

The Impact of COVID-19 Pandemic on Service Delivery: An Empirical Analysis of Lepelle-Nkumpi Local Municipality

KAGISO MAKALELA

<https://orcid.org/0000-0002-3399-828X>

University of Mpumalanga, South Africa.

Kagiso.Makalela@ump.ac.za

JOHN MOLEPO

<https://orcid.org/0000-0002-8371-074X>

Tshwane University of Technology, South Africa

MolepoJN@tut.ac.za

Abstract

This paper aims to investigate the impact of the COVID-19 pandemic on service delivery with specific reference to Lepelle-Nkumpi Local Municipality. Many local municipalities in South Africa are facing unrelenting service delivery challenges and backlogs. On the other hand, the advent of the COVID-19 pandemic exacerbated the service delivery challenges in almost all the municipalities. This paper followed a quantitative research approach for data collection and analysis to ascertain the impact of COVID-19 on service delivery. The paper relied on the Theory of Social Change as a theoretical lens and for the interpretation of research results. The primary data collection method, such as a questionnaire, was used to collect quantitative data from the 449 households in selected wards in the municipality. Moreover, the systematic sampling method was used to select household participants. The data was analysed using descriptive and inferential statistics to determine the impact of the COVID-19 pandemic on service delivery. Chi-Square test (χ^2) method was used to judge the goodness of fit between expected and observed results, coupled with a coefficient of correlation (r) to determine the magnitude and the direction of the relationship COVID-19 pandemic and service delivery. This paper found that Lepelle-Nkumpi municipality was overwhelmed because of the COVID-19 pandemic. Services such as water, electricity, sanitation, and refuse collection were not adequately provided during the pandemic. This paper recommends, among others, the use of ICT for service delivery during crises such as the COVID-19 pandemic.

Keywords: Backlogs, crises, Municipality, Pandemic, Service Delivery.

Introduction.

The primary focus of this paper is to investigate the impact of the COVID-19 pandemic in the Lepelle-Nkumpi Local Municipality (LNLM). The advent of the COVID-19 pandemic was first identified from China city of Wuhan at the end of 2019. The pandemic spread across the globe at an unprecedented pace, resulting in a precipitous increase in dearth and halting of economic activities and development (Herdiana, Mukhlis, and Madya, 2020). The development of literature has widely asserted that the COVID-19 problem is not exclusively

limited to public health, but it involves multi-dimensional, including socio-economic, modes of communication, governance, and institutional systems. In a nutshell, the COVID-19 pandemic is perceived to have pragmatically disrupted service delivery across all municipalities. However, at the helm for effective planning and management of the pandemic lies the local government in collaboration with other spheres of government (Herdiana, Mukhlis, and Madya, 2020). The local government is deemed to play a leading role in tackling COVID-19. That is precisely because the local government is the sphere of government in close contact with the people. It is considered the immediate responder to the provision of services to rural communities with amalgamated support from both the national and provincial governments. Moreover, chapter 3 of the Constitution of the Republic of South Africa 1996, apart from alluding to intergovernmental relations, also on the other hand advocates for coordinated and concerted efforts by the government to secure the well-being of the people of the republic. The latter includes the protection of people in incidences of disaster such as the COVID-19 pandemic.

Important to realize that local municipalities on the other hand are expected to be at the forefront in tackling disasters such as the COVID-19 pandemic as postulated by the Disaster Management Act 57 of 2002 (RSA, 2002). The local municipalities must consider the following: first, ascertain the disparity in the COVID-19 infections across different regions, second, keep abreast of the spread of COVID-19 cases in rural communities, thirdly, provide adequate and uninterrupted services to communities, lastly, effectively manage the spread of the pandemic to avoid casualties (Apeti, Combes, Debrun and Minea, 2021). Consequently, a multiplicity of scholars such as Munzhedzi and Phago (2020); Nomani and Parveen (2020), have written extensively about the deleterious impact of the COVID-19 pandemic on local government service delivery, institutional and governance changes. The impact of the COVID-19 pandemic on service delivery is attributed to the fact that countermeasures such as municipal budget were constraints as part of measures to contain the spread of COVID-19 because the budget increased due to the increased number of COVID-19 infections (Herdiana, Mukhlis and Madya, 2020). Even though many rural municipalities continue to experience limited budgets.

Literature Review.

Service delivery in the context of the COVID-19 pandemic.

The COVID-19 pandemic had and continues to exacerbate service delivery backlogs across all municipalities. Many local governments are facing large losses in revenue and increased expenditure because of the COVID-19 crisis (Green and Loualiche, 2021). The local government experienced a budget deficit precisely because of a substantial decline in the tax revenue collected by the state and local governments during the pandemic. The lack of revenue collection was predominately a result of government regulations such as lockdown, as many municipalities were not able to collect rates and taxes for the services. The development literature is clear that municipalities experienced several challenges in delivering services during the pandemic. the challenges include corruption, limited financial resources, capacity building on personnel, and political meddling (Makalela, 2018; Nemec, and Špaček, 2020). The ongoing challenges perpetuated the backlog in service delivery across municipalities. Scholars such as Dzigbede, Gehl and Willoughby (2020), asserted that in the main, local municipalities must collaborate effectively for the benefit of rural communities. Hence, the municipalities ought to play a leading role in dealing with the COVID-19 pandemic. Herdiana, Mukhlis and Madya (2020) argued that the local government is one of the determining factors for the success of the response to COVID-19.

