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Information about COVID-19: Lessons Learned from Mali

Information sur la COVID-19 : leçons apprises au Mali

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ABSTRACT

Introduction. In Mali, information related to COVID-19 is regularly shared by the coordination board against COVID-19 through daily official press releases and situation reports. The goal of this study was to analyze data related to the tested samples; and the confirmed, contacts, recovered and dead cases in order to take lessons for the future. **Population and methods**. Data from the first 100 days after the detection of the first cases in Mali were collected and recorded on an Excel file before they got analyzed using SPSS 25.0 software. Analyses were descriptive and correlational. **Results**. We included 14938 tested samples, 2260 confirmed cases, 12864 contact cases, 1502 recovered cases and 117 deaths were reported during the first 100 days of the epidemic. There was a positive correlation between the number of confirmed cases; and the number of tested samples, the number of recovered cases and the number of deaths. These results suggest that the number of confirmed cases increase with the number of tested samples. **Conclusion**. These results call for more testing and encourage the identification, location and follow-up of COVID-19 cases. They can also be used to support the improvement of data quality and the response to COVID-19. As a result, they can contribute to improve population health.

RÉSUMÉ

Introduction. Au Mali, l'information relative au COVID-19 est régulièrement partagée par le conseil de coordination contre le COVID-19 à travers des communiqués de presse officiels quotidiens et des rapports de situation. L'objectif de cette étude était d'analyser les données relatives aux échantillons testés, aux cas confirmés, aux contacts, aux cas retrouvés et aux cas décédés afin de tirer des leçons pour l'avenir. **Population et Méthodes**. Pour atteindre cet objectif, les données des 100 premiers jours après la détection des premiers cas au Mali ont été collectées et enregistrées sur un fichier Excel avant d'être analysées avec le logiciel SPSS 25.0. Les analyses ont été descriptives et corrélationnelles. **Résultats**. Nous avons inclus 14938 échantillons testés, 2260 cas confirmés, 12864 cas contacts, 1502 cas guéris et 117 décès ont été rapportés durant les 100 premiers jours de l'épidémie. Les résultats montrent également qu'il existe une corrélation positive entre le nombre de cas confirmés, le nombre d'échantillons testés, le nombre de cas guéris et le nombre de décès. Ces résultats suggèrent que le nombre de cas confirmés augmente avec le nombre d'échantillons testés. **Conclusion**. Ces résultats appelleraient à davantage de tests et encourageraient l'identification, la localisation et le suivi des cas de COVID-19. Ils pourraient également être utilisés pour soutenir l'amélioration de la qualité des données et de la réponse au COVID-19. Par conséquent, ils pourraient contribuer à améliorer la santé de la population.

INTRODUCTION

In health field, information is the basis for intervention, because from the quality of information depends the quality of intervention (1-3). In other words, the more intervention relies on good information the more likely it is to be effective. In the fight against epidemics, information is even more important given the speed of transmission of these diseases, their health and non-health consequences, and the effectiveness they require for intervention (4-7). As part of the fight against COVID-19, information is regularly provided by countries to inform national and international opinion on the evolution of the epidemic. In Mali, this information is communicated by the coordination board against COVID-19, which is attached to the National Institute of Public Health (INSP), which in turn comes under the Ministry of Health and Social Affairs (MSAS). Does this information help to better understand the real evolution of the epidemic, given

that in an epidemic like COVID-19, there is what we know about the epidemic (theoretical evolution) and the real evolution of the epidemic? In situations where the quality of information is good and complete, what we know about the epidemic is fairly close to its real evolution. In contrary situations, we find information that is more or less, if not completely, dissociated from the real evolution of the epidemic. In these conditions, one can wonder whether the information communicated by the coordination board can facilitate the understanding of the real evolution of the epidemic, because what is expected from this information is to inform the national and international opinion on the real situation of COVID-19 in Mali. In other words, it should facilitate the understanding of the real magnitude of the epidemic; and its real distribution, speed of spread and severity. This study aimed to provide an analysis of the information provided on COVID-19 in Mali by examining the data shared through the daily press releases and situation reports of the coordination board during the first 100 days of the epidemic. Press releases and situation reports are considered to be among the most official communication tools on COVID-19 in Mali.

