

ROAD FATALITIES: DID COVID-19 IMPACT TREND IN CAPE TOWN?

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ABSTRACT

South Africa has a road traffic fatality rate per 100 000 population of 21.3 (RTMC, 2019; STATSSA, 2019), and is ranked 39 out of 175 countries for the highest road fatality rate, placing it in the worst 25% of countries around the world (WHO, 2018). This is an improvement from prior years when the rate was over 30 fatalities per 100 000 population.

The year 2020 saw severe mobility restrictions being implemented by governments around the world to combat the spread of Covid-19. These restrictions improved air quality, while road fatalities and injuries decreased. This was also the case in South Africa, where the overall fatalities dropped below 10 000 persons, the first time since the early 2000s.

Before the Covid-19 Pandemic, the Western Cape had a downwards road fatality trend. However, this was not the case for the City of Cape Town. This paper explores if Cape Town's road safety trends have been able to benefit from the opportunity provided by Covid-19, as witnessed in many cities around the world. Unfortunately, the findings in this study indicate that Cape Town suffers from an increasing road fatality trend and pedestrians make up over 60% of these fatalities.

1. BACKGROUND

In January 1979, the British Medical Journal referred to road fatalities as an epidemic. The Global status report on road safety reports that the number of annual road traffic deaths has reached 1.35 million (WHO, 2018). During the Covid-19 health pandemic, however, travel restrictions and changing mobility patterns reduced the overall number of road fatalities and injuries globally. The International Traffic Safety Data and Analysis Group, a permanent working group for road safety of the International Transport Forum, reported an overall reduction in mobility of 12.2% (ITF, 2021). In the United Kingdom (UK), car mobility decreased by a third, while cycling increased by 300% (UK Government, 2021). The pandemic also saw an increase of e-commerce (Christie, 2021) around the globe. Christie (2021) reports a statistically significant reduction in road fatalities in the UK by 14%. The International Traffic Safety Data and Analysis Group reports smaller reductions in road fatalities. They established that road fatalities, in the 34 included countries, collectively reduced by 8.6% during the Covid-19 pandemic. Yasin et al. (2021) found that, while reduced mobility decreases the road crash risk, less congestion during this period yielded an increase in average speeds and, hence, more severe crashes.

According to the Road Traffic Management Corporation (RTMC), South Africa also witnessed a reduction in road fatalities. In 2019, the overall road fatalities in the country amounted to 12 502 persons, while this number dropped to 9 969 persons in 2020 (RTMC,

2021). This was the first time since the early 2000s that the absolute road fatality number in the country dropped below 10 000 road deaths. The 21% drop in fatalities coincides with the number of weeks that mobility was almost 100% restricted in the South African context, as only permit holders were allowed to be on the road during the so-called lockdown periods. In South Africa, this was mainly during the second quarter of 2020, from the end of March till the end of June.

In South Africa, road fatalities in 2021 were slightly higher than in 2019, as 12 545 fatalities were recorded. This is an increase of 3.4% in fatalities, while the number of fatal crashes increased by 2.2% (RTMC, 2021). The larger increase in fatalities may be due to reduced congestion and increased speeds, as witnessed by Yasin et al. (2021). Based on the TomTom Traffic Index ([Cape Town traffic report | TomTom Traffic Index](#)), congestion levels during 2021 in Cape Town are approximately 10% lower than in 2019. Venter et al. (2020) show that work travel has nearly recovered to pre-Covid levels with only an 8% difference from the baseline.

2. METHODOLOGY

This paper unpacks road fatality statistics in the City of Cape Town. The data was provided by the RTMC and includes fatalities only. The data is provided for the period from 2017 to 2021. The paper identifies absolute fatality trends, an overview of the suburban areas which contribute most to fatalities, how the road fatality numbers compare to the population size in these areas, as well as trends per time of day and speed limit. Further analysis includes the road user type, the suburban areas where the largest growth in fatalities happen and the trends for Cape Town youth. Finally, an analysis is conducted for the vehicle types causing road fatalities on the Cape Town roads. For all analyses, there is an analysis as to whether trends have changed after the Covid-19 lockdowns. For all analyses and findings, a statistical significance test is conducted. This is done using the standard deviation and T-test, using a 95% significance interval. Due to space restrictions in this paper, elaborate results of the statistical tests are not included. Insignificant results are not presented and the text will make specific mention of statistical significance.