The government of the post-apartheid epoch entrusted the delivery of an ample number of services to the local sphere of government (Madzhivandila and Asha, 2012). It is quite clear, that municipalities have been facing difficulties to deliver even way before the COVID-19 pandemic. That is although South Africa has taken a significant and positive stride on the premise of developmental local government. The democratic municipalities continue to be inundated with significant challenges in service provision (Beyers, 2015). Service delivery planning and implementation of government programs under the auspice of COVID-19 are marred with upheavals. The COVID-19 pandemic disrupted the systems and mechanisms of community participation, many communities and development projects were abandoned because of the pandemic. The inability of local municipalities to deliver expected services to its service delivery beneficiaries is often marred with community dissatisfaction, which leads to service delivery protests.

The South African Government's response to the COVID-19 pandemic.

The South African government's response to the COVID-19 pandemic was led by the National Department of Health. To curb the spread of the pandemic, the government introduced several laws and measures under the National Disaster Management Act 57 of 2002. The country's response was consistent with the COVID-19 Strategic Preparedness and Response (SPAR) operational planning guidelines of the World Health Organization (WHO), released in February 2020. The WHO (2020e) guidelines set out several measures that countries were encouraged to adopt to help contain the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The government mobilized a multisector response, within which the health response was integrated, and established the National Coronavirus Command Council to guide the lockdown regulations. The government adopted different 8 stages in the response to the pandemic.

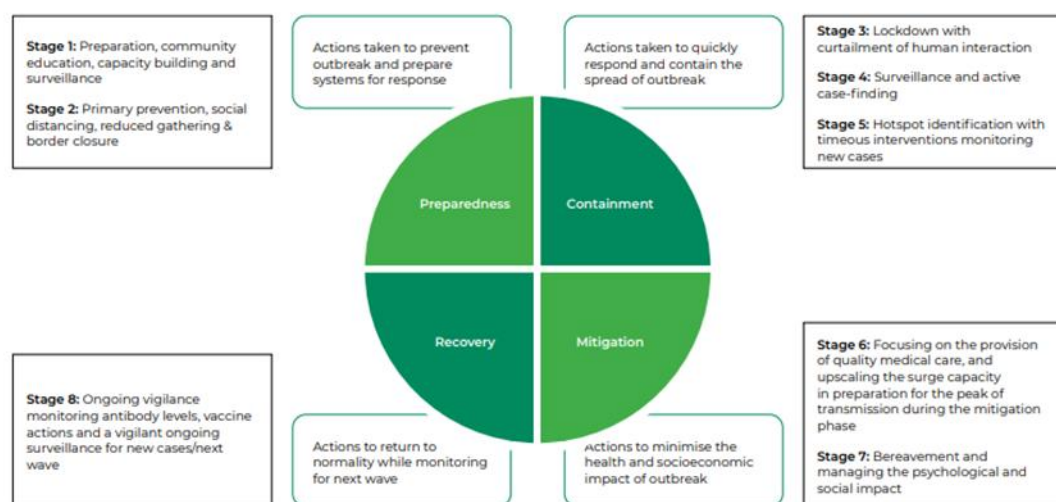


Figure 1: Stages of the South African response to COVID-19.

The eight overlapping stages were developed as part of the national health response plan to curb the spread of the pandemic.

- Stage 1 was about preparation, including establishing national testing and surveillance capacity.

- Stage 2 focused on primary prevention and commenced 10 days after the first South African case of COVID-19 had been confirmed. The government declared a national state of disaster, international travel was banned, schools and universities were closed, gatherings were restricted, and social distancing and handwashing were promoted.
- Stage 3 enacted the national lockdown, with regulations implemented on 26 March 2020 (Singh and Chauhan, 2020). The lockdown comprised five levels, ranging from extensive restrictions on movement and economic activity (alert level 5) to the easing of nearly all restrictions (alert level 1) (Garba, Lubuma, and Tsanou, 2020).
- Stage 4 started on day 33 of the lockdown. The government deployed more than 28,000 community health workers to undertake active house-to-house screening and case finding, particularly in high-risk communities (e.g., informal settlements). They used a mobile phone app to administer a symptom checklist and data for each household was uploaded with location coordinates to a central database to allow mapping. Suspected COVID-19 cases were referred to mobile testing stations or health facilities for further assessment.
- Stage 5 involved identifying hotspots and putting in place preventative measures in areas with localized outbreaks.
- Stage 6 involved the provision of medical care, including investment in infrastructure in the form of field hospitals.
- Stage 7 took a psychosocial perspective, addressing deaths, burials, and the mental health challenges associated with bereavement.
- Stage 8 ensures vigilance through continued case-finding and monitoring immunity levels, using surveillance in anticipation of potential subsequent waves of the epidemic (Abdool, 2020).

As part of the government response, the government of South Africa through the disaster management plans also promulgated the lockdown in order to limit in terms of the movement of people. The lockdown comprised five levels. The stages of the lockdown range from extensive restrictions on movement and economic activity (hard lockdown) to the easing of nearly all restrictions (soft lockdown). The South African government's response to the pandemic is aligned with the WHO's guidelines for managing and containing COVID-19. At the time the nationwide lockdown was declared on 26 March 2020, the country had only reported 927 cases of Covid-19 (DoH, 2020f), mainly in clusters in the metros. The total lockdown, originally intended to last for 21 days, imposed a stay-at-home order on the entire population; closed down non-essential services, schools, and institutions of higher learning; and advised the public to remain indoors and avoid unnecessary social contact. The strict lockdown was enforced by police and the army in certain communities.

