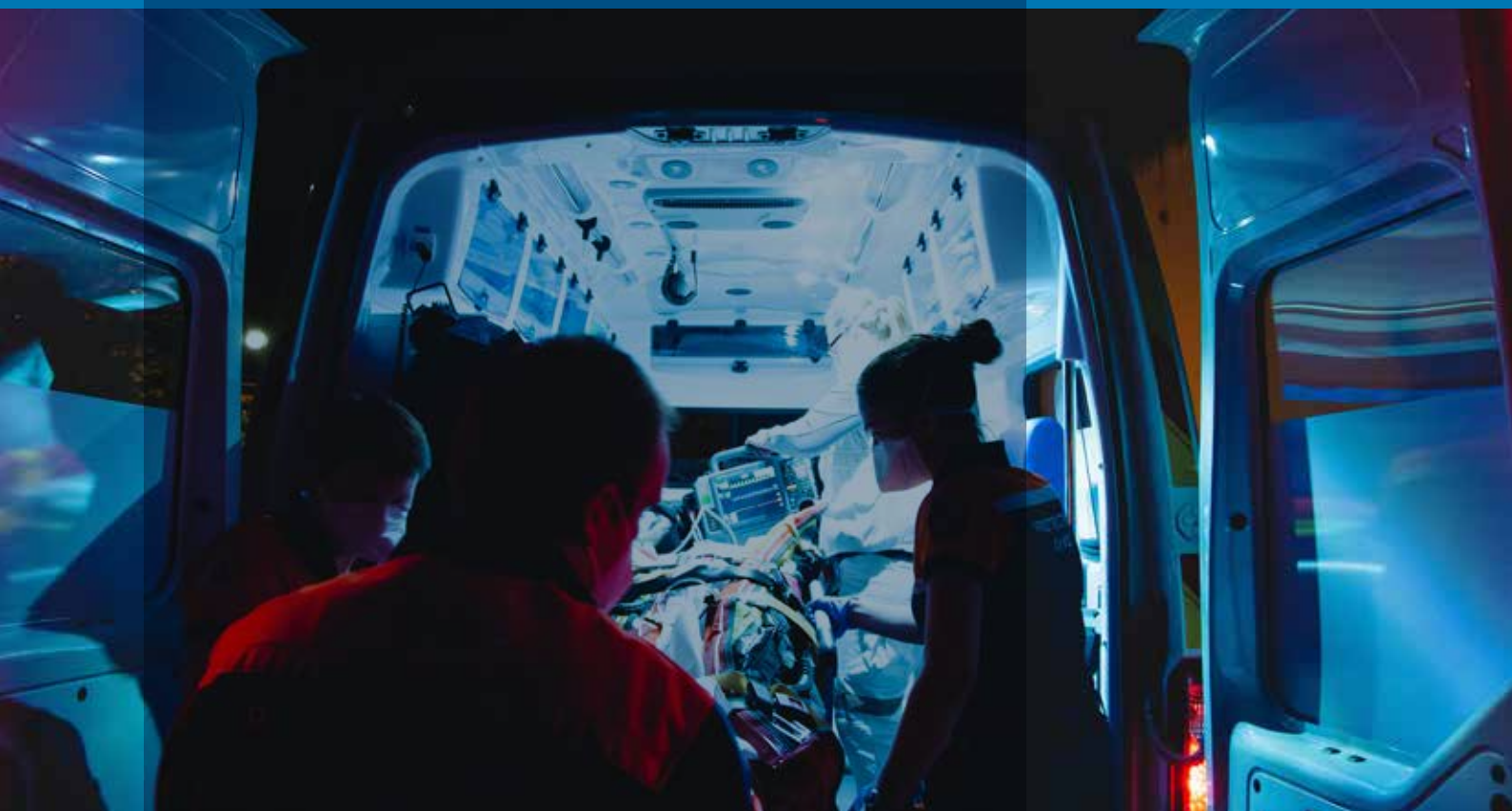


THE 3RD INJURY MORTALITY SURVEY:

A national study of injury mortality levels and causes in South Africa in 2020/21

Report prepared for the National and Provincial Departments of Health



**OCTOBER
2023**

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Burden of Disease Research Unit

In collaboration with Gender and Health Research Unit, Biostatistics Research Unit, Mental Health, Alcohol, Substance Use and Tobacco Research Unit South African Medical Research Council



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ISBN: 978-1-928340-76-8

SUGGESTED CITATION

Roomaney RA, Mhlongo S, Dekel B, Ketelo A, Martin L, Ntsele S, Mamashela T, Lombard C, Parry C, Jewkes R, Abrahams N, Matzopoulos R, Prinsloo M. The third Injury Mortality Survey: A national study of injury mortality levels and causes in South Africa in 2020/21. Cape Town: South African Medical Research Council.

ISBN: 978-1-928340-76-8.

ACKNOWLEDGEMENTS

We wish to thank the South African Medical Research Council and the Ford Foundation for their financial assistance towards this research.

We are grateful to the various provincial Forensic Pathology Services (FPS) for allowing us access to their facilities and assisting with fieldwork; the Provincial Health Research Committees for seeing the value in this work and granting us permission to access the facilities; the Western Cape Department of Health for allowing us to access the Provincial Injury Mortality Surveillance System data; and the letter of approval we received from the Director General of the National Health Department, Ms MP Matsoso.

We thank Mr Redlinghys (North West), Dr Xamlashe (Eastern Cape), Ms Banda (Northern Cape), Dr Khoali (Free State), Dr Morule, Prof. Vellema and Prof. Saayman (Gauteng), and Mr Madonsela (Mpumalanga) for providing approval to access mortuaries.

A sincere thank you to Mr Vismer for providing the Western Cape data, and Mr Galant who provided material for training purposes.

We are also grateful to Mr Fourie, Mr Louw and Mr Chauke for arranging practical training for the fieldworkers at the Pretoria FPS.

We wish to thank Geospace International (Pty) Ltd, in particular, Mr Francois Bezuidenhout the Geospace manager, and Mr Lucas Mokwena, the Director of Geospace and staff, who facilitated the appointment of fieldworkers, organized the mortuary data collection and conducted preliminary data cleaning.

A sincere thank you to Ms Ria Laubscher for the ad-hoc statistical consultation during the data analysis stage.

Thank you to Ms Stroud, who provided the administrative and logistical support for the training. We are also grateful to the fieldworkers assigned by Geospace for their diligence during training and following protocol during the fieldwork phase. Without their enthusiastic commitment, the survey would not have been possible.

Thank you to Mr Wisdom Basera for checking an early draft of the report. Finally, we are grateful to our external reviewers, Prof. Liesl Zühlke and Dr Colleen Saunders, for their insightful comments.

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The first Injury Mortality Survey (IMS) in South Africa aimed to capture the profile of non-natural deaths for 2009 (2009 IMS). The second IMS, conducted in 2017 (2017 IMS), is followed by this report, which presents findings from the third IMS for the 2020/21 period (2020/21 IMS).

KEY MESSAGES

- We conducted a study to present the profile of non-natural deaths in South Africa during 2020/21 (2020/21 IMS).
- Overall, the all-cause injury mortality rate appeared to decrease across the three surveys (2009 IMS, 2017 IMS and 2020/21 IMS); however the decrease in 2020/21 may be linked to the coronavirus disease (COVID-19) and related restrictions.
- Homicide rates remain unchanged between the 2017 IMS and 2020/21 IMS, although an increase in firearm homicide was noted compared to 2009 IMS.
- Transport-related mortality appears to be on a downward trend, as observed in the 2017 IMS. However, COVID-19 related curfews and alcohol restrictions likely played a role in the decrease observed in the 2020/21 period.

INTRODUCTION

Injuries contribute greatly to South Africa's quadruple disease burden which includes HIV/AIDS and TB, maternal and child mortality, non-communicable diseases, and injuries. The first nationally representative study of injury mortality in South Africa (2009 IMS) was essential in revealing the extent of underreporting and misclassified injury deaths, establishing the need for dedicated national surveys on injury-related deaths to monitor changes and to identify injury prevention priorities. With the onset of the COVID-19 pandemic and related restrictions, a decrease in non-natural deaths was observed in the country. Therefore, we aimed to describe the profile of non-natural deaths in South Africa during the COVID-19 period, considering injury mechanisms, age, sex and province.

AIM AND OBJECTIVES

This study aimed to establish the cause-specific incidence of fatal injury for 2020/21 within the context of the COVID-19 pandemic and related restrictions, including the five-level COVID-19 alert system (lockdown).

The specific objectives were to:

- describe the incidence of fatal injuries in South Africa by age, sex and cause during the COVID-19 pandemic and related lockdowns,
- compare the provincial injury mortality rates, and
- compare the findings of this survey to other relevant data sources.

METHODS

The study population included all persons who died of a non-natural cause (injury) during the period 1 April 2020 – 31 March 2021 and had a legally required post-mortem at a state mortuary within South Africa. We conducted a retrospective descriptive study, utilising routine data collected through the post-mortem investigation process at sampled mortuaries for eight of South Africa's nine provinces. These data were combined with complete caseload data from the Western Cape province's FPS surveillance system.

A multi-stage stratified cluster sample was drawn for the eight provinces, using mortuaries as the primary sampling unit (cluster). A sampling frame of 111 mortuaries was used to draw a representative sample that was stratified by mortuary size. Sixty-five mortuaries were selected for inclusion and supplemented by 16 from the Western Cape's FPS surveillance, providing a complete sample of 81 mortuaries. All non-natural deaths were included in small and medium mortuaries. At large mortuaries, all child (0 – 17 years) and adult female homicides were included, and every second case was selected for other deaths.

Fieldwork was conducted from 11 November 2021 to 9 March 2022. Analysis weights were calculated and the realised sample of 32 532 non-natural deaths was estimated to a weighted total of 52 221 non-natural deaths. Mortality rates were calculated for sex and age using 2020 population estimates for South Africa, and age-standardised rates were calculated using the direct method employing the World Health Organization (WHO) world standard population.

KEY FINDINGS:

- The number of non-natural deaths decreased when restrictive COVID-19 lockdown measures were implemented (i.e., alert level 5 and 4).
- The 2020/21 IMS estimated a national age-standardised injury mortality rate of 89.9 per 100 000 population (95% confidence interval CI: 84.4 - 95.1 per 100 000 population).
- The road traffic mortality rate was 17.4 per 100 000 population (95% CI: 16.0 – 18.8 per 100 000 population).
- Homicide rates were 37.0 per 100 000 population (95% CI: 34.3 – 39.7 per 100 000 population).
- The firearm homicide rate was 16.0 per 100 000 population (95% CI: 14.3 – 17.6 per 100 000 population).

Homicide

- Age-standardised homicide rates were highest in the Eastern Cape, Western Cape and KwaZulu-Natal provinces and lowest in Limpopo.
- Age-specific homicide rates were highest for those aged 15-29 and 30-44 years.
- Homicide rates among males were 6.8 times higher than those for females.
- 44.5% of male and 34.8% of female homicides were firearm related.
- The number of homicides appeared to be lower during COVID-19 Alert Level 5, Level 4 and Level 3 (early January 2021).

Road Traffic

- Road traffic mortality rates were highest in the Mpumalanga, Limpopo and Free State provinces, and lowest in KwaZulu-Natal and Gauteng.
- Road traffic mortality rates were highest among those aged 30-44 years.
- Overall, 23.6% of deaths occurred in motor vehicle drivers, 36.4% of male deaths were pedestrians & nearly half of female deaths were passengers.
- 55.8% of deaths occurred over weekends (Friday to Sunday).
- The number of road traffic deaths was lowest during COVID-19 alert level 5, level 4 and level 3 (early January 2021).

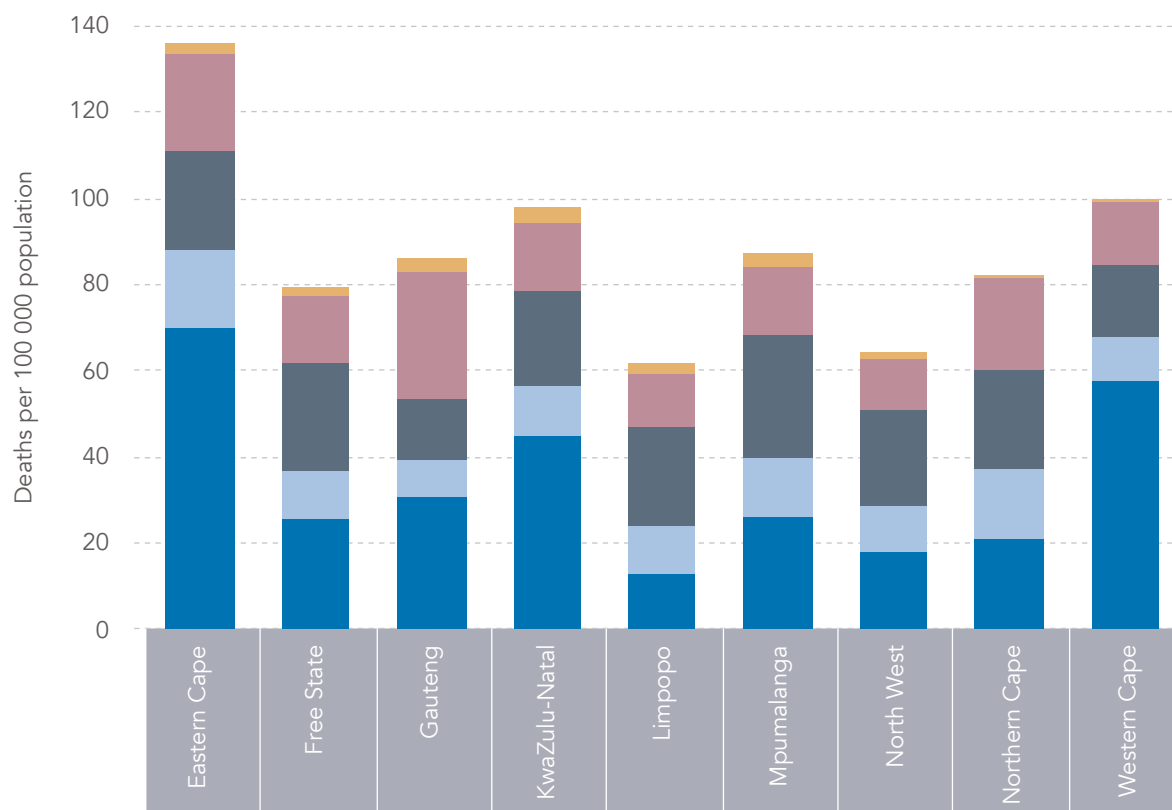
Suicide

- Suicide rates were highest in the Eastern Cape and Northern Cape provinces.
- Suicide rates were highest among females aged 15-19 years and males aged 25-29 years.
- Male suicide rates were 4.4 times higher than that of females.
- Hanging was the leading suicide mechanism for males and poison ingestion was the leading mechanism for females.
- Approximately one-third of suicide deaths occurred on a Sunday and Monday.
- The number of suicides was lowest during COVID-19 alert level 5.

Other unintentional deaths

- Rates of other unintentional deaths were highest in Gauteng and Eastern Cape provinces.
- The rates of other unintentional deaths were high in children under 5 years and adults older than 60 years.
- Overall, fires were the leading mechanism of other unintentional deaths, followed by surgical/medical and drowning or immersion.
- Male death rates for other unintentional deaths were 2.3 times higher than that of females.
- The number of other unintentional deaths was lowest during COVID-19 alert level 5.

AGE-STANDARDISED INJURY MORTALITY RATES PER PROVINCE, 2020/21 IMS



	Eastern Cape	Free State	Gauteng	KwaZulu-Natal	Limpopo	Mpumalanga	North West	Northern Cape	Western Cape
Undetermined	2,7	1,6	3,1	3,4	2,6	3,1	1,3	0,5	0,1
Other unintentional	22,2	16,0	29,0	15,4	12,5	15,3	12,1	21,2	14,5
Transport	23,0	24,6	14,3	21,8	22,5	28,8	21,9	22,7	16,8
Suicide	18,2	11,2	8,7	11,7	11,5	13,5	11,0	16,5	10,3
Homicide	69,4	25,5	30,5	44,8	12,5	25,9	17,6	20,7	57,2



BACKGROUND

1. BACKGROUND

Injuries, whether violence-related or unintentional, are responsible for the deaths of 4.4 million people globally, accounting for nearly 8% of all deaths.⁽¹⁾ The WHO has stated that poverty is known to increase the risk of injury and violence, with 90% of injury-related deaths occurring in low- and middle-income countries,⁽¹⁾ such as South Africa. Past studies have shown that injuries contribute significantly to South Africa's quadruple burden of disease.^(2, 3) South Africa has one of the highest proportions of deaths due to injury worldwide; it ranked 20th out of 231 countries in 2019.⁽⁴⁾ A study conducted by the South African Medical Research Council (SAMRC) showed that interpersonal violence ranked as the second highest modifiable risk factor responsible for the loss of disability-adjusted life years (DALYs) in South Africa in 2012.^(5, 6) Interpersonal violence accounted for approximately 1.8 million DALYs and 36 703 deaths in 2012.⁽⁵⁾ It was the second leading risk factor, responsible for 8.5% of the total DALY loss in South Africa in 2012.^(5, 6) Alcohol consumption is another important risk factor in South Africa and is frequently linked to violence.

In December 2019, the first cases of COVID-19 were detected in China.⁽⁷⁾ Following the spread of the disease, the WHO declared the outbreak a Public Health Emergency of International Concern on the 30th of January 2020 and later declared the outbreak a pandemic on the 11th of March 2020.⁽⁷⁾ The South African government responded promptly; ten days after the first detected case of COVID-19 in the country, on the 5th of March 2020, they declared a national state of disaster.⁽⁸⁾

Like many countries worldwide,⁽⁹⁾ the South African government implemented a range of policies and laws, with five distinct alert levels, to contain the spread of COVID-19.¹ These measures included stay-at-home orders, restrictions on national and provincial movement, and bans on the sale and distribution of alcohol. Alert levels were formulated by the government and generally indicated the stringency of the regulations for that period, with the harshest regulations at the most stringent alert level (level 5). However, in response to public scrutiny, the rules and regulations during certain alert levels were occasionally amended. South Africa, along with Uganda, was described as having implemented some of the strictest home confinement measures in sub-Saharan Africa.⁽¹⁰⁾

The profile, pattern, apparent manner of death,² and mechanism of injury deaths³ may have been directly and indirectly affected by the COVID-19 pandemic due to the extraordinary circumstances that the lockdown imposed on South African citizens. One study found that restrictions on the sale of alcohol resulted in reductions

1 The five-level COVID-19 alert system was commonly referred to as 'lockdown levels' in the local media

2 The term 'apparent manner of death' is used due to the Inquests Act of 1959 (amendment) which precludes pathologists from stating the intent or manner of death in suspected non-natural deaths. For 'apparent manner of death' categories (e.g., homicide, suicide, transport, other unintentional and undetermined deaths), International Classification of Disease version 10 (ICD-10) codes were used, and transport-related deaths were separated from other unintentional deaths for the purpose of this report.

3 The term 'mechanism of death' is used due to the Inquests Act of 1959 (amendment) which precludes pathologists from stating the intent or manner of death in suspected non-natural deaths. For the 'mechanism of death' categories (e.g., firearm, strangulation, sharp force, blunt force, etc), ICD-10 codes were used.

in non-natural deaths.⁽¹¹⁾ However, the study did not differentiate between the mechanisms of non-natural deaths⁴. This report aims to explore the impact of the COVID-19 pandemic and related restrictions on the profile of non-natural deaths by mechanism in South Africa.

As routine injury-related death monitoring in South Africa is not robust,⁽¹²⁾ it is imperative to conduct regular national surveys to monitor changes and to identify injury prevention priorities. Two previous IMS studies have been conducted and included a nationally representative sample of injury deaths for 2009 (13) and 2017. (14) These surveys demonstrated the utility of data collected from the post-mortem investigation process in describing the fatal injury profile. The results of these routine surveys have been instrumental in informing national burden of disease estimates. Since 2000, these estimates have been relied upon to monitor injury mortality trends nationally.^(2, 15-17)

This report additionally serves as a follow-up to the 2009 and 2017 IMS studies and follows a similar template to the preceding studies, with additional analyses on multiple injuries, legal intervention and sexual assault for homicide, as well as provincial injury mortality rates.

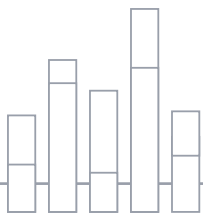
⁴ The terms 'injury-related deaths' and 'non-natural deaths' are used interchangeably throughout this report. Non-natural deaths include all deaths that are not due to or may not have been due to natural causes and in terms of the Inquests Act of 1959 (amendment) are subject to medico-legal investigation. Non-natural deaths can be grouped by mechanism of death (e.g., firearm, strangulation, sharp force, blunt force, etc) and apparent manner of death (e.g., homicide, suicide, transport, other unintentional and undetermined deaths).

AIMS AND OBJECTIVES

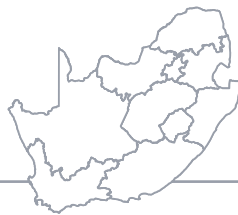
2. AIMS AND OBJECTIVES

This study aimed to establish the cause-specific incidence of fatal injury for the period 1 April 2020 – 31 March 2021.

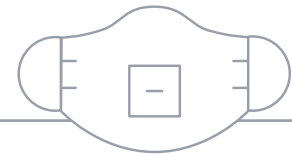
The specific objectives were to:



Describe the incidence of fatal injury in South Africa for 2020/21 by age, sex and cause



Compare the provincial injury mortality rates



Describe the injury mortality patterns during the COVID-19 lockdown (alert levels)



METHODS

3. METHODS

3.1. STUDY DESIGN

This was a retrospective, descriptive study that involved the examination of death registers and post-mortem folders of individuals who had non-natural deaths in South Africa during the period 1 April 2020 – 31 March 2021. The study includes a nationally representative sample of mortuaries in eight of the nine South African provinces, in addition to routinely captured data from the Western Cape province's FPS. This surveillance system maintains full coverage of medico-legal mortuaries in the province, and employs a coding system that was compatible with the current survey.

3.2. STUDY POPULATION

The study population consisted of all persons who died in a non-natural manner in South Africa between 1 April 2020 and 31 March 2021, and underwent a legally required post-mortem examination at a medico-legal mortuary. These mortuaries are maintained by the FPS within each provincial health department. A post-mortem examination or autopsy is performed for all non-natural deaths to determine the likely cause of death. Once completed, the pathologist fills out a death notification form, and the body is released for burial.(18)

Foetuses and deaths resulting from natural causes were excluded after capturing basic demographic information. The sampling frame included a list of all medico-legal mortuaries operating in South Africa between 1 April 2020 and 31 March 2021 for eight of the nine provinces. Full data for the Western Cape province was accessible through a routinely collected FPS electronic mortuary surveillance database.

3.3. SAMPLING

For all provinces (except the Western Cape), a multistage stratified cluster sample was drawn using mortuaries as the primary sampling unit (cluster). A sampling frame of 111 mortuaries (51 688 folders) across those eight provinces that were operating in South Africa in 2020/21 was used to draw a representative sample of mortuaries (Table 1).

The mortuaries were stratified by size before sampling. Mortuary size categorisation was established by the Gender and Health Research Unit for the sampling frame of the mortuary study on Female and Child Homicide (19, 20) which was based on the number of bodies recorded by each mortuary during the previous year. The categories were, small (up to 500 bodies), medium (501–1 500 bodies) and large (>1 500 bodies). A second level of sampling was applied according to the size of the mortuaries. For small and medium mortuaries, all records were included. In the large mortuaries, except for child (0 - 17 years) and adult female homicides, every second folder was selected. This resulted in 65 mortuaries being selected for inclusion for an expected sample of 27 828 records, obtained via a preliminary body count list from mortuaries.

Complete data for an additional 16 mortuaries (n = 6 958 records) in the Western Cape Province were sourced from the FPS electronic mortuary surveillance database. In total, 81 mortuaries were selected.

Table 1: Description of the sampling frame, and selected mortuaries and post-mortem folders by strata, province and mortuary size

Province	Sampling frame							
	Total Mortuaries (selected)				Post-mortem folders (expected)			
	Small	Medium	Large	Total	Small	Medium	Large	Total
Eastern Cape	11 (6)	5 (3)	1 (1)	17 (10)	4106 (2064)	3617 (2062)	1893 (947*)	9616 (5073)
Free State	9 (5)	2 (2)		11 (7)	1837 (559)	1554 (1554)		3391 (2113)
Gauteng	3 (2)	3 (2)	5 (3)	11 (7)	929 (651)	3766 (2441)	11783 (4144*)	16478 (7236)
KwaZulu -Natal	24 (13)	4 (2)	1 (1)	29 (16)	4083 (2901)	3482 (1814)	1448 (724*)	9013 (5439)
Limpopo	8 (4)	4 (2)		12 (6)	1707 (864)	2755 (981)		4462 (1845)
Mpumalanga	17 (9)	1 (1)		18 (10)	3271 (2015)	549 (549)		3820 (2564)
North West	5 (3)	2 (2)		7 (5)	1817 (973)	1448 (1448)		3265 (2421)
Northern Cape	5 (3)	1 (1)		6 (4)	1120 (634)	503 (503)		1623 (1137)
Total**	82 (45)	22 (15)	7 (5)	111 (65)*	18902 (10367)	17674 (11352)	15124 (5815)	51688 (27828)

*Expected from sub-sampling

** The total excludes the Western Cape province where data were sourced from the FPS electronic mortuary surveillance database for 16 mortuaries.

3.4. DATA COLLECTION

At each sampled mortuary, all cases were identified from the mortuary register or from the computer administration system where available. Data were collected for all cases that presented at the mortuary from 00:00 on 1 April 2020 to 23:59 on 31 March 2021 using a Tablet form data capture system, Kobotools (21).

The required data were collected as part of the routine post-mortem investigation procedure. The mortuary death register number, deceased identity number and death notification number (BI-1663) were collected as identifiers for case follow-up and quality control purposes (checking in the event of data capture errors). The primary source of the data was the post-mortem reports and ancillary documentation including police reports from the South African Police Services (SAPS) and hospital records in case folders.

The data captured included demographic information, province, date of death, manner and mechanisms of the injury death (i.e., firearms, sharp force, poison ingestion, burns, drowning, etc.). In addition, circumstances surrounding the death, for instance, whether the death occurred in custody and whether the death was work-related were captured. For homicide, information on whether multiple injuries were recorded, whether the death was related to a legal intervention (i.e., by police, security, etc.), and whether there was any evidence of sexual assault and pregnancy were captured. Where the homicide was related to a concealed pregnancy/abandoned, infant: the gestational age, body mass, body length and the place where the infant was abandoned

were recorded. Blood alcohol concentration (BAC) data were collected from the post-mortem folders or, if the result was not available in the file, requested directly from the laboratories at a later stage.

For the Western Cape province, complete data (n = 6 958 non-natural deaths from 16 mortuaries) were drawn from a mortuary-based surveillance system that is fully institutionalized within the province's FPS. This system provides routine injury mortality data that is compatible with the IMS coding for all mortuaries in the Western Cape.

Ethical approval was granted by the SAMRC to collect specific information about the deceased, which included their full name, surname and identity number. For all homicide cases, additional details collected including the SAPS Crime Administration System (CAS) number and police station where the death was reported.

3.5. APPOINTMENT OF GEOSPACE INTERNATIONAL (PTY) LTD FOR DATA COLLECTION

Geospace International (Pty) Ltd was first appointed to do data collection on 1 November 2019 via a Service Level Agreement with the SAMRC. All data were fully secured on the Kobotools platform before handover to the project team for further cleaning and analysis.

3.6. PILOT TESTING OF THE DIGITAL QUESTIONNAIRE

The questionnaire was an improvement on the routine instrument that had been developed and utilized for the 2009 survey.⁽²²⁾ The electronic data collection tool, data management and quality control software were tested by members of the project team, Geospace staff and fieldworkers. This testing phase allowed for the review and refinement of the questionnaire and training materials before they were used in fieldworker training.