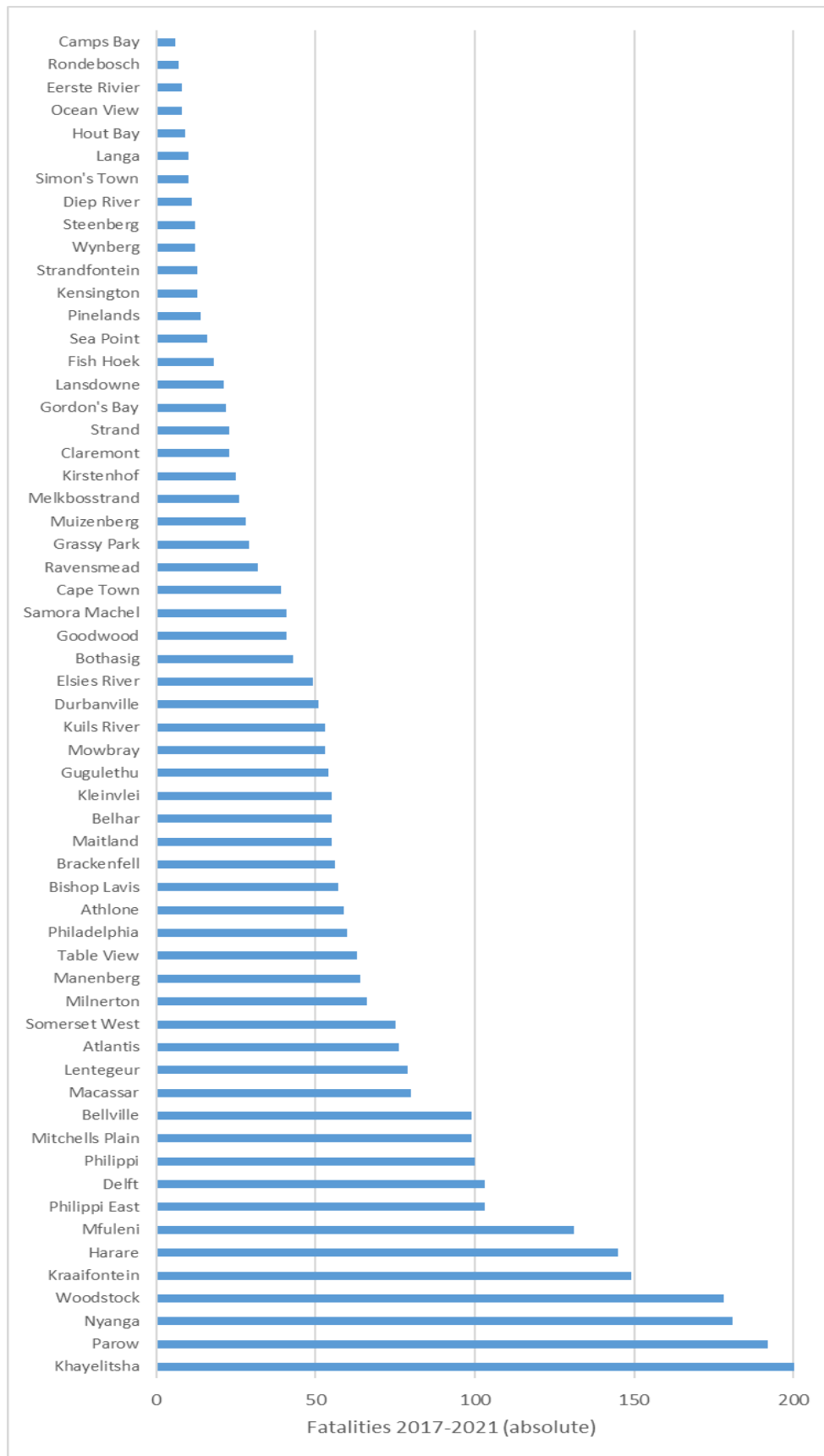
3. ANALYSIS

3.1 Absolute Fatality Trends in Cape Town

Overall, the database includes 2 666 usable fatality records over the four-year period, including 2020 when Covid-19 reduced mobility and fatalities. Only 21% of fatalities are female, while the remaining 79% are male. This has not significantly changed over time, as similar splits were identified by Vanderschuren and Zuidgeest (2017). In 2017 and 2018, fatalities in Cape Town were stagnant at 520 and 522 fatalities per annum, respectively. In 2019, there was a statistically significant increase to 602 fatalities. While 2020 saw a drop in fatalities (477 persons), as expected, 2021's fatalities (538 persons) are higher than the 2017/2018 benchmark. Figure 1 includes an overview of the accumulated fatalities per Cape Town suburban area (see the end of the paper).

