

Impact of the first COVID-19 lockdown on male urethritis syndrome services in South Africa

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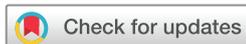
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ABSTRACT

Objectives Globally, there have been significant changes in utilisation of STI testing and treatment services during the period of the COVID-19 pandemic. The impact of COVID-19 in countries that use syndromic STI management is not documented. This study used routine STI surveillance data to evaluate the impact of COVID-19 on utilisation of STI syndromic management services during the first wave of the COVID-19 epidemic in South Africa.

Methods We conducted a time-trend analysis of male urethritis syndrome (MUS) cases reported through routine national STI surveillance in South Africa and COVID-19 data available through the national dashboard. We defined three time periods (prelockdown, lockdown and postlockdown) based on COVID-19 response levels. Trends in MUS reporting was compared between these time periods at national and provincial level and with the number of positive COVID-19 tests in a district.

Results An overall reduction of 27% in the national number of MUS cases reported (monthly average from 27 117 to 20 107) occurred between the pre-COVID-19 and COVID-19 lockdown periods ($p < 0.001$), with a range of 18%–39% between the nine provinces. Postlockdown, case numbers returned almost to the prelockdown level (26 304; -3.0%). No significant difference was found in number of MUS cases between the prelockdown and postlockdown periods. A weak correlation ($R^2 = 0.21$) was identified between the change in number of MUS reported and COVID-19 positive tests in a district.

Conclusions A strong reduction in reported MUS cases for syndromic management was observed during the first wave of the COVID-19 epidemic and lockdown across all provinces in South Africa. This is likely the result of various healthcare system and service delivery factors associated with lockdown measures. The observed return of MUS cases reported to prelockdown measures is reassuring.

INTRODUCTION

The COVID-19 pandemic has had significant impact on healthcare services worldwide. South Africa has been one of the worst affected countries by COVID-19: with cases reaching 995 000 in December 2020 and continuing to rise to almost 3 million confirmed cases at the end of 2021.¹ In response to this epidemic, the country implemented COVID-19 lockdown regulations with different risk levels and restrictions over time, based on the spread and burden of infection.²

KEY MESSAGES

- ⇒ The COVID-19 first wave and associated restrictions resulted in 27% reduction in number of male urethritis syndrome cases reported in the public healthcare sector across South Africa.
- ⇒ The number of male urethritis cases reported returned to pre-COVID-19 level following relaxation of the lockdown restrictions suggesting resilience of the healthcare system.
- ⇒ Further research is warranted to understand the impact of COVID-19 on the burden of sexually transmitted infections in settings where syndromic management is used.

The first wave of COVID-19 and associated lockdown regulations (including closure of all non-essential businesses and travel, public transport restrictions and a countrywide curfew) have severely impacted healthcare services in the country. The total number of patient visits declined by 18% during the period of March 2020–December 2020 compared with the same period in the previous year, and increases were observed in indicators such as maternal mortality (23%) and neonatal mortality (5%) as well as reductions in HIV testing by 48% and antiretroviral therapy initiation by 46%.^{3 4}

Globally, there is increasing data demonstrating the negative effects of COVID-19 pandemic and associated lockdown regulations on STI testing services. In the USA, 59% decline in testing for *Chlamydia trachomatis* and *Neisseria gonorrhoeae* was reported for women and 63% for men in early April 2020 before slowly increasing again over the following months.⁵ In England, sexual health screens declined by 25% from 2019 to 2020, though the decline was significantly higher during the initial period of national lockdown from April to June 2020 when gonorrhoea screens dropped by 52%.⁶ Data from the Catalonia region of Spain showed a 51% decrease in the number of STI cases reported during the COVID-19 lockdown in the region.⁷ In contrast to the relatively well-documented effects of the COVID-19 epidemic on STI services in the USA, Europe and Australia,^{5–8} there is lack of data from low-income and middle-income countries where syndromic management is used. This study explores the impact of the COVID-19 epidemic and its lockdown on STI syndromic management services in South Africa.

METHODS

Study design and data sources

Time-trend analysis was conducted of aggregated male urethritis syndrome (MUS) cases reported through routine STI surveillance in South Africa on the District Health Information Services (DHIS) platform. MUS was used as proxy for STI syndromic management services, since it is the only data element that is routinely collected across all public healthcare facilities (which cater for ~85% of the total population).⁹ Source data are collected using a daily tally sheet at primary healthcare facilities; these data are then reported through a summary tool and entered into the DHIS system. Monthly data for MUS at the district level across all 52 districts in the country from the DHIS was accessed in June 2021, for the period January 2019–December 2020, which was before COVID-19 vaccination was available.

COVID-19 data were retrieved from the publicly available COVID-19 dashboard data published by the National Institute of Communicable Diseases.¹ This report collated laboratory data from public and private sector laboratories; these data had been deduplicated to the level of individual persons. Health Research Ethics Committee approval was not required as analysis was conducted on routine, aggregated and anonymised data in collaboration with the Department of Health.

