

# A Study on the Characteristic Features of Covid-19 Deaths in a Regional Hospital in Mthatha in the Eastern Cape, South Africa

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## Abstract

**Background:** Covid-19 is an acute health emergency to human beings all over the world. This pandemic has destabilised the day-to-day life of almost everyone. It is a challenge to scientists and politicians to initiate a return to normal human life from the grip of Covid-19 so that the economies of countries do not stop growing.

**Objective:** To study the characteristics of Covid-19 deaths in a regional hospital in Mthatha in the Eastern Cape, South Africa.

**Method:** It is a retrospective record review study of the cases of patients in Mthatha Regional Hospital (MRH) in South Africa who were not able to be saved.

**Results:** There were 100 deaths in MRH. Of these 57 (57%) were females and 43 (43%) males. The average age was 63.3 years. Shortness of breath was the most common presenting symptom followed by weakness, a cough and fever. More than half of the Covid-19 cases had associated co-morbidity such as hypertension (50%), diabetes (37%) and HIV (15%). The mean oxygen saturation (SpO<sub>2</sub>) at the time of admission was 75.5±17 on pulse oximetry.

**Conclusion:** The covid-19 mortality was 1.3 times higher among females in the regional hospital under study. The majority of the victims were suffering hypertension and diabetes.

**Keywords:** Covid-19, diabetes, hypertension, HIV, oxygen

## Introduction

Covid-19 is a severe respiratory syndrome. It has been increasing worldwide, and more than 300 000 people died because of this pandemic worldwide.<sup>1</sup> The rapid progression of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) pandemic is a global challenge.<sup>2</sup> Corona viruses such as middle east respiratory syndrome (MERS) and severe acute respiratory syndrome (SARS) were also associated

with severe respiratory consequences with higher death rates among patients with diabetes.<sup>3</sup> There are limited studies, but the majority of them claim that diabetic patients are at higher risk of viral infections with severe catastrophic consequences.<sup>4</sup>

Age and sex and health status of the patient has a prognostic value in Covid-9 patients worldwide. Therefore, these values of age and sex must be utilised in decision-making to make predictions

about Covid-19.<sup>5</sup> There is also a racial difference among patients affected by Covid-19 and this must be utilised in preventive strategies.<sup>6</sup> Mechanical invasive ventilation is common among Covid-19 patients, but the majority will die because of multiple organ failure in hospital.<sup>7</sup> There is a published study in South Africa to identify high-risk individuals. The patterns of Covid-19 deaths identified by sex, age, co-morbidities, and provinces point to the need for targeted and localised interventions. The individuals who suffered from high blood pressure and diabetes should be given careful attention during the Covid-19 pandemic across SA.<sup>8</sup> The black race is more vulnerable in comparison to white individuals in United States. The risk of high mortality in Covid-19 was seen in people with low socio-economic status.<sup>9</sup> The purpose of this study was to highlight the characteristics of Covid-19 deaths at a regional hospital in Mthatha, Eastern Cape, South Africa.

### Method and Material

This was a retrospective record review of the first 100 patients who died due to Covid-19 between 10 July 2020, and 31 January 2021 at the Mthatha Regional Hospital (MRH) in the Eastern Cape Province of South Africa. Patients admitted to the isolation ward after confirming a positive result of reverse-transcriptase polymerase chain reaction (RT-PCR) and/or rapid antigen test for SARS-CoV2 virus from a nasopharyngeal swab formed the study participants. MRH is a 302-bed referral hospital designated for Covid-19 management. The hospital

has a 36-bed isolation unit to accommodate, and additional beds were repurposed during the peak of the pandemic to accommodate the additional Covid-19 patients. The hospital provides level one and two care to approximately half a million people.

Data were manually collected from clinical health records and included demographic characteristics and comorbid conditions. Comorbid conditions derived from the patients were abstracted from documentation on the clinical health records. An Excel spreadsheet was used to extract the data and every 10th entry was rechecked for accuracy and quality assurance. Data were analysed using the Statistical Package for Social Sciences (SPSS) version 18.0 and displayed in tables.

### Results

The majority 57(57%) of the patients were female and 43 were male with the mean age of 63.3±16 years. Shortness of breath was the most common presenting symptom followed by weakness, a cough, and fever (Table 1). Half of the hospitalised patient who died from Covid-19 had hypertension (50%) followed by diabetes mellitus (37%), HIV (15%) and TB (11%) comorbidity (Table 1). The mean oxygen saturation (SpO<sub>2</sub>) at the time of admission was 75.5±17 on pulse oximetry. The majority of patients received supplementary oxygen by facemask (66%), followed by nasal high flow (28%), CPAP (3%) and 3% were on room air (Table 1). About two-thirds (60%) of the hospitalised patients who died due to Covid-19 illness were above 60 years and of this 13% were above 80 years of age (Table 2).