There are four areas in Cape Town that have an accumulated absolute fatality number of over 150 persons (2017-2021). These areas are Woodstock, Nyanga, Parow and Khayelitsha. Parow and Khayelitsha show a statistically significant increase in fatalities between 2017 and 2021 of 62.7% and 8.7%, respectively. Parow, in particular, with its enormous increase, warrants attention from the City of Cape Town. Readers need to be cautioned about reading too much into the high value for Woodstock, as there have been

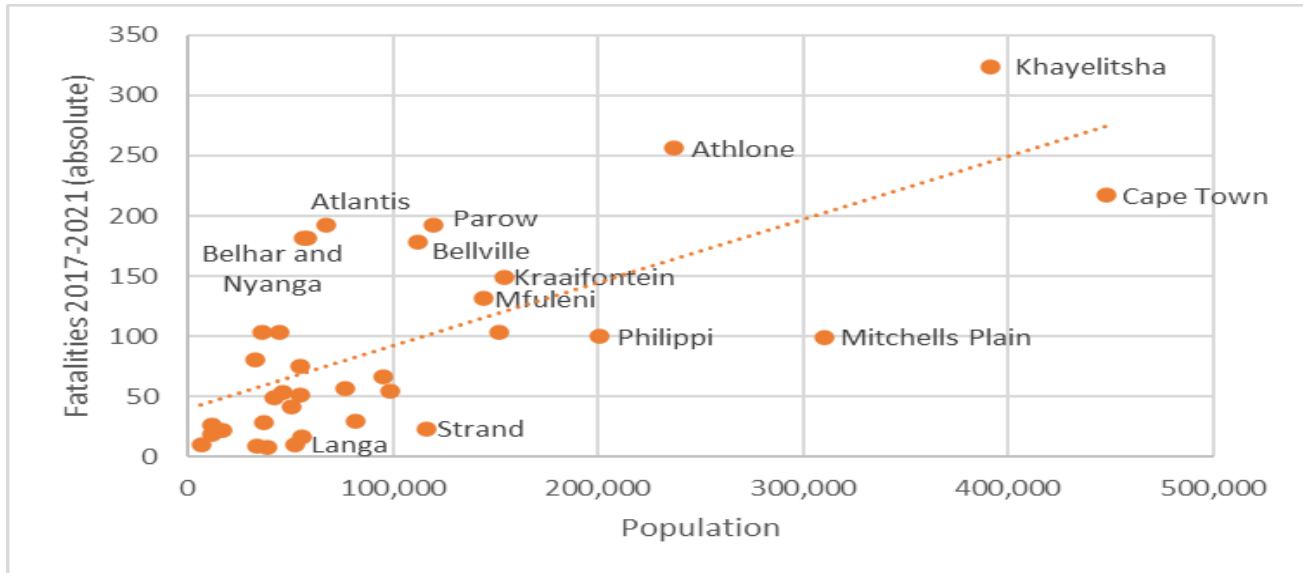
cases in the past when the area where a crash happened was unknown and was allocated to Woodstock, as this is where the Forensic Pathology Laboratory is housed.



Source: RTMC Database

Figure 1: Absolute fatalities in Cape Town (2017-2021 accumulated)

Accumulated absolute fatalities are likely biased towards more dense suburban areas. A comparison of the population, based on the validated 2011 census data, and fatalities per area was, therefore, established in Figure 2. When population is considered, Nyanga, Parow and Khayelitsha clearly score well above the expected value indicated by the trendline. Other areas that have statistically significant fatality values that are well above expectation are Atlantis, Bellville and Athlone.