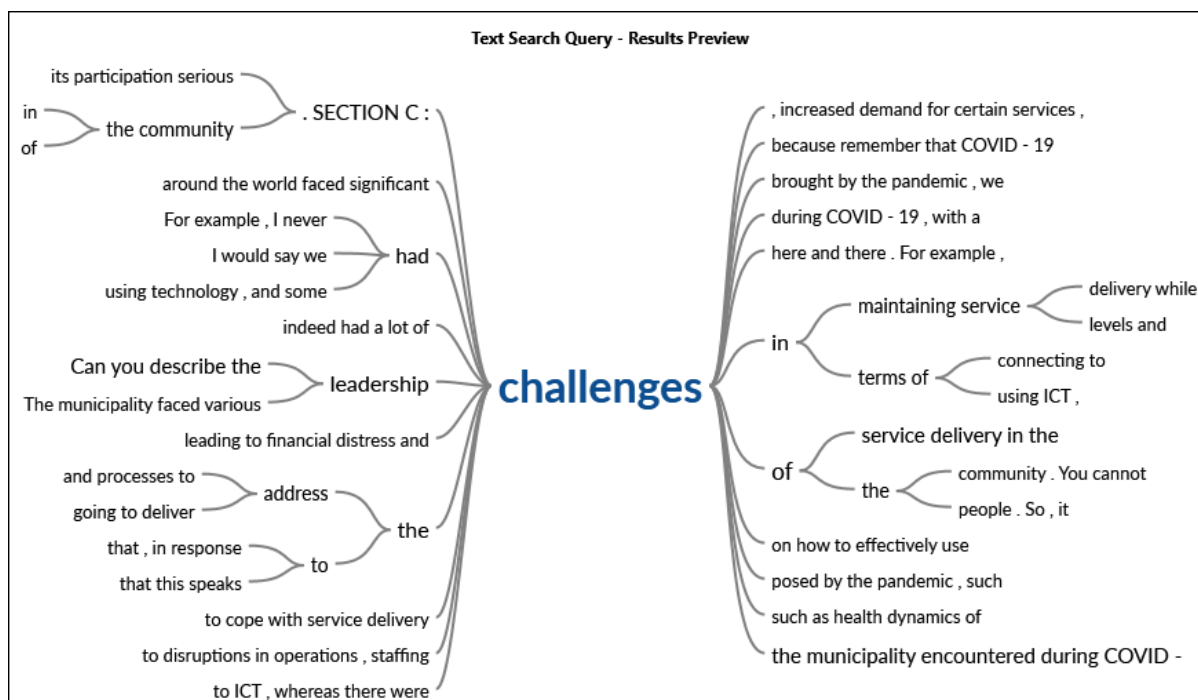


Figure 2: Text search query on challenges of service delivery during the pandemic.

The above figure 2 depicts the text search query for the challenges of service delivery for ease of reference. It is important to note that the municipalities have always been faced with the challenge of ensuring that all households have access to reliable and safe basic services. The COVID-19 pandemic has brought this into sharp focus, as households without access to running water, sanitation or electricity would probably have had both higher risks. For example, many households had difficulties primarily in maintaining hygiene practices. A household without access to running water, for example, would have to source water from a communal source, creating a transmission risk. As of 2019, about 12% of the South African population did not have access to a basic water supply, while about 21,3% did not have access to basic sanitation services (Department of Human Settlement (DHS) and Department of Water and Sanitation (DWS), 2020). The provision of water and sanitation to vulnerable communities to help curb the spread of COVID-19 cannot focus only on access and supply; it also needs to consider the general management of water resources to help prevent disease and ensure that vulnerable groups do not face added dangers in securing water. In its initial response to the pandemic, the Department of Water and Sanitation rolled out water tankers to communities without access to potable water, with a focus on rural areas. The diversion of infrastructure investment resources to fund short-term disaster responses and operational costs could also undermine critical longer-term investment in infrastructure and reduce capital budgets (Butler, Pilotto, Hong and Mutambatsere, 2020).

Writers such as Dikotla et al (2014) stated that Service delivery remains an enormous challenge facing municipalities. The local government's failure and inability to provide basic services has been shown by numerous strikes and protests in which community members demonstrate their dissatisfaction and discomfort regarding the state of services provided by the municipalities (Asha, 2014). Moreover, the low level of service delivery is influenced by a lack of financial capacity and inadequate skills for planning and budgeting (Beyers, 2015). Rural communities suffer from a lack of basic services even though access to services is recognized as a fundamental human right (RSA, 1996). It is also clear that the governance system to ensure

effective service delivery to meet the aspirations of people seems not to be effective (Nnadozie, 2011). The state of service delivery across the country witnessed enormous backlogs and challenges. The latter is characterized by inadequate provision of water, poor roads, and electricity shortages (Beyers, 2015). The IDP report of the municipality also indicated that more noticeable progress still needs to be made in the different villages of the municipality in providing basic services to ensure a quality living standard in communities (Kotze and Taylor, 2010). In practice, local authorities have been struggling with the ineffective implementation of IDP even prior COVID-19 pandemic, and that resulted in service delivery upheavals and backlogs (Asha and Makalela, 2020; Herdiana, Mukhlis and Madya, 2020). Poor services such as water, electricity, sanitation, and refuse removal continue to characterize almost all South African municipalities. However, based on several considerations, the local government's role in tackling COVID-19 is still challenged (Herdiana, Mukhlis and Madya, 2020).

Research Methodology.

