ride-Share Health and Safety: Participant Feedback Report. Retrieved from http://ellenmaceachen.ca/wp-content/uploads/2017/03/MacEachen-et-al_Uber-Health-and-Safety-Participant-Report_November-1-2018-FINAL.pdf.

Mirpuri, S., Gill, P., Ocampo, A., Roberts, N., Narang, B., Hwang, S.W., Gany, F., 2018. Discrimination and health among taxi drivers in New York and Toronto. J. Community Health 0 (0), 1–6. https://doi.org/10.1007/s10900-018-0466-4.

Murray, K.E., Buul, A., Aden, R., Cavanaugh, A.M., Kidane, L., Hussein, M., ... Checkoway, H., 2017. Occupational health risks and intervention strategies for US taxi drivers. Health Promotion International (March 2018), 1–10. https://doi.org/10.1093/heapro/dax082.

Shattell, M., Apostolopoulos, Y., Collins, C., Sönmez, S., Fehrenbacher, C., 2012. Trucking organization and mental health disorders of truck drivers. Issues Ment. Health Nurs. 33 (7), 436–444. https://doi.org/10.3109/01612840.2012.665156.

Wang, P.C., Delp, L., 2014. Health status, job stress and work-related injury among Los Angeles taxi drivers. Work 49 (4), 705–712. https://doi.org/10.3233/WOR-131696.