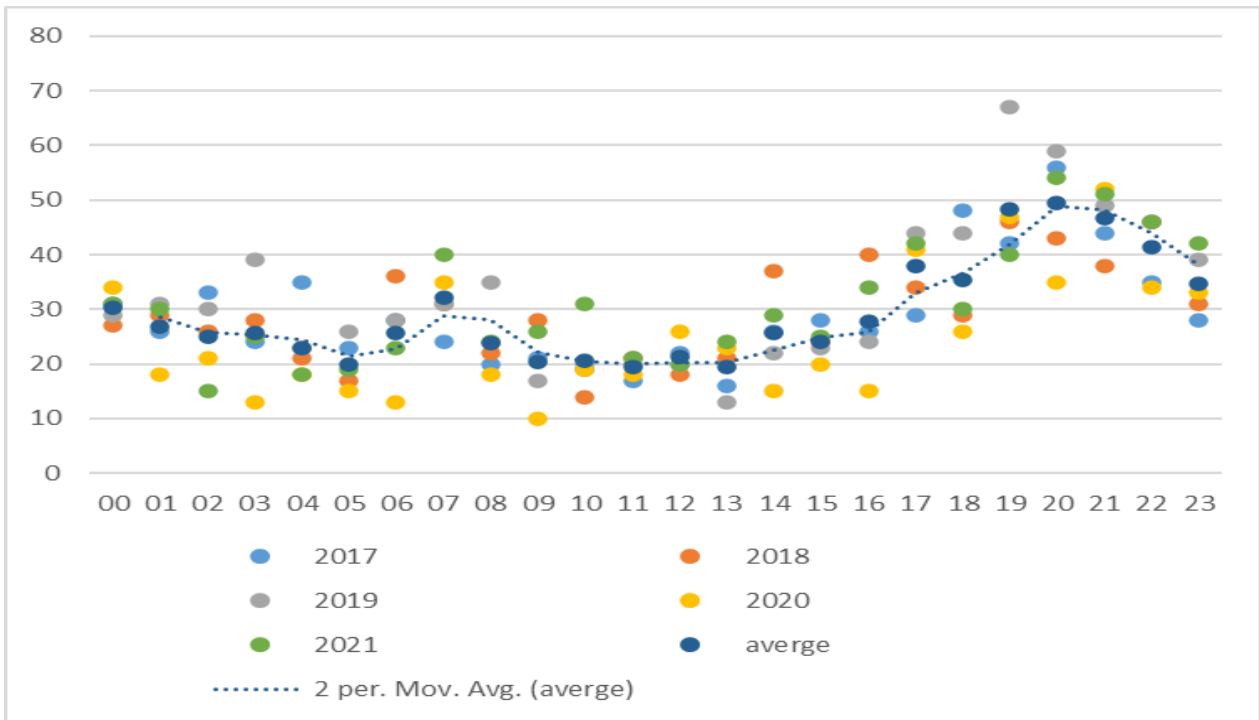
Source: RTMC Database and Census 2011

Figure 2: Population and absolute fatalities in Cape Town (2017-2021 accumulated)

Figure 2 also indicates that fatalities in Langa, Strand, Philippi and Mitchells Plain are below expectations. A more detailed analysis of the characteristics of high- and low fatality outliers is warranted, but falls outside the scope of this paper.

3.2 Fatalities per Time of Day in Cape Town

In Cape Town, most road fatalities occur in the afternoon peak and during the night (before midnight). Comparing the peaks, congestion levels are generally higher in the morning peak while speeds are lower (see Figure 3). As lower speeds reduce the crash impact, fatalities in this period are relatively low. During the afternoon peak, higher speeds are likely to play a role. Furthermore, as visibility reduces towards and during the night, fatalities increase. In the Cape Town context, the abuse of alcohol has also been identified as one of the corporates influencing fatalities in the afternoon, evening, and night. In a study by the Medical Research Council (2006), pedestrians had the highest percentage of cases that tested positive for alcohol (60%) at the time of the collision, as well as the highest levels of alcohol consumption (on average four times the legal limit). Although the absolute values in 2020 are lower, due to the Covid-19 pandemic, the trends over time of day are unchanged.