POPULATION AND METHODS

This was a retrospective study of the first 100 days of the COVID epidemic in Mali. We focused on the indicators informed by the coordination board and published regularly through press releases and situation reports. Specifically, we focused on the tested samples; the confirmed, contacts, recovered and dead cases; and the locations affected by the epidemic. A tested sample was considered to be a sample provided by an individual in order to test for coronavirus infection (8). A confirmed case was an individual who had been tested and found to be infected with the virus. He could be asymptomatic or symptomatic. Asymptomatic cases were those who present any clinical sign, while symptomatic cases could present a single or multiple clinical signs (8). The well-known clinical signs attributable to COVID-19 are: fever, cough, myalgia, dyspnea, nasal congestion, headache, rhinorrhea, sore throat, vomiting, diarrhea, red eye, anosmia, agueusia and malaise (9-15). Some evidence shows that asymptomatic cases can be more numerous and may account for 50-80% of cases. A contact case was considered to be a person who had been in contact with a confirmed case two days before and who begins to show signs up to 14 days after onset (8). A recovered case was a confirmed case who remains negative after two consecutive RT-PCR tests. A dead case is a confirmed case who died before recovery, or a dead person who was found to be positive after a post-mortem testing (8). Press release and situation reports shared by the Coordination board against COVID-19 during the first 100 days of the COVID-19 epidemic were downloaded from internet. It was possible to include more press releases and situation reports, but those of the first 100 days were sufficient to get an overview on the theoretical evolution of COVID-19 in Mali. Thus, from the press releases and situation reports of the first 100 days, the data related to the above-mentioned indicators were extracted and recorded on an Excel file before being analyzed with SPSS 25 software. The analyses were essentially descriptive and correlated with the Spearman Chi 2 test below a threshold of significance ($p \leq 0,01$).

RESULTS

Descriptive analyses

Descriptive analyses showed that the number of tested samples during the first 100 days of the fight against COVID-19 was 14938. The mean was 149.38, the median 126.5 and the mode zero (see **Table I**).

Table I: Trend of tested samples; and confirmed, contact, recovered and dead cases during the first 100 days of COVID-19 in Mali

	Tested samples	Confirmed cases	Contact cases	Cured cases	Deceased cases
Mean	149,38	22,60	128,64	14,02	1,17
Median	126,50	19,00	114,00	14,00	1,00
Mode	0,00	19,00	7,00[a]	0,00	0,00
Standard deviation	137,51	16,74	96,60	13,03	1,295
Minimum	0,00	2,00	0,00	0,00	0,00
Maximum	654,00	81,00	536,00	61,00	6,00
Sum	**14938,00**	**2260,00**	**12864,00**	**1502,00**	**117,00**

The total number of confirmed cases was 2260.00, with a mean of 22.60, a median of 19.00 and a mode of 19.00. The total number of recovered cases was 1502.00, the mean 14.02, the median 14.00 and the mode 0.00. The total number of dead cases was 117.00 with a mean of 1.17, a median of 1.00 and a mode of 0.00. The total number of contact cases was 12864.00. The mean was 128.64 and the median 114.00. The trend curves of the tested samples; and of confirmed, contact, dead and recovered cases all had a sawtooth pattern. Figure 1 shows the evolution curve for confirmed cases. Concerning the distribution, only the number of confirmed cases and the number of dead cases had a normal distribution (see Figure 1).