3.7. FIELDWORK TRAINING

Training of fieldworkers was conducted by project members on the 8th and 9th of November 2021 at the SAMRC in Pretoria and the Pretoria FPS. Fieldworkers were trained on the purpose and importance of the study, sampling strategy, research ethics, post-mortem investigation procedures, the structure of post-mortem folders and the possibility of vicarious trauma from reviewing traumatic information. Further training included Kobotools digital data capture using tablets, the fieldworkers' roles and responsibilities in the field, the SAMRC project organisational structure, the logistics of the project, and the reporting structure within the project team. A practical exercise was incorporated into the training whereby the fieldworkers visited the Pretoria FPS and had access to post-mortem folders to digitally capture the required information. An operational manual was provided to each fieldworker, which included information on all topics discussed during the training.

3.8. FIELDWORK

Fieldwork took place from 11 November 2021 to 9 March 2022 across all of the 65 sampled mortuaries. Data collection temporarily ceased from the 14th of December 2021 to 9 January 2022 to allow for the festive season holiday break and because FPS facilities were busy during this same period.

Primary data collection excluded the Western Cape as the routinely collected FPS electronic mortuary surveillance database was used for this province.

3.9. DATA MANAGEMENT AND QUALITY CONTROL

Data checks were incorporated in the data-capture application, for example, consistency between the manner of death and cause of death, and accuracy of capturing the death registration number. Data captured by individual fieldworkers were uploaded to a central web-based dataset on the Kobotools platform.

Geospace staff members and SAMRC project team members conducted preliminary data quality checks throughout fieldwork and feedback was provided to the fieldwork team. SAMRC project team members continued with data cleaning on the final dataset in preparation for data analysis.

3.10. DATA CLEANING AND MERGING

3.10.1. UNDETERMINED CAUSE OF DEATH CLEANING

Due to the significant number of natural deaths that occurred during the COVID-19 period, our objective was to identify and remove any potentially misclassified natural cases from the 'undetermined cause of death' category. A rigorous examination of the 'undetermined cause of death' category was carried out to identify any natural cases that might have been inadvertently categorised as such.

This examination utilized available information, specifically other codes (e.g., 'natural environment/surgical misadventure') and circumstances of the undetermined injury, which were described using free text fields. In addition, the IMS 2020/21 dataset was merged with the Rapid Mortality Surveillance (RMS) dataset for the same period. The RMS dataset collates information on deaths in South Africa from the National Population Register by the Department of Home Affairs (23) and categorizes deaths as either natural, non-natural, under investigation or undetermined. All records that were classified as still be under investigation, or identified as natural cases within the IMS dataset, or classified as natural cases using the RMS dataset, were excluded from this analysis. In total, an additional 663 of the 2052 (weighted) undetermined cases were excluded.

3.10.2. BLOOD ALCOHOL CONCENTRATION DATA AND MERGE

We requested blood alcohol concentration (BAC) laboratory data from forensic laboratories for the relevant period. These samples were analysed using the Gas Chromatography with Flame Ionization Detection method. The BAC laboratory data for various locations were submitted in Microsoft Excel spreadsheets. Given the unstandardized ways in which the data were recorded, we subsequently performed data cleaning and attempted to standardize it using Microsoft Excel.

The collated BAC laboratory data was merged with the 2020/21 IMS dataset using the province, mortuary name, case number and seal number. A portion of the 2020/21 IMS data had information on the BAC laboratory results in the patient folder. The results of the BAC laboratory and the BAC patient folder were compared. Where these BAC values differed, the laboratory BAC was taken to be the gold standard. Due to the small number of linked BAC cases, the results of the BAC analysis are reported in Appendix IV.

3.11. ANALYSIS WEIGHTS

Analysis weights were applied to account for the selection probabilities of mortuaries within survey strata (mortuary size) and the sample realisation. Selection probabilities were based on the number of mortuaries randomly selected in each stratum of the total number of facilities.

Weight calculations were performed in Microsoft Excel using the formula:

$$\text{Weight} = \text{realisation weight (RW)} \times 1/\text{sampling fraction (SF)} \times 1/\text{primary sampling unit selection probability (PSUP)}$$

where:

RW = expected sample/realised sample for each mortuary

SF = 1/2 for mortuaries that had half their post-mortem folders surveyed

SF = 1 for mortuaries that had all their post-mortem folders surveyed

PSUP = number of mortuaries selected for stratum / total number of mortuaries in stratum

Post hoc re-adjustment weighting was done for KwaZulu-Natal province to account for the actual numbers observed and captured by the fieldworkers.

3.12. OVERVIEW OF EXPECTED AND REALIZED CASELOAD

During fieldwork, small discrepancies in the number of folders expected in each mortuary were found for 2020/21 in the 65 facilities that were visited. Overall, there were 29 282 cases, which is 1 454 (5.2%) more cases than expected (N = 27 828). Among the cases, 3 708 (12.7%) were concluded to have been natural deaths. The number of cases drawn, compared to the anticipated sample from each mortuary, is shown in Table 1 of Appendix I.

Information on the status of the record (whether found or not) was recorded if the death was non-natural. Of the 25 574 non-natural cases sampled, 1 578 (6.2%) had missing folders, 1 814 (7.1%) had missing post-mortem information within the folder and in 11 (0.04%) cases, the body was only stored at the mortuary. For the missing folder cases, it was assumed that the manner of death (i.e., whether homicide, suicide, transport-related, other unintentional or undetermined) was the same as indicated in the death register, but no detail on the mechanism of death (i.e., firearm, poison ingestion, pedestrian, burns, etc.) was available. The provincial distribution of the realized caseload is shown in Table 2 of Appendix I.

This report focuses on the 32 532 non-natural deaths, comprising the 25 574 non-natural deaths that were recorded during the fieldwork and the 6 958 non-natural deaths drawn from the Western Cape's database. This corresponds to an estimated total of 52 221 non-natural deaths when the sampling weights were applied.

3.13. DATA ANALYSIS

After cleaning the data and finalizing the weights, analysis was done using Stata version 17.(24)

By using standard methods for analysing survey data, national estimates for the proportion of deaths for overall homicide, road traffic deaths and other injury categories were computed. The analysed data took into account the survey design and the analysis weights of mortuaries.

Mortality rates were calculated by age and sex using the September 2020 population estimates for South Africa provided by Dorrington.(25) Age-standardised rates were calculated from age-specific mortality rates using the WHO world standard population. (26) When calculating age and sex standardised rates, missing age was redistributed by multiplying the age-standardised mortality (without accounting for missing age) with a scaling factor calculated by taking total injury cases/(total injury cases minus the total cases with unknown or missing age).

3.14. WEEKLY DEATHS BY COVID-19 ALERT LEVELS

To provide information on the number of deaths due to a specific cause of death by week, we overlaid the COVID-19 alert levels onto counts of the weekly cause of death data. Details regarding the dates and related regulations of each alert level were sourced from various references, including the South African Government website,(27-29) media articles (30) and a published paper on the surgical backlog caused by the lockdown alert levels.(31)

For our analysis, we defined a week as running from a Sunday to a Saturday. Since alert-level changes were often announced during the week, we categorized a week based on the alert level that prevailed for most of the days, specifically 5 or more days (more than 70% of the data) in that week. Similar strategies have been adopted in other papers to simplify the discrepancy in weeks and alert levels.(11) An example of the assumption is made in the week of 31 May - 6 June 2020. The country transitioned from alert level 4 to alert level 3 on a Monday (1 June 2020). Therefore this week is categorised as alert level 3 because most days in that week fell under alert level 3. The weekly deaths and alert levels are shown for each apparent manner of death category.

Table 2: Description of COVID-19 alert levels (01 January 2020 - 30 May 2021).

Date	Alert level	Summary of alert levels		
		Curfew	Alcohol restrictions	Restrictions
27 Mar – 30 Apr 2020.	Level 5	Every person confined to their home.	No alcohol sales permitted.	People confined to place of residence and only allowed outside for essential purposes.* Businesses and other entities ceased operations. No inter-provincial movement of people.* National borders closed*.
01 May – 31 May 2020.	Level 4	Night curfew.	No alcohol sales permitted.	People confined to place of residence from 21h00 until 04h00.* Closing times for places permitted to be in operation was 20h00. Exercise allowed 5km within radius of home. No inter-provincial movement of people.* All gatherings prohibited (except funerals, being at the workplace, obtaining goods or services). Partial re-opening of borders.
01 Jun – 12 Jul 2020.	Level 3	Night curfew.	Alcohol sales permitted with conditions.	People confined to place of residence from 22h00 until 04h00.* Take-away restaurants and online food delivery allowed. Closing times for establishments was 21h00 (including cinemas, theatres, casinos, museums, public swimming pools, beaches, public parks, zoos, restaurants, shebeens and taverns, religious gatherings, social and political gatherings). Night clubs remained closed to public. Inter-provincial travel permitted and partial re-opening of borders. Bus and taxi services may not carry more than 70% of licensed capacity for long distance travel (≥ 200 km) Schools re-opened. Sale of liquor for off-site consumption permitted 10h00 – 18h00 Monday to Thursdays. Sale of liquor for on-site consumption permitted until 20h00.
13 Jul – 17 Aug 2020.	Level 3 (modified)	Night curfew.	No alcohol sales permitted.	Sale of liquor prohibited.

Date	Alert level	Summary of alert levels		
		Curfew	Alcohol restrictions	Restrictions
18 Aug – 20 Sep 2020.	Level 2	Late night curfew.	Alcohol sales permitted with conditions.	Every person confined to place of residence from 23h00 until 04h00.* Closing times for establishments was 22h00 (including cinemas, theatres, casinos, museums, public swimming pools, beaches, public parks, zoos, restaurants, shebeens and taverns, religious gatherings, social and political gatherings). Inter-provincial travel permitted. Night clubs remain closed. Sale of liquor for off-site consumption permitted 10h00 – 18h00 Monday to Thursdays. Sale of liquor for on-site consumption permitted until 22h00.
21 Sep – 28 Dec 2020.	Level 1	Late night curfew.	Alcohol sales permitted with conditions.	Night clubs remain closed to public, Initiation practices and celebrations are permitted. Alcohol establishments that have licences to operate beyond 23h00 will revert back to full licence conditions.
29 Dec 2020 – 28 Feb 2021.	Level 3	Night curfew.	Alcohol sales permitted with conditions.	Beaches closed. Inter-provincial travel allowed. Partial re-opening of borders. Nightclubs remain closed.
1 Mar – 30 May 2021.	Level 1	Curfew lifted.	Subject to usual laws.	Partial re-opening of borders. Nightclubs remain closed.

* Allowed under certain circumstances specified by the South African Government.
Sources: SABC News
Chu et al. (2022)
South African Government
Coronavirus COVID-19 Alert level 1
Alert level 3 during Coronavirus COVID-19 lockdown

3.15. ETHICAL CONSIDERATIONS AND PERMISSIONS

Ethical approval for the study was obtained from the SAMRC's Health Research Ethics Committee. As study subjects were deceased and records were reviewed posthumously at mortuaries, informed consent was not necessary. However, the confidentiality of the deceased was ensured at all times, though the name, surname and identity number of the deceased were collected, these were stored in a separate database and only used in the follow-up study. The fieldworkers were trained in confidentiality protocols and on the importance and responsibilities of maintaining confidentiality. The fieldworker could not access the information captured after it was uploaded, and the data were stored behind the SAMRC firewall on a password-protected database.

Permission to undertake the study was sought from each Provincial Department of Health. Access to the mortuaries in each province was granted by the respective Provincial Health Research Committees, and forensic pathologists representing the different provinces were also notified of the study. The head of each mortuary was approached to arrange access to death registers and post-mortem reports at the sampled mortuaries, and the study commenced once all agreed.

RESULTS

4. RESULTS

4.1. MAIN FINDINGS

4.1.1. GEOGRAPHIC AND DEMOGRAPHIC CHARACTERISTICS

Table 3 and Figure 1 show the number and distribution of South Africa's non-natural deaths by province. Overall, the largest weighted proportion of non-natural deaths was recorded for Gauteng (26.0%) followed by KwaZulu-Natal (20.0%), while the Northern Cape had the lowest proportion of non-natural deaths (1.6%) in 2020/21 (Table 3).

Table 3: Non-natural deaths by province, South Africa, 01 April 2020- 31 March 2021

Province	Unweighted		Weighted	
	n	%	N	%
Eastern Cape	4 649	14.3	8 393	16.0
Free State	1 782	5.5	2 172	4.2
Gauteng	5 852	18.0	13 580	26.0
KwaZulu-Natal	6 685	20.6	10 467	20.0
Limpopo	1 642	5.1	3 284	6.3
Mpumalanga	2 358	7.3	4 010	7.7
North West	1 987	6.1	2 505	4.8
Northern Cape	619	1.9	853	1.6
Western Cape	6 958	21.4	6 958	13.0
Total	32 532	100.0	52 221	100.0

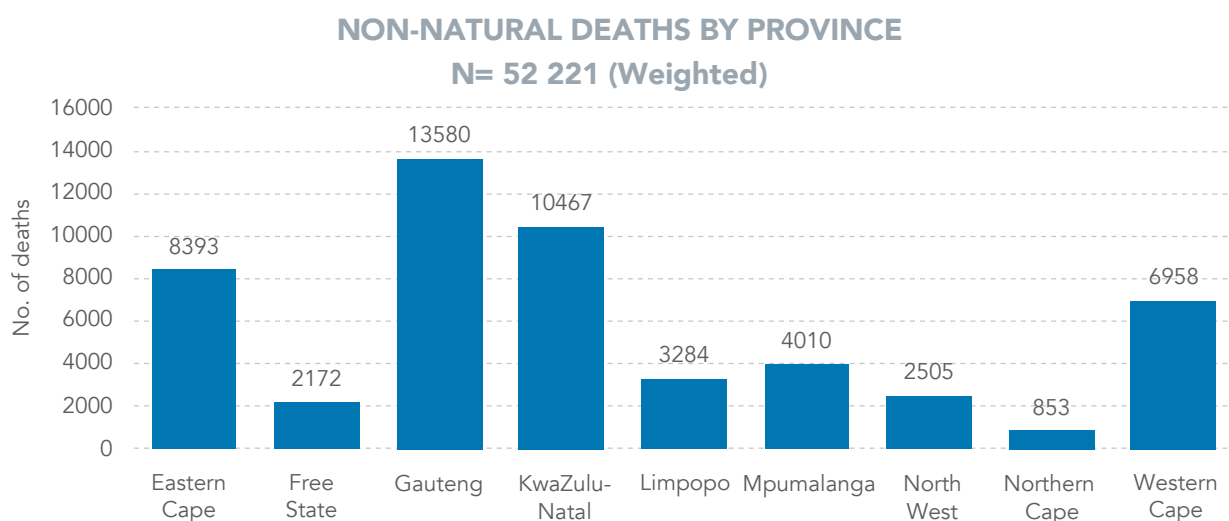


Figure 1: Distribution of non-natural deaths by province (weighted analysis), South Africa 1 April 2020 - 31 March 2021 (N = 52 221)

The age distribution, using 5-year age intervals, showed a skewed distribution towards adults with the mode age groups being 25-29 and 30-34 years. The twenty year age interval from 20 to 39 years represented 53% of all non-natural deaths (Table 4). The age-sex profile differed: more male than female non-natural deaths occurred for most age groups, except in those aged under 1 year and those older than 84 years. There were four male non-natural deaths for every female non-natural death.

Table 4: Age distribution of non-natural deaths by sex, South Africa, 01 April 2020 - 31 March 2021 (N = 52 221)

Age (years)	Sex (weighted)							
	Male		Female		Unknown sex		Total	
	n	%	n	%	n	%	n	%
<1	355	0.9	371	3.5	10	5.1	735	1.4
1-4	888	2.1	573	5.5	0	0.0	1 461	2.8
5-9	633	1.5	336	3.2	0	0.0	970	1.9
10-14	694	1.7	343	3.3	2	1.0	1 039	2.0
15-19	1 945	4.7	673	6.4	0	0.0	2 618	5.0
20-24	4 823	12.0	938	8.9	1	0.5	5 762	11.0
25-29	6 697	16.0	1 148	11.0	2	1.0	7 846	15.0
30-34	6 639	16.0	1 054	10.0	6	3.0	7 699	15.0
35-39	5 348	13.0	973	9.3	3	1.5	6 324	12.0
40-44	3 537	8.5	760	7.3	2	1.0	4 299	8.2
45-49	2 565	6.2	614	5.9	0	0.0	3 179	6.1
50-54	1 834	4.4	543	5.2	1	0.5	2 379	4.6
55-59	1 450	3.5	470	4.5	2	0.9	1 922	3.7
60-64	1 044	2.5	352	3.4	0	0.0	1 396	2.7
65-69	750	1.8	315	3.0	0	0.0	1 066	2.0
70-74	527	1.3	256	2.4	0	0.0	783	1.5
75-79	290	0.7	188	1.8	0	0.0	478	0.9
80-84	211	0.5	162	1.5	0	0.0	372	0.7
85+	99	0.2	186	1.8	0	0.0	285	0.6
Unknown	1 215	2.9	227	2.2	167	85.0	1 609	3.1
Total	41 543	100.0	10 482	100.0	196	100.0	52 221	100.0

4.1.2. APPARENT MANNER OF DEATH IN INITIAL MORTUARY REGISTER VS POST-MORTEM

The apparent manner of death in the mortuary register was compared to the apparent manner determined after the post-mortem investigation and differed marginally across all manners of death (Table 5). The weighted register numbers did not include the Western Cape deaths as these were supplied by the Western Cape FPS electronic mortuary surveillance database, and did not include the apparent manner of death as recorded in the register, before the post-mortem investigation.

Table 5: Apparent manner of death, mortuary register vs post-mortem

Apparent manner of death	Register (weighted*)		After post-mortem (weighted**)	
	n	%	n	%
Homicide	17 764	39.2	21 840	41.8
Suicide	5 886	13.0	6 662	12.8
Transport	10 342	22.8	11 554	22.1
Other unintentional	9 428	20.8	10 777	20.6
Undetermined	1 844	4.07	1 389	2.7
Total	45 263	100.0	52 221	100.0

*Western Cape deaths for the period are excluded as these were supplied by the Western Cape FPS database which did not include information from the registers.

** Weighted post-mortem numbers include Western Cape.

4.1.3. APPARENT MANNER OF DEATH, AFTER POST-MORTEM

The results to follow includes weighted estimates for all non-natural deaths, including the Western Cape data. Homicide (41.8%) and transport-related deaths (22.1%), were the leading apparent manners of non-natural death. This was followed by other unintentional deaths (20.6%) and suicide (12.8%) (Figure 2). For 2.7% of non-natural deaths, the apparent manner of death could not be determined. The apparent manner of death for each province is shown in Appendix II.

APPARENT MANNER OF DEATH N = 52 221 (Weighted)

■ Homicide ■ Suicide ■ Transport ■ Other unintentional ■ Undetermined

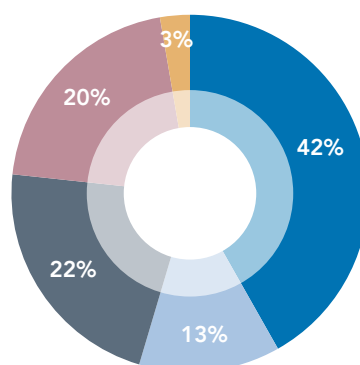


Figure 2: Apparent manner of death after a post-mortem (weighted analysis), South Africa, 1 April 2020 - 31 March 2021 (N = 52 221).

Table 6 shows that nearly 80.0% of non-natural deaths were male (M) and approximately 20.0% were female (F). The M:F ratio was highest for homicide, with 6.7 male deaths for every female death. This was followed by suicide (4,2:1), transport deaths (3,4:1), other unintentional deaths (2,1:1) and undetermined deaths (3,7:1).

Table 6: Sex distribution by apparent manner of death, South Africa, 01 April 2020 - 31 March 2021 (N = 52 221)

Sex	Apparent manner of death (weighted)											
	Homicide		Suicide		Transport		Other unintentional		Undetermined intent		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Male	19 002	87.0	5 366	80.6	8 938	77.4	7 252	67.3	986	71.0	41 543	79.6
Female	2 813	12.9	1 293	19.4	2 606	22.6	3 503	32.5	494	19.2	10 482	20.1
Unknown	24	11.2	3	0.0	11	0.1	22	0.2	155	9.8	196	0.4
Total	21 840	41.8	6 662	12.8	11 554	22.1	10 777	20.6	1 389	2.7	52 221	100.0

*Categories may not add up due to rounding of weighted numbers

4.1.4. WORK-RELATED INJURY DEATHS

Death due to work-related injuries was reported in 336 (0.9%) of the non-natural death post-mortem folders (Table 7). Of these, 49.4% (n = 166) were other unintentional deaths, 25.4% (n = 86) were transport-related deaths and 22.9% (n = 77) were homicide. As a result of the small number of work-related injury deaths recorded, these deaths were included in the analysis of each apparent manner of death and not reported elsewhere.

Table 7: Work-related injuries* by apparent manner of death, South Africa, 01 April 2020 - 31 March 2021

Manner of death (weighted)	Yes		No		Unknown		Total	
	n	%	n	%	n	%	n	%
Homicide	77	22.9	16 560	45.7	107	24.9	16 744	45.2
Transport	86	25.4	9 557	26.4	208	48.4	9 850	26.6
Other unintentional	166	49.4	8 993	24.8	87	20.2	9 246	25.0
Undetermined	8	2.3	11 35	3.1	28	6.5	1 171	3.2
Total	336	0.9	36 244	97.9	430	1.2	37 010	100.0

*Death as a result of injury, which has occurred while on duty at work. This was not specifically recorded in the Western Cape database.

**Categories may not add up due to rounding of weighted numbers

4.1.5. DEATH IN CUSTODY

Death in custody was reported in 199 (0.5%) of the non-natural death post-mortem folders (Table 8). Of these, 30.1% (n = 60) were suicide, 29.0% (n = 58) were homicides, 19.2% (n = 38) were other unintentional deaths and 19.8% (n = 39) were transport-related deaths.

Table 8: Death in custody* by apparent manner of death, South Africa, 01 April 2020 - 31 March 2021

Manner of death (weighted)	Yes		No		Unknown		Total	
	n	%	n	%	n	%	n	%
Homicide	58	29.0	16 667	39.2	19	43.0	16 744	39.1
Suicide	60	30.1	5 705	13.4	6	14.1	5 771	13.5
Transport	39	19.8	9 807	23.1	3	7.6	9 850	23.0
Other unintentional	38	19.2	9 204	21.6	7	15.2	9 249	21.6
Undetermined	4	1.9	1 158	2.7	9	20.2	1 171	2.7
Total	199	0.5	42 541	99.4	44	0.1	42 784	100.0

*Death in custody refers to those non-natural deaths that occurred in police or correctional services custody and were only captured if specifically stated in the post-mortem folder. This variable was not specifically recorded in the Western Cape database.

4.2. NATIONAL AND PROVINCIAL INJURY MORTALITY RATES

Age-specific and age-standardised injury mortality rates are summarised in Table 9. The national age-standardised mortality rate for all injury deaths was 89.9 per 100 000 population and the rate for males was four times higher than that for females (147.2 versus 35.4 per 100 000 population, respectively).

The age-specific all-injury mortality rate was highest in the 30–44-year age group, at 132.9 per 100 000 population. The mortality rate for children under 5 years of age (38.9 per 100 000 population) was almost double the rate of the 5–14-year age group (18.4 per 100 000 population).

The provincial age-standardised all-injury mortality rate (Table 10) was highest in the Eastern Cape (135.6 per 100 000 population), followed by the Western Cape (99.0 per 100 000 population), KwaZulu-Natal (97.1 per 100 000 population) and Mpumalanga (86.6 per 100 000 population).

4.2.1. NATIONAL AND PROVINCIAL HOMICIDE RATES

The national age-standardised homicide rate was 37.0 per 100 000 population (Table 9). When the age-specific rates for homicide were compared, the 30–44 year and 15–29 age groups were highest at 63.3 and 57.1 per 100 000 population respectively. The high rates for these age groups were largely driven by high number of homicides among males.

Overall, homicide rates were 6.9 times higher in males than in females (65.3 versus 9.5 per 100 000, respectively). The provincial age-standardised homicide rate (Table 10) was lowest in Limpopo (12.5 per 100 000 population) and highest in the Eastern Cape (69.4 per 100 000 population) and the Western Cape (57.2 per 100 000 population). The Western Cape had the highest rate of firearm homicide (31.1 per 100 000 population) (Table 10).

4.2.2. NATIONAL AND PROVINCIAL ROAD TRAFFIC MORTALITY RATES

The national age-standardised road traffic mortality rate was 17.4 per 100 000 population (Table 9). Road traffic mortality rates were generally higher from the age of 15 years and were highest in the 30–44-year age group at 27.5 per 100 000 population. The male road traffic mortality rate (27.8 per 100 000 population) was 3.6 times higher than that for females (7.7 per 100 000 population).

The provincial age-standardised road traffic mortality rate was lowest in Gauteng (12.9 per 100 000 population) and KwaZulu-Natal (15.5 per 100 000 population). It was highest in Mpumalanga (27.3 per 100 000 population), Limpopo (22.0 per 100 000 population) and Free State (21.2 per 100 000 population) (Table 10).

4.2.3. NATIONAL AND PROVINCIAL SUICIDE RATES

The national age-standardised suicide rate (Table 9) was 11.5 per 100 000 population and the suicide rate for males was 4.4 times higher than for females. The age-specific suicide rate was highest in the 15–44-year age group at 16.8 per 100 000 population.

The provincial age-standardised suicide rate (Table 10) was highest in the Eastern Cape (18.2 per 100 000 population) and the Northern Cape (16.5 per 100 000 population) – which had only 800 deaths, largely driven by suicides.

4.2.4. NATIONAL AND PROVINCIAL OTHER UNINTENTIONAL INJURY MORTALITY RATES

The national age-standardised mortality rate for other unintentional injuries was 19.1 per 100 000 population (Table 9). It was the leading manner of non-natural death for children under 5 years of age (27.0 per 100 000 population).

The provincial age-standardised mortality rate for other unintentional injury deaths (Table 10) was highest in Gauteng (29.0 per 100 000 population) and the Eastern Cape (22.2 per 100 000 population).

Table 9: National age-specific and age-standardised injury mortality rates* (per 100 000 population), South Africa 01 April 2020 - 31 March 2021

Cause of death	Age group (years)																		Total age-standardised rate								
	0-4		5-14		15-29		30-44		45-59		60-69		70-79		80+		M	F	P								
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F				P							
All injuries	43.7	33.7	38.9	24.2	12.6	18.4	183.8	38.0	111.2	223.8	40.7	132.9	158.5	37.4	93.0	133.4	36.7	77.8	139.9	49.0	84.6	155.9	77.4	101.4	147.2	35.4	89.9
Homicide	3.8	3.6	3.8	2.7	1.9	2.3	102.3	11.5	57.1	112.9	13.1	63.3	60.4	10.6	33.5	37.0	8.6	20.6	27.0	12.0	17.9	29.3	16.7	20.7	65.3	9.5	37.0
Firearm	0.3	0.4	0.3	1.0	0.4	0.7	40.9	3.9	22.5	55.3	5.0	30.3	32.2	4.6	17.3	17.9	4.4	10.1	11.5	2.9	6.3	3.5	2.0	2.5	29.1	3.3	16.0
Non-firearm	3.5	3.2	3.5	1.6	1.5	1.6	61.4	7.6	34.6	57.6	8.1	33.0	28.1	6.1	16.2	19.0	4.2	10.5	15.6	9.2	11.6	26.2	14.7	18.2	36.2	6.2	21.0
Transport	7.5	5.3	6.4	7.4	3.7	5.6	33.2	9.7	21.5	50.1	11.4	30.9	41.3	10.4	24.6	30.8	9.1	18.3	29.1	9.3	17.0	17.7	8.2	11.1	31.8	8.8	19.9
Road traffic	6.9	4.7	5.8	6.4	3.1	4.7	28.6	8.5	18.6	44.4	10.3	27.5	37.3	9.1	22.1	26.8	8.3	16.1	26.2	8.4	15.3	17.2	7.3	10.5	27.8	7.7	17.4
Other transport	0.5	0.5	0.5	1.1	0.6	0.8	4.5	1.1	2.8	5.7	1.1	3.4	4.1	1.3	2.6	4.1	0.8	2.2	2.9	0.9	1.7	0.5	0.9	0.8	4.1	1.1	2.5
Suicide	0.0	0.0	0.0	2.6	1.4	2.0	25.8	7.8	16.8	28.8	4.7	16.8	21.6	4.7	12.5	22.3	3.1	11.3	22.8	3.8	11.3	27.3	4.2	11.1	19.3	4.4	11.5
Other unintentional	30.6	23.3	27.0	11.1	5.3	8.3	20.3	8.3	14.3	28.0	10.6	19.3	30.7	11.1	20.1	39.8	15.1	25.6	54.3	22.4	34.9	77.2	46.7	56.2	27.1	11.8	19.1
Undetermined	1.9	1.6	1.8	0.3	0.2	0.3	2.3	0.8	1.5	4.1	1.0	2.6	4.6	0.6	2.4	3.6	0.8	2.0	6.7	1.5	3.6	4.2	1.6	2.5	3.7	0.9	2.4

*Rates sub-categories may not add up due to rounding. M= Male, F= Female, P= Persons.