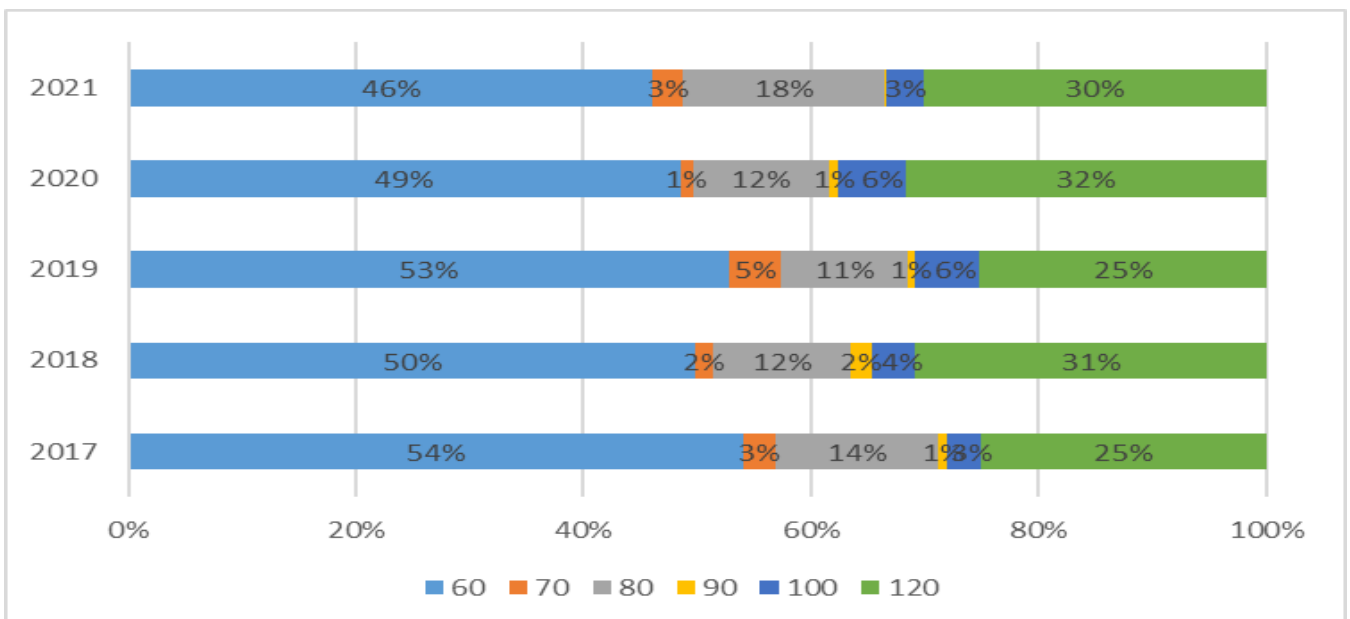


Source: RTMC Database

Figure 3: Fatalities per time of day in Cape Town (2017-2021)

3.3 Fatalities per Maximum Speed Limit Posting in Cape Town

As indicated in Section 3.2, speeds do influence crash impacts and, therefore, fatalities. This warranted an analysis of fatalities per posted speed limit. A comparison over time (see Figure 4) reveals that fatalities are shifting towards high-speed roads, i.e., there is a statistically significant shift towards 120 km/h roads from 25% to 30%, between 2017 and 2021.



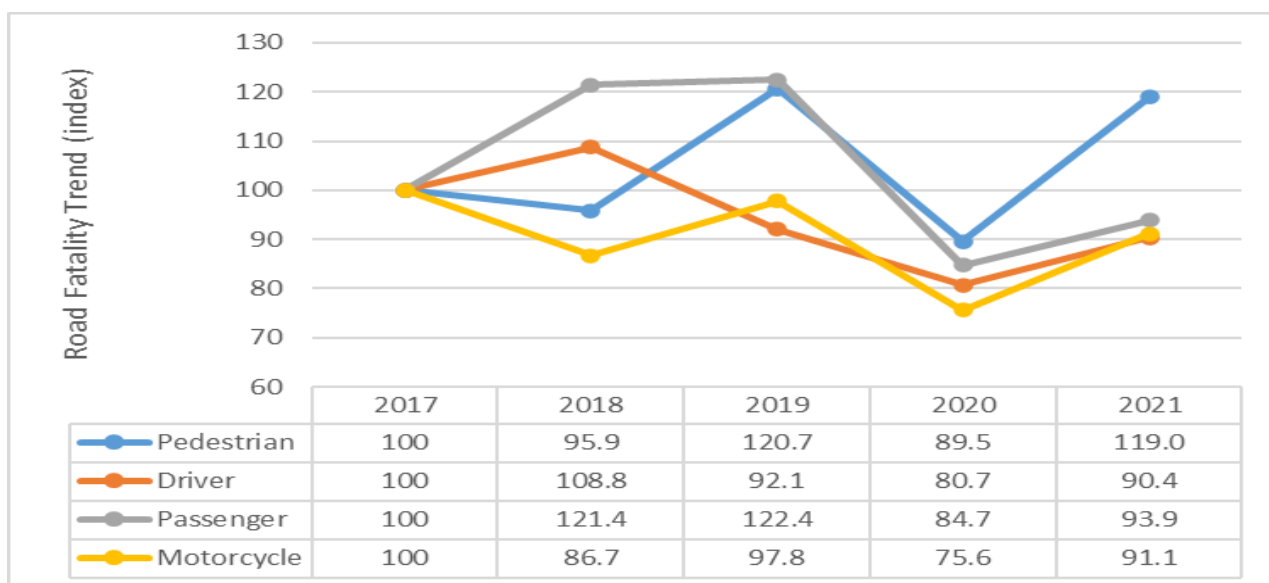
Source: RTMC Database

Figure 4: Fatalities per speed limit (km/h) in Cape Town (2017-2021)