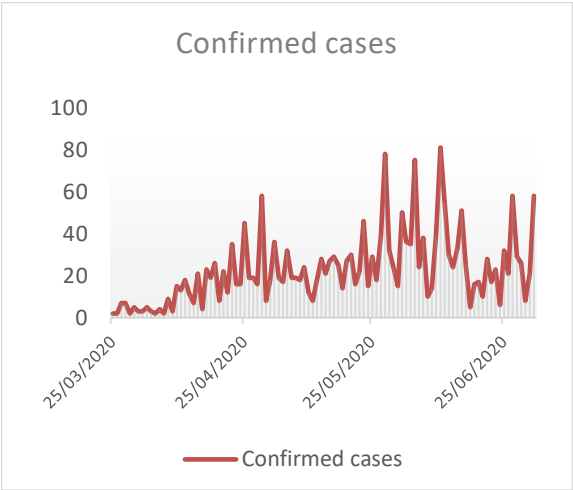

Figure 5. Evolution of the number of confirmed cases during the first 100 days of the fight against COVID-19 in Mali

Descriptive analyses also showed that the proportion of individuals among the confirmed cases who lost their live during the first 100 days of COVID-19 was low (see **Figure 2**). The reported deaths corresponded to 5.17% of the number of the confirmed cases.

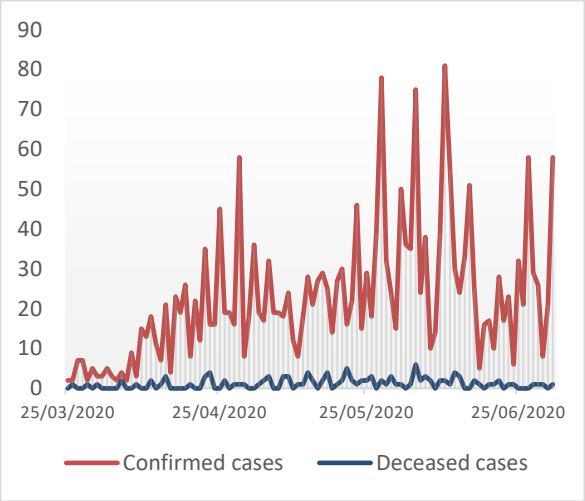

Figure 2: Evolution of confirmed and dead cases during the first 100 days of the fight against COVID-19 in Mali

Finally, the descriptive analyses showed that 42 localities from 11 regions were affected (see **Table II**). These 11 regions include Bamako, Tombouctou, Mopti, Koulikoro, Kayes, Kidal, Sikasso, Gao and Ségou. The regions with the most confirmed cases were Bamako, Tombouctou and Mopti. The regions of Sikasso, Ségou and were among the least affected regions.

Table 2. Geographical distribution of confirmed cases by locality

Locality	Confirmed cases	Cases of death	Lethality%
Bamako District	1071	68	6,35
CI	130	7	5,38
CII	98	4	4,08
CIII	95	14	14,74
CIV	219	4	1,83
CV	231	16	6,93
CVI	298	23	7,72
Tombouctou region	522	9	1,72
Tombouctou	483	9	1,86
Goundam	11	0	0,00
Djiré	19	0	0,00
Rharous	9	0	0,00
Mopti region	**235**	**22**	**9,36**
Mopti	144	12	8,33
Douentza	23	4	17,39
Sévaré	10	0	0,00
Kona	2	0	0,00
Koro	10	1	10,00
Youwarou	4	1	25,00
Bankass	6	2	33,33
Djenne	13	0	0,00
Bandiangara	22	2	9,09
Koulikoro region	**166**	**3**	**1,81**
Kalabancoro	92	2	2,17
Kati	72	0	0,00
Koulikoro	2	1	50,00
Fana	1	0	0,00
Kayes region	**106**	**4**	**3,77**
Kayes	53	2	3,77
Kéniéba	33	0	0,00
Yelimane	4	2	50,00
Kita	5	0	0,00
Sadiola	1	0	0,00
Diamou	9	0	0,00
Bafoulabé	1	0	0,00
Kidal region	**47**	**0**	**0.00**
Kidal	47	0	0.00
Sikasso region	**43**	**4**	**9,30**
Sikasso	7	2	28,57
Yanfolila	3	0	0,00
Koutiala	33	2	6,06
Gao region	**47**	**2**	**4,26**
Gao	46	2	4,35
Ansongo	1	0	0,00
Ségou region	**23**	**5**	**21,74**
Ségou	18	4	22,22
San	2	1	50,00
Niono	2	0	0,00
Markala	1	0	0,00
Ménaka region	**0**	**0**	**0**
Taoudenit region	**0**	**0**	**0**
Total	**2260**	**117**	**5.18**