Table 10: Age-standardised injury mortality rates* (per 100 000 population) by province, 01 April 2020 - 31 March 2021

Cause of death	Provinces																										
	Eastern Cape			Free State			Gauteng			KwaZulu-Natal			Limpopo			Mpumalanga			North West			Northern Cape			Western Cape		
	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P
All injuries	232.6	50.2	135.6	126.6	34.9	78.9	130.1	40.6	85.6	169.9	33.6	97.1	105.2	25.4	61.6	142.8	33.4	86.6	96.3	29.1	63.9	131.7	32.3	81.9	171.0	29.0	99.0
Homicide	126.7	18.4	69.4	43.9	8.3	25.5	51.2	8.9	30.5	84.4	10.5	44.8	22.1	4.4	12.5	45.6	6.9	25.9	27.6	6.5	17.6	36.1	6.0	20.7	105.6	9.4	57.2
Firearm	46.6	7.0	25.4	8.8	0.7	4.5	24.2	3.0	13.7	43.0	5.5	22.6	7.1	0.9	3.7	14.6	1.5	7.9	8.0	1.1	4.7	1.7	0.0	0.9	58.5	3.9	31.1
Non-firearm	80.1	11.4	43.9	35.3	7.6	20.8	27.1	6.1	16.8	41.4	5.4	22.3	15.0	3.5	8.8	30.9	5.5	18.0	19.7	5.5	12.9	34.4	6.0	19.9	47.1	5.5	26.2
Transport	35.6	12.2	23.0	37.6	13.0	24.6	23.3	5.2	14.3	36.6	9.0	21.8	37.6	10.0	22.5	48.4	10.7	28.8	32.7	10.5	21.9	35.9	10.4	22.7	26.0	8.1	16.8
Road traffic	31.1	10.6	20.1	32.1	11.5	21.2	21.1	4.6	12.9	26.0	6.5	15.5	36.6	9.9	22.0	45.5	10.4	27.3	28.7	9.4	19.3	29.6	9.1	18.9	25.5	7.9	16.5
Other transport	4.6	1.6	3.0	5.7	1.5	3.4	2.2	0.6	1.4	10.6	2.6	6.3	1.9	0.1	0.5	2.8	0.2	1.5	4.0	1.1	2.6	6.2	1.4	3.8	0.5	0.2	0.4
Suicide	32.0	6.4	18.2	17.0	6.0	11.2	14.0	3.6	8.7	20.3	4.2	11.7	21.6	3.3	11.5	22.9	5.3	13.5	17.5	4.1	11.0	27.4	6.2	16.5	17.1	3.9	10.3
Other unintentional	34.3	11.9	22.2	25.1	7.8	16.0	36.5	21.9	29.0	23.7	8.7	15.4	19.8	6.7	12.5	21.7	9.7	15.3	16.7	7.4	12.1	32.0	9.8	21.2	22.3	7.5	14.5
Undetermined	3.8	1.3	2.7	2.8	0.2	1.6	5.1	1.1	3.1	4.9	1.2	3.4	4.1	0.9	2.6	4.4	1.1	3.1	1.7	0.6	1.3	0.4	0.0	0.5	0.0	0.1	0.1

*Rates sub-categories may not add up due to rounding. M= Male, F= Female, P= Persons.

4.3. MECHANISM OF NON-NATURAL DEATHS FOR EACH APPARENT MANNER OF DEATH

The following section provides a more detailed profile of the non-natural deaths according to each apparent manner of death (homicide, suicide, transport, other unintentional injuries and injury deaths due to undetermined intent). In all cases, the weighted numbers have been applied to reflect the estimated total of 52 884 injury deaths occurring during the period of 01 April 2020 - 31 March 2021.

4.3.1. HOMICIDE

Of the estimated 21 840 homicides, 19 002 (87.0%) occurred among males (Table 11). A large proportion of homicides occurred among individuals aged of 20 and 39 years. Homicides were most prevalent in the 25–29-year age groups for both males and females, followed by a decline with advancing age (Figure 3 and Table 11). Approximately 2.1% of homicides targeted children under the age of 15. An estimated 2.6% (n = 559) of homicides occurred in people of unknown age. For less than 1.0% of homicides (n = 24), the sex of the deceased was unknown and was not included in Figure 3.

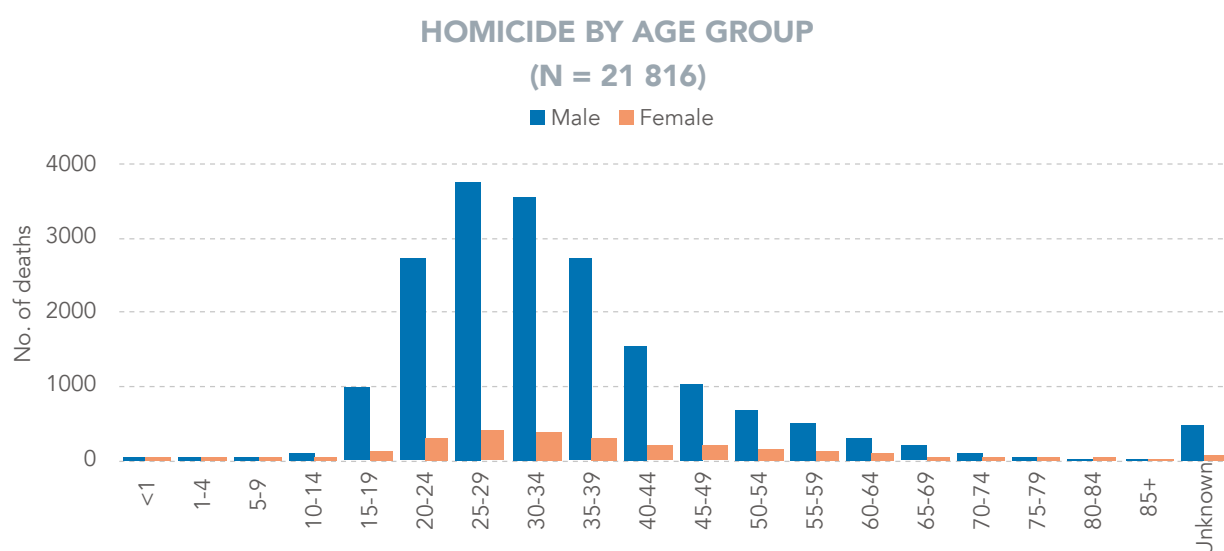


Figure 3: Distribution of homicides by age and sex, South Africa, 01 April 2020 - 31 March 2021 (N* = 21 816)

* The N in Fig. 3 excludes unknown sex (n = 24).

Table 11: Age distribution of homicide by sex, South Africa, 01 April 2020 - 31 March 2021

Age (years)	Homicide (weighted)							
	Male		Female		Unknown sex		Total	
	n	%	n	%	n	%	n	%
<1	59	0.3	58	2.1	7	28.7	123	0.6
1-4	49	0.3	43	1.5	0	0.0	91	0.4
5-9	54	0.3	48	1.7	0	0.0	102	0.5
10-14	93	0.5	55	2.0	0	0.0	149	0.7
15-19	989	5.2	135	4.8	0	0.0	1 124	5.1
20-24	2 734	14.4	298	10.6	0	0.0	3 032	14.0
25-29	3 771	19.8	402	14.3	0	0.0	4 174	19.0
30-34	3 572	18.8	376	13.4	3	12.3	3 950	18.0
35-39	2 727	14.3	311	11.0	2	8.2	3 040	14.0
40-44	1 533	8.1	208	7.4	2	8.2	1 743	8.0
45-49	1 044	5.5	191	6.8	0	0.0	1 235	5.7
50-54	681	3.6	141	5.0	1	4.1	823	3.8
55-59	503	2.7	129	4.6	0	0.0	632	2.9
60-64	295	1.6	98	3.5	0	0.0	393	1.8
65-69	202	1.1	58	2.1	0	0.0	260	1.2
70-74	103	0.5	63	2.3	0	0.0	166	0.8
75-79	55	0.3	46	1.6	0	0.0	101	0.5
80-84	38	0.2	39	1.4	0	0.0	77	0.4
85+	21	0.1	36	1.3	0	0.0	57	0.3
Unknown age	481	2.5	78	2.8	9	38.4	567	2.6
Total	19 002	100.0	2813	100.0	24	100.0	21 840	100.0

Overall, 43.2% (n = 9 438) of homicides were firearm related (Table 12). Firearm discharge was the leading mechanism of homicide for both males (44.5%) and females (34.8%). For males, this was followed by sharp force (28.4%) and blunt force (20.2%). This was similar for females, where sharp force (26.4%) was the second leading mechanism of homicide, followed by blunt force (19.4%). Strangulation deaths were higher among females (7.8%, n = 219) than males (0.8%, n = 145). Concealed pregnancies/abandoned infants accounted for 0.4% (n = 94) of the homicides. Less than 1.0% of homicides were due to legal intervention¹ (data not shown).

¹ Legal intervention includes deaths as a result of police or security intervention.

Table 12: Mechanism of homicide by sex, South Africa, 01 April 2020-31 March 2021

Mechanisms	Homicide (weighted)							
	Male		Female		Unknown sex		Total	
	n	%	n	%	n	%	n	%
Firearm discharge	8457	44.5	980	34.8	1	4.1	9438	43.2
Sharp force (cut / stabbed)	5395	28.4	741	26.4	3	12.3	6140	28.1
Blunt force (beaten with object, punched)	3841	20.2	545	19.4	1	4.1	4387	20.1
Strangled	145	0.8	219	7.8	0	0.0	364	1.7
Fire/other burn	146	0.8	61	2.2	0	0.0	208	1.0
Concealed pregnancy/abandoned foetus	47	0.2	43	1.5	3	12.3	94	0.4
Poison, ingestion	31	0.2	16	0.6	0	0.0	47	0.2
Asphyxiated/suffocated	20	0.1	24	0.8	0	0.0	43	0.2
Hanging	25	0.1	5	0.2	0	0.0	30	0.1
Drowning, immersion	9	0.0	3	0.1	0	0.0	12	0.1
Electrocution	4	0.0	0	0.0	0	0.0	4	0.0
Explosive blast	2	0.0	0	0.0	0	0.0	2	0.0
Poison, gassing	2	0.0	0	0.0	0	0.0	2	0.0
Pushed	2	0.0	0	0.0	0	0.0	2	0.0
Other	47	0.3	38	1.4	2	8.2	87	0.4
Missing folder	807	4.2	114	4.1	14	59.0	935	4.3
Unknown	23	0.1	23	0.8	0	0.0	46	0.2
Total	19002	100.0	2813	100.0	24	100.0	21840	100.0

Overall, for homicide, nearly a quarter of deaths (n = 5 130) occurred in Gauteng, followed by KwaZulu-Natal, and the Eastern Cape (Table 13). However, when referring to homicide rates and thereby taking population size into account, rates of homicide were highest in the Eastern Cape and Western Cape (69.4 per 100 000 population and 57.2 per 100 000 population, respectively) (Table 10).

Table 13 and Figure 4 show a comparison of firearm and non-firearm (i.e., sharp force, blunt force, strangled, etc.) homicide by province. More than 40% of deaths were due to firearms. KwaZulu-Natal had the highest proportion of firearm homicide (25.8%), followed by Gauteng (25.0%) and the Western Cape (23.5%). The Eastern Cape had high levels of non-firearm homicides compared to firearm homicides (Figure 4). When taking population size into account (Table 10), the highest rates of firearm homicide occurred in the Western Cape (31.1 per 100 000 population) and the Eastern Cape (25.4 per 100 000 population). Non-firearm homicide rates were highest in the Eastern Cape (43.9 per 100 000 population) and the Western Cape (26.2 per 100 000 population).

Table 13: Firearm and non-firearm homicide by province, South Africa, 01 April 2020-31 March 2021

Province	Homicide (weighted)					
	Firearm		Non-firearm		Total	
	n	%	n	%	n	%
Eastern Cape	1 556	16.5	2 725	22.0	4 281	19.6
Free State	120	1.3	586	4.7	707	3.2
Gauteng	2 363	25.0	2 768	22.3	5 130	23.5
KwaZulu Natal	2 432	25.8	2 443	19.7	4 875	22.3
Limpopo	186	2.0	472	3.8	658	3.0
Mpumalanga	367	3.9	847	6.8	1 214	5.6
North West	186	2.0	514	4.1	700	3.2
Northern Cape	9	0.1	201	1.6	210	1.0
Western Cape	2 220	23.5	1 847	14.9	4 067	18.6
Total	9 438	43.2	12 402	56.8	21 840	100.0

FIREARM AND NON-FIREARM HOMICIDE BY PROVINCE (N = 21 840)

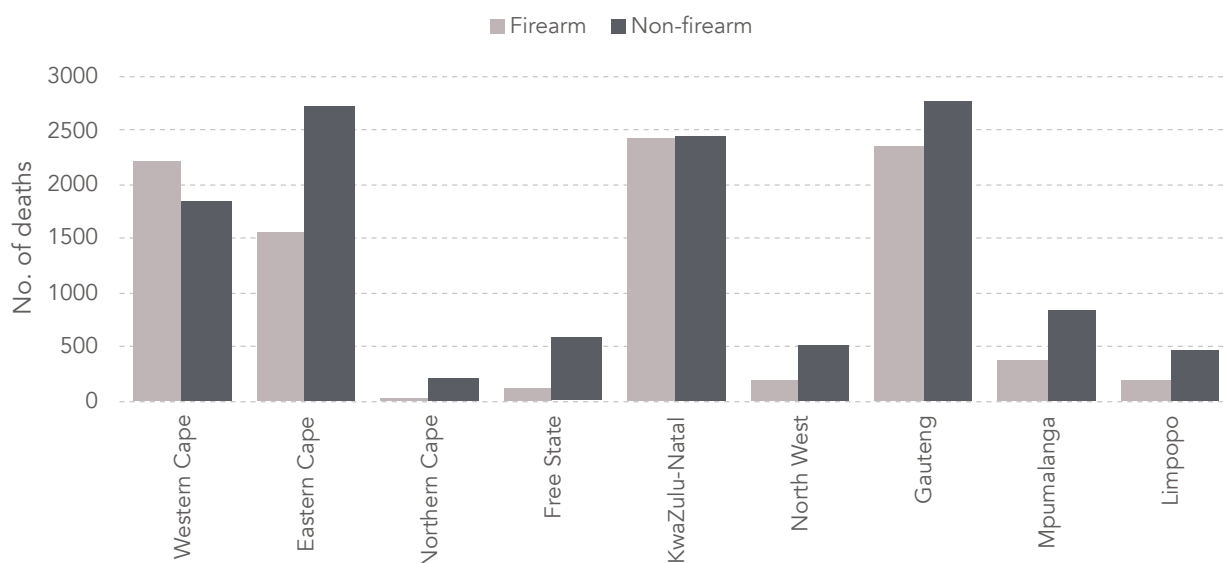


Figure 4: Firearm and non-firearm homicide by province, South Africa, 01 April 2020-31 March 2021. (N = 21 840)

Multiple types of injuries were noted for 16.0% of the 16 744 homicides for which this information was recorded (Table 14). This information was not specifically captured in the Western Cape database. An estimated 15.1% of males and 18.2% of females had multiple injuries. The Free State province had the highest proportion of multiple injuries (34.4%), followed by the Eastern Cape (29.3%).

Table 14: Multiple types of injuries for homicide by sex and province, South Africa, 01 April 2020 - 31 March 2021^a

Sex (weighted)	n	%
Male (n = 14 424)	2 172	15.1
Female (n = 2 319)	422	18.2
Province (weighted)		
Eastern Cape (n = 4 233)	1 239	29.3
Northern Cape (n = 183)	18	9.7
Free State (n = 655)	225	34.4
KwaZulu-Natal (n = 4 403)	202	4.6
North West (n = 673)	92	13.7
Gauteng (n = 4 776)	645	13.5
Mpumalanga (n = 1 175)	85	7.2
Limpopo (n = 646)	88	13.6
Total (n = 16 744)	2 594	15.5

^a This is when the pathologist would indicate more than one circumstance of injury, i.e. blunt force and stabbing.

*The Western Cape database did not include this as a specific variable for capture, hence excluded

A sexual assault kit was used during the post-mortem, for 632 (3.1%) of the 20 699 homicides where the information was recorded (Table 15). This was done for 13.2% of female homicides and less than 2.0% of male homicides.

Table 15: Sexual assault kit used, South Africa, 01 April 2020-31 March 2021

Sex (weighted)	n	%	Total*
Male	290	1.6	18 100
Female	342	13.2	2 592
Unknown sex	0	0.0	7
Total	632	3.1	20 699

Figure 5 shows the number of homicides that occurred per week, and according to COVID-19 alert levels. The number of homicides were lower during alert level 5 and level 4; when movement outside the home was severely restricted, and alcohol was banned. There was a spike in homicides when movement restrictions were relaxed, and alcohol sales was partially re-instated (first week of June 2020). There was another spike in the number of homicides towards the end of year festive period (the week of 20 – 26 December 2020).

NUMBER OF HOMICIDES PER WEEK AND COVID-19 ALERT LEVELS (N = 21 748)

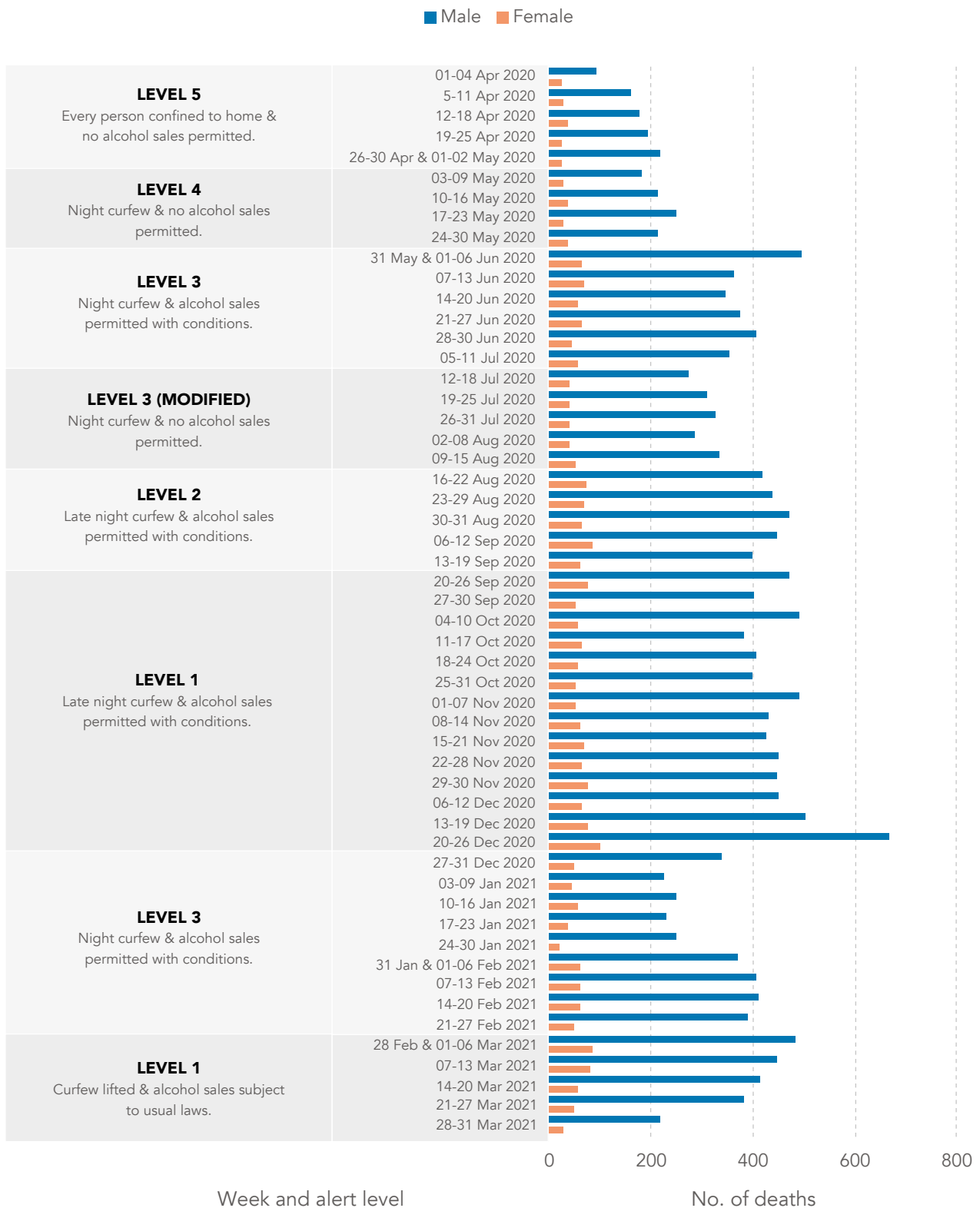


Figure 5: Distribution of homicide by month and sex with COVID-19 alert levels South Africa 01 April 2020 - 31 March 2021 (N=21 748). Excludes people of unknown sex and those missing date of death information (n = 92).

Figure 6 indicates that homicide deaths were highest on Saturdays for females (19.4%) and Sundays for males (19.5%). Nearly 52% of the homicides occurred over the weekend (Friday to Sunday).

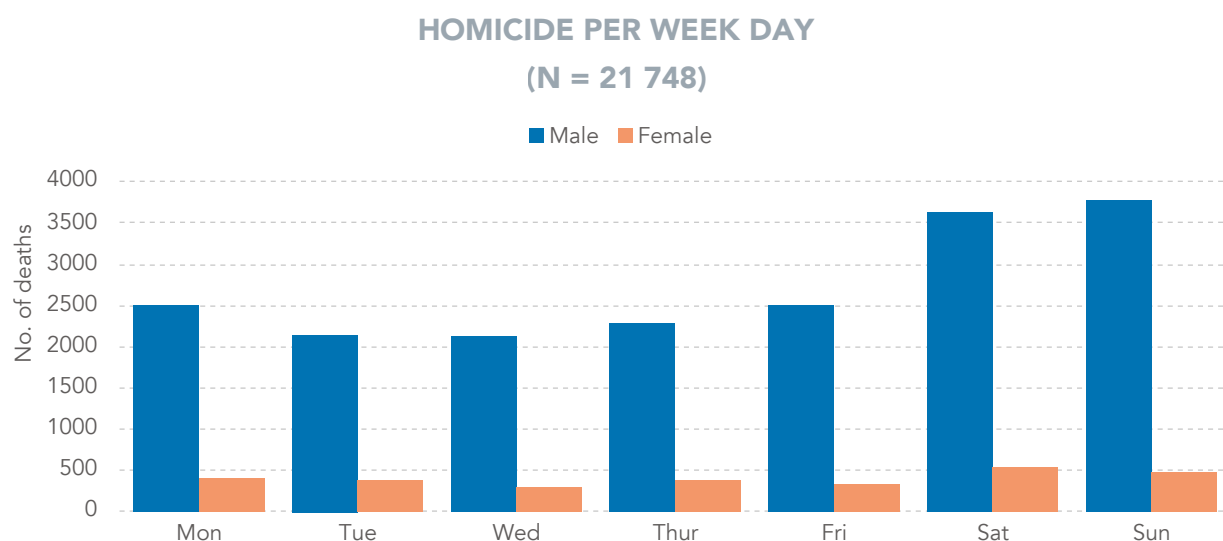


Figure 6: Distribution of homicide by week and sex, South Africa 2017 (N = 21 748). Excludes people of unknown sex and those missing date of death information (n = 92).

4.3.2. SUICIDE

Of the estimated 6 662 suicides, 80.5% (n = 5 366) were male (Table 16). Figure 7 and Table 16 show that suicides were highest among those individuals aged between 25 and 29 years (15.1%), followed by the 30–34-year age group (14.4%). For females, suicide were highest at the younger ages of between 15 and 29 years, and for males between 20 and 39 years. Overall, more than half (54.1%) of all suicides occurred between the ages of 20 and 39 years.

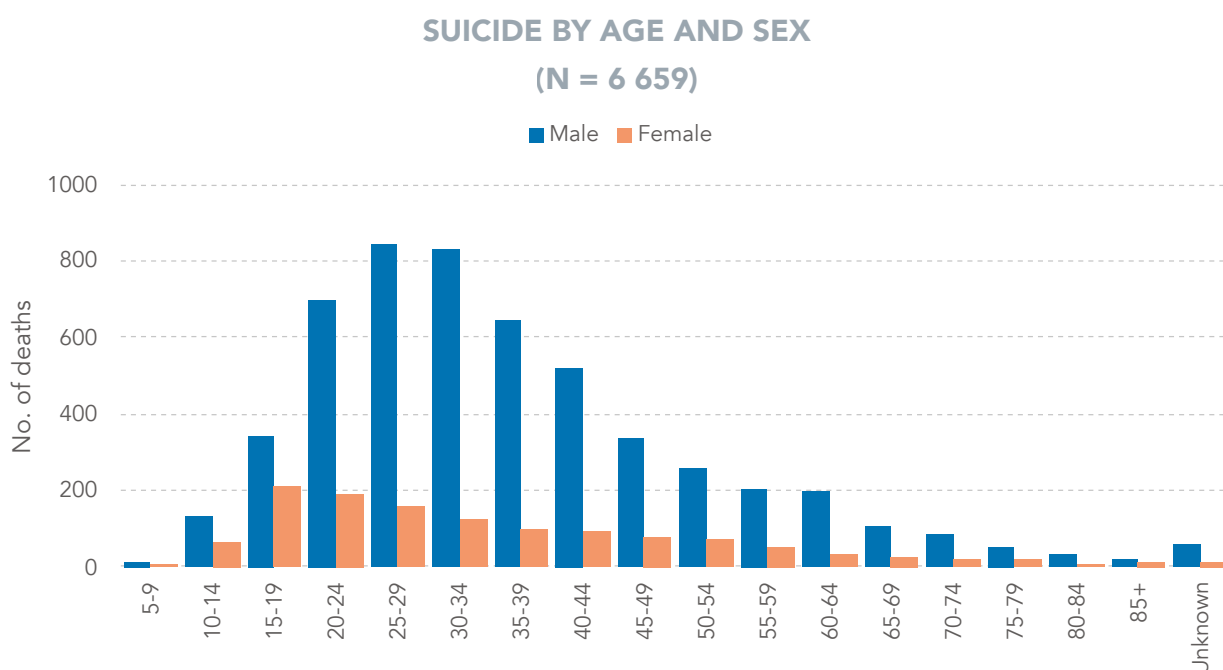


Figure 7: Distribution of suicide by age and sex, South Africa 01 April 2020 - 31 March 2021 (N = 6 659). Note: Unknown sex is excluded from the total in the figure (n = 3).