This paper followed a quantitative research approach for the purposes of data collection and analysis. the paper used a questionnaire to collect data from 449 households in Lepelle-Nkumpi municipality using systematic sampling method based on a specific equal interval starting with a random selection of the population (Etikan, and Bala, 2017). To achieve the desired sample size with a 95% level of confidence, the paper used Slovin's formula to calculate the quantitative research sample. The data was analysed using descriptive and inferential statistics. Chi-Square test (χ^2) method was used to judge the goodness of fit between expected and observed results coupled with coefficient of correlation (r) $-1 \leq r \leq +1$ to determine magnitude and the direction of the relationship COVID-19 pandemic and service delivery. The Statistical Package for Social Sciences (SPSS) version 29.0 was used and backed up by Microsoft Excel (MS Excel) to produce statistical analysis.

Theoretical Framework.

This paper is conceived from the Social Change Theory, and it was used as a lens for analysis and interpretation of the research findings. Anecdotally, the COVID-19 pandemic brought about change in local government. The variation of change in governance, communication, service delivery, social-economic, infrastructure and municipal fiscus. Therefore, the fundamental root for Social Change Theory is derived from the work of Phillips, (2001). The author juxtaposes and proposes to explain the social change, issues, and problems that have arisen to define and delimit the area of change. The Social Change Theory postulates the fact that change is an evident feature of social reality than any social-scientific theory. This means that planning and implementation of service delivery is inextricably a subject of change. The subject of change in the sense that development needs and priorities continue to evolve over time in line with the current circumstances. Service delivery is a product of change by the non-social environment (Strasser and Randall, 1974). The non-social environment includes the manifestation of unplanned disasters such as pandemics, earthquakes, plagues, and floods. The latter are incorporated into contemporary social change theories, precisely because of their unpredictability and the difficulty in making generalizations or predictions about their consequences.

Presentation of Results and Findings.

The provision of service delivery during the COVID-19 pandemic.

The below section indicates the degree of responses carried out using the Likert scale to evaluate statements B1, B2, B3, and B4 to check statements with more or less agreement. The statements are carried out to check the perceptions of communities about service delivery during the COVID-19 pandemic. The construct of the perceptions of communities' perceptions during the pandemic consists of the following:

- Statement B1: provision of sanitation during COVID-19.
- Statement B2: provision of electricity during COVID-19.
- Statement B3: provision of refuse removal during COVID-19.
- Statement B4: provision of water during COVID-19.

Table 1. The degree of responses related to service delivery during the pandemic (n=449).

Items	Frequency (%)					Mean	SD
	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree		
Statement B1	333 (74%)	81 (18%)	4 (1%)	22 (5%)	9(2%)	1.43	0.894
Statement B2	193(43%)	77 (17%)	30 (7%)	125 (28%)	24 (5%)	2.35	1.404
Statement B3	163 (36%)	77 (17%)	43 (10%)	102 (23%)	64 (14%)	2.61	1.509
Statement B4	227 (51%)	63 (14%)	105 (23%)	49 (11%)	5 (1%)	1.98	1.131

Source: Survey Data (2024)

As indicated in Table 1 above, the mean of statement B3 (2.61), which was related to the adequate provision of sanitation services in the community during the COVID-19 pandemic, is high compared to other items. This statement is a clear indication that sanitation service played a salient role in curbing the spread of the pandemic. As part of the COVID-19 protocols communities were expected to constantly wash their hands and sanitize. The second item with a high mean is statement B2 (mean=2.35) suggests that a consistent cut-off on the provision of electricity had a negative bearing on COVID-19. Moreover, the third highest mean emanates from statement B4 (mean=1.98) which indicated that the lack of collection of refuse removal services during the pandemic had an impact on the management of the pandemic. The standard deviation (SD) indicated the multiplicity of data variance around the mean. Therefore, the statement B1 (SD=0.894) confirms the lowest SD with the variance of data clustered around the mean (1.43). the subsequent section explains the degree of responses indicated that Lepelle-Nkumpi Municipality was overwhelmed and had difficulties in implementing service delivery during the pandemic. The available resources and the development plans had to change to curb the spread of the pandemic. The results can further be explained by considering the items/statements from B1-B4 as follows:

- ***Statement B1- Provision of sanitation during the COVID-19 pandemic.***

The respondents were asked to indicate whether the municipality adequately provided sanitation services during the COVID-19 pandemic. Table 6.1 shows that the majority of the respondents 36% (n=163) strongly disagreed with the statement, while 23% (n=102) agreed; 17% (n=77) disagreed; 14% (n=64) strongly agreed, and 10% (n=43) undecided. The results show that a significant proportion 53% (n=240/449) confirmed the statement. The implication is that the provision of sanitation during the pandemic was a major challenge. It is clear from the qualitative findings that the sanitation backlog was exacerbated by the pandemic. The large proportion of respondents who disagreed with the statement indicated that there is an urgent need for the municipality to improve sanitation services. The findings further revealed that the inability of the municipality to provide adequate sanitation resulted in difficulties in curbing the spread of the pandemic. The findings resonate with the findings of the study conducted by Purnama and Susanna (2020) on the Hygiene and sanitation challenge for COVID-19 prevention in Indonesia. The study revealed that low personal hygiene and poor sanitation were found to be the main factors that inhibit the management and control of the pandemic. However, the latter is despite the undisputed contestation of the proportion of the response from the respondents 37% (n=166/449) that agreed with the statement that the municipality adequately provided sanitation during the pandemic.