3.4 Fatalities per Road User in Cape Town

Over 60% of fatal road safety victims over the 2017-2021 period are pedestrians. Some 15.5% of the fatalities are drivers, while another 14.8% of fatalities are passengers. Motorcycle victims account for almost 6% of all fatalities in Cape Town, between 2017 and 2021, while cyclists account for 1.4% in this period. Figure 5 reveals that the increase in fatalities is due to the statistically significant increase in pedestrian victims. Further investigation revealed that the increasing trend is also witnessed amongst the Cape Town youth (persons less than 18 years of age).

For all road users, fatalities in 2020 are reduced, due to Covid-19. Although e-commerce also increased in Cape Town during Covid-19, often provided by motorcycle users, there is, so far, no statistically significant increase in motorcycle user fatalities.



Source: RTMC Database

Figure 5: Fatalities per road user in Cape Town (2017-2021, Index, 2017=100)

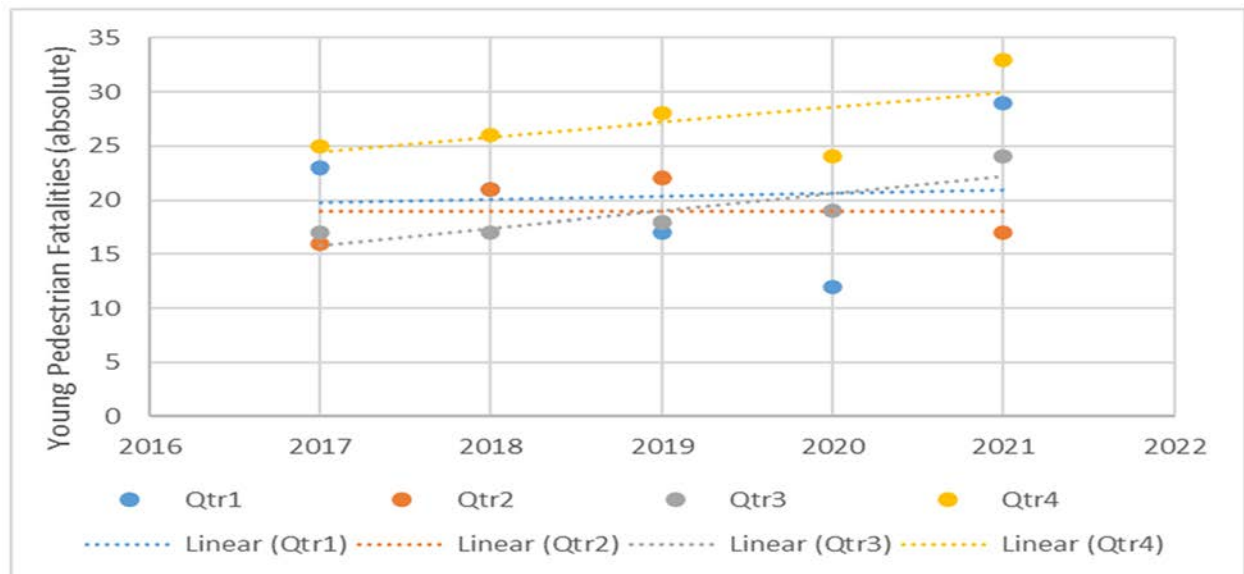
When analysing pedestrian fatalities per suburban area, the most significant increases are in Parow (+73%) and Khayelitsha (+40%), while Nyanga recorded a decrease (-14.3%) in pedestrian fatalities. There are some other areas in Cape Town that show statistically significant pedestrian fatality increases. These are (in alphabetical order): Bishop Lavis, Bonteheuwel, Brackenfell, Delft, Heideveld, Kuils River, Lenteguur, Manenberg, Mfuleni, Milnerton, Observatory, and Samora Machel.

