Journal of Multidisciplinary Healthcare Dovepress

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A Retrospective Analysis of Jordan's National COVID-19 Call Center: Operations, Effectiveness, and Lessons Learned

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Introduction: Contact tracing has been a cornerstone of non-pharmaceutical interventions to control the COVID-19 epidemic, with highly mixed effectiveness internationally. In Jordan, the Ministry of Health (MOH) collaborated with the Jordan Nurses and Midwives Council and the USAID Local Health System Sustainability Project to set up a call center for contact tracing of COVID-19.

Objective: This study described the operation and assessed the effectiveness of Jordan's COVID-19 call center activities in reaching COVID-19 cases and their contacts.

Methods: A retrospective observational design was conducted using data from all calls made by the COVID-19 call center cases between November 2020 and April 2022. Data were collected from initial and follow-up calls to PCR-confirmed COVID-19 cases and their contacts. Data on socio-demographics, symptoms, and contact tracing activities were recorded. The study focused on key outcomes, including call success rates, the number of cases and contacts reached, and the role of different detection modes in identifying cases.

Results: During the study period, the call center attempted to contact 1,027,911 COVID-19 cases, successfully reaching 802,525 cases (78.1%). Follow-up calls were made to 1,126,334 cases, with a success rate of 74%. The call center appeared particularly valuable during the initial period of the pandemic until it was overwhelmed by the significantly more transmissible Omicron variant of the virus. Two weaknesses were identified: gaps in reaching non-Jordanian citizen cases and difficulty in keeping up with case volume during the Omicron wave of February-March 2022, when reported cases peaked at over 20,000 per day. One-third of all reached cases said that they had been referred for testing through contact tracing.

Conclusion: Contact tracing activities led by the MOH were instrumental in identifying new cases, optimizing resource allocation, improving surveillance and data systems, targeting vulnerable population, and supporting mitigation strategies to combat the COVID-19 pandemic in Jordan.

Keywords: COVID-19, call center, contact tracing, surveillance systems, Jordan

Introduction

Contact tracing, a resource-intensive multistep activity,[1] is considered the cornerstone of efficient and effective public health interventions for controlling infectious disease transmission. Timely identification and investigation of infected cases can ensure the self-isolation, notification, and quarantine of contacts, thus limiting transmission.[2,3] Identification of exposure through contact tracing is critical for both the identification of patients who may be asymptomatic but still able to spread the virus and for the early identification of pre-symptomatic cases.[4,5] In East Asia, prior proficiency in severe acute respiratory syndrome (SARS) and Middle East Respiratory Syndrome (MERS) contact-tracing activities facilitated the rapid adaptation to COVID-19. This adaptation was further supported by robust political commitment and substantial

Received: 24 April 2024
Accepted: 1 October 2024
Published: 8 November 2024

financial investment.[6,7] Consequently, these measures effectively reduced the virus's effective reproductive number[8,9] and secondary attack rates.[10] In cross-national experiments and a natural experiment in the UK, the stringency of contact tracing implementation has been associated with improved control of the COVID-19 outbreak, including a reduction in deaths.[11,12] Contact tracing has also resulted in successful containment of COVID-19 in selected outbreaks,[9,13–15] but has minimal impact elsewhere.[14–17]

Contact tracing must be fine-tuned to the local needs and clinical characteristics of the pathogen being investigated. The more rapid the spread of the virus, the more the effectiveness of case investigation and contact tracing will depend on the speed and comprehensiveness with which cases are isolated and contacts are quarantined.[6,18–20] The US Centers for Disease Control and Prevention (CDC) has identified investigating more than 60% of cases and placing their contact into quarantine within six days as an effective approach.[21] Although previous reports have utilized surveillance data available from case investigations and contact-tracing activities, diverse approaches have been used for data analyses. Some authors reported the proportions of those interviewed; identified close contacts; and had at least one contact notified, tested, and newly diagnosed with COVID-19.[15,16,22,23] Other authors reported the percent of COVID-19 cases yielded from contact tracing (33% to 100%) and the percentage of cases that reported contacts (7% and 100%).[16,22–26]