Table 16: Age distribution of suicide by sex, 01 April 2020 - 31 March 2021

Age	Suicide (weighted)							
	Male		Female		Unknown sex		Total	
	n	%	n	%	n	%	n	%
5-9	13	0.2	9	0.7	0	0	22	0.3
10-14	131	2.4	67	5.2	0	0	198	3.0
15-19	344	6.4	213	16.5	0	0	557	8.4
20-24	701	13.1	190	14.7	0	0	891	13.4
25-29	842	15.7	161	12.5	1	35.0	1 005	15.1
30-34	831	15.5	127	9.8	0	0	957	14.4
35-39	643	12.0	101	7.8	0	0	744	11.2
40-44	522	9.7	95	7.3	0	0	617	9.3
45-49	338	6.3	79	6.1	0	0	418	6.3
50-54	257	4.8	75	5.8	0	0	332	5.0
55-59	201	3.8	51	3.9	0	0	252	3.8
60-64	196	3.7	31	2.4	0	0	227	3.4
65-69	104	1.9	25	2.0	0	0	129	1.9
70-74	83	1.6	18	1.4	0	0	102	1.5
75-79	50	0.9	16	1.3	0	0	66	1.0
80-84	35	0.6	8	0.6	0	0	43	0.6
85+	19	0.4	11	0.8	0	0	29	0.4
Unknown age	57	1.1	16	1.2	2	65.0	74	1.1
Total	5 366	100.0	1 293	100.0	3	100	6 662	100

Table 17 shows that hanging was the leading mechanism of suicide for males (76.2%, n = 4 087) while poison ingestion was the leading suicide mechanism for females (46.0%, n = 595).

Table 17: Mechanism of suicide by sex, South Africa 01 April 2020-31 March 2021

Mechanisms	Suicide (weighted)							
	Male		Female		Unknown sex		Total	
	n	%	n	%	n	%	n	%
Hanging	4087	76.2	548	42.4	2	65.5	4636	70.0
Poison, ingestion	665	12.4	595	46.0	1	34.5	1261	19.0
Firearm discharge	320	6.0	53	4.1	0	0.0	373	5.6
Sharp force (cut/slit)	44	0.8	11	0.9	0	0.0	55	0.8
Jumped from height	40	0.7	7	0.6	0	0.0	47	0.7
Poison, gassing	32	0.6	12	0.9	0	0.0	45	0.7
Fire/other burn	15	0.3	10	0.8	0	0.0	24	0.4
Drowning	5	0.1	2	0.1	0	0.0	7	0.1
Asphyxia	2	0.0	3	0.2	0	0.0	5	0.1
Electrocution	3	0.1	0	0.0	0	0.0	3	0.0
Other	25	0.5	5	0.4	0	0.0	30	0.5
Unknown	0	0.0	2	0.1	0	0.0	2	0.0
Unknown (record missing)	126	2.3	46	3.6	0	0.0	172	2.6
Total	5363	100.0	1293	100.0	2.9	100.0	6659*	100.0

* Total excludes three cases that had missing information on the mechanism of suicide.

Figure 8 shows the weekly number of suicides by COVID-19 alert level. Lower numbers of suicide were observed during alert levels 4 and 5. The week with the highest number of suicides was the 20 – 26 December 2020. Figure 9 shows that the number of suicide deaths were higher on a Monday (15.6%, n = 1 037) and Sunday (15.2%, n = 1 013).

SUICIDE BY WEEK AND COVID-19 ALERT LEVELS

(N = 6 649)

■ Male ■ Female

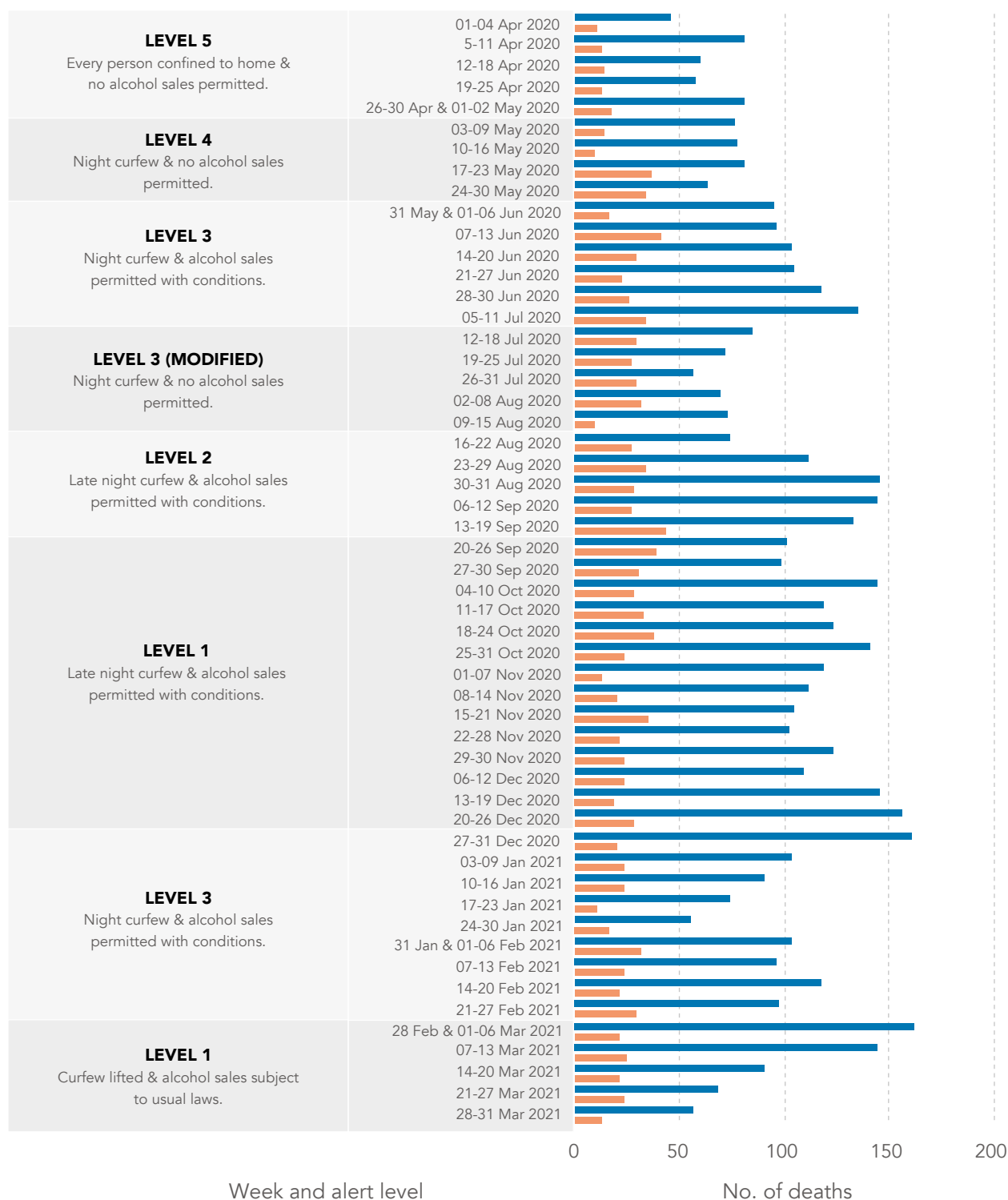


Figure 8: Distribution of suicide by month and lockdown level, South Africa, 01 April 2020 - 31 March 2021 (N = 6 649). Excludes people of unknown sex and those missing date of death information (n = 13).

SUICIDE PER WEEK DAY (N = 6 649)

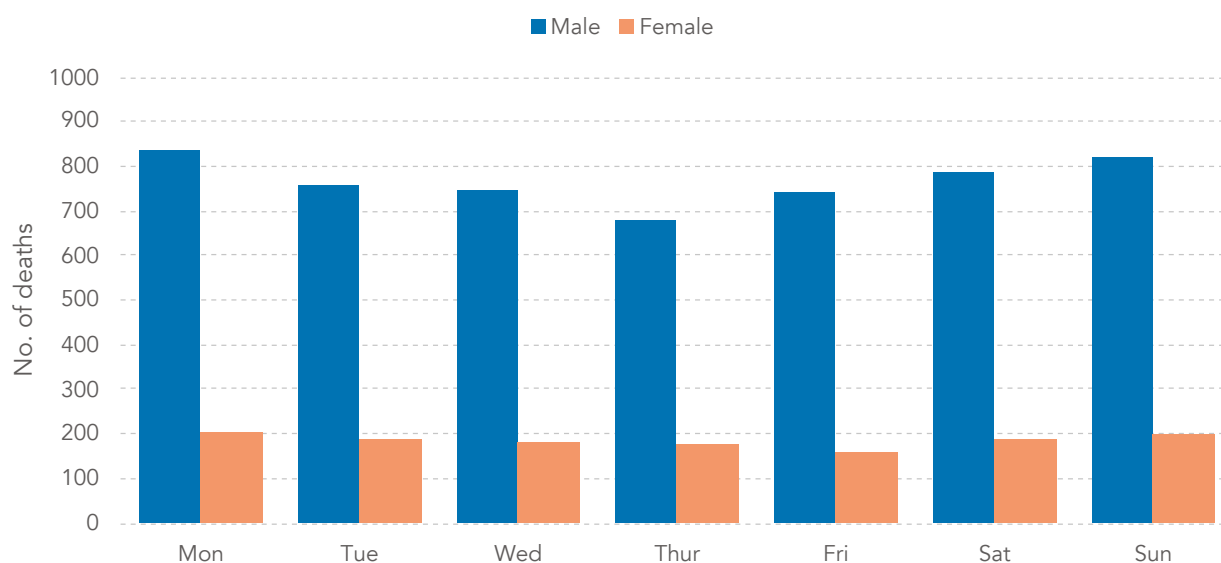


Figure 9: Distribution of suicide by week and sex, South Africa, 01 April 2020 - 31 March 2021 (N = 6 649). Excludes people of unknown sex and those missing date of death information (n = 13).

4.3.3. TRANSPORT DEATHS

Transport deaths constituted the second largest category of injury mortality after homicide and accounted for 22.9% of injury-related deaths. Road traffic injuries are an important sub-set (see Table 18) of transport injuries, accounting for 87.9% of all transport deaths. As they are often described independently of other transport injuries, this section provides separate tabulations and figures for road traffic injuries alongside those for all transport deaths including road, rail, water- and air-travel deaths.

The leading category of male transport deaths occurred among pedestrians (36.4%), but for females, passenger deaths were the leading category of transport deaths (46.4%) (Table 18). The category of road traffic deaths was unspecified for 6.7% motor vehicle cases and 0.7% motorcycle cases. The folder was missing for 37.6% of all transport deaths, hence the percentage of missing folder information was noted under the "other transport" category.

Table 18: Mechanism of road traffic and other transport deaths by sex, South Africa 01 April 2020 - 31 March 2021

Mechanisms	All transport (Weighted)							
	Male		Female		Unknown sex		Total	
	n	%	n	%	n	%	n	%
Road traffic injuries:	7 839	77.1	2 318	22.8	5	0.0	10 162	87.9
Motor vehicle pedestrian	2 854	36.4	853	36.8	0	0.0	3 708	36.5
Motor vehicle passenger	1 921	24.5	1 077	46.4	2	41.2	3 000	29.5
Motor vehicle driver	2 183	27.9	211	9.1	2	38.1	2 396	23.6
Motor vehicle unspecified	525	6.7	156	6.8	1	20.6	682	6.7
Motor cycle driver	165	2.1	9	0.4	0	0.0	175	1.7
Motor cycle passenger	2	0.0	2	0.1	0	0.0	4	0.0
Motor cycle unspecified	64	1.0	6	0.2	0	0.0	70	0.7
Bicycle	124	1.6	4	0.2	0	0.0	128	1.3
Other transport injuries:	1 099	78.9	288	20.7	6	0.0	1 393	12.1
Rail pedestrian	38	3.5	6	2.2	0	0.0	45	3.2
Rail passenger	2	0.2	0	0	0	0.0	2	0.1
Rail driver	2	0.2	0	0	0	0.0	2	0.1
Rail unspecified	11	1.0	1	0.3	0	0.0	12	0.9
Aviation casualty	17	1.6	0	0	0	0.0	17	1.2
Other	82	7.4	6	2.2	0	0.0	88	6.3
Missing folder	416	37.9	102	35.5	6	100.0	52	37.6
Unknown	530	48.3	173	59.9	0	0.0	703	50.5
Total	8 938	77.4	2 606	22.6	11	0.0	11 554	100.0

Note: Road traffic includes -bakkie, bicycle, car, motorcycle, taxi/bus, truck, other (hit by a tyre from a moving trailer & ambulance) & unspecified vehicle. Other transport injuries include aircraft, tractor, train, watercraft & other (donkey cart, excavator & forklift).

For both road traffic and other transport injuries, most deaths were among males (77.1% and 78.9% respectively). For road traffic injuries, 51% of deaths were recorded among those between 20 and 39 years of age (Figure 10 and Table 19). Approximately 11% (n = 1 070) of road traffic deaths occurred among children under the age of 18 years old. Other transport deaths were highest between 25–34 years for both males and females (Figure 11). For all transport deaths, the M:F ratio was highest in the 25–29 years age category at 5:1. Similar to road traffic deaths, among other transport deaths, 10% (n = 144) occurred among children under 18 years of age.

ROAD TRAFFIC DEATHS BY AGE AND SEX (N = 10 157)

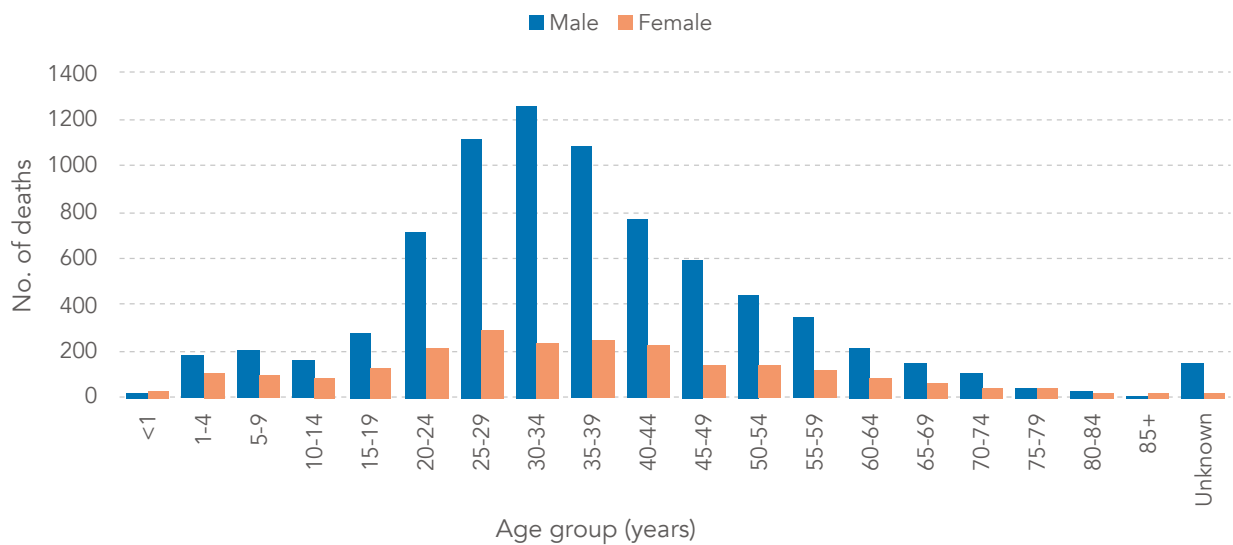


Figure 10: Distribution of road traffic deaths by age and sex, South Africa, 01 April 2020-31 March 2021 (N = 10 157). Note: Unknown sex is excluded from the total in the figure (n = 5).

OTHER TRANSPORT DEATHS BY AGE AND SEX (N = 1 387)

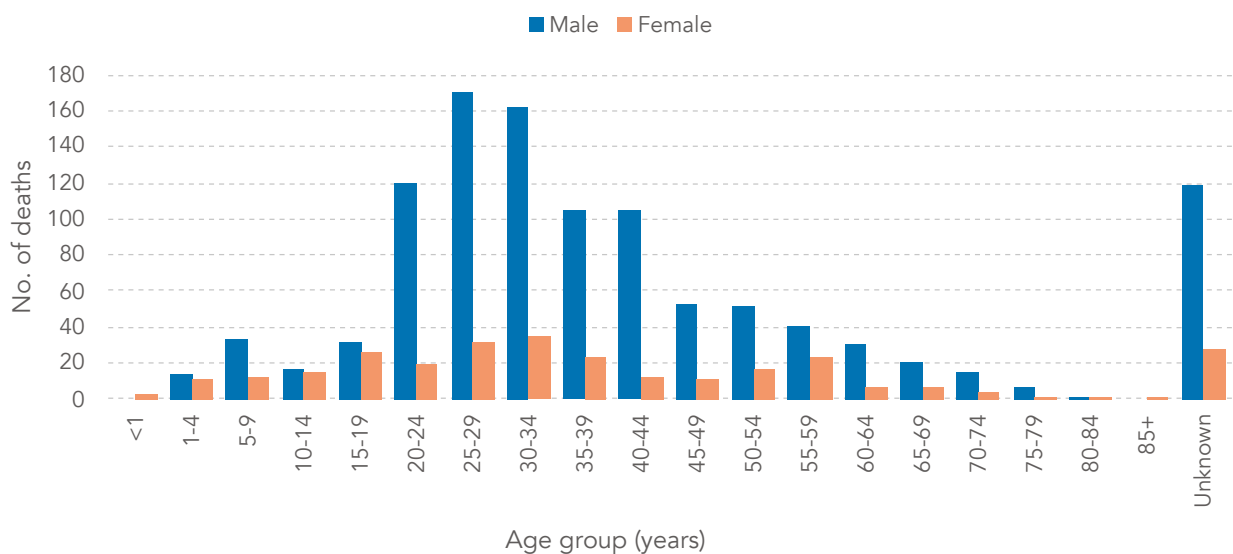


Figure 11: Distribution of other transport deaths by age and sex, South Africa 01 April 2020 - 31 March 2021 (N = 1 387). Note: Unknown sex is excluded from the total in the figure (n = 6).

Figure 12 shows road traffic deaths per week and COVID-19 alert levels. There was a noticeable drop in deaths during alert levels 4 and 5, most likely due to people being confined in their homes.

Figure 13 shows other transport deaths per week and COVID-19 alert levels. Patterns are difficult to discern due to small numbers.

Table 19: Age distribution of transport and road traffic deaths by sex, South Africa, 01 April 2020 - 31 March 2021

Age group (years)	All transport deaths (weighted)								Road traffic (weighted)							
	Male		Female		Unknown sex		Total		Male		Female		Unknown sex		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<1	21	0.2	31	1.2	0	0.0	51	0.4	21	0.3	28	1.2	0	0.0	48	0.5
1-4	191	2.1	116	4.5	0	0.0	308	2.7	177	2.3	106	4.6	0	0.0	282	2.8
5-9	233	2.6	102	3.9	0	0.0	335	2.9	199	2.5	90	3.9	0	0.0	289	2.8
10-14	174	1.9	96	3.7	0	0.0	270	2.3	158	2.0	81	3.5	0	0.0	239	2.4
15-19	307	3.4	149	5.7	0	0.0	457	4.0	275	3.5	123	5.3	0	0.0	397	3.9
20-24	837	9.4	231	8.9	0	0.0	1 068	9.2	717	9.1	211	9.1	0	0.0	928	9.1
25-29	1 285	14.4	320	12.3	0	0.0	1 605	13.9	1 115	14.0	289	12.0	0	0.0	1403	14.0
30-34	1 417	15.8	275	10.6	2	17.5	1 693	14.7	1 254	16.0	240	10.0	0	0.0	1494	15.0
35-39	1 186	13.3	267	10.3	0	0.0	1 453	12.6	1 081	14.0	244	11.0	0	0.0	1325	13.0
40-44	869	9.7	238	9.1	0	0.0	1 107	9.6	764	9.7	226	9.8	0	0.0	990	9.7
45-49	645	7.2	152	5.8	0	0.0	797	6.9	592	7.6	142	6.1	0	0.0	734	7.2
50-54	495	5.5	155	6.0	0	0.0	650	5.6	443	5.7	139	6.0	0	0.0	582	5.7
55-59	386	4.3	145	5.6	2	17.5	533	4.6	345	4.4	122	5.2	2	38.0	469	4.6
60-64	240	2.7	92	3.5	0	0.0	331	2.9	209	2.7	85	3.7	0	0.0	294	2.9
65-69	175	2.0	74	2.9	0	0.0	249	2.2	153	2.0	68	2.9	0	0.0	221	2.2
70-74	120	1.4	46	1.8	0	0.0	166	1.4	106	1.3	43	1.8	0	0.0	148	1.5
75-79	50	0.6	37	1.4	0	0.0	87	0.8	42	0.5	36	1.6	0	0.0	79	0.8
80-84	33	0.4	21	0.8	0	0.0	53	0.5	32	0.4	19	0.8	0	0.0	50	0.5
85+	3	0.0	16	0.6	0	0.0	19	0.2	3	0.0	14	0.6	0	0.0	17	0.2
Unknown age	272	3.0	41	1.6	7	64.9	320	2.8	153	2.0	14	0.6	3	62.0	170	1.7
Total	8 938	100.0	2 606	100.0	11	100.0	11 554	100.0	7 839	100.0	2 318	100.0	5	100.0	10 162	100.0

ROAD TRAFFIC DEATHS BY WEEK AND COVID-19 ALERT LEVELS

(N = 10 121)

■ Male ■ Female

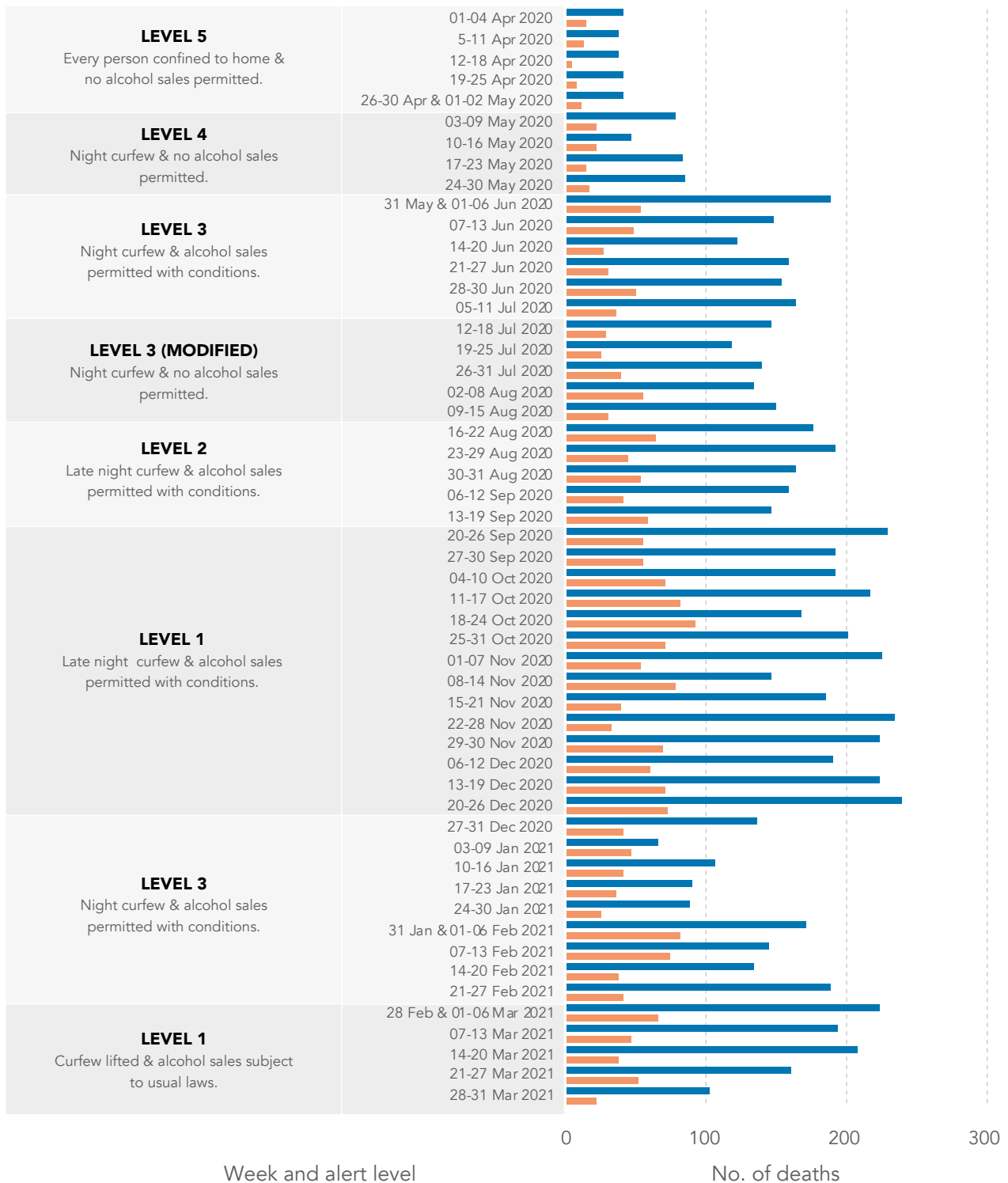


Figure 12: Distribution of road traffic injury deaths by month, sex and lockdown level, South Africa, 01 April 2020 - 31 March 2021 (N = 10 121). Excludes people of unknown sex and those missing date of death information (n = 41)

OTHER TRANSPORT DEATHS BY WEEK AND COVID-19 ALERT LEVELS (N = 1 366)

■ Male ■ Female

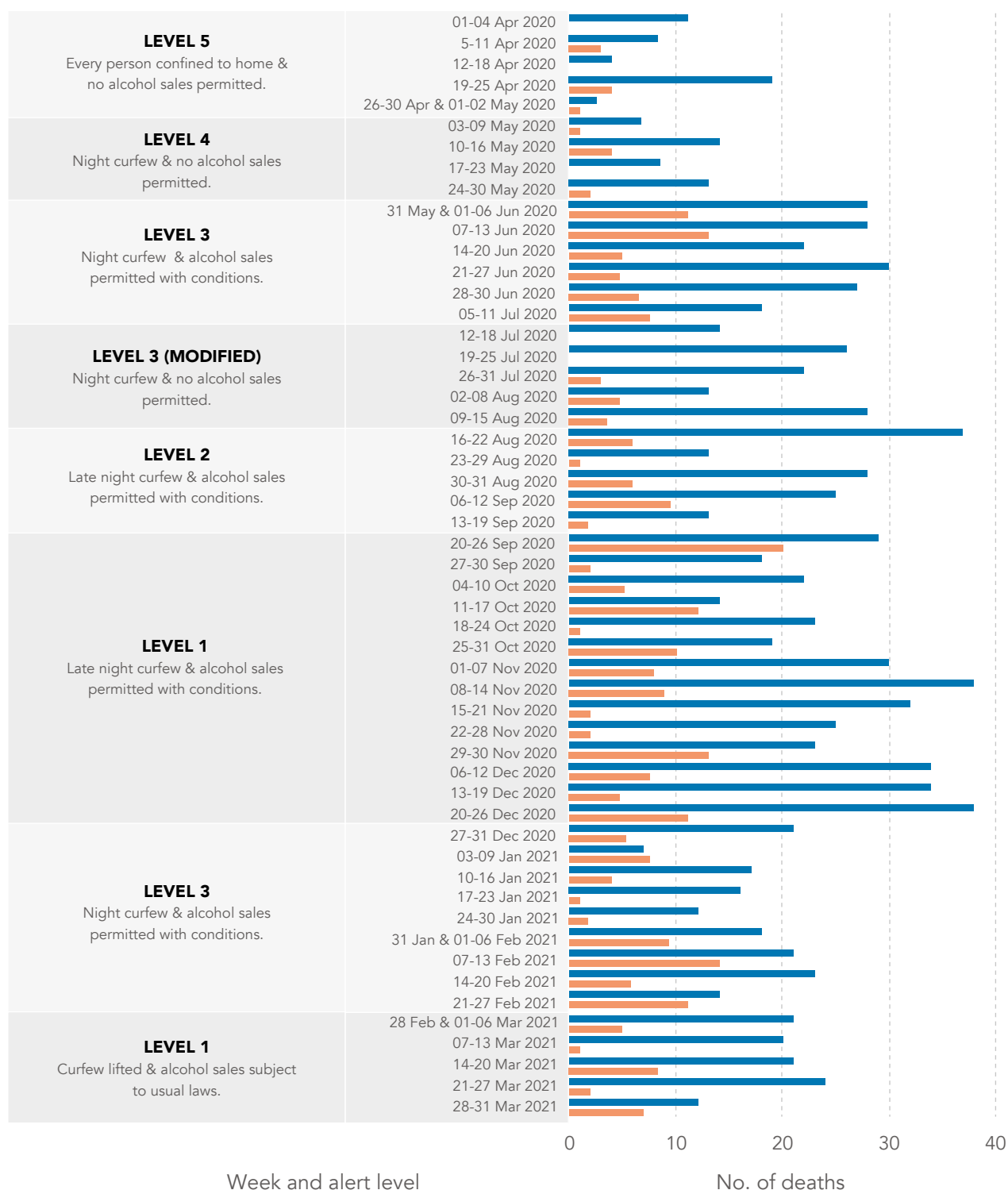


Figure 13: Distribution of other transport deaths by month and sex, South Africa 01 April 2020 - 31 March 2021 (N = 1 366). Excludes people of unknown sex and those missing date of death information (n = 27).