3.5 Pedestrian Fatality Trends Amongst the Youth in Cape Town

It is very concerning to identify increasing fatality trends for pedestrians, the most vulnerable road users (see Section 3.4). As indicated, the increasing fatality trend also holds true for the Cape Town youth. Figure 6 reveals that increases happen in Quarters 3 and 4. This hints towards a seasonal impact. Quarter 3 represents dark and rainy winters in Cape Town, that are only over towards the latter part of Quarter 4, as scholars start their summer break.

Further investigation of the fatality trends revealed a statistically significant increase in young pedestrian fatalities on roads with a speed limit of 60 km/h and roads with a speed

limit of 120 km/h. Between 2017 and 2021, fatalities of minors (persons less than 18 years old) on high-speeds roads in Cape Town tripled.



Source: RTMC Database

Figure 6: Young pedestrian fatalities per calendar quarter in Cape Town (2017-2021)

Investigating the vehicle types that are mostly responsible for the fatalities of young pedestrians, it was found that bakkies, minibus taxis and sedans are the culprits.

3.6 Fatalities per Vehicle Type in Cape Town

Given the vast changes in mobility patterns, an analysis was conducted per vehicle type causing fatal road crashes. The analysis of the before and after Covid-19 period did not yield statistically significant differences. This is remarkable, as congestion levels in Cape Town, according to TomTom (2019 vs 2021 data) and South Africa according to Venter et al. (2020), are still lower than before the Covid-19 pandemic. Increased speeds could, therefore, have caused an increased fatality trend, but this is not the case, nor has the reduction in vehicles caused a decreasing trend.

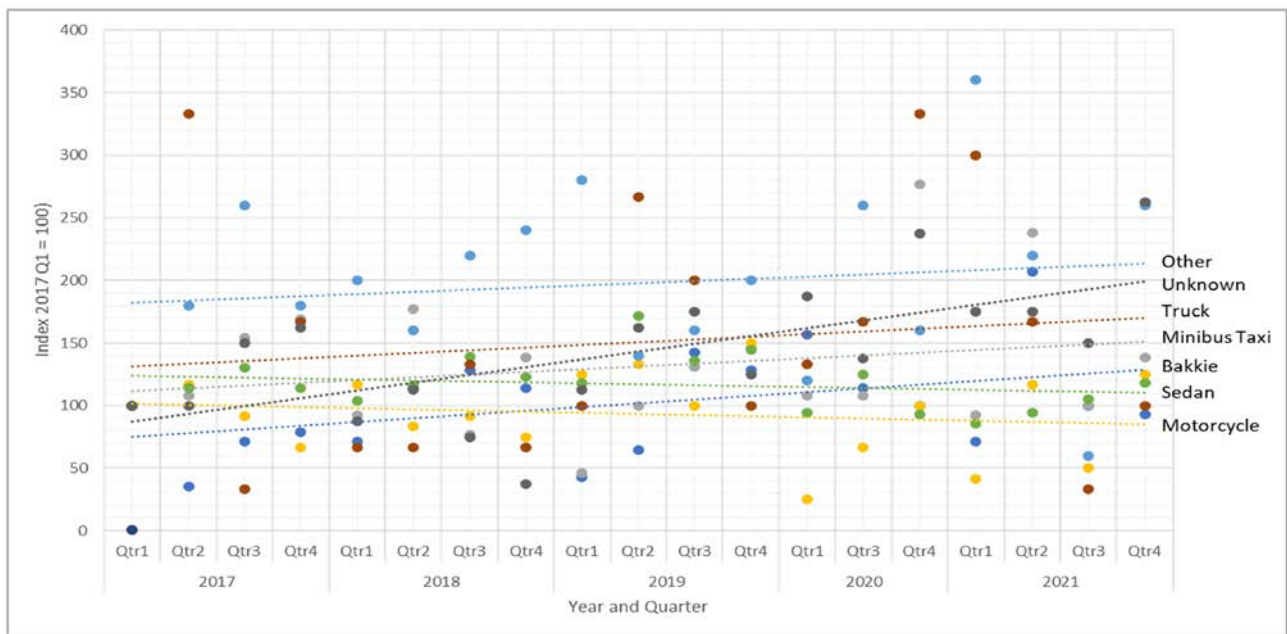
Figure 7 provides an overview of vehicle types involved in fatal crashes per quarter. The latter was done to create increased sensitivity to changes. Apart from sedans and motorcycles, all vehicle types show small increases in fatal crash involvement. It is interesting to witness the slightly negative trend i.e., reduction in fatalities, caused by motorcycles, as the use of these vehicles has increased, due to e-commerce.