**Table 1. Characteristics of Covid-19 deaths at the regional hospital in Mthatha (N=100)**

|                             |         |
|-----------------------------|---------|
| Mean age ± SD               | 63.3±16 |
| Gender (n=100)              |         |
| Male                        | 43      |
| Female                      | 57      |
| Presenting symptoms (n=100) |         |
| Shortness of breath         | 91      |

**Cont... Table 1. Characteristics of Covid-19 deaths at the regional hospital in Mthatha (N=100)**

|                                      |    |
|--------------------------------------|----|
| Weakness                             | 87 |
| Cough                                | 68 |
| Fever                                | 33 |
| Loss of taste                        | 7  |
| Loss of smell                        | 4  |
| Comorbidity (n=100)                  |    |
| Hypertension                         | 50 |
| Diabetes                             | 37 |
| HIV                                  | 15 |
| TB                                   | 11 |
| CVA                                  | 5  |
| CKD                                  | 4  |
| COPD                                 | 3  |
| Epilepsy                             | 3  |
| Supplementary oxygen methods (n=100) |    |
| Face mask                            | 66 |
| Nasal high flow                      | 28 |
| CPAP                                 | 3  |
| Room air                             | 3  |

**Table 2. Age and gender distribution among Covid-19 deaths at the regional hospital in Mthatha (n=100). Age**

| (yrs.) | Male (%)  | Female (%) | Total (%) |
|--------|-----------|------------|-----------|
| ≤20    | 1 (2.3)   | 0 (0)      | 1(1)      |
| 21-40  | 2 (4.7)   | 9 (15.8)   | 11(11)    |
| 41-60  | 11 (25.6) | 17 (29.8)  | 28 (28)   |
| 61-80  | 27 (62.8) | 20 (35.1)  | 47 (47)   |
| >80    | 2 (4.7)   | 11 (19.3)  | 13 (13)   |

## Discussion

This is probably a first report on the characteristics of death arising from Covid-19 in the regional hospital in Mthatha. The Mthatha (Umtata), the capital of the Republic of Transkei in the apartheid time, has given rise to national and international leaders from this region, but it is still poverty stricken. People are very poor and extreme poverty is chronic in nature as there

is no scope for employment. There is already a triple burden of unnatural death, HIV, and tuberculosis in this region. Covid-19 has added one more.

The mean of Covid-19 patients in this study is 63.3 which is almost comparable with other studies (Table 1). A systematic review and meta-analysis exploring different age, sex, and health differences by Mesas et al. in 2020 showed the average age was 60

years which is a little lower than in our report.<sup>5</sup> An earlier study carried out by the author showed that the mean age of hospitalised patients was 55.5 years.<sup>10</sup> About one-fifth (19.3%) died at 80 or above years. About half (47%) of the patients died between 61 and 80 years of age in this study (Table 2). This is the most vulnerable age group reported.<sup>5</sup> People less than 65 years have very little risk of Covid-19 death if they were not suffering from any morbid conditions.<sup>11</sup> Strategies to focus on protecting high-risk individuals in managing the pandemic.<sup>11</sup>

It is surprising that about two-thirds (57%) were women who died in this hospital of Covid-19. This is higher than in other published studies.<sup>5</sup> The men are more vulnerable to Covid-19 infection than females.<sup>5, 12</sup> Why, then, are the women having almost one and half times (57/43) higher death rate due to Covid-19 infection? It is because the women are probably higher in number in this region than men with a ratio of 55:45.<sup>13</sup> This could not be explained alone, as there is 1.32 times higher mortality among females. Men smoke tobacco and cannabis and use alcohol in abundance a lot in this region, and therefore men should be more at risk of Covid-19 infection.<sup>5</sup> The Covid-19 produces more severe symptoms and higher mortality among men than women.<sup>14</sup> It is not clear how the immune response differs with sex difference during Covid-19 infection against severe acute respiratory syndrome.<sup>14</sup> Male patients have a higher level of innate immune cytokines such as IL-8 and IL-18 along with more robust non-classical monocytes.<sup>14</sup> Female patients have more robust T cell activation than male patients. By contrast, higher levels of innate immune cytokines were associated with worse disease progression in female patients, but not in male patients.<sup>14</sup> These findings provide a possible explanation for the observed sex biases in Covid-19 and provide an important basis for the development of a sex-based approach to the treatment and care of male and female patients with Covid-19.