There were distinct weekend highs for both road traffic and other transport deaths (Figure 14 and Figure 15). Friday, Saturday and Sunday together, accounted for 55.8% of all road traffic injury deaths.

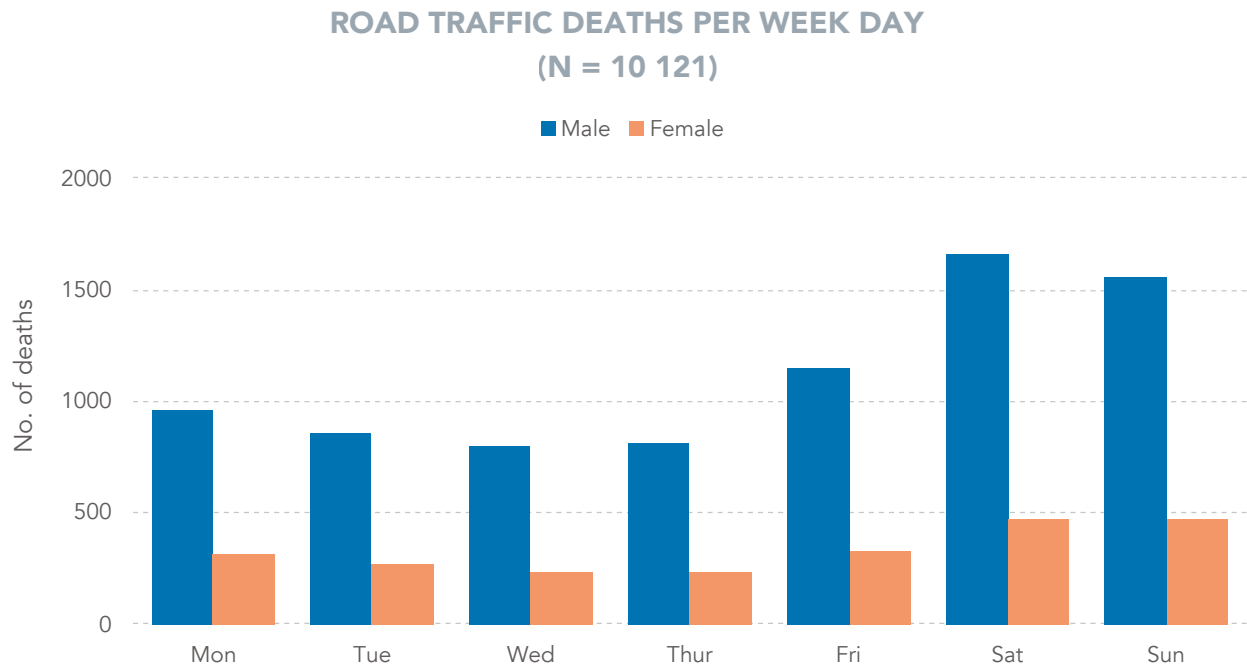


Figure 14: Distribution of road traffic injury deaths by week and sex, South Africa, 01 April 2020-31 March 2021 (N = 10 121). Excludes people of unknown sex and those missing date of death information (n = 41).

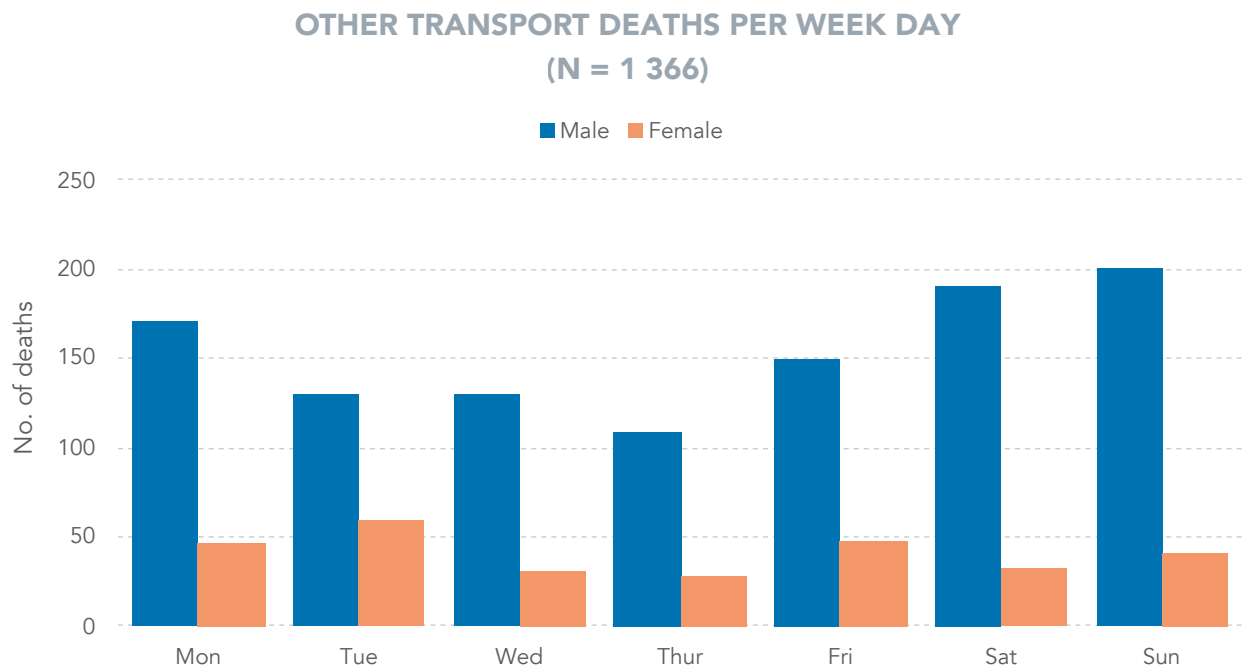


Figure 15: Distribution of other transport deaths by week and sex, South Africa, 01 April 2020-31 March 2021 (N = 1 366). Excludes people of unknown sex and those missing date of death information (n = 27).

4.3.4. OTHER UNINTENTIONAL DEATHS

Of the 10 777 other unintentional deaths, 67.3% were male (Table 20). Figure 16 shows that the overall high numbers of deaths among the 30-34 year age group (9.8%). Other unintentional deaths were also high for children aged 1-4 years (9.4%). Age was unknown for 2.7% of other unintentional deaths.

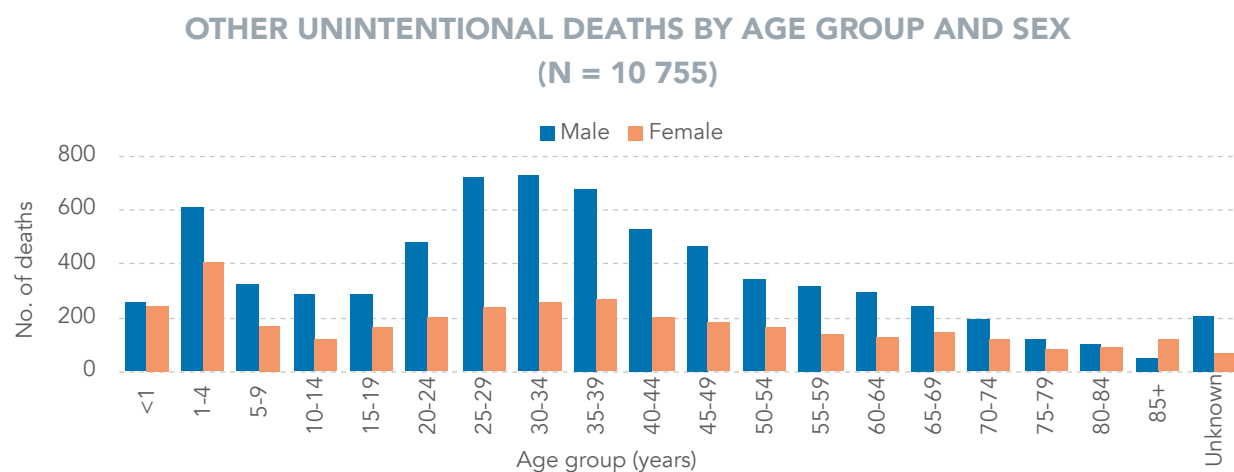


Figure 16: Distribution of other unintentional fatal injuries by age and sex, South Africa 01 April 2020 - 31 March 2021 (N = 10 487). Note: Unknown sex is excluded from the total in the figure (n = 22).

Table 20: Age distribution of other unintentional fatal injuries by sex, 01 April 2020 - 31 March 2021

Age	Other unintentional (weighted)							
	Male		Female		Unknown sex		Total	
	n	%	n	%	n	%	n	%
<1	258	3.6	246	7.0	2	9.2	506	4.7
1-4	611	8.4	405	12.0	0	0	1 017	9.4
5-9	323	5.0	170	5.0	0	0	494	4.6
10-14	287	4.0	118	3.0	2	9.2	407	3.8
15-19	287	4.0	163	5.0	0	0	450	4.2
20-24	481	6.6	202	5.8	0	0	683	6.3
25-29	721	9.9	238	6.8	1	4.6	960	8.9
30-34	730	10.0	255	7.3	0	0	984	9.1
35-39	678	9.4	268	7.7	0	0	947	8.8
40-44	533	7.4	200	5.7	0	0	733	6.8
45-49	468	6.5	182	5.2	0	0	650	6.0
50-54	343	4.7	162	4.6	0	0	505	4.7
55-59	321	4.4	138	3.9	0	0	459	4.3
60-64	292	4.0	127	3.6	0	0	420	3.9
65-69	242	3.3	147	4.2	0	0	389	3.6
70-74	196	2.7	120	3.4	0	0	316	2.9
75-79	121	1.7	83	2.4	0	0	204	1.9
80-84	100	1.4	91	2.6	0	0	191	1.8
85+	53	0.7	120	3.4	0	0	173	1.6
Unknown age	205	2.8	68	1.9	17	77.0	290	2.7
Total	7 252	100.0	3 503	100.0	22	100	10 777	100

Table 21 shows that fires (22.0%) were the leading mechanism of other unintentional deaths followed by surgical/medical complications (17.0%) and drowning (15.0%). A high proportion of males drowned (18.0%), while females had a high proportion of surgical/medical complication deaths (23.0%).

Table 21: Mechanism of other unintentional fatal injuries by sex, South Africa, 01 April 2020 - 31 March 2021

Mechanism	Other unintentional deaths (weighted)							
	Male		Female		Unknown sex		Total	
	n	%	n	%	n	%	n	%
Fire/ other burns	1 520	21.0	870	25.0	6	28.0	2 396	22.0
Surgical/ Medical	1 025	14.0	798	23.0	0	0.0	1 823	17.0
Drowning, immersion	1 285	18.0	316	9.0	2	9.2	1 603	15.0
Poison, ingestion	675	9.3	392	11.0	1	4.6	1 068	9.9
Fall	640	8.8	162	4.6	0	0.0	802	7.4
Electrocution	504	7.0	138	3.9	0	0.0	642	6.0
Asphyxiated/Suffocated	240	3.3	104	3.0	0	0.0	344	3.2
Natural/ Environmental	126	1.7	70	2.0	0	0.0	196	1.8
Crushing	143	2.0	43	1.2	0	0.0	186	1.7
Maternal death	0	0.0	174	5.0	0	0.0	174	1.6
Blunt force	136	1.9	30	0.9	0	0.0	166	1.5
Poison, gassing	90	1.2	61	1.8	0	0.0	151	1.4
Lightning	91	1.3	46	1.3	0	0.0	137	1.3
Animal contact	76	1.1	16	0.5	0	0.0	92	0.9
Sudden Infants Death Syndrome	44	0.6	42	1.2	0	0.0	85	0.8
Exposure/ hypothermia	62	0.9	8	0.2	0	0.0	70	0.7
Mining	64	0.9	0	0.0	0	0.0	64	0.6
Explosive blast	33	0.5	1	0.1	0	0.0	34	0.3
Sharp force (cut)	17	0.2	7	0.2	0	0.0	23	0.2
Machinery	14	0.2	2	0.1	0	0.0	16	0.2
Circumcision	15	0.2	0	0.0	0	0.0	15	0.1
Firearm Discharge	13	0.2	1	0.0	0	0.0	14	0.1
Other	63	0.9	28	0.8	2	9.2	93	0.9
Missing folder	309	4.3	168	4.8	9	41.0	486	4.5
Unknown	35	0.5	10	0.3	2	8.3	46	0.4
Total	7 252	100.0	3 503	100.0	22	100.0	10 777	100.0

Figure 17 shows other unintentional deaths by week and COVID-19 alert level. These deaths were lowest during lockdown levels 4 and 5.

OTHER UNINTENTIONAL DEATHS BY WEEK AND COVID-19 ALERT LEVELS (N = 10 735)

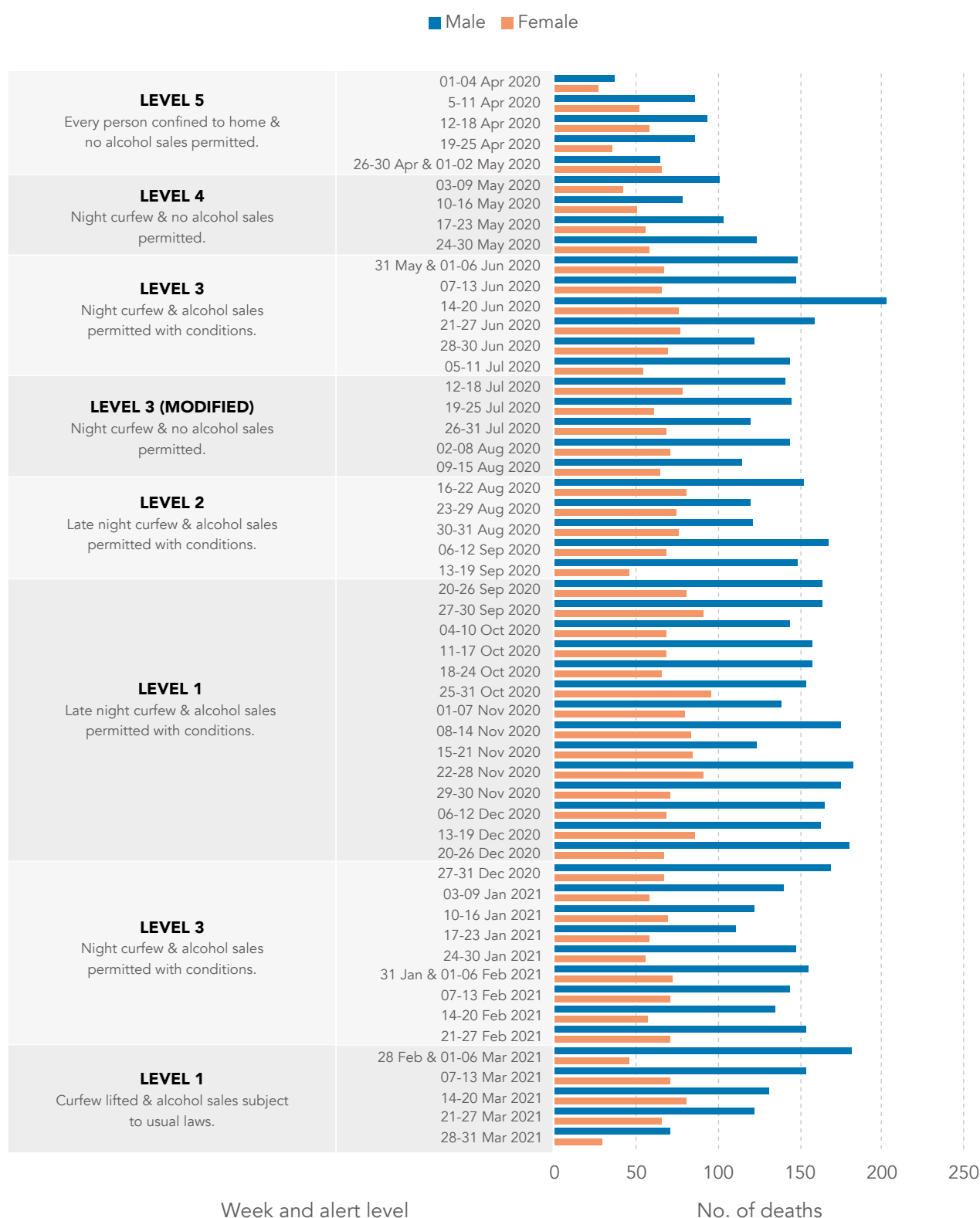


Figure 17: Distribution of other unintentional by month, sex and lockdown level, South Africa 01 April 2020 - 31 March 2021 (N = 10 735). Excludes people of unknown sex and those missing date of death information (n = 42).

For males, other unintentional deaths were highest on Sundays, while for females it was highest on Wednesdays (Figure 18). Nearly one-third of other unintentional deaths occurred on a Saturday and Sunday.

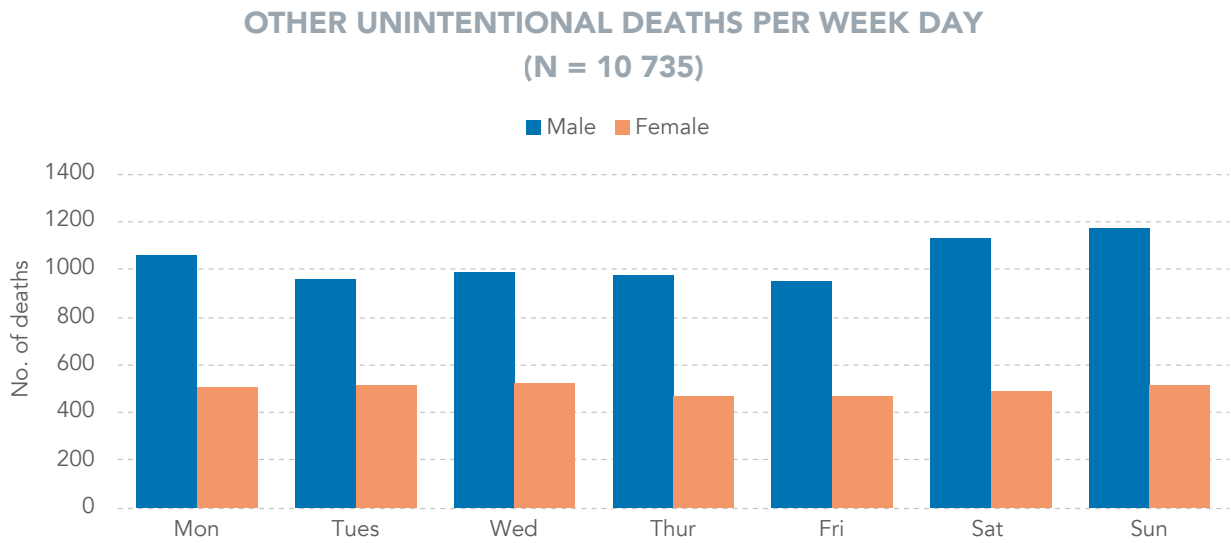


Figure 18: Distribution of other unintentional by week and sex, South Africa, 01 April 2020 - 31 March 2021 (N = 10 735). Excludes people of unknown sex and those missing date of death information (n = 42).

4.3.5. UNDETERMINED DEATHS

Of the 1 387 deaths of undetermined intent (Table 23), 70.9% were male. Overall, the highest number of deaths occurred among those of unknown age (26.0%) and those aged 35–39 years (10.2%) (Figure 19). The sex was unknown in 9.8% of undetermined death cases.

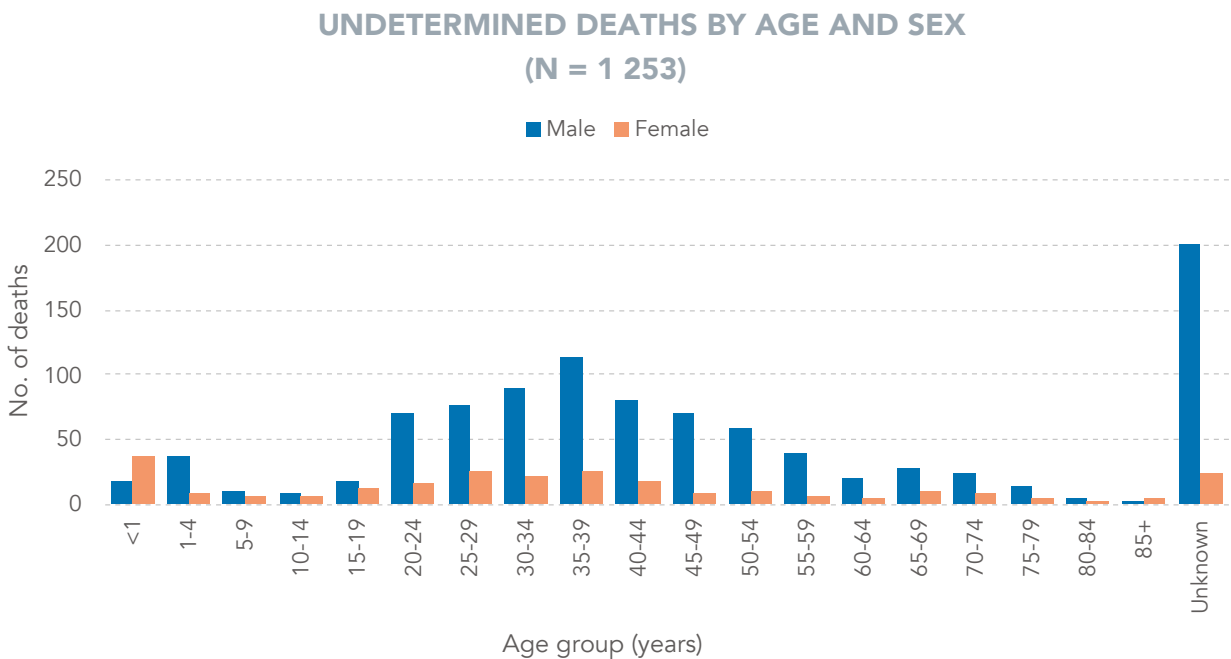


Figure 19: Distribution of undetermined deaths by age and sex, South Africa 01 April 2020-31 March 2021 (N = 1 253). Note: Unknown sex is excluded from the total in the figure (n = 136).

Table 22: Age distribution of undetermined deaths by sex, South Africa 01 April 2020-31 March 2021

Age group (years)	Undetermined intent (weighted)							
	Male		Female		Unknown sex		Total	
	n	%	n	%	n	%	n	%
<1	17	2.0	37	14.0	1	1.0	55	4.0
1-4	37	4.0	9	3.0	0	0.0	46	3.0
5-9	10	1.0	7	3.0	0	0.0	17	1.0
10-14	9	1.0	7	2.0	0	0.0	16	1.0
15-19	18	2.0	13	5.0	0	0.0	31	2.0
20-24	70	7.0	16	6.0	1	1.0	87	6.0
25-29	77	8.0	26	10.0	0	0.0	103	7.0
30-34	90	9.0	22	8.0	1	1.0	113	8.0
35-39	114	12.0	26	10.0	1	1.0	141	10.0
40-44	80	8.0	19	7.0	0	0.0	98	7.0
45-49	70	7.0	9	3.0	0	0.0	79	6.0
50-54	59	6.0	10	4.0	0	0.0	69	5.0
55-59	40	4.0	7	3.0	0	0.0	46	3.0
60-64	20	2.0	5	2.0	0	0.0	25	2.0
65-69	27	3.0	11	4.0	0	0.0	38	3.0
70-74	25	2.0	9	3.0	0	0.0	34	2.0
75-79	14	1.0	5	2.0	0	0.0	19	1.0
80-84	5	1.0	3	1.0	0	0.0	9	1.0
85+	3	0.0	4	1.0	0	0.0	7	0.0
Unknown age	201	20.0	24	9.0	132	97.0	357	26.0
Total	986	100.0	267	100.0	136	100.0	1 389	100.0

Within the deaths of undetermined intent, the leading mechanism of deaths included blunt force (9.2%) and poison ingestion (5.2%) (Table 23). Females had a higher proportion of poison ingestion deaths (10.5%) compared to males (4.5%). Deaths due to blunt force was higher in males (10.8%) compared to females (7.8%). For more than half of undetermined deaths, the mechanism was recorded as other or unknown.

Table 23: Mechanism of deaths of undetermined intent by sex, South Africa 01 April 2020-31 March 2021

Mechanism	Undetermined intent (Weighted)							
	Male		Female		Unknown sex		Total	
	n	%	n	%	n	%	n	%
Blunt force	107	10.8	21	7.8	0	0.0	128	9.2
Poison, ingestion	44	4.5	28	10.5	0	0.0	72	5.2
Fire/other burns	6	0.6	4	1.3	0	0.0	9	0.7
Drowning, immersion	7	0.7	0	0.0	0	0.0	7	0.5
Sharp force (cut)	3	0.3	2	0.7	0	0.0	5	0.3
Poison, gassing	3	0.3	1	0.4	0	0.0	4	0.3
Firearm Discharge	3	0.3	0	0.0	0	0.0	3	0.2
Fall/ push/ jump	2	0.2	0	0.0	0	0.0	2	0.1
Explosive blast	2	0.2	0	0.0	0	0.0	2	0.1
Asphyxiated/Strangled	1	0.1	0	0.0	0	0.0	1	0.1
Other	10	1.0	5	1.9	4	2.9	19	1.3
Missing folder	149	15.1	34	12.9	31	23.0	214	15.4
Unknown	650	65.9	172	64.5	101	74.1	923	66.5
Total	986	100.0	267	100.0	136	100.0	1389	100.0

4.4. COMPARISON WITH OTHER SOURCES

In this section, we compare the 2020/21 IMS results with other sources that can provide valuable comparisons. These include comparisons with:

- Previous IMS surveys (2009 IMS and 2017 IMS)
- Official murders reported by the SAPS
- Road traffic deaths reported by the Road Traffic Management Corporation (RTMC)

4.4.1. COMPARISON OF THE 2020/21 IMS WITH 2009 IMS AND ADJUSTED 2017 IMS

Our findings document the fatal injury profile in South Africa at three different time points (2009, 2017 and 2020/21) (Table 24). Interpretations of changes in mortality rates between these years should be made with caution due to the following important factors:

- a) Changes in data collection, methodology and analysis between the surveys.
- b) The 2020/21 survey covers the COVID-19 period during which numerous restrictions led to changes in behaviour.
- c) The 2009 and 2017 IMS surveys cover a calendar year (January to December), whereas the 2020/21 survey covers a financial year period (March to April) and thus the time period differs slightly.

In general, the total mortality rate due to all injuries appeared to decrease from 109.0 per 100 000 population in the 2009 IMS to 89.9 per 100 000 population in the 2020/21 IMS (Table 24). Nonetheless, when comparing mortality rates by apparent manner of death and mechanism of death, different patterns become evident.