Statistical analysis

DHIS data were extracted and analysed in Excel (Microsoft Corporation, Seattle, Washington, USA). Three periods were defined based on the national lockdown level rounded to the closest month to match the DHIS reporting periods. Based on the COVID-19 response lockdown levels, the following periods were defined: prelockdown (January 2019–March 2020), lockdown (April 2020–September 2020) and postlockdown (October 2020–December 2020).² We ran an equal variance Student's t-test for the data variable 'New Episodes of MUS cases' between all pairs of periods to identify whether each sample belonged to the same distribution. Pearson correlation coefficient was

calculated between the proportion change in MUS cases between the prelockdown and lockdown periods and the COVID-19 cases as a proportion of the population of each South African district during the lockdown period.

RESULTS

Impact of COVID-19 and lockdown restrictions on MUS reporting

Nationally, a mean monthly number of 27 717 MUS cases was reported before the COVID-19 pandemic; this number reduced by 27% during the lockdown period to 20 107 cases ($p<0.001$) (figure 1). Postlockdown, the trend moved in the opposite direction, with a 32% increase in reported MUS cases from lockdown (mean of 20 107 cases) to postlockdown (mean of 26 304 cases; $p<0.001$). There was no significant difference in mean monthly reporting rates between the prelockdown and postlockdown periods ($p=0.37$) indicating reporting levels returned to normal.

MUS cases reported were also compared for each of South Africa's nine provinces between the three time periods (online supplemental material 1). Compared with prelockdown, a reduction in mean number of MUS cases was observed in all provinces during lockdown, with the largest reduction in the Free State province (39%) and the lowest in Kwazulu-Natal (18%). The mean number of MUS cases reported restored to prelockdown levels during the postlockdown period in all provinces.

Impact of burden of COVID-19 on MUS reporting at district level

A weak negative correlation ($R^2=0.21$) was observed between the proportion of the population with positive COVID-19 test and the change in MUS reporting between the prelockdown and postlockdown periods in each of the 52 districts in South Africa (online supplemental material 2). Though a relatively weak correlation, this was found to be a highly significant result ($p<0.001$).

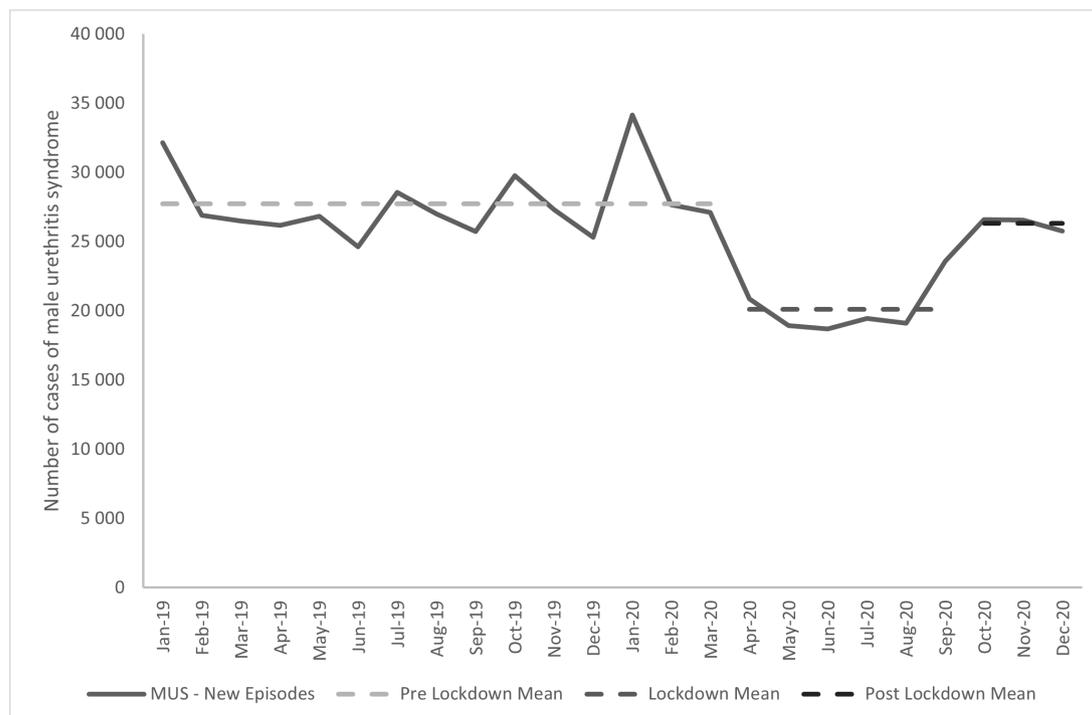


Figure 1 Monthly number of male urethritis syndrome (MUS) cases reported at public healthcare facilities in South Africa, 2019–2020.