The steepest increase is witnessed for unknown vehicle types. This is very problematic, as this provides no opportunity for the City of Cape Town to identify measure to combat road fatalities caused by these vehicles.

4. CONCLUSIONS AND RECOMMENDATIONS

Road safety continues to be a major challenge, globally and in South Africa. Although globally some cities show a decrease in fatalities due to changing mobility patterns, this is not the case in South Africa. South Africa has witnessed an increase in annual fatalities between 2019 and 2021, from 12 502 to 12 545 fatalities, which is a statistically significant

increase. During 2020, the year that lockdowns were implemented to reduce the spread of Covid-19, South Africa did see a reduction in road fatalities. Unfortunately, this trend was not sustained after Covid-19. A missed opportunity to combat the carnage on the country's roads.



Source: RTMC Database

Figure 7: Fatalities per vehicle type, per quarter, including trendlines in Cape Town (2017-2021, Index, 2017=100, excluding 2020-Qtr 2=Covid-19)

Road safety trends in Cape Town, the case study city analysed in this paper, are less clear. While there is a statistically significant reduction in fatalities between 2019 and 2021 from 609 to 538 fatalities, when comparing 2017/2018 (520/522) to 2021, there is a statistically significant increase in fatalities on the Mother City's roads. At this moment in time, it can only be hoped that the downwards trend between 2019 and 2021, which may have been initiated by the changes in mobility patterns, due to Covid-19, will be maintained in the future. As mentioned, according to the TomTom data, motorised mobility in the Mother City is approximately 10% less than immediately before Covid-19 lockdowns. The reduced motorised traffic can be an indication of road users replacing trips with, for example, e-working, or moving to non-motorised modes due to personal preference or economic necessity (South Africa is experiencing an economic downturn since the Covid-19 Lockdowns). Unfortunately, data on non-motorised transport volumes is not regularly collected by the City of Cape Town, so the author can only speculate that pedestrian volumes may have increased since Covid-19.

Within the City of Cape Town, the reduction in fatalities does not appear when looking at trendlines between 2017 and 2021. As mentioned, there is an increase between 2017/2018 and 2021. This increase in fatalities is in relation to pedestrian road users that make up over 60% of the overall fatalities in Cape Town during the period of investigation.

There are various areas that show significant increases in (pedestrian) fatalities. The two most concerning suburban areas are Parow and Khayelitsha. Given this finding, it is obvious where the City of Cape Town should initiate further investigations to improve road safety.

It is of major concern that the vulnerable road users, i.e., pedestrians, are still not protected sufficiently in Cape Town. Although Cape Town was well aware of global trends during Covid-19 to promote non-motorised transport and improve facilities for pedestrians and cyclists, and some discussions were held (which can be confirm as the author was involved in some of these talks), no improvements were implemented. The City of Cape Town, unfortunately, missed a great opportunity.

Regarding pedestrian fatalities, Parow showed an increase in fatalities of 73% and Khayelitsha 40% between 2017 and 2021. This while Nyanga recorded a decrease of 14.3% in the same period. The City of Cape Town should investigate the reasons for the statistically significant reduction in fatalities in Nyanga and assess if these successes can be repeated in Parow and Khayelitsha, amongst others.

Statistically significant increases in pedestrian fatalities amongst young Capetonians (<18 years) were recorded. These fatalities happen in urban areas and high-speed corridors, mostly during the dark month (July, August and September) of the year. Covid-19 has not changed the young pedestrian fatality trend significantly. To combat the risk to young people, more appropriate infrastructure is needed. The fatalities on high-speed roads, indicates that crossing facilities are still missing or under-performing. Given the season with increasing trends of young pedestrian fatalities, i.e., the dark and rainy month?? in Cape Town, their visibility also needs to be addressed. Street lighting and reflective clothing are two logical measures.

Covid-19 has increased e-commerce globally, in South Africa, as well as in Cape Town. It is remarkable to find that the motorcycles involved in fatal crashes have not increased. To the contrary, the trend is negative. Although this finding should be celebrated, it is recommended to unpack non-fatal road crash data to make sure the interpretation of this finding is warranted.

A final observation based on the analysis in this paper is the statistically significant increase in the number of road fatalities where the vehicle type is unknown. This undermines any analysis done related to vehicle type. It is recommended that the RTMC identifies ways to improve the data collection and, hence, any findings and recommendations drawn from the information. This will require buy-in from police stations, provinces and the staff at the RTMC.

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