The homicide mortality rate appeared to be largely unchanged across the three time points (38.4, 37.1 and 37.0 per 100 000 population, respectively). However, the mortality rate due to firearm homicide increased between the 2009 IMS (11.2 per 100 000 population) and 2020/21 IMS (16.0 per 100 000 population). Across the three-time periods; suicide rates appeared to be on a slight decline (13.4, 12.1 and 11.5 per 100 000 population, respectively). Transport mortality rates appeared to decline across the three time points; however, in the 2020/21 IMS, the COVID-19 alert level restrictions (e.g. regarding curfews, travel and alcohol) may have had a large influence on the decline of transport deaths. The rate of other unintentional injury deaths appeared to be increasing between 2009 IMS (13.5 per 100 000 population) and 2020/21 IMS (19.1 per 100 000 population).

Table 24: National age-standardised injury mortality rates (per 100 000 population), 2009, 2017 and 2020/21

Apparent manner and mechanism of death	Age-standardised injury mortality rates (per 100 000 population)			% change in age-standardised mortality rates	
	2009 IMS (95% CI)	2017 IMS Adjusted (95% CI)*	2020/21 IMS (95% CI)	% Change 2009 to 2017	% Change 2017 to 2020/21
Homicide	38.4 (33.8-43.0)	37.1 (34.2 - 40.1)	37.0 (34.3 - 39.7)	-3.39	-0.27
-firearm	11.2 (9.9-12.6)	12.0 (10.4 - 13.6)	16.0 (14.3 - 17.6)	7.14	33.33
Suicide	13.4 (11.6-15.2)	12.1 (11.0 - 13.2)	11.5 (10.6 - 12.5)	-9.70	-4.96
Transport	37.1 (31.1-41.2)	29.1 (27.3 - 30.9)	19.9 (18.4 - 21.4)	-21.56	-31.62
-road traffic	36.1 (30.9-41.3)	27.3 (25.6 - 29.0)	17.4 (16.0 - 18.8)	-24.38	-36.26
Other unintentional	13.5 (11.8-15.2)	17.0 (13.9 - 20.2)	19.1 (17.5 - 20.6)	25.93	12.35
Undetermined	4.6 (3.5-5.7)	-	2.4 (1.8 - 3.1)	-	-
All injuries	109.0 (97.1-121.0)	95.3 (89.7 - 100.9)	89.9 (84.8 - 95.1)	-12.57	-5.67

*IMS 2017 adjusted rate represents the rates when the undetermined cause of death was proportionally redistributed.

4.4.2. COMPARISON OF MURDERS REPORTED BY THE SOUTH AFRICAN POLICE SERVICES (SAPS)

For the 2020/21 period, SAPS officially reported 19 972 murders nationally (32) compared to the estimated 21 840 (95% CI: 20 458 – 23 221) homicides reported by the 2020/21 IMS for the same period (i.e., the 2020/21 IMS homicide numbers are 8.6% higher than SAPS). Overall, Table 25 shows that the 2020/21 IMS reported higher numbers of homicide than SAPS across the provinces except for the provinces with smaller number of homicides (Northern Cape, North West, Limpopo and Free State).

Where SAPS reports fewer cases than the 2020/21 IMS, one possible reason for the difference could be that the SAPS cases reflect “murder cases” which could include multiple victims; whereas the 2020/21 IMS represents deceased individuals who had undergone a post-mortem. In addition, SAPS may have misclassified homicide deaths as culpable homicides or inquests. The 2020/21 IMS would not have information on culpable homicides as this is determined in court at a later date.

Table 25. The number of murders reported by the South African Police Services (n= 19 972) and the number of homicides estimated in 2020/21 IMS (n= 21 840), by province.

Province	SAPS Murders 2020 / 2021	IMS Homicides 2020/21 (95% CI)	Difference	
			N	%
Northern Cape	287	210 (123 -296)	-77	-36.7%
Free State	834	707 (640 – 774)	-127	-18.0%
Limpopo	717	658 (562 – 754)	-59	-9.0%
North West	734	700 (636 – 763)	-34	-4.9%
KwaZulu-Natal	4825	4875 (4046 – 5703)	50	1.0%
Western Cape	3 848	4067 (4067 – 4067)	219	5.4%
Eastern Cape	3 713	4281 (3452 – 5110)	568	13.3%
Gauteng	4079	5130 (4496 – 5764)	1051	20.5%
Mpumalanga	935	1214 (889 – 1538)	279	23.0%
South Africa (total)	19 972	21840 (20458 – 23221)	1868	8.6%

4.5. COMPARISON WITH STATISTICS FROM THE ROAD TRAFFIC MANAGEMENT CORPORATION (RTMC)

RTMC reports statistics using a calendar year (January – December) making it difficult to compare directly with the 2020/21 IMS due to the differing time periods.(33) For the year 2020, RTMC reported 9 969 road fatalities and, for the year 2021, they reported that 12 545 road fatalities occurred. In comparison, the 2020/21 IMS reported 10 152 road traffic injury deaths for 01 March 2020- 30 April 2021.

The RTMC reported a road traffic fatality rate of 16.7 per 100 000 population for 2020 and 20.9 per 100 000 population for 2021.(33) The 2020/21 IMS reported a road traffic mortality rate of 17.4 (95% CI: 16.0 – 18.8) per 100 000 population; which is similar to the average rate of road traffic incidents reported by RTMC over a two year period i.e. 18.8 per 100 000 population.



DISCUSSION

5. DISCUSSION

The 2020/21 IMS has offered fresh insights into the fatal injury profile in South Africa, coinciding with the COVID-19 pandemic and associated restrictions from March 2020 to April 2021. The overall results show a slight decrease in the all-injury mortality rate compared to the 2017 and 2009 IMS surveys, with rates dropping from 109.0, to 95.3, to 89.9 per 100 000 population, respectively. Since 2017, the homicide rate remained largely unchanged, the suicide rate saw a slight decrease, and the rate for transport-related mortality dropped more substantially. However, the rate of other unintentional injury deaths increased since 2017. It is important to exercise caution when comparing the 2020/21 IMS to the previous IMS surveys. The 2020/21 IMS occurred during the COVID-19 period, which was an exceptional year in terms of morbidity and mortality due to the effects of the COVID-19 virus and the preventive methods used to control its spread.

The profile and pattern of injury deaths were likely directly and indirectly impacted by the COVID-19 pandemic and related infection containment measures, such as lockdowns imposed on South African citizens. In addition to stay-at-home measures, the South African government also placed restrictions on the sale and consumption of alcohol. These 'alcohol bans' were rationalized in terms of reducing the number of trauma cases in already overwhelmed health facilities (31, 34, 35).

Other studies have explored the impact of COVID-19 lockdown restrictions, including alcohol bans on non-natural mortality in South Africa, and they found that a complete ban on the sale of alcohol resulted in a significant reduction of non-natural deaths (11, 36). While our study also observed a decrease in non-natural deaths in the 2020/21 IMS compared to 2017, more data points are needed to determine whether this indicates a genuine decline in non-natural deaths or if it was an anomaly due to COVID-19 and related restrictions. While the COVID-19 restrictions were known to influence the overall injury mortality rates, our study highlights that transport-related injury types were associated with the greatest variability.

There were substantial declines in transport deaths, including a 36% decrease in road traffic mortality rates since 2017. While the decrease in road traffic mortality is positive and aligns with global road injury reduction targets,(37) the factors contributing to these reductions may not be replicable. The decrease could be due to declines in alcohol use and/or speed or improved road traffic law enforcement.

Road traffic deaths were likely impacted by COVID-19 restrictions, with a decline noted during alert level 5 and level 4, which included restrictions on movement outside of the home, between provinces, and across borders. The observation is in accordance with a global narrative review, which reported a sharp decrease in road traffic collisions and traffic volume in April 2020 compared to the previous year in 32 out of 36 included countries. (38) However, the presence of empty roads and lax law enforcement may have led to increased speeding by drivers, potentially resulting in more severe collisions.(38) Locally, Barron et al.(39) found that the alcohol sales ban led to a 14% decrease in injury-related mortality. Another study on trauma admissions also saw a large reduction in the trauma volume at a regional hospital, linked to lockdown-related restrictions.(31)

Our study showed that the overall homicide rate remained largely unchanged between 2020/21 and 2017, with a minor 0.3% decrease noted. The male homicide rate was about 7 times higher than that of females, consistent to what was reported in the 2017 IMS. Notably, there was an increase in firearm-related homicides since 2017, with approximately 45% of male and 35% of female homicides attributed to firearm violence. The regions with the highest homicide rates remained the Eastern Cape, Western Cape, and KwaZulu-Natal.

Despite the expectation that homicide and violent crimes might decrease due to COVID-19 restrictions and people being confined to their homes, reports from around the world indicated an increased risk of intimate partner violence and child maltreatment as COVID-19 conditions exacerbated risk factors for abuse within households. Qualitative data in South Africa suggest the same,(40-43) however the limited quantitative data available from service uptake did not confirm this (44) and data on intimate partner femicide were not available. The high homicide rates may be attributed to the illegal supply of guns and related gang violence (45-47), escalating taxi violence (48, 49) and an increase in mass shooting incidents.(50) The increase in firearm violence has been observed since 2010 and has been linked to poor enforcement of gun control legislation and an increase in the availability of both illegal and legal firearms.(51)

This study observed a slight decrease in the suicide rate since 2017, dropping from 12.1 to 11.5 per 100 000 population. Notably, a reduction was noted for suicide during the periods of complete alcohol bans, after which deaths increased and remained constant. The impact of the COVID-19 pandemic on suicide rates remains uncertain. There was international speculation that suicide risk may have risen due to worsening mental health, fear of infection and isolation resulting from the COVID-19 pandemic.(52, 53) However, a global systematic review found conflicting evidence on whether suicide attempts and suicide deaths increased or decreased. (54) Other studies have described factors associated with suicide ideation during the COVID-19 pandemic, including fear of COVID-19, lower perceived social support, high rates of exhaustion among frontline medical workers, sleep disturbances, loneliness, and those with poor perceived quality of physical health.(55)

This study showed that other unintentional deaths increased between 2017 and 2020/21 and appeared consistently high, after the initial hard lockdown (alert levels 5 and 4). While one may assume that the frequency of certain accidental injuries, such as drowning, could have been influenced by COVID-19 restrictions due to the closure of beaches and public swimming facilities,(56) the 2020/21 IMS data does not support this assumption. Another potential factor in reducing accidental deaths was the decrease in elective surgeries.(31) However, the study indicates that the most common causes of unintentional injuries were, in fact, due to fires (burns), surgical misadventure, and drownings.

This study had several limitations. First, caution must be exercised when comparing the results of this IMS to previous studies, as the period under study coincided with the COVID-19 restrictions, making direct comparisons challenging. Another limitation of this study was the small proportion of cases that could be linked to the blood alcohol concentration laboratory data (reported in Appendix 4). The blood alcohol concentration data received from laboratories were not reported in a standardized manner which made linkage to our survey data challenging. However, this could be due to a lack of standardization by FPS facilities and differing practices by practitioners in determining substances as a contributory factor to the death. There could have been additional problems relating to a global shortage of vials that occurred in late 2022.(57) For example, media reports stated that there were no alcohol blood kits to test for people driving under the influence of alcohol in KwaZulu- Natal province over the 2022/2023 festive period.(58) It is unclear how long the shortage of test kits has been an issue and whether it affected our reporting period.

Temporal patterns were observed for both homicide and road traffic deaths, which were clustered on weekends and during holiday periods. This likely coincided with alcohol consumption, as reflected in the limited blood alcohol data available. We also note that the category of undetermined deaths needed to be redistributed in this study. The proportion of deaths reported as undetermined could be lowered through training. The completion of death notification forms by doctors in South Africa is considered suboptimal and as such, a free online training course for medical students and doctors has been developed.⁽⁵⁹⁾ This course is based on ICD principles for identifying the underlying cause of death.⁽⁵⁹⁾

While it appears that some progress is being made in road traffic-related deaths, the rate of homicides, suicides and unintentional injuries remain high. The findings of this study can inform government policies related to firearms, alcohol, mental health and road safety. A multi-pronged and multi-sectoral approach is essential to gain a better understanding of the injury burden and to implement effective interventions for its reduction. Provincial authorities can also use this report's results to inform their responses.



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APPENDIX I

7. APPENDIX I

Table 1: Expected cases versus realised cases by mortuary

Province	Mortuary	Sample (unweighted)		
		Expected	Actual	Difference (%)
Eastern Cape	Lusikisiki	354	346	-2.3
Eastern Cape	Graaf Reinet	203	174	-14.3
Eastern Cape	Uitenhage	300	577	92.3
Eastern Cape	Mt Fletcher	377	359	-4.8
Eastern Cape	Bizana	349	344	-1.4
Eastern Cape	Mdantsane	481	466	-3.1
Eastern Cape	New Brighton	638	639	0.2
Eastern Cape	Butterworth	783	757	-3.3
Eastern Cape	Bhisho	641	664	3.6
Eastern Cape	Mthatha	947*	979	3.4
Free State	Ficksburg	90	86	-4.4
Free State	Jagersfontein	80	94	17.5
Free State	Harrismith	135	145	7.4
Free State	Smithfield	76	78	2.6
Free State	Kroonstad	178	183	2.8
Free State	Welkom	634	609	-3.9
Free State	Bloemfontein	920	914	-0.7
Gauteng	Carletonville	409	373	-8.8
Gauteng	Heildeberg	242	224	-7.4
Gauteng	Roodepoort	1326	1297	-2.2
Gauteng	Ga-Rankuwa	1115	1051	-5.7
Gauteng	Germiston	1490*	1383	-7.2
Gauteng	Diepkloof	1112*	975	-12.3
Gauteng	Johannesburg	1542*	1364	-11.5
KwaZulu Natal	Mtubatuba	189	247	30.7
KwaZulu Natal	Escourt	251	329	31.1
KwaZulu Natal	Ladysmith	402	566	40.8
KwaZulu Natal	Paulpietersburg	28	72	157.1
KwaZulu Natal	Howick	93	137	47.3
KwaZulu Natal	New Hanover	101	108	6.9
KwaZulu Natal	Richards Bay	424	724	70.8
KwaZulu Natal	Umzimkhulu	94	168	78.7

Province	Mortuary	Sample (unweighted)		
		Expected	Actual	Difference (%)
KwaZulu Natal	Greytown	260	402	54.6
KwaZulu Natal	Vryheid	114	241	111.4
KwaZulu Natal	Eshowe	156	259	66.0
KwaZulu Natal	KwaDukuza	463	664	43.4
KwaZulu Natal	Madadeni	326	394	20.9
KwaZulu Natal	Park Rynie	689	1259	82.7
KwaZulu Natal	Pinetown	1125	1458	29.6
KwaZulu Natal	Phoenix	724*	710	-1.9
Limpopo	Groblersdal	238	264	10.9
Limpopo	Kgapane	121	107	-11.6
Limpopo	Bela-Bela	287	259	-9.8
Limpopo	Elim	218	196	-10.1
Limpopo	Mokopane	429	364	-15.2
Limpopo	Tshilidzini	552	514	-6.9
Mpumalanga	Evander	248	260	4.8
Mpumalanga	Tintswalo	161	163	1.2
Mpumalanga	KwaMhlanga	300	297	-1.0
Mpumalanga	Embhuleni	145	153	5.5
Mpumalanga	Ermelo	182	187	2.7
Mpumalanga	Tonga	265	256	-3.4
Mpumalanga	Themba	498	525	5.4
Mpumalanga	Belfast	91	75	-17.6
Mpumalanga	Volkruis	125	111	-11.2
Mpumalanga	Witbank	549	524	-4.6
North West	Potchefstroom	263	273	3.8
North West	Lichtenburg	259	236	-8.9
North West	Vryburg	451	425	-5.8
North West	Phokeng	732	725	-1.0
North West	Klerksdorp	716	669	-6.6
Northern Cape	Springbok	128	125	-2.3
Northern Cape	Upington	448	371	-17.2
Northern Cape	Calvinia	58	50	-13.8
Northern Cape	Kimberley	503	334	-33.6
Total sample (unweighted)		27828	29282	5.2

*For the large mortuaries, the expected sample was 50% of the total body count.

Provincial distribution of realised caseload

The extent to which the findings from this survey can be extrapolated to the total deaths for 2020/21 for South Africa depends on its representativeness. Table II compares the structure of the survey sample by province to the deaths reported in mortuaries for 2020/21. The results suggest that the sample is quite well representative of the population from which it was drawn.

Table II: Characteristics of the weighted sample* compared with total deaths reported in mortuaries for, 01 April 2020-31 March 2021

Province	Weighted sample*		Total deaths for 2020/21	
	n	%	N	%
Eastern Cape	9 545	18.4	9 616	18.6
Free State	2 578	5.0	3 391	6.6
Gauteng	15 584	30.1	16 478	31.9
KwaZulu Natal	12 112	23.4	9 013	17.4
Limpopo	3 408	6.6	4 462	8.6
Mpumalanga	4 355	8.4	3 820	7.4
North West	2 954	5.7	3 265	6.3
Northern Cape	1 246	2.4	1 623	3.1
Total	51 781	100.0	51 668	100.0

*Weighted sample includes a small proportion of natural deaths which were excluded. The weighted sample excludes the Western Cape, as data were available from the province's FPS database.

Figure I and Figure II show the cause of death breakdown of the unweighted and weighted number of deaths respectively¹. Of the total 38 097 unweighted deaths, 85.4% were non-natural and 14.6% were natural. When weighted, the total number of deaths was 60 596, of which 86.2% were non-natural.

CAUSE OF DEATH
N=38 097 (Unweighted)

■ Natural ■ Non-natural

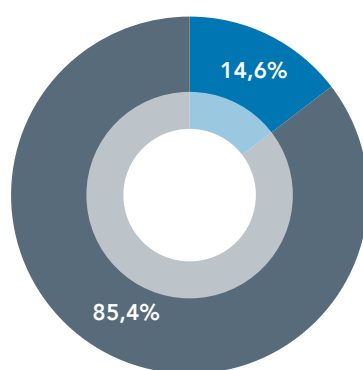


Figure 1: Cause of death (unweighted analysis), South Africa 2017 (N = 38 097)

CAUSE OF DEATH
N=60 596 (Weighted)

■ Natural ■ Non-natural

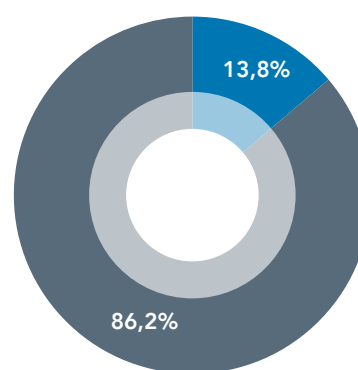


Figure 2: Cause of death (weighted analysis), South Africa 2017 (N = 60 596)

¹ The unweighted numbers indicate the number of cases observed from the survey sample, while the weighted numbers indicate the estimated total numbers representative of the country. It is the weighted data that provide results that should be interpreted for policy formulation.

APPENDIX II

8. APPENDIX II

APPARENT MANNER OF DEATH BY SOUTH AFRICAN PROVINCES (Weighted) (N=52 221)

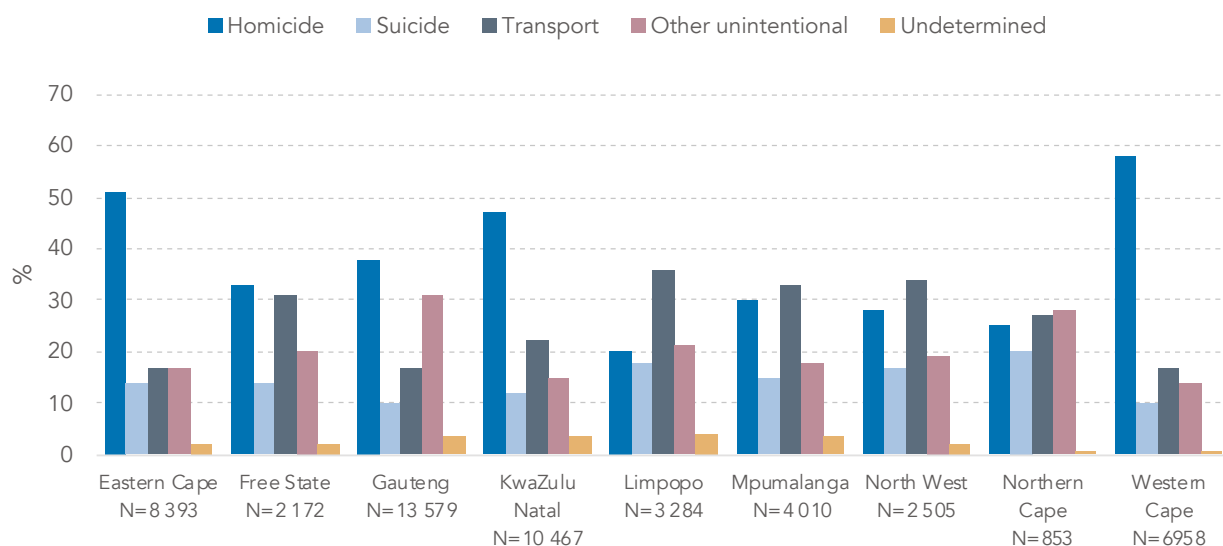


Figure 1. Apparent manner of death by province (weighted analysis), (N = 52 221)

EASTERN CAPE DEATHS BY WEEK AND COVID-19 ALERT LEVELS (WEIGHTED)

(N = 8 364)

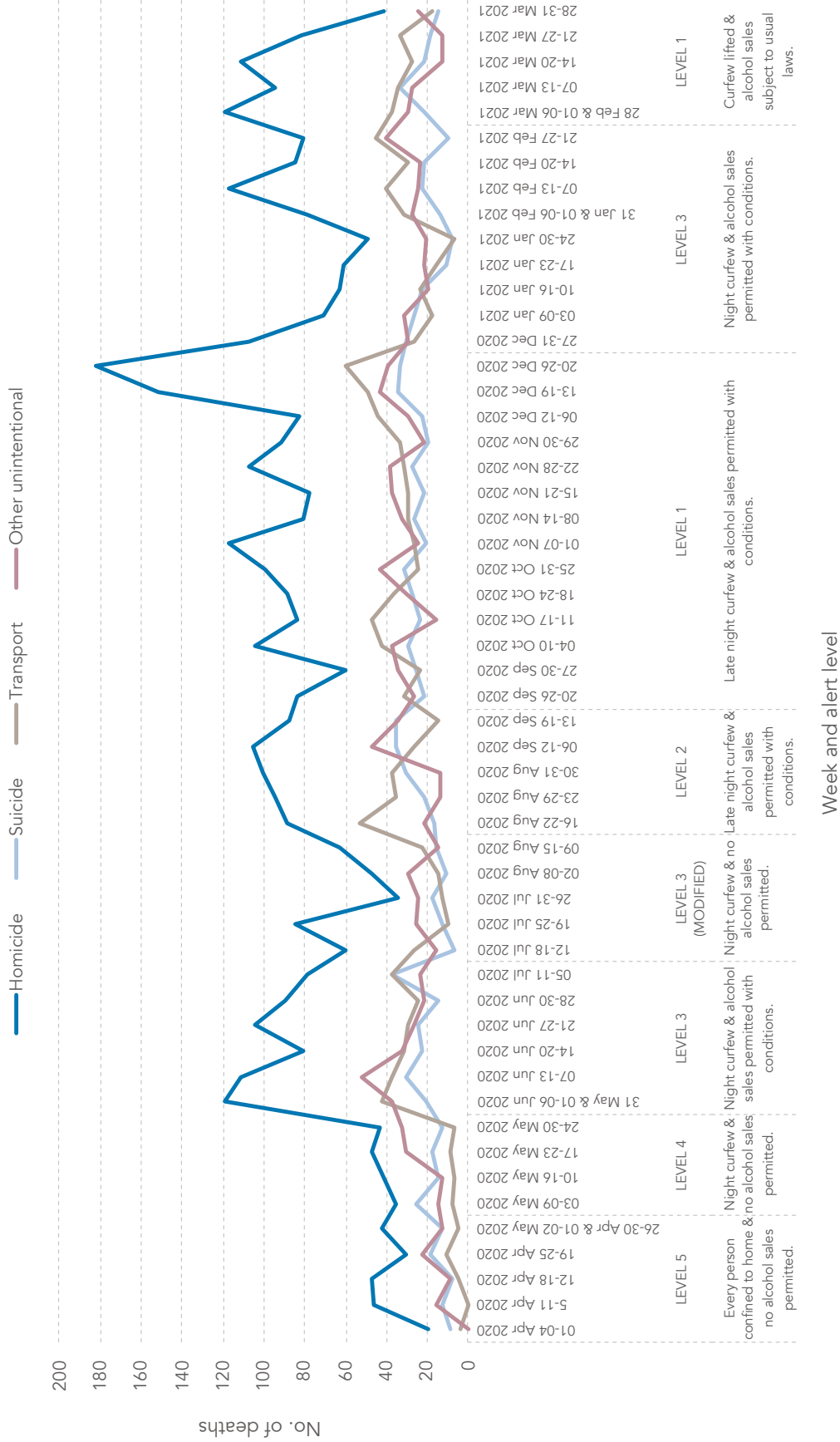


Figure 2. Weekly deaths by apparent manner of death in the Eastern Cape (weighted analysis), (N = 8 364)

FREE STATE DEATHS BY WEEK AND COVID-19 ALERT LEVELS (WEIGHTED)

(N = 2 171)