- ***Statement B2: Provision of electricity during the COVID-19 pandemic.***

The respondents were asked to indicate whether the municipality was able to adequately provide electricity during the COVID-19 pandemic. Table 6.1 shows that the majority of the respondents 43% (n=193) strongly disagreed with the statement, while 28% (n=125) agreed; 17% (n=77) disagreed with the statement; 7% (n=30) were undecided and a mere 5% (n=24) strongly agreed with the statement. Most of the respondents, 43% and 17% respectively, agreed that the municipality could not adequately provide electricity in many communities during the pandemic. Furthermore, the results can be affirmed by the qualitative findings which cited the consistent cut-off of electricity because of load-shedding, dilapidated electric infrastructure, and stolen cables among others. The findings can also be confirmed by the study conducted by Bielecki, Skoczowski, Sobczak, Buchoski, Maciąg, and Dukat (2021) revealed that the COVID-19 lockdown contributed to the high demand for electricity due to the compulsion to stay and work from home and limiting of social activities. Scholars such as Snow, Bean, Glencross and Horrocks (2020) resonate with the findings of Bielecki, Skoczowski, Sobczak, Buchoski, Maciąg, and Dukat (2021) and the qualitative findings that the COVID-19 reoriented the lives of many communities across the globe toward working, learning, and subsisting from home. Thus, increasing the demand for use of electricity. Therefore, it can be concluded that the municipality did not provide adequate electricity to communities during the pandemic.

- ***Statement B3- Provision of refuse removal service during COVID-19.***

The respondents were asked to indicate whether the municipality adequately provided refuse removal services during the COVID-19 pandemic. Table 6.1 shows that the majority of the respondents 51% (n=227) strongly disagreed with the statement, while 23% (n=105) were undecided; 14% (n=64) disagreed; 11% (n=49) agreed, and a small proportion 1% (n=5) strongly disagreed with the statement. The findings show that a significant proportion of the respondents 51% and 14% respectively disagreed with the statement. The implication is that the municipality failed to provide refuse removal services in many rural communities during

the pandemic. the development of literature revealed that the COVID-19 pandemic has had a deleterious impact on the environment. The latter was accelerated by the change in consumption and waste disposal patterns during the lockdown period (Glenn, Rice, Primeau, Hollen, Jado, Hannan and Gaither (2020). Scholars such as Richter, Ng, Vu and Kabir (2021) explicitly share a similar view with Glenn, Rice, Primeau, Hollen, Jado, Hannan and Gaither (2020) the COVID-19 pandemic has had unprecedented effects on consumer behaviors and waste disposal habits. Therefore, it can be concluded that the municipality failed to provide refuse removal services in many rural communities during the pandemic. Although a small proportion of respondents, 12% (56/449) agreed with the statement.

- ***Statement B4: Provision of water during the COVID-19 pandemic.***

The respondents were asked to indicate whether the municipality was able to adequately provide water during the COVID-19 pandemic. Table 6.1 shows that the majority of the respondents 74% (n=333) strongly disagreed with the statement; while 18% (n=81) disagreed; 5% (n=22) agreed; 2% (n=9) strongly agreed and a mere 1% (n=4) of the sampled respondents were undecided. Therefore, most of the respondents strongly disagreed. The findings despite the promulgation of the COVID-19 regulations on the use of water to curb the spread of the pandemic, the municipality did not adequately provide water to communities during the pandemic. Water provision remains a very daunting challenge in the municipality. The findings are also confirmed by a larger proportion (18%) of the respondents who disagreed with the statement that the municipality failed to provide water. There is a small proportion of those who agreed (2%) that the municipality was able to provide water during the pandemic. A small proportion agreed on the basis that they benefited from the municipal water tankers program during COVID-19. Furthermore, a mere (1%) of the respondents were undecided and did not want to either confirm or deny the statement. The findings also resonate with the literature review on the general challenges of water provision during the pandemic. scholars such as Chamberlain and Potter, (2022), indicated that the COVID-19 pandemic has illuminated the widespread lack of access to adequate water in many informal settlements and rural areas in South Africa. On the other hand, scholars such as Makalela (2021) revealed that a population of 40 million in South Africa are without access to basic water services. Therefore, from the literature and the quantitative findings, it can be concluded that the municipality struggled with water provision during the pandemic.

The relationship between the COVID-19 pandemic and service delivery using the Chi-squared (χ^2) test and the Coefficient of Correlation (r) test.

As previously alluded to, this paper used descriptive and inferential statistics to determine the relationship between the COVID-19 pandemic and service delivery. Pearsons Chi-squared (χ^2) test and the Coefficient of Correlation (r) test was used to determine the p-value of the relationship between dependent, independent variables and to ascertain the magnitude of the direction.

- *COVID-19 pandemic and Sanitation service provision.*

Table 2: P-value for COVID-19 pandemic and Sanitation service provision.