Correlation analysis

Correlation analyses showed that the number of confirmed cases was positively correlated with the number of tested samples, contact cases, recovered cases and deaths (see Table 3). In other words, during the first 100 years of COVID-19 the increase

in the number of confirmed cases paralleled the increase in the number of tested samples, contact cases, recovered cases and dead cases.

Table III. Correlation between the number of tested samples; and confirmed, recovered, dead and contacts cases

			Confirmed	Tested	Cured	Dead	Contact
Rho de Spearman	Confirmed cases	**Correlation coefficient**	1,000				
		Sig. (bilateral)	.				
		N	100				
	Tested samples	**Correlation coefficient**	,587**	1,000			
		Sig. (bilateral)	,000	.			
		N	100	100			
	Recovered cases	**Correlation coefficient**	,429**	,618**	1,000		
		Sig. (bilateral)	,000	,000	.		
		N	100	100	100		
	Dead cases	**Correlation coefficient**	,261**	,219*	,202*	1,000	
		Sig. (bilateral)	,009	,029	,044	.	
		N	100	100	100	100	
	Contact cases	**Correlation coefficient**	,189	,039	-,033	,106	1,000
		Sig. (bilateral)	,060	,699	,748	,294	.
		N	100	100	100	100	100

*The correlation is significant at the 0.05 level (bilateral).

DISCUSSION

The results showed that during the 100 first days of the fight against COVID-19, Mali reported 2260 confirmed cases. The saw-tooth distribution of these cases seems to reflect more the report of testing than the real evolution of the epidemic. In other words, the real distribution of the cases of COVID-19 remains unknown. The situation of the tested people also remains unknown; the press releases and the situation reports only report the tested samples. This has not made it possible to estimate the number of people actually tested. Here, it is important to know that a tested sample is not a tested person. For diseases such as COVID-19, a person may provide several samples for the testing and monitoring. For this reason, Mali did not count 14726 tested persons, but 14726 tested samples. From this, it should be understood that less than 0.08% of the population was tested during the first 100 days since the Malian population was estimated in 2016 to be close to 18 million individuals (16). From this observation, it is difficult to say that the testing efforts undertaken, in Mali, during the first 100 days of the epidemic provide an overview of the real situation of the epidemic. Without this overview, it is not easy to control the epidemic. Evidence indicates that the rapid and accurate detection of COVID-19 cases is crucial to ensure the control of the epidemic in communities and hospitals (17).

Correlation analyses showed that there was a positive correlation between the number of confirmed cases and the number of tested samples. These results suggest that the number of confirmed cases increases with the number of tested samples. In other words, Mali could have more positive cases by testing more people. Thus, the 2260 confirmed cases that have been reported may underestimate the real magnitude of the epidemic. This situation was reported by a study conducted in Mali (18). It undermines any assumptions that African countries have few cases of COVID-19 or that Africans are more protected against the disease. In our view, Africans are simply not being tested. If they were tested effectively and on a large scale, there would necessarily be more cases and it would be understood that they are not as protected as it is said (19, 20). There is evidence that the spread of diseases such as COVID-19 is more a matter of policy and epidemic management failures than biological factors (21).

In addition to underestimating the real magnitude of the epidemic, information in press releases and situation reports does not address the asymptomatic or symptomatic nature; and the mild, moderate, severe or critical nature of the cases. It was not clear whether confirmed cases were asymptomatic or symptomatic; and whether symptomatic cases were mild, moderate, severe or critical (5, 22). In the literature, it is said that 3% to 6% of the cases progress to the critical phase of the disease (23-26). In Mali, the health authorities gave information on the confirmed cases without giving further details on the severity of the cases. In our opinion, this is an inadequacy which, in terms of public health intervention, can be a barrier to understanding the real evolution of the epidemic, evaluating the adopted measures and adopting the most appropriate measures against COVID-19.