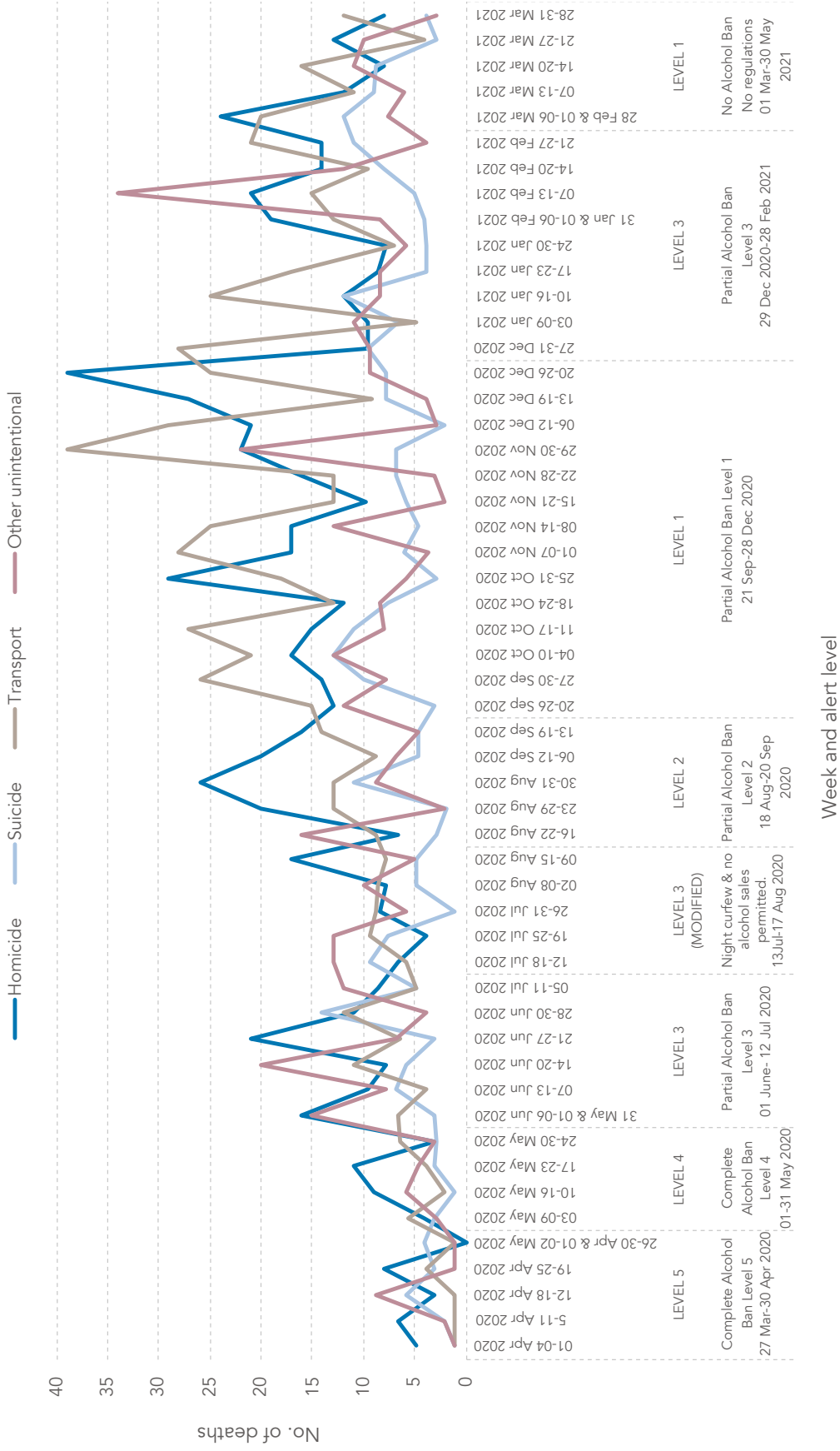
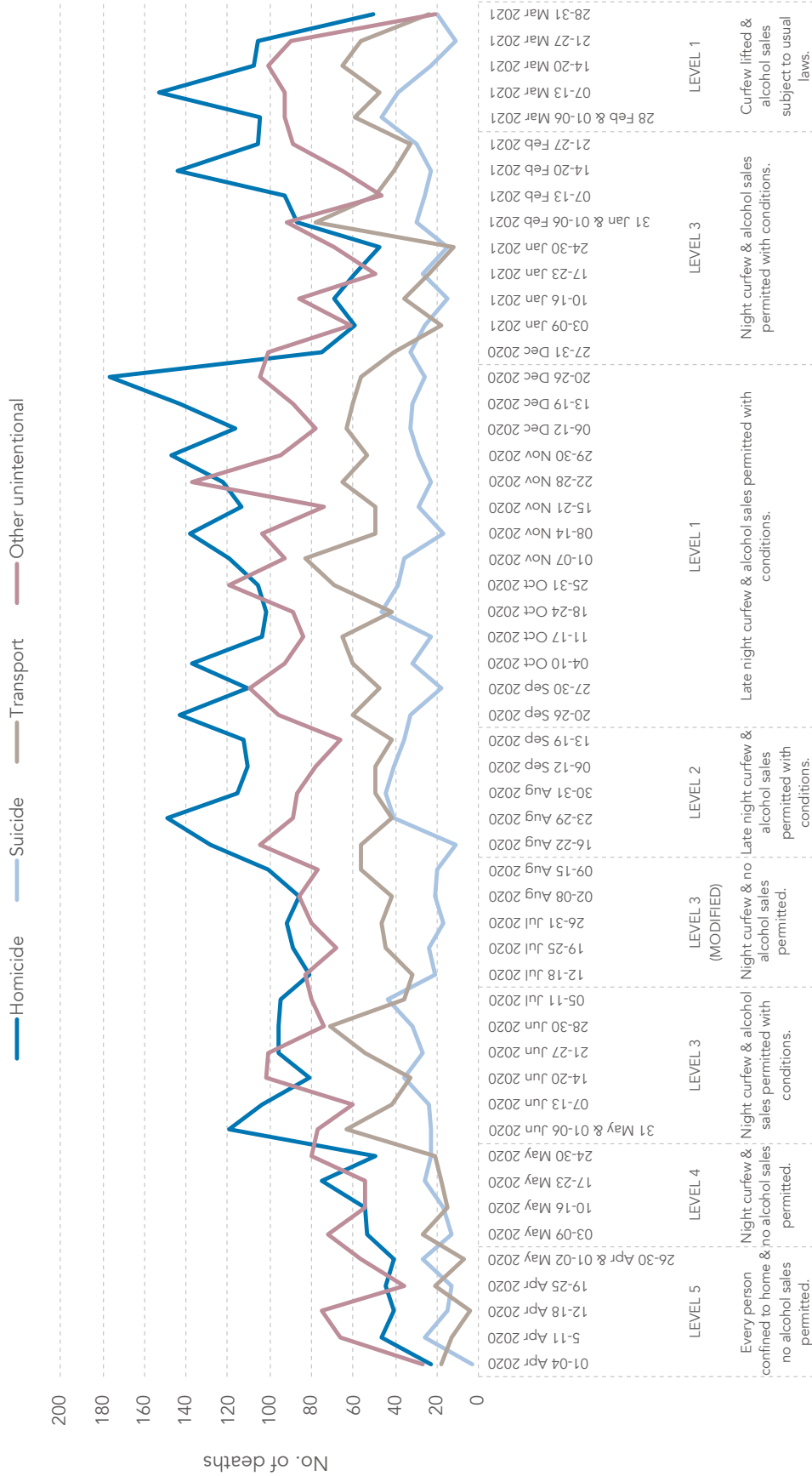


Figure 3. Weekly deaths by apparent manner of death in the Free State (weighted analysis), (N = 2 171)

GAUTENG DEATHS BY WEEK AND COVID-19 ALERT LEVELS (WEIGHTED)

(N = 13 536)

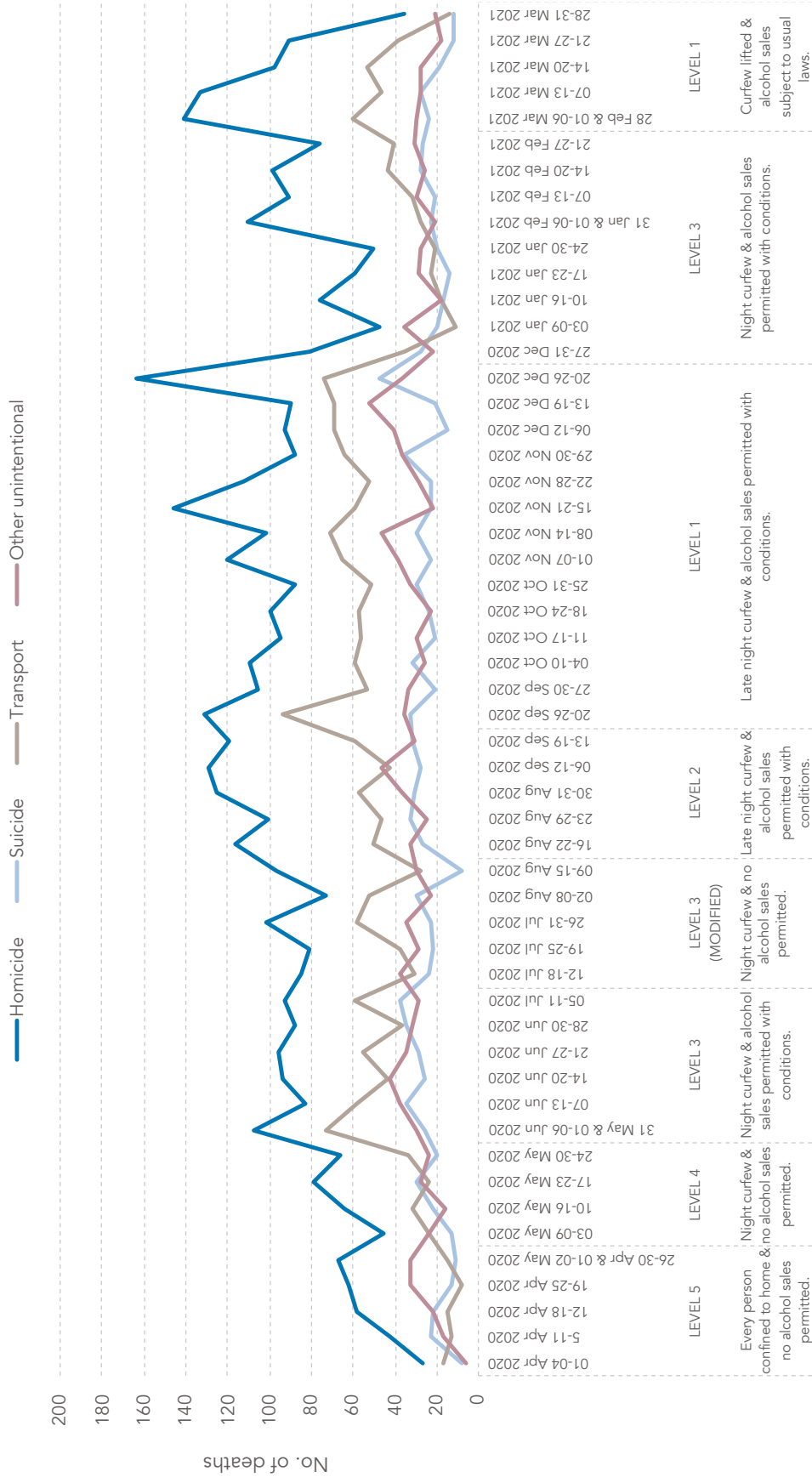


Week and alert level

Figure 4. Weekly deaths by apparent manner of death in Gauteng (weighted analysis), (N = 13 536)

KWAZULU-NATAL DEATHS BY WEEK AND COVID-19 ALERT LEVELS (WEIGHTED)

(N = 10 330)



Week and alert level

Figure 5. Weekly deaths by apparent manner of death in KwaZulu-Natal (weighted analysis), (N = 10 330)

LIMPOPO DEATHS BY WEEK AND COVID-19 ALERT LEVELS (WEIGHTED)

(N = 3 274)

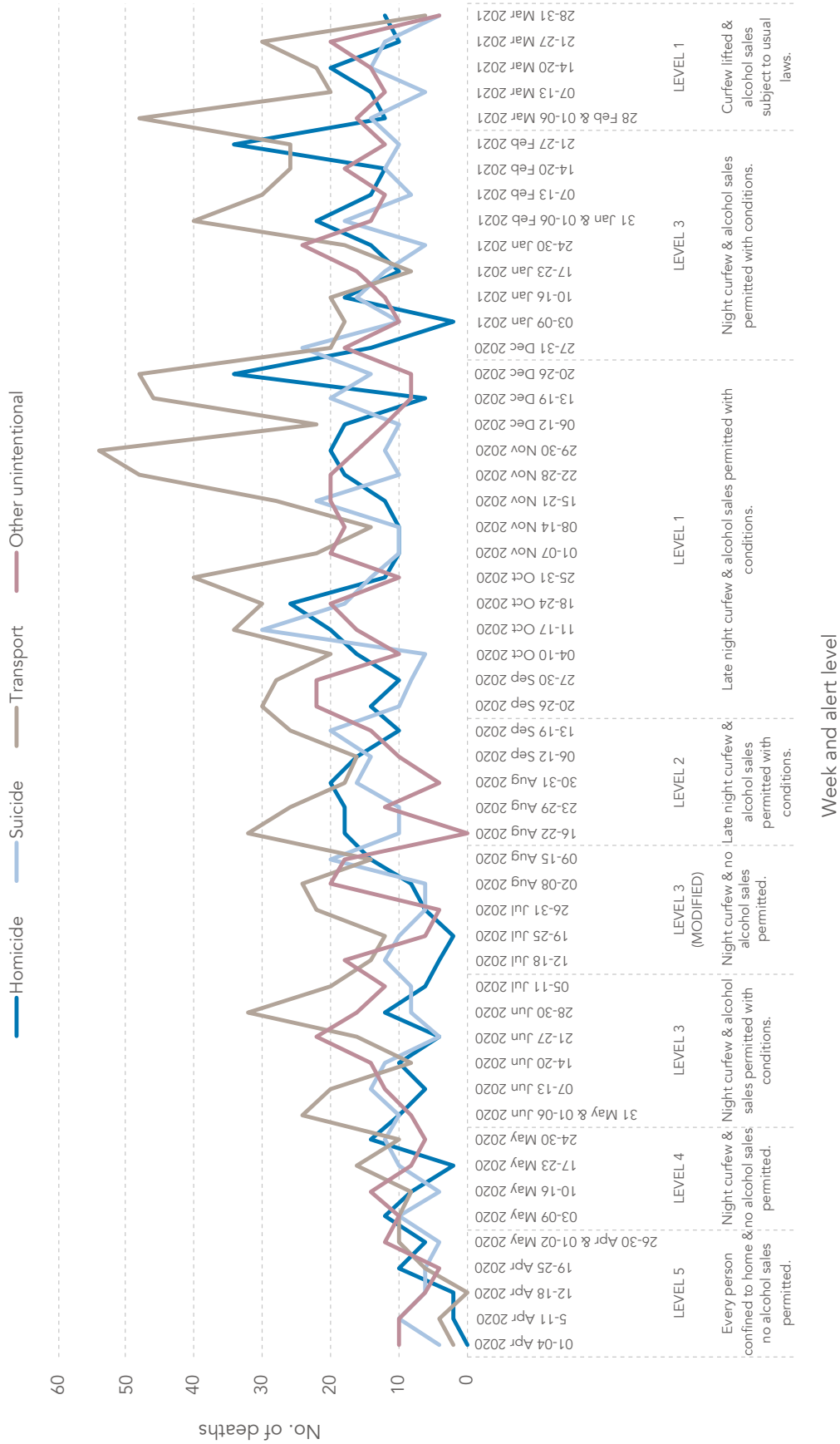


Figure 6. Weekly deaths by apparent manner of death in Limpopo (weighted analysis), (N = 3 274)

MPUMALANGA DEATHS BY WEEK AND COVID-19 ALERT LEVELS (WEIGHTED)

(N = 3 996)

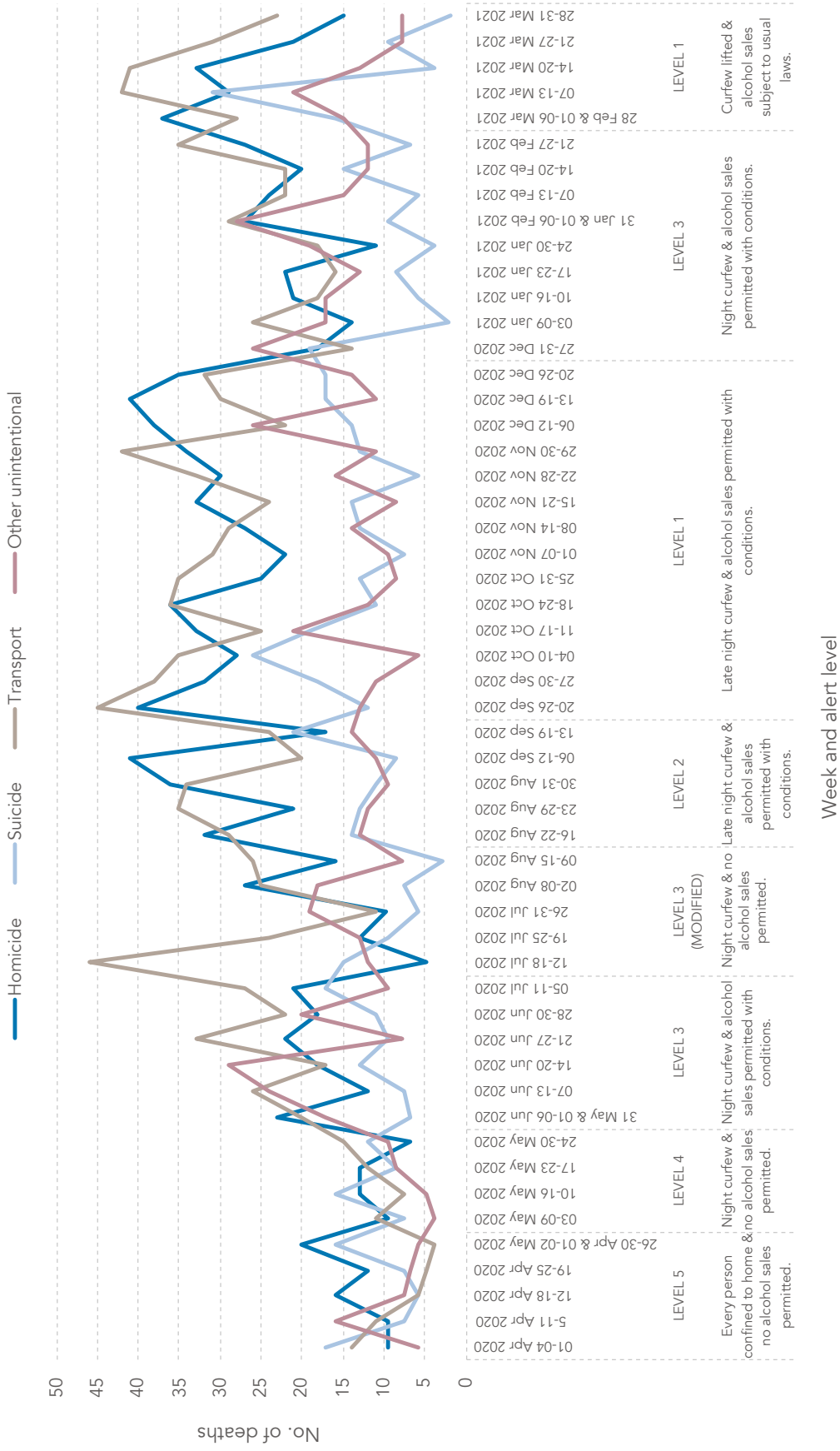
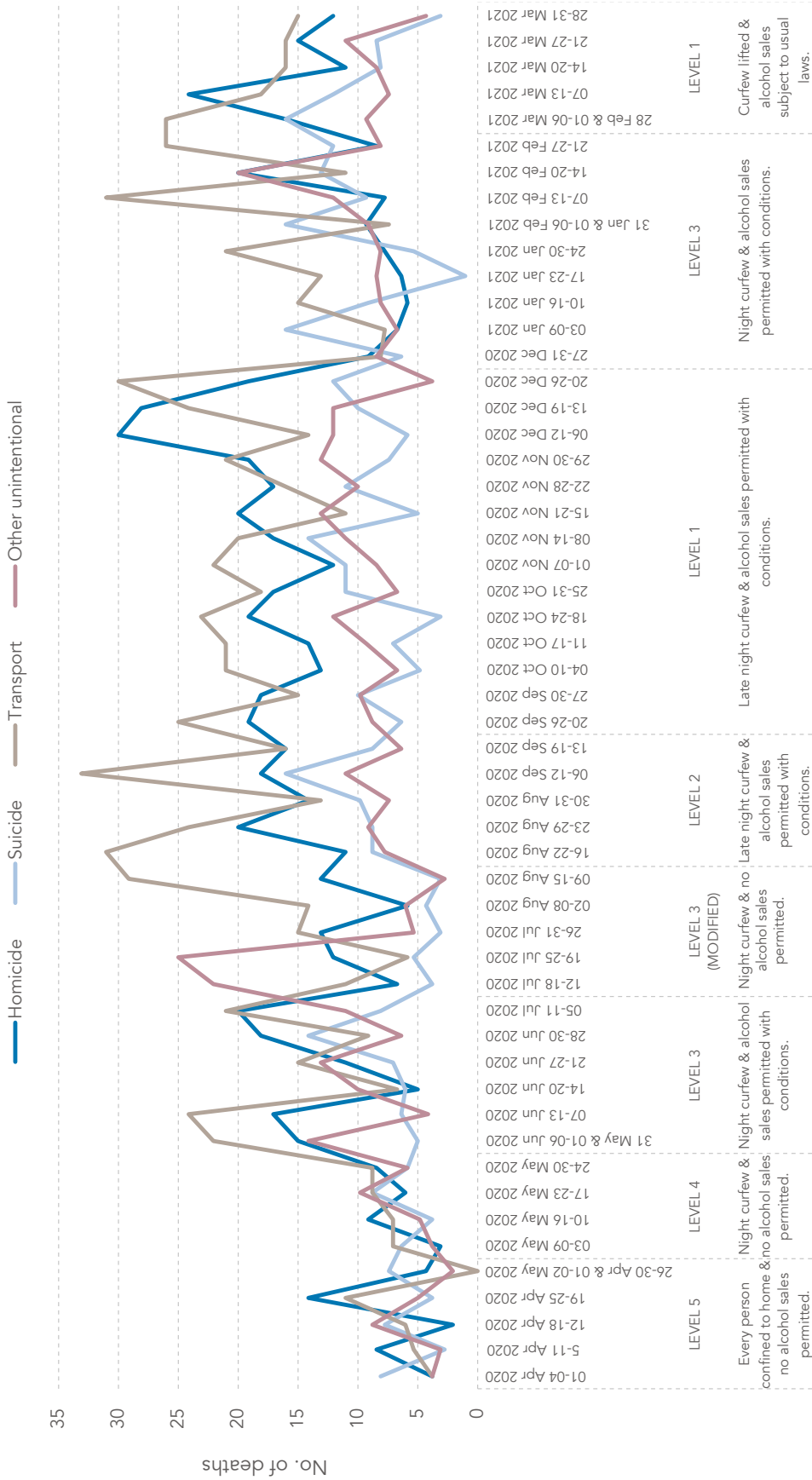


Figure 7. Weekly deaths by apparent manner of death in Mpumalanga (weighted analysis), (N = 3 996)

NORTH WEST DEATHS BY WEEK AND COVID-19 ALERT LEVELS (WEIGHTED)

(N = 2 494)

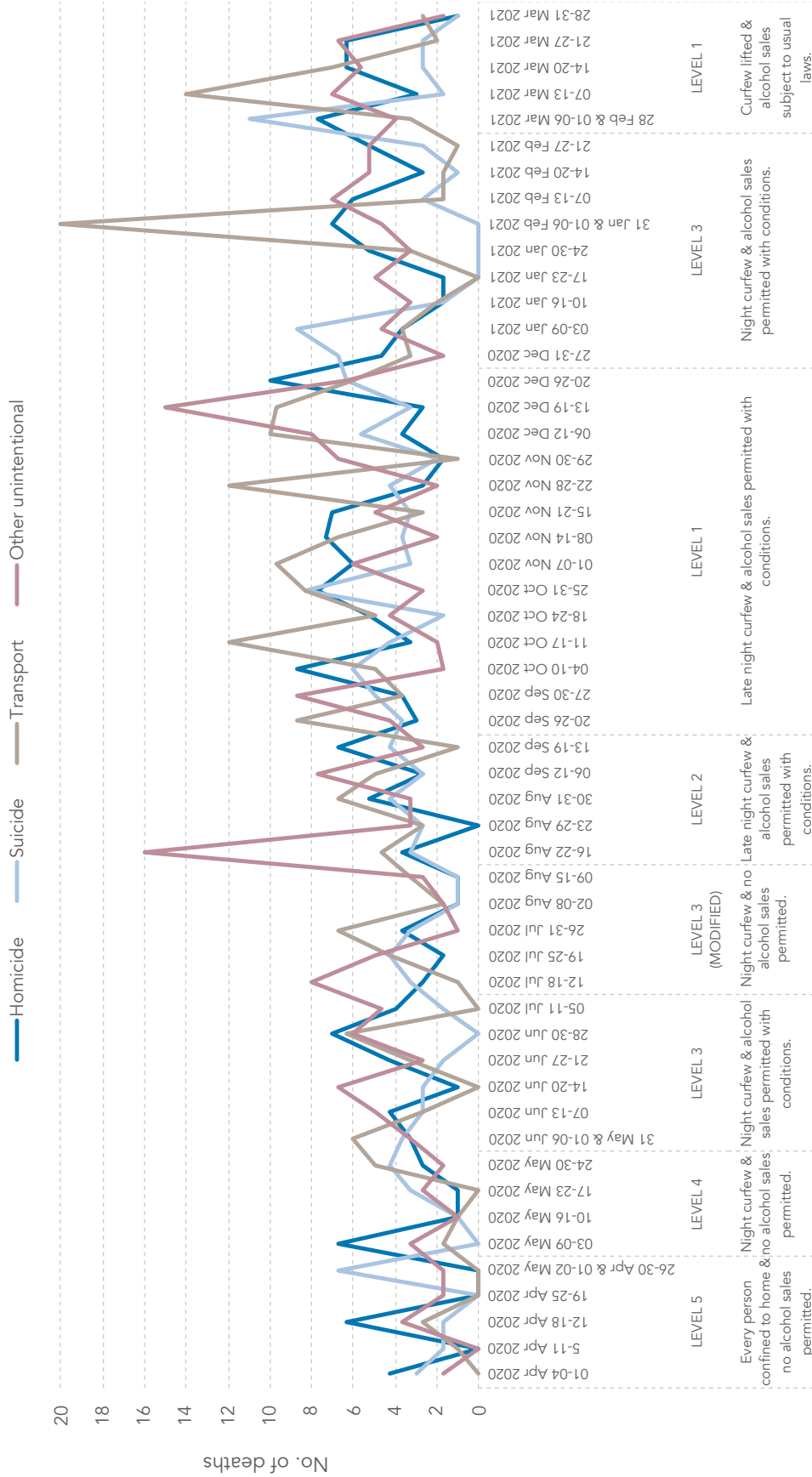


Week and alert level

Figure 8. Weekly deaths by apparent manner of death in North West (weighted analysis), (N = 2 494)

NORTHERN CAPE DEATHS BY WEEK AND COVID-19 ALERT LEVELS (WEIGHTED)

(N = 852)

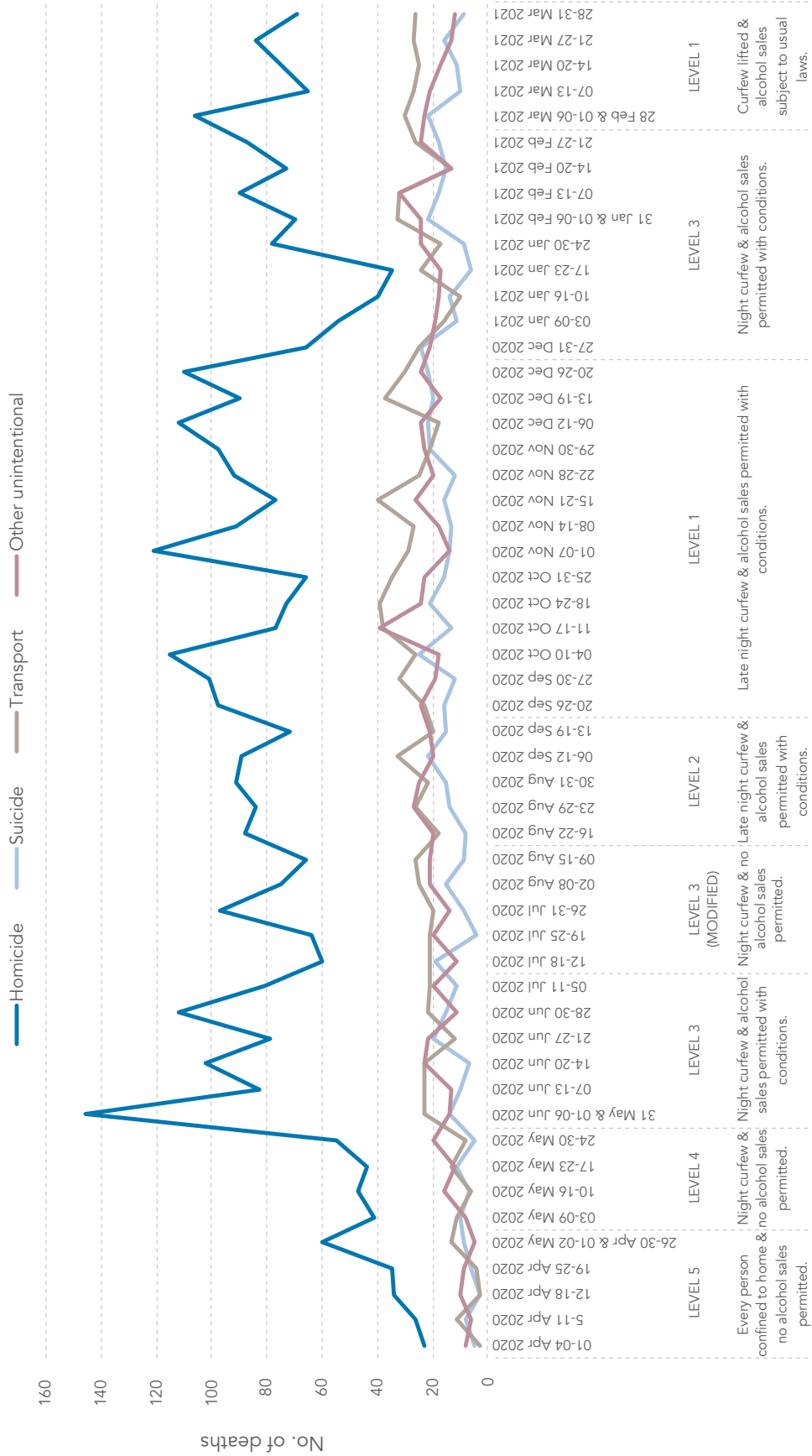


Week and alert level

Figure 9. Weekly deaths by apparent manner of death in Northern Cape (weighted analysis), (N = 852)