Dependent variable		COVID-19					P-value
Independent Variable	categories	Strongly disagree	disagree	Undecided	agree	Strongly agree	
Sanitation service provision	Strongly disagree	2 (1.2%)	4(2.5%)	53 (32.5%)	44 (27%)	60 (36.8%)	0.001
	disagree	0 (0%)	16(20.8%)	10 (13%)	39(50.6%)	12(15.6%)	
	Undecided	1(2.3%)	7(16.3%)	10(23.3%)	13 (30.2%)	12 (27.9%)	
	agree	6 (5.9%)	11 (10.8%)	19 (18.6%)	39 (38.2%)	27(26.5%)	
	Strongly agree	1(1.6%)	1(1.6%)	4(6.3%)	6(9.4%)	52(81.3%)	

Source: Survey Data (2024)

The table shows the association between the COVID-19 pandemic and sanitation service provision in the municipality. The table shows a significant statistical relationship between COVID-19 and sanitation service provision. The relationship is confirmed by the p-value ($p \leq 0.001$) which is less than 0.05. A high proportion of respondents 81.3% ($n=52$), strongly agreed that there is a significant statistical relationship between COVID-19 and sanitation provision, while 23.3% ($n=10$) did not want to comment on the statement, and a small proportion 1.2% ($n=2$) strongly disagreed with the statement. Moreover, the significant statistical relationship ($p \leq 0.001$) is because sanitation services were not adequately provided during the pandemic. According to Stats SA Community Survey (2016), 78% of households in the municipality do not have access to solid waste disposal services. Lepelle-Nkumpi IDP (2021/2026) revealed that 57% of all the wards in the municipality indicated the need to provide sanitation services as part of their community development needs. The study also used a coefficient of correlation to determine the direction and the level of correlation between COVID-19 and sanitation service provision. The coefficient of correlation between COVID-19 and sanitation service provision was (0.1149). The study revealed a positive coefficient correlation. This is because adequate provision of sanitation services during the pandemic was associated with ways to reduce the spread of the pandemic. Communities were constantly washing their hands and sanitizing which led to a reduction in COVID-19 cases. Therefore, it can be concluded that COVID-19 exacerbated the sanitation backlog in the municipality.

- *COVID-19 pandemic and Electricity service provision.*

Table 3: P-value for COVID-19 pandemic and Electricity service provision.

Dependent variable		COVID-19					P-value
Independent Variable	categories	Strongly disagree	disagree	Undecided	agree	Strongly agree	
Electricity service provision	Strongly disagree	3 (1.6%)	3 (1.6%)	51 (26.4%)	57 (29.5%)	79 (40.9%)	0.001
	disagree	1 (1.3%)	0 (0%)	11 (14.3%)	21 (27.3%)	44 (57.1%)	
	Undecided	3 (10%)	2 (6.7%)	8(26.7%)	3 (10%)	14 (46.7%)	
	agree	3 (2.4%)	26 (20.8%)	25 (20%)	47 (37.6%)	24 (19.2%)	
	Strongly agree	0(0%)	8 (33.3%)	1 (4.2%)	13(54.2%)	2(8.3%)	

Source: Survey Data (2024)

The above table shows the association between COVID-19 and electricity service provision. The table revealed there is a significant statistical association between COVID-19 and electricity service provision. The table is confirmed by the p-value ($p \leq 0.001$) which is less than 0.05. The proportion of the respondents 57.1% ($n=44$) and 54.2% ($n=13$) respectively agreed that there is a significant relationship between COVID-19 and electricity service provision, while 26.7% ($n=8$) did not want to comment on the statement. Therefore, the significant association ($p \leq 0.001$) is precisely because the pandemic necessitated a lockdown to curb the spread of the virus. This means the movement of people was not permitted which resulted in the high electricity demand. Scholars such as Bielecki, Skoczowski, Sobczak, Buchoski, Maciąg and Dukat (2021) conducted a study on the Impact of the lockdown during the COVID-19 pandemic on electricity use by residential users. Their study revealed that on average, residential users staying practically the whole day in their flats increased their energy consumption. Similarly, scholars such as Akrofi and Antwi (2020), indicated that the compulsion to stay at home, limiting professional and social activities as part of the COVID-19 regulations, has significantly caused changes in the load profiles in all groups of energy users. The literature review show that the COVID-19 pandemic had a detrimental impact on the provision of electricity. The paper also used a coefficient of correlation to determine the direction and the level of correlation between two variables of interest. The coefficient of correlation between COVID-19 and electricity service provision was (-0.2623). The coefficient shows that there is a negative correlation between the variables. The negative direction indicated that the lack of electricity impacts negatively on COVID-19. This is because during the pandemic electricity consumption was high, especially in hospitals that received a lot of COVID-19 patients coupled with load shedding.

- *The COVID-19 pandemic and the refuse removal services.*

Table 4: P-value for COVID-19 and refuse removal service provision.

Dependent variable		COVID-19					P-value
Independent Variable	categories	Strongly disagree	disagree	Undecided	agree	Strongly agree	
Refuse removal service provision	Strongly disagree	4 (1.8%)	28(12.3%)	55 (24.2%)	80(35.2%)	60(26.4%)	0.001
	disagree	0 (0%)	3(4.8%)	9(14.3%)	34(54%)	17(27%)	
	Undecided	2(1.9%)	3(2.9%)	21(20%)	12 (11.4%)	67(63.8%)	
	agree	3(6.1%)	5(10.2%)	11(22.4%)	14(28.6%)	16(32.7%)	
	Strongly agree	1(20%)	0(0%)	0(0%)	1(20%)	3(60%)	

Source: Survey Data (2024)

The table shows the relationship between COVID-19 and refuse removal services in the municipality. The table shows a significant statistical relationship between COVID-19 and refuse removal. The relationship is confirmed by the p-value ($p \leq 0.001$) which is less than 0.05. a high proportion of respondents 63.8% ($n=67$) strongly agreed with the statement, while 20% ($n=21$) were undecided and a mere 1.8% ($n=4$) strongly disagreed with the statement. Therefore, the significant statistical relationship ($p \leq 0.001$) confirms the qualitative findings and literature review that the municipality was overwhelmed regarding refuse collection during the pandemic. The findings further revealed that the lack of adequate refuse removal services is marred with unhygienic living conditions which had the potential to expose people to the pandemic. The study also used a coefficient of correlation to determine the direction and the level of correlation between COVID-19 and refuse collection service provision. The coefficient of correlation between COVID-19 and refuse collection service provision was (0.1272). The study shows a positive coefficient correlation. This is because adequate collection of refuse collection during the pandemic was associated with proper hygiene and a clean environment. The more there is proper hygiene and a clean environment the less the spread of the pandemic.