Similarly, health authorities provided information about recovered cases without giving details about their trajectory. For that, it was difficult to determine whether confirmed cases progressed to recovery following a hospitalization or a follow-up at home. In the literature, it is indicated that 12% to 19% of the cases of COVID-19 go through hospitalization (23-26). This information is crucial for public health intervention and the response to this disease.

With all these problems, it is difficult to say that the data reported on the evolution of the dead cases reflect the mortality caused by COVID-19. In order to better know this mortality, it is necessary to know the actual evolution of the epidemic through a large-scale ante-mortem or post-mortem testing strategy. In Mali, people continue to die and are neither ante-mortem nor post-mortem tested. Under these conditions, how to know deaths causes and how to link deaths to COVID-19? As a result, it was difficult to know the extent of deaths related to COVID-19. More testing is needed, particularly among contact cases. Here, it should be noted that contact cases are not routinely tested in Mali. Because of this inadequacy, several cases of COVID-19 may have escaped the system, especially given the fact that many contaminated people remain asymptomatic for some time or forever (27-31). It could thus favour pre-symptomatic or asymptomatic transmission, defined as the transmission of the virus from an infected person showing no signs at the time of testing to an uninfected person (32).

With regard to localities, first of all, press releases and situation reports provided information only on the localities of confirmed cases. Also, several localities close to Bamako seemed to be less affected than localities quite far from Bamako such as Tombouctou, Mopti and Kidal. This is the case of Ségou, Sikasso and Koutiala. Koulikoro reported 155 confirmed cases, but with a closer inspection it is easy to see that of these 155 cases, 151 were from Kalabancoro and Kati, which are geographically most part of Bamako than Koulikoro because of the galloping urbanization. Epidemiologically, they should be considered as part of Bamako. The real city of Koulikoro, which is 60 kilometres from Bamako, has reported only two cases of COVID-19 during the first 100 day of the epidemic. This is surprising given that Bamako is the most affected locality (33). Thus, without Koulikoro, the most affected localities after Bamako, Tombouctou and Mopti are Kayes and Kidal. How could all the localities along the roads to Tombouctou, Mopti, Kayes and Kidal have been spared by this highly contagious virus? This question imposes the need to better understand the dynamics of the spread of the virus through the localities. Future studies could address this issue. In the meantime, there is an urgent need to determine the real distribution of the epidemic. In Mali, it cannot be said that it is known. There is also the need to highlight the most administrative peripheral levels, namely the quarters and villages. For example, it is more interesting to know that the cases are from Dravéla or Sirakoro Dounfing than to say that they are from Commune III. The Commune III of Bamako has 20 quarters, including Dravéla and Sirakoro Dounfing. With the quarters and villages, we have a better understanding of the distribution of cases and the spatial evolution of the epidemic. While waiting for these recommendations to be taken into account, it is strongly advised to not rely on the data related to the reported localities. Consequently, all localities in Mali must be considered in the same way in terms of the risk of transmission of COVID-19. It is not because no case has been recorded in a locality that the risk of transmission is zero in that locality.

CONCLUSION

The results of this study provide an overview of the evolution of the tested samples; and of confirmed, contacts, recovered and dead cases of COVID-19. They also provide an overview of the situation of the localities affected by the pandemic. They suggest that Mali needs to do more testing by screening more people in ante-mortem and post-mortem, particularly among contact cases. They also show that efforts are needed in the identification, location and follow-up of confirmed, contact, recovered and dead cases. They will help to understand the theoretical evolution of COVID-19, to guide the progress toward the understanding of the real evolution of the epidemic and to improve communication around the problem by adapting the content of press releases and situation reports to the needs of populations and health actors. In this way, they will contribute to reducing the spread of the epidemic and preserving populations' health.

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