To date, most studies assessing the role of contact tracing during the COVID-19 pandemic have been conducted in developed countries. There have been few reports on the role of these initiatives in developing countries.[27–29] A better understanding of the role of call center surveillance activities associated with case investigation and contact tracing is critical for responding to future potential public health threats within developing countries' health systems, given their limited resources and often younger and less well-educated populations. Jordan sought to mitigate the impact of the pandemic by implementing a national COVID-19 call center. This call center aimed to support contact tracing and case investigation efforts by managing high volumes of cases and leveraging digital tools for efficient follow-up. The objective of this study is to describe the operation of Jordan's COVID-19 call center, including its case investigation and contact tracing activities, and to evaluate the effectiveness of these activities in mitigating the spread of COVID-19. This study provides insights into the lessons learned for improving public health interventions in real-world settings.

Methods

Study Design

This study utilized a retrospective observational design to analyze data from all calls made during a contact tracing initiative aimed at combating the spread of COVID-19 in Jordan between November 2020 and April 2022.

Study Setting

The initial response to the COVID-19 pandemic in Jordan included a strict nationwide lockdown between March and June 2020. Jordan then implemented a gradual reopening of essential services until all services were completely reopened around September 2020. Simultaneously, the Jordanian Ministry of Health (MOH) expanded its traditional public health strategies, including case investigation and contact tracing,[30] while rapidly scaling up molecular COVID-19 testing capabilities. This expansion involved establishing PCR testing sites in each governorate and linking all laboratories to a national electronic laboratory reporting system known as "Sundos".[31]

Despite these efforts, Jordan faced significant challenges due to limited resources, particularly in terms of personnel, technology, and surveillance infrastructure. To address these challenges, the MOH sought assistance from the USAID-supported Local Health System Sustainability (LHSS) project, which played a crucial role in enhancing the MOH's COVID-19 call center infrastructure. In collaboration with the Jordan Nurses and Midwives Council (JNMC), LHSS supported the training of approximately 450 nurses, most of whom were subsequently contracted to assist the call center in contact tracing efforts between November 2020 and April 2022.

COVID-19 test results were communicated to individuals via automatic text messages. Positive results were used to initiate case investigations and trace close contacts. The MOH utilized a phone banking system to maximize outreach to PCR-confirmed COVID-19 cases recorded in the Sundos system. Each day, the MOH provided call center nurses with Excel files listing names, national ID numbers, and contact information for individuals with positive test results. The

nurses were responsible for informing confirmed cases of their results, referring them to healthcare services if needed, collecting information on their symptoms and contacts, and advising them on isolation and quarantine measures. The identities of contacts were obtained from COVID-19 cases and shared with MOH surveillance teams for follow-up. The initial call was designated as "day 1", with follow-up calls conducted on days 5, 7, 10, and 14 to monitor symptoms and provide home-based care guidance.

Data Collection

Data collected during these calls, along with case investigations (excluding personal contact information), were recorded in the COVID-19 call center's electronic database using Google Forms, facilitating retrospective evaluations of the program's impact on controlling the epidemic. After the call center operations ended, access to this database was restricted to MOH staff. The authors requested and received permission from the MOH to use the data, which were de-identified by MOH information technology specialists through scrambling and encrypting personal information (including national ID numbers) to ensure privacy while allowing internal linkage within the dataset. On July 13, 2022, the study team received three annual Microsoft Excel files (covering 2020, 2021, and 2022) containing data from initial calls to COVID-19 cases, as well as three corresponding files for follow-up calls.

The surveillance data collected included dates of testing, test results, dates of phone calls to cases, socio-demographic information (age, sex, city/governorate of residence), reasons for COVID-19 testing, risk factors, comorbidities, symptoms associated with COVID-19 infection, and outcomes such as hospitalization and death (reported by proxy). Participants were asked to categorize how they were detected for COVID-19 testing, identifying one of five main pathways: hospital or medical office visits due to symptoms or other reasons; self-presentation at a laboratory, with or without symptoms; mandatory testing for travelers at entry points (required until March 1, 2022); random selection by the MOH for population surveillance; or identification as close contacts of a confirmed case during contact tracing. Additionally, the call center data included information on whether all family members were tested for COVID-19, the total number of family members, and the number of family members tested as part of contact tracing. These variables were utilized to assess the effectiveness of the contact tracing activities.