WESTERN CAPE DEATHS BY WEEK AND COVID-19 ALERT LEVEL (WEIGHTED)

(N = 6 957)



Week and COVID 19 alert level

Figure 10. Weekly deaths by apparent manner of death in the Western Cape (weighted analysis), (N = 6 957)

APPENDIX III

9. APPENDIX III

HOMICIDE (N=21 766)

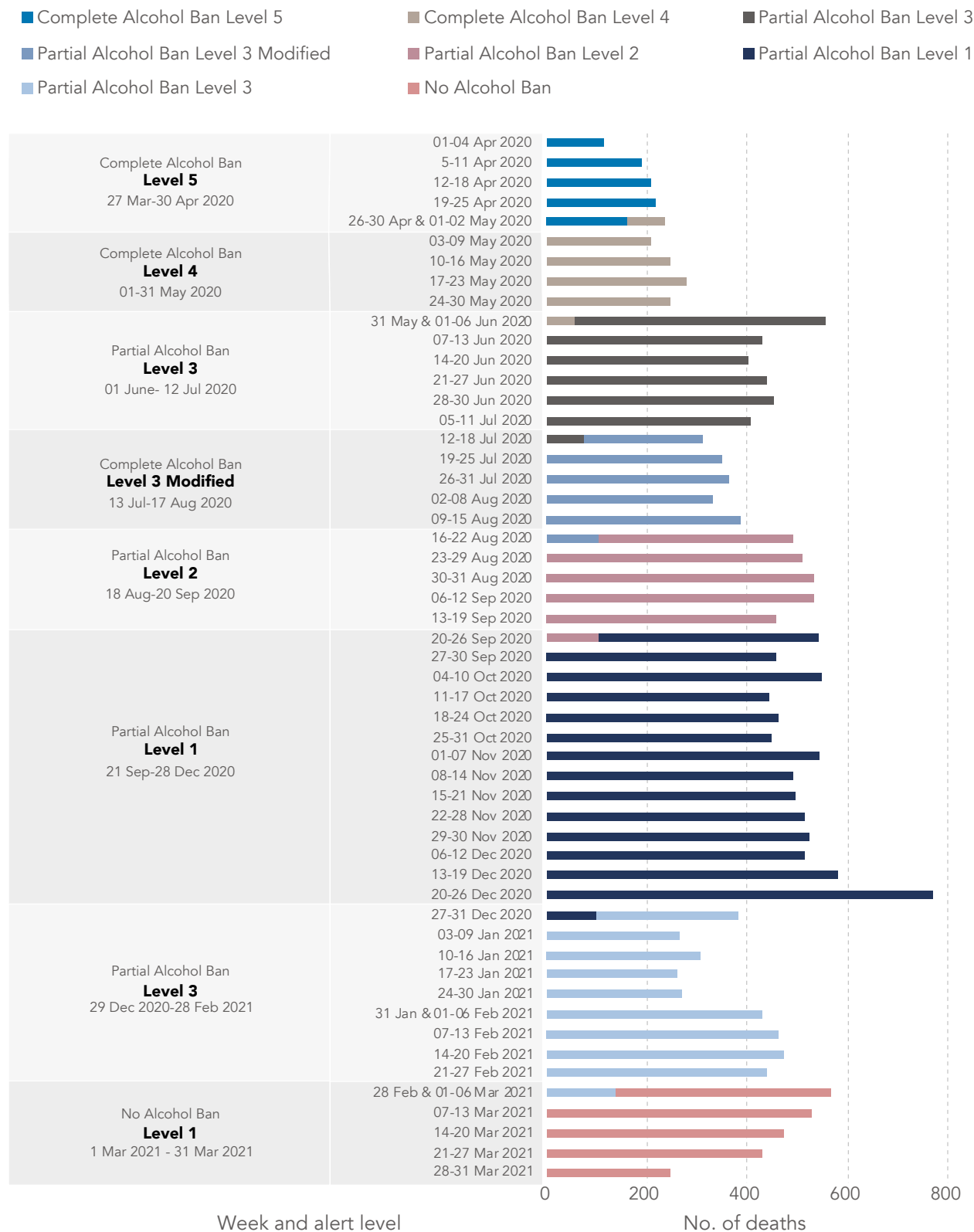


Figure I. Weekly homicide deaths with COVID-19 lockdown levels (weighted analysis), (N = 21 766). Includes unknown gender.

SUICIDE (N=6 652)

- Complete Alcohol Ban Level 5
- Complete Alcohol Ban Level 4
- Partial Alcohol Ban Level 3
- Partial Alcohol Ban Level 3 Modified
- Partial Alcohol Ban Level 2
- Partial Alcohol Ban Level 1
- Partial Alcohol Ban Level 3
- No Alcohol Ban

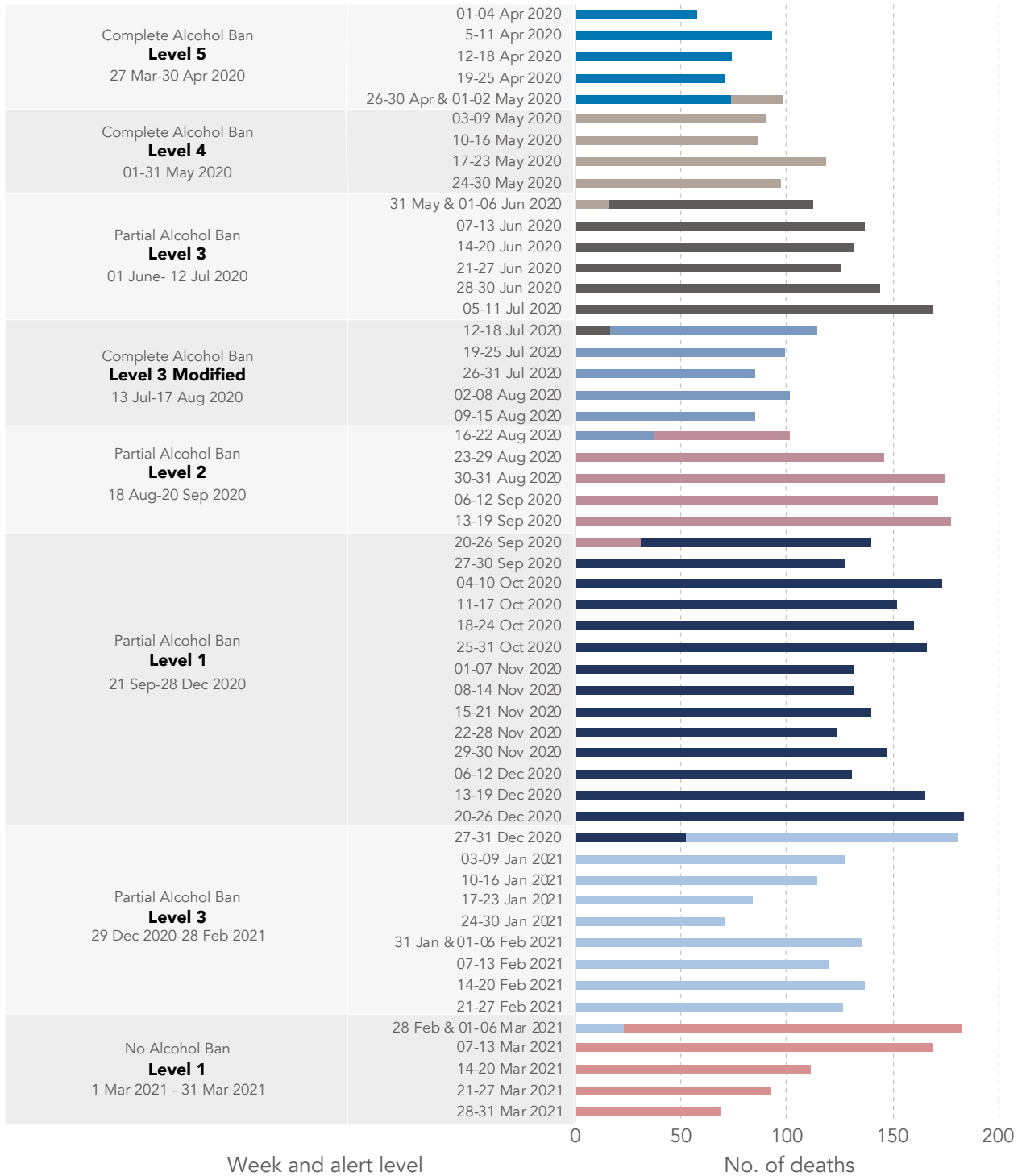


Figure 2. Weekly suicide deaths with COVID-19 lockdown levels (weighted analysis), (N = 6 652). Includes unknown gender.

TRANSPORT-ROAD TRAFFIC (N=10 126)

- Complete Alcohol Ban Level 5
- Complete Alcohol Ban Level 4
- Partial Alcohol Ban Level 3
- Partial Alcohol Ban Level 3 Modified
- Partial Alcohol Ban Level 2
- Partial Alcohol Ban Level 1
- Partial Alcohol Ban Level 3
- No Alcohol Ban

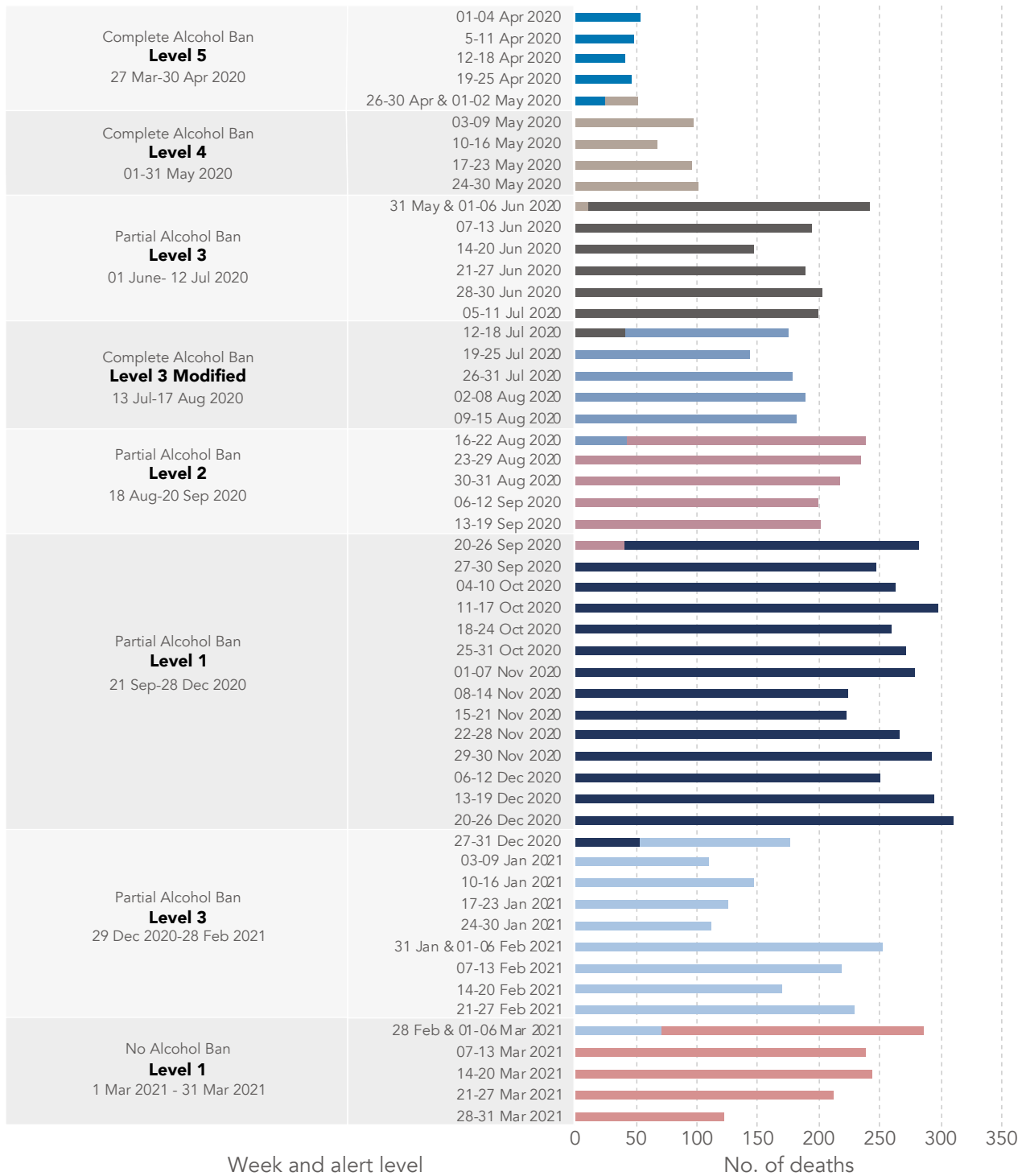


Figure 3. Weekly road traffic deaths with COVID-19 lockdown levels (weighted analysis), (N = 10 126). Includes unknown gender.

OTHER TRANSPORT (N=1 370)

- Complete Alcohol Ban Level 5
- Complete Alcohol Ban Level 4
- Partial Alcohol Ban Level 3
- Partial Alcohol Ban Level 3 Modified
- Partial Alcohol Ban Level 2
- Partial Alcohol Ban Level 1
- Partial Alcohol Ban Level 3
- No Alcohol Ban

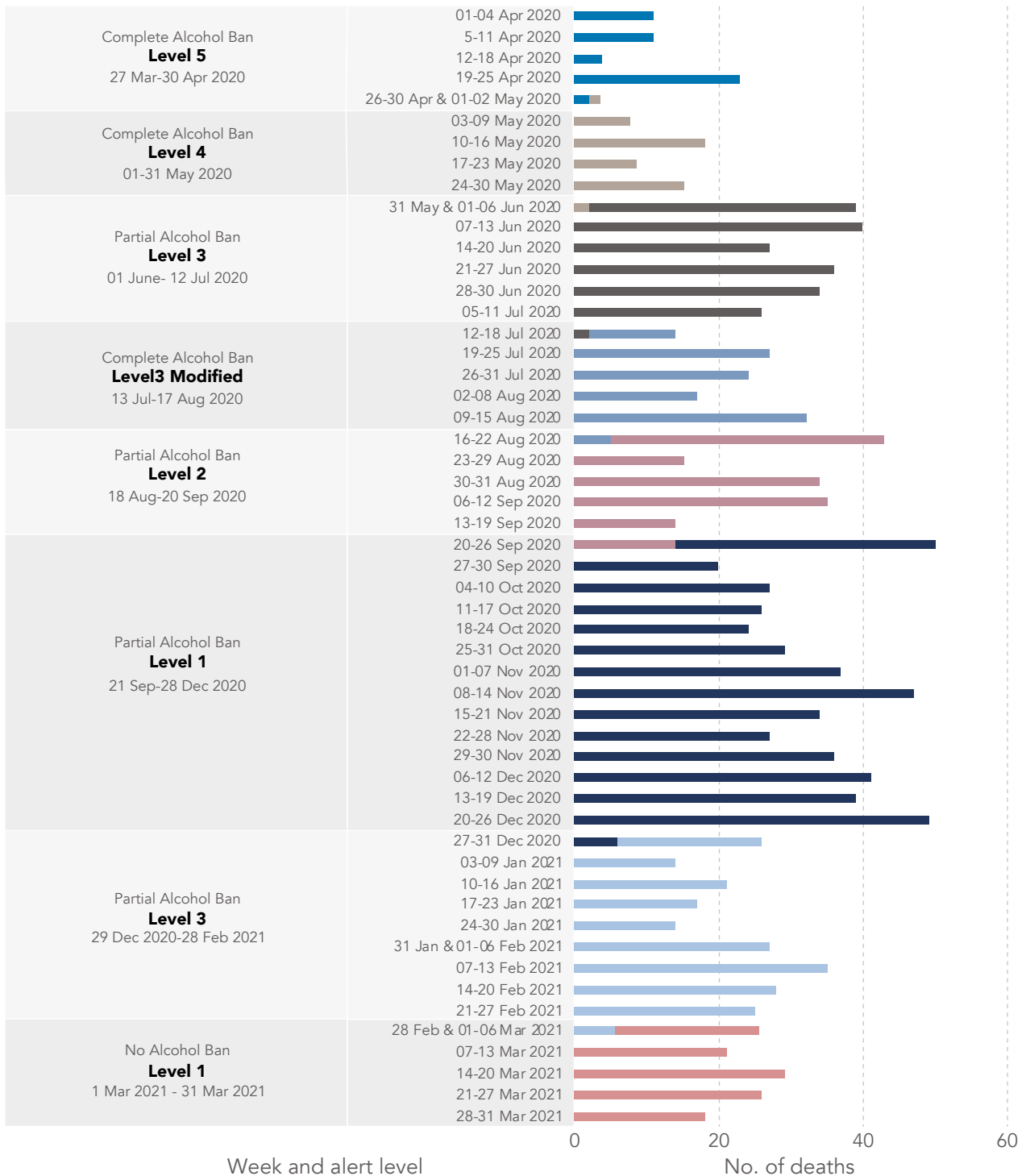


Figure 4. Weekly other transport traffic deaths with COVID-19 lockdown levels (weighted analysis), (N = 1 370). Includes unknown gender.

OTHER UNINTENTIONAL (N=10 754)

- Complete Alcohol Ban Level 5
- Complete Alcohol Ban Level 4
- Partial Alcohol Ban Level 3
- Partial Alcohol Ban Level 3 Modified
- Partial Alcohol Ban Level 2
- Partial Alcohol Ban Level 1
- Partial Alcohol Ban Level 3
- No Alcohol Ban

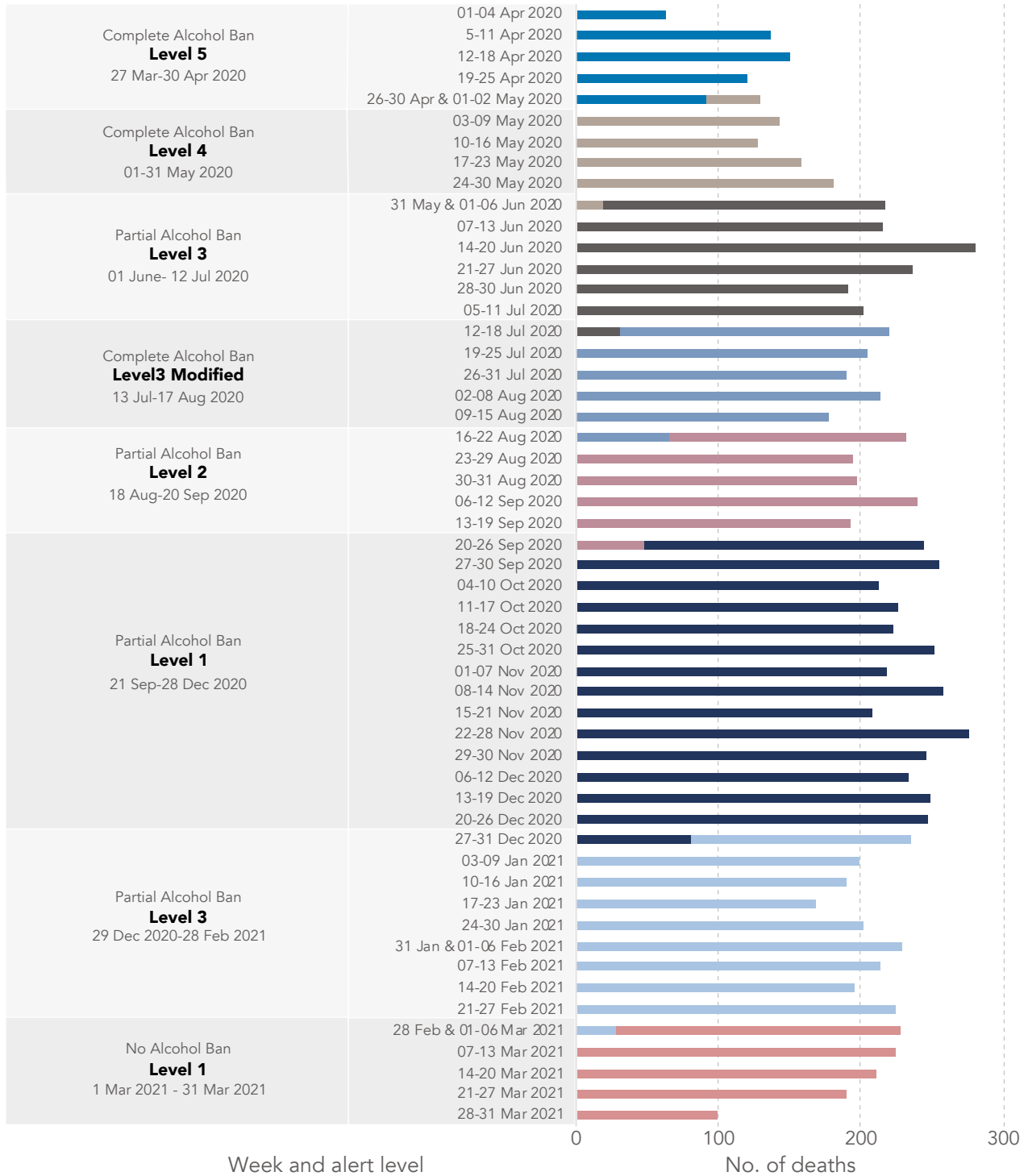


Figure 5. Weekly other unintentional deaths with COVID-19 lockdown levels (weighted analysis), (N = 1 370). Includes unknown gender.

APPENDIX IV

10. APPENDIX IV

We were only able to link 7.2% (n= 2 364) of the BAC lab data to the total number of the unweighted non-natural deaths (n=32 532).

10.1. BLOOD ALCOHOL CONCENTRATION (BAC) FOR HOMICIDE CASES

BAC data were available for 1 556 homicides (7.1% of all homicides) (Appendix IV - Table 1). Of these, almost a quarter tested positive for alcohol and most of these (20.8% of the total) were over the legal driving limit (≥ 0.05 g/100ml) when tested. Sharp force homicide had the highest proportion (42.0%) with high alcohol levels. In addition, excessive BACs were recorded for more than 32% of homicides that occurred on Saturday and Sunday.

Table 1: Blood Alcohol Concentration (g/ml)* by the leading mechanism of homicide, day- and month of death, 01 April 2020 - 31 March 2021

	0 g/100ml %	0.01 - 0.049 g/100ml %	≥ 0.05 g/100ml %
Homicide with available BAC results* (n=1 556)	75.8	3.5	20.8
Leading mechanism of homicide			
Sharp force (n=359)	55.2	2.8	42.0
Firearms (n=950)	82.6	3.8	13.7
Blunt force (n=213)	80	2.9	17.1
Strangled (n=8)	87.8	0.0	12.2
Day of death			
Monday (n=216)	83.4	3.9	12.7
Tuesday (n=199)	82.7	2.0	15.3
Wednesday (n=188)	87.0	2.1	10.9
Thursday (n=175)	81.6	3.4	15.0
Friday (n=208)	80.7	2.9	16.4
Saturday (n=278)	65.4	3.5	31.1
Sunday (n=291)	60.9	5.5	33.6
Month and year of death			
April 2020 (n=179)	90.1	5.5	4.4
May 2020 (n=242)	85.6	0.8	13.6
June 2020 (n=453)	66.8	3.3	29.9
July 2020 (n=334)	76.7	3.8	19.6
August 2020 (n=292)	73.6	3.1	23.3
September 2020 (n=43)	72.1	4.7	23.3

*Results reflect only those cases where the BAC was linked to laboratory data

10.2. BAC FOR ROAD TRAFFIC INJURY DEATHS

BAC was tested for 492 road traffic injury deaths (Appendix IV - Table 2), and excessive BAC levels were particularly recorded for road traffic deaths that occurred on a Saturday and Sunday, and during April, June, July and September. This must be interpreted with caution as a small number of cases were available in 2021.

Table 2: Blood Alcohol Concentration* for road traffic injuries by day- and month of death

	0 g/100ml %	0.01-0.049 g/100ml %	≥0.05 g/100ml %
Road traffic injury deaths with available BAC results (N=492)			
Day of death			
Monday (n=71)	59.5	5.4	35.0
Tuesday (n=65)	60.4	1.5	38.1
Wednesday (n=57)	76.7	3.5	19.8
Thursday (n=41)	59.2	2.5	38.3
Friday (n=73)	50.2	4.0	45.9
Saturday (n=93)	48.6	3.1	48.3
Sunday (n=92)	40.7	7.5	51.8

*Results reflect only those cases where the lab BAC linked

Appendix IV - Figure 1 illustrates the progressive levels of alcohol intoxication by the leading road user categories. Motor vehicle (MV) drivers had the highest proportion of alcohol-positive cases, where 52.1% tested above the legal limit of 0.05 g/100ml of alcohol for driving. In addition, 32.7% of MV pedestrian fatalities had blood alcohol levels of 0.05 g/100ml and above.

BLOOD ALCOHOL CONCENTRATION LEVEL BY TYPE OF ROAD USER DEATH (N = 459)

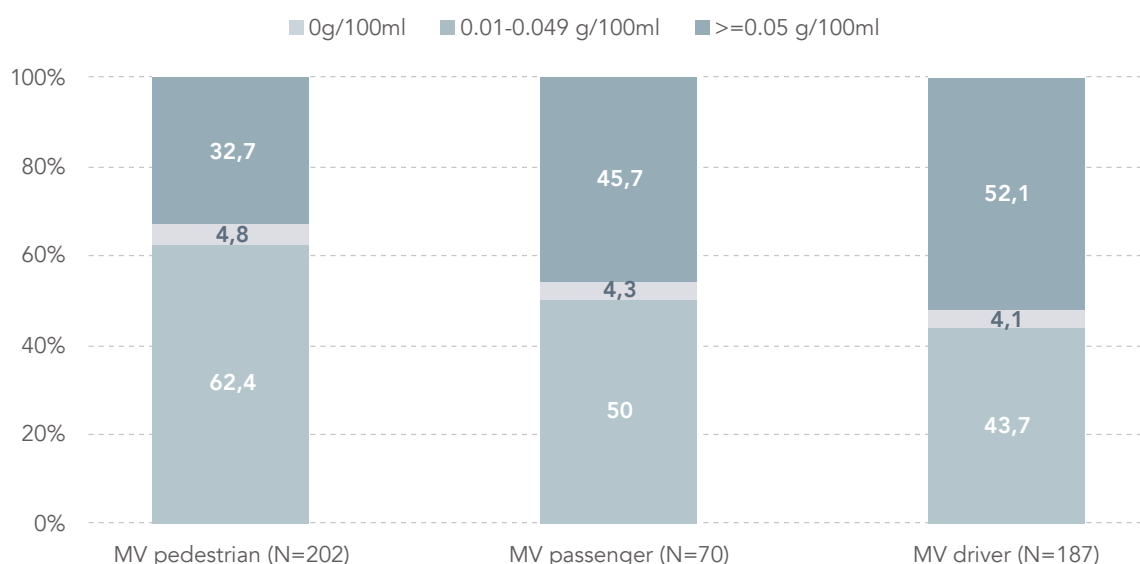


Figure 1: BAC levels by leading road user categories (N = 459)

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