- *COVID-19 pandemic and Water service provision.*

Table 5. P-value for COVID-19 pandemic and Water service provision.

Dependent variable.		COVID-19					P-value
Independent Variables	categories	Strongly disagree	disagree	Undecided	agree	Strongly agree	
Water service provision	Strongly disagree	6 (1.8%)	21 (6.3%)	68 (20.4%)	102 (30.6%)	136 (40.8%)	0.014
	disagree	2 (2.5%)	14 (17.3%)	21 (25.9%)	26 (32.1%)	18 (22.2%)	
	Undecided	0 (0%)	0 (0%)	2 (50%)	2 (50%)	0 (0%)	
	agree	2 (9.1%)	4 (18.2%)	4 (18.2%)	7 (31.8%)	5 (22.7%)	

	Strongly agree	0 (0%)	0 (0%)	1 (11.1%)	4 (44.4%)	4 (44.4%)	
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Source: Survey Data (2024)

The above table was used to determine the association between COVID-19 water service provision. The results from the table show a significant statistical association between COVID-19 and water service provision. The latter is confirmed by the p-value ($p \leq 0.014$) which is less than 5% significant level. The findings from this research revealed that 44.4% ($n=4$) strongly agreed with the statement, while 30.6% ($n=30.6\%$) agreed. The highest frequency of the respondents who agreed with the statement is precisely because during the pandemic it was a requirement for people in communities to constantly wash their hands. Using water to wash hands was scientifically proven to curb the spread of the pandemic. It is important to note that the daunting challenge of water provision in the municipality is not a new phenomenon (Makalela, 2021). Scholars such as argued that for the effective management of the pandemic, adequate and effective hand hygiene requires sufficient water from reliable sources, preferably accessible on-premises, and access to handwashing facilities (with water and soap) that enable hygiene behaviors (Howard, Bartram, Brocklehurst, Colford Jr, Costa, Cunliffe, D and Wright, (2020). Moreover, the coefficient correlation (r) was used to determine the magnitude of the relationship between COVID-19 and water service provision in the municipality. The findings revealed a negative coefficient correction $-(0.1194)$. The implication is that during the pandemic many rural communities were left without adequate water supply. The lack of adequate water supply contributed to the inability of the municipality to curb the spread of the pandemic. On the other hand, interrupted water supply led to more COVID-19 cases. The imprecision is that more people were unable to conform to the promulgated regulations on hand washing to curb the spread of the pandemic.

- *COVID-19 pandemic and financial resources for service delivery.*

Table 6: P-value for COVID-19 and financial resources.

Dependent variables		COVID-19					P-value
Independent Variable	categories	Strongly disagree	disagree	Undecided	agree	Strongly agree	
Financial resources	Strongly disagree	1 (14.3%)	0(0%)	2(28.6%)	4(57.1%)	0(0%)	0.001
	disagree	1 (4.5%)	6(27.3%)	2(9.1%)	9(40.9%)	4(18.2%)	
	Undecided	2(2.4%)	6(7.2%)	34(41%)	14(16.9%)	27(32.5%)	
	agree	2(1.4%)	27(18.9%)	18(12.6%)	78(54.5%)	18(12.6%)	
	Strongly agree	4(2.1%)	0(0%)	40(20.6%)	36(18.6%)	114(58.8%)	

Source: Survey Data (2024)

The table shows the relationship between the COVID-19 pandemic and municipal financial resources. The table shows a significant statistical relationship between COVID-19 and financial resources. The relationship is confirmed by the p-value ($p \leq 0.001$) which is less than 0.05. A high proportion of respondents 58.8% ($n=114$) strongly agreed with the statement, while 41% ($n=34$) did not want to comment on the statement, and 27.3% ($n=6$) disagreed

with the statement. The implication of the above table confirms the magnitude of the relationship between COVID-19 and financial resources. The findings of the qualitative research solicited from both members of the focus group and key informants revealed that the municipality was in financial distress during the pandemic. the municipality had to channel its financial resources towards curbing the spread of the pandemic. Furthermore, no municipality nor any government in the world was prepared to cope with the COVID-19 pandemic. Many municipalities had to reprioritize their service delivery budget for COVID-19. On the other hand, writers such as Nemec and Špaček (2020), conducted a study on COVID-19 and local government finance in the municipalities of both Slovakia and Czechia. The study revealed that because of COVID-19, many municipalities had to face problems on both the revenue and expenditure sides of their budgets. Scholars such as Gordon, Dadayan and Rueben (2020), explicitly indicated that the COVID-19 pandemic put enormous strain on the state and local government budget because of the need to finance specific anti-pandemic measures. Therefore, it can be concluded that the municipality suffered financially because of COVID-19.

The paper also used a coefficient of correlation to determine the direction and the level of correlation between COVID-19 and financial resources. The coefficient of correlation between COVID-19 and financial resources was (0.2870). The study shows a positive coefficient correlation. This is because, during the pandemic, municipalities had to rearrange and reprioritize their budget programs that support curbing the spread of the pandemic. Many municipalities had to commit financially to deal with the spread of the pandemic.