DISCUSSION

The COVID-19 epidemic has impacted greatly on STI services across the world. Our data show a significant reduction in MUS cases reported during the first COVID-19 wave in South Africa, a country that uses syndromic management. This observation confirms reductions in STI services reported from high-income settings that use aetiological STI management. Our data show resilience of the healthcare system following relaxation of lockdown restrictions, with the mean number MUS cases returned to prelockdown levels.

The observed 27% decline in monthly number of MUS cases between the prelockdown and lockdown periods is higher than the 18% decline reported for overall public health attendance in South Africa.³ This might indicate that patients and healthcare providers do not consider STI care as an essential service. However, the decline in MUS cases reported is lower than the reduction in STI testing seen elsewhere, for example, 62% for American men, 52% in the UK and 51% in Catalonia.^{5–7} Most likely, this is due to a larger reduction of especially asymptomatic individuals accessing STI testing in these countries, while syndromic management only involves symptomatic men who would be more likely to seek treatment.

Several service utilisation and service delivery-related factors may have impacted on the number of MUS cases reported during the first COVID-19 wave and associated lockdown measures. First, individuals may have chosen not to access public healthcare services due to movement restrictions, transport limitations and fear of COVID-19 acquisition during the lockdown period.² They may have decided to postpone their clinic visit or instead consulted in the private healthcare sector. Reduced availability of facility staff due to illness and contact isolation led to temporary closure of some healthcare facilities and to deprioritising non-emergency services including STI treatment. In addition, data recording, collection and reporting may also have been affected resulting in under-reporting of the number of MUS cases on the DHIS platform. Despite a significant association, the effect of the test-confirmed COVID-19 cases in a district on number of MUS cases reported was limited. This might reflect that the systemic factors associated with lockdown restrictions play a larger role than direct impact of COVID-19. Last, changes in STI incidence may have impacted on the number of MUS cases reported, although the magnitude, if any, and direction of any incidence change are unclear. Incidence might have decreased due to lower numbers of new sexual partnerships.¹⁰ However, incidence might have increased due to reduced access to condoms and increases in transactional sex. Although the change in STI incidence is undocumented, the return of MUS cases treated at healthcare facilities to the prelockdown level suggests resilience of the healthcare system.

This study has several limitations. We used aggregated routine surveillance data from the DHIS platform. Although this system has strong coverage across the country, it does not include data on STI syndromes in women or allow age-stratified breakdown or analysis of specific risk factors. Although data cleaning was performed, it cannot be ruled out that there are some data errors, although the similar trends across provinces suggests that these effects may be limited. Last, only a small proportion of

COVID-19 cases in South Africa are confirmed in the laboratory, which may have affected the relationship between change in MUS reporting and COVID-19 burden at district level.

In conclusion, we observed a strong reduction of MUS cases for syndromic management reported during the first wave of the COVID-19 epidemic across all provinces in South Africa. This is likely the result of various healthcare system and service delivery factors associated with lockdown measures. The observed return of MUS cases reported to prelockdown measures is reassuring.

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Contributors All authors have contributed to the manuscript and have read and approved the final version. PD, RM and RPHP conceptualised the study, analysed the data and wrote the draft and final version of the manuscript. RM, ZP, TC and NS authorised data access. YP, ZP, TC, NS and DF contributed to data interpretation and provided inputs on the draft and final versions of the manuscript.

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ONLINE SUPPLEMENTARY MATERIAL 1

Table S1. Monthly number of male urethritis syndrome cases reported in public healthcare facilities by province in South Africa, 2019-2020.

Province	Monthly Mean Pre-Lockdown (Jan 2019 – March 2020)	Monthly Mean Lockdown (April 2020 – Sept 2020)	Monthly Mean Post-Lockdown (Oct 2020 – Dec 2020)	% Change - Pre-Lockdown to Lockdown	% Change - Lockdown to Post-Lockdown
Eastern Cape	4,366	3,133	4,340	-28%	39%
Free State	1,252	767	1,310	-39%	71%
Gauteng	5,859	3,894	4,600	-34%	18%
KwaZulu-Natal	7,164	5,866	7,685	-18%	31%
Limpopo	1,888	1,547	1,710	-18%	11%
Mpumalanga	1,900	1,396	1,745	-26%	25%
Northern Cape	435	276	363	-37%	32%
Northwest	1,095	712	906	-35%	27%
Western Cape	3,757	2,516	3,644	-33%	45%
South Africa Total	27,717	20,107	26,304	-27%	31%

ONLINE SUPPLEMENTARY MATERIAL 2

Figure S1. Proportion change in reporting of cases of male urethritis syndrome by burden of COVID-19 in all 52 districts of South Africa by province.