The majority victims who died were suffering from hypertension (50%) and diabetes (37%) in this study (Table 2). Thirty-one percent (31%) of victims were suffering from both hypertension and diabetes, but the outcome is same. Diabetes and high blood pressure increase the risk of death in Covid-19 patients.<sup>3</sup> The average admission period was 6.7 days among all patients who were victims of Covid-19 deaths. There was not much difference in survival time in patients who were suffering from hypertensive (6.5 days) and diabetes (6.6 days) in this study. The Covid-19 infection outcome is unpredictable as it drops the oxygenation level rapidly.

HIV infection is prevalent in this community and recorded 15% in this study, which is almost equal to the national average. The estimated overall HIV prevalence rate is approximately 13.7% among the South African population.<sup>15</sup> Only one patient was recorded who died was less than 20 years old in this study (Table 2). She was HIV positive stage 4. The Covid-19 infection has probably precipitated her death much faster, although there is no study found to substantiate this claim in literature. The majority (25/36) of the patients were females who were admitted to the thirty-six bedded Covid-19 ward in this hospital. All were African black subjects so one can does not compare the racial predisposition for Covid-19. They were also poor as those who cannot afford to have medical insurance generally come to public hospitals in South Africa.<sup>13</sup> The black race is more vulnerable in comparison to white individuals in United States,<sup>6</sup> but this may not be true of South African blacks. The risk of high mortality from Covid-19 was linked with low socio-economic status.<sup>9, 12</sup> This discrimination has been more prevalent in American society.<sup>9</sup> Therefore, those who are poor become of victims of all kinds of vulnerable situations and Covid-19 is one of them.

The most common usual clinical findings in this study are dyspnoea, cough, and fatigue.<sup>3</sup> Shortness

of breath was found on almost all the patient (91%) records. Respiratory tract involvement is the most common finding where there is involvement of the lungs.<sup>2</sup> This is the reason the first thing in hospital is to do an X-ray chest or MRI to know the level of lung involvement. The lungs get opaque because of the Covid-19 infiltrate and this leads to pneumonic consolidation. There are various mechanisms but the one most accepted is cytokine storms, where the body's own defence is used to heal the damaged organ and system.<sup>16</sup> The cytokine storm is fatal in Covid-19, and leads to multiple pathological characteristics such as ARDS, coagulation, and multi-organ dysfunctions.<sup>16</sup> Blood IL-6 levels are highly correlated with the lethal complications of Covid-19 and is a marker of disease severity. It is presumed that the body's immunity must not be too strong as that leads to cytokine storms, or too weak low that one can does not fight a virus.<sup>16</sup> There are lot of things that are still not clear which are displayed on television channels nearly every day. It is a droplet viral infection so it is different from some other viral infections because an individual may look healthy but at the same time be infectious. Therefore, it is an infection that spreads without any notice. Those people who are suffering from hypertension and diabetes are more at risk of hospitalisation as well as a poor outcome.<sup>3,4,11</sup>

Obesity is very common among African women in this region. Most of the patients admitted to the Covid-9 ward were obese. However, the body mass index was not estimated. A growing number of evidence connects obesity with Covid-19 as a major cause of death. There are several mechanisms from immune system activity which lead to inflammation.<sup>17</sup> It is not clear what causes this but certainly about three-fourths of the women in this study who died because of Covid-19 were obese.

This hospital is a poorly resourced hospital where there is lack of either ventilators or skilled staff to deal

with ventilators. Therefore, not a single patient was found in this study who was intubated. A majority of patients wore a facial mask or were on high oxygen flow.<sup>7</sup> The situation is not different in a private hospital in this region. A colleague of mine has died without putting him on a ventilator in a private hospital. It is considered that the chances of death are very high for those who are kept on ventilators but not zero. There is a sizeable number of patients who have survived in different hospitals; therefore, one must try hard to win against this Covid-19 epidemic.

### Conclusion

The Covid-19 mortality among females was 1.3 times higher in the regional hospital in Mthatha. Three-fourths of the victims were associated with hypertension and diabetes as a comorbidity. The survival period was around five or six days in this study.

**Ethical Considerations:** The Ethics Committee of the Walter Sisulu University has approved this study (Reference number: 098/2020) and approval from the Eastern Cape Department of Health (Reference number: EC\_202010\_027) along with hospital management have also been received.

**Conflict of Interest:** None

**Funding:** Self-funded

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