- *COVID-19 pandemic and Information Communication and Technology.*

Table 7: P-value for COVID-19 and ICT in service delivery.

Dependent variable		COVID-19					P-value
Independent Variable	categories	Strongly disagree	disagree	Undecided	agree	Strongly agree	
ICT	Yes	5(1.3%)	28(7.3%)	87(22.8%)	120(31.4%)	142(37.2%)	0.001
	No	5 (7.5%)	11(16.4%)	9(13.4%)	21(31.3%)	21(31.3%)	

Source: Survey Data (2024)

The table shows the relationship between the COVID-19 pandemic and ICT. The table shows a significant statistical relationship between COVID-19 and ICT. The relationship is confirmed by the p-value ($p \leq 0.001$) which is less than 0.05. The majority of respondents 37.2% ($n=142$) strongly agree with the statement, while 31.4% ($n=120$) agreed; 22.8% ($n=87$) did not want to comment on the statement and a mere 16.4% ($n=11$) disagreed with the statement. The above table confirms the association between COVID-19 and ICT. The qualitative findings also emphasized the importance of ICT during the pandemic. Lepelle-Nkumpi municipality did not use ICT facilities adequately for effective planning and implementation of service delivery during the pandemic. Yang, Fichman, Zhu, Sanfilippo, Li, and Fleischmann (2020), argue that using ICT during the COVID-19 crisis intervention was prevalent among governments and societies to cope with the pandemic. The government promulgated regulations that inhibited community gatherings to manage the spread of the pandemic. The latter necessitated the use of virtual platforms such as MS Teams and Zoom, social media, and digital platforms for

news. Writers such as Lee, Malcein and Kim (2021), argued that because of the 4th Industrial Revolution, many municipalities in developing countries have had to invest in ICT infrastructure for effective planning and implementation of service delivery. Therefore, it can be concluded that the ICT of the municipality played a significant role during the pandemic with an acknowledgment of challenges related to the lack of facilities to support ICT in rural areas of the municipality.

The study also used a coefficient of correlation to determine the direction and the level of correlation between COVID-19 and ICT services. The coefficient of correlation between COVID-19 and ICT was $-(0.117)$. The study shows a negative coefficient correlation. This was precipitated by the fact that the municipality was not readily equipped to use technology to promote service delivery during the pandemic.

- *COVID-19 and Governance change in the municipality.*

Table 8: P-value for COVID-19 and governance.

Dependent variable		COVID-19					P-value
Independent Variable	categories	Strongly disagree	disagree	Undecided	agree	Strongly agree	
Governance change.	Yes	2(0.6%)	27(8.4%)	74 (23%)	109(33.9%)	110(34.2%)	0.001
	No	8(6.3%)	12(9.4%)	22(17.3%)	32(25.2%)	53(%)	

Source: Survey Data (2024)

The table shows the relationship between the COVID-19 pandemic and the need for governance change. The table shows a significant statistical relationship between COVID-19 and governance. The relationship is confirmed by the p-value ($p \leq 0.001$) which is less than 0.05. The majority of the respondents 34.2% ($n=110$) indicated 'yes' in which they strongly agreed with the statement on the need for municipal governance to change. A small proportion of respondents 6.3% ($n=8$) indicated 'no' in which they strongly disagreed with the statement. Therefore, the majority of respondents alluded to the need for governance to change to respond to the current circumstances. The literature and quantitative findings affirm the need for governance to change in a manner that responds to crises. The pandemic strengthened the importance of agility, resilience, and effective decision-making in response to crises. The pandemic necessitated the municipality to develop policies on risk allowance and employee substitutes to respond adequately to the pandemic. Writers such as Schmidt (2020) emphasized theorizing the institutional change and governance in European responses to the COVID-19 pandemic.

Conclusion and Recommendations.

It can be deduced from this paper that the COVID-19 contributed deleteriously to service delivery in Lepelle-Nkumpi municipality. The overall analysis revealed that the municipality was financially overstretched to deliver services because of the pandemic. The service delivery beneficiaries also demonstrated dissatisfaction as services were not adequately delivered. This paper also established the significant relationship between COVID-19 and service delivery. The promulgated COVID-19 regulations by the government to curb the spread of the pandemic also found to have contributed negatively the ability of the municipality to deliver

services. The regulations, such as lockdown, disrupted community meetings for service delivery consultation purposes.

From the conclusion, the following recommendations can be drawn:

The use of ITC for service delivery in the municipality.

It is recommended that municipalities need to adopt new technological methods for effective planning and implementation of service delivery during crises such as the COVID-19 pandemic. Municipalities must develop universal functional ICT facilities in rural communities for the purposes of engagement and information sharing.

Adaptability and service delivery provision during the COVID-19 pandemic.

It is recommended that for the provision of services such as water, electricity, sanitation, and refuse removal services, the municipality needs to develop an adaptable and resilient structured approach to deliver services during a crisis such as the pandemic. for example, fast-track water tankers for emergency purposes during crises and improve existing water infrastructure, resort to underground electric infrastructure to prevent theft, eradicate the sanitation backlog and provide RDP toilets to indigent households, provide skip bins, and impose and enforce fines on illegal dumping.

strategies to enhance effective planning and implementation of service delivery.

This paper recommends a change in governance systems and approaches and machinate modern methods of community engagement, storage of municipal data and documentation, and prioritization of Research and Development directorates to fast-track service delivery.

Declarations

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Conflict of Interests.

The authors declare no conflict of interest.

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