Data Management

Annual baseline data files were merged to create a single comprehensive file of 1,027,911 initial baseline call attempts, 22% of which were unanswered. Follow-up data files were merged to create a single file of 1,126,334 follow-up call attempts, 20% of which were unanswered. We attempted to merge the baseline and follow-up call attempts, but due to the high rates of missingness of national IDs, we were able to match only 180,590 COVID-19 baseline cases with one or more follow-up calls and thus did not use this file for the effectiveness analysis.

Data Analysis

Data management and analyses were conducted using STATA version 16. The study estimated Jordan's population at the end of 2021 from the Jordan Department of Statistics,[32] and Jordan's COVID-19 epidemic curve from the World Health Organization.[33] The COVID-19 waves in Jordan were defined as follows: first wave, November 1, 2020, to January 13, 2021; second wave, February 8, 2021, to May 8, 2021; third wave, October 16 to December 25, 2021; and fourth wave, January 6 to March 12, 2022.

Ethical Considerations

The study adhered to ethical principles outlined in the Declaration of Helsinki guidelines. The original data collection interviews were conducted for public health purposes and not research purposes. At the beginning of the interview with the call center, all participants provided verbal informed consent, including the secondary use of their data for research. The minors were not interviewed. The MOH, which maintained the final dataset, anonymized all data by scrambling and encrypting the identifiers (so that they would be linkable to other days within the dataset only) before providing the dataset to the authors for secondary analysis. As the data were anonymized and a secondary analysis was conducted to evaluate the contact-tracing program (rather than for generalizable research). This manuscript was reviewed and

approved by the Scientific Research Ethics Committee of Jordan Ministry of Health/Al Basheer Hospital (MOH/REC/2023/94).

Results

The Jordan MOH reported 1,608,497 COVID-19 PCR-positive cases during the operation of the call center.[33] The initial calls were attempted to 64.0% (1,027,911 cases) of positive COVID-19 cases reported by MOH. Of these, 802,525 COVID-19 cases (78.1% of all call attempts, and 49.9% of all reported MOH COVID-19 cases) were successfully completed. While 225,386 cases (21.9% of all call attempts) were unreached. Among the unreached cases, the phone number provided by the case at the time of specimen collection was not in service for 55,652, (24.7%), the phone was not answered for 141,049 (62.6%), 7,178 (3.2%) were reported to be in jail, and 21,489 cases (9.5%) refused to participate in the phone interview, accounting for 2.1% of all call attempts.

Figure 1 shows the number of calls reached and the number of MOH-reported COVID-19 cases over time. During the first COVID-19 wave, the call center successfully interviewed 123,059 (55.1%) of the MOH-reported COVID-19 cases (223,270). During the second wave, the percentage of reached calls among reported COVID-19 cases increased to 68.7% (264,448) of the reported cases (384,777). During the period between the second and third waves, May-October 2021, this percentage increased to 73.9% (88,084) of the reported cases (119,219). During the third wave, the percentage of reached calls decreased to 50.5% (106,995) of the reported cases (211,734). The lowest percentage reached was reported during wave four, with 29.7% (173,992) of the reported cases (585,128).

The percentage of baseline call attempts that were successfully interviewed was 78.1%. This indicator ranged between 72.4%, in December 2020, and 82.3% in March 2022. During the first wave, the percentage of call attempts reached was 74.4%, before increasing to 79.8% during the second wave and 80.6% between waves two and three, this call success rate reached 80.6%, before decreasing to 73.7% in the third wave. Figure 2 presents the number of calls attempted/reached over time.

At baseline, the distribution of reached COVID-19 cases by sex was nearly equal, with 50.3% being males. The majority of the cases (58.6%) were between the ages of 20 and 50 years, while 22.0% were 18 years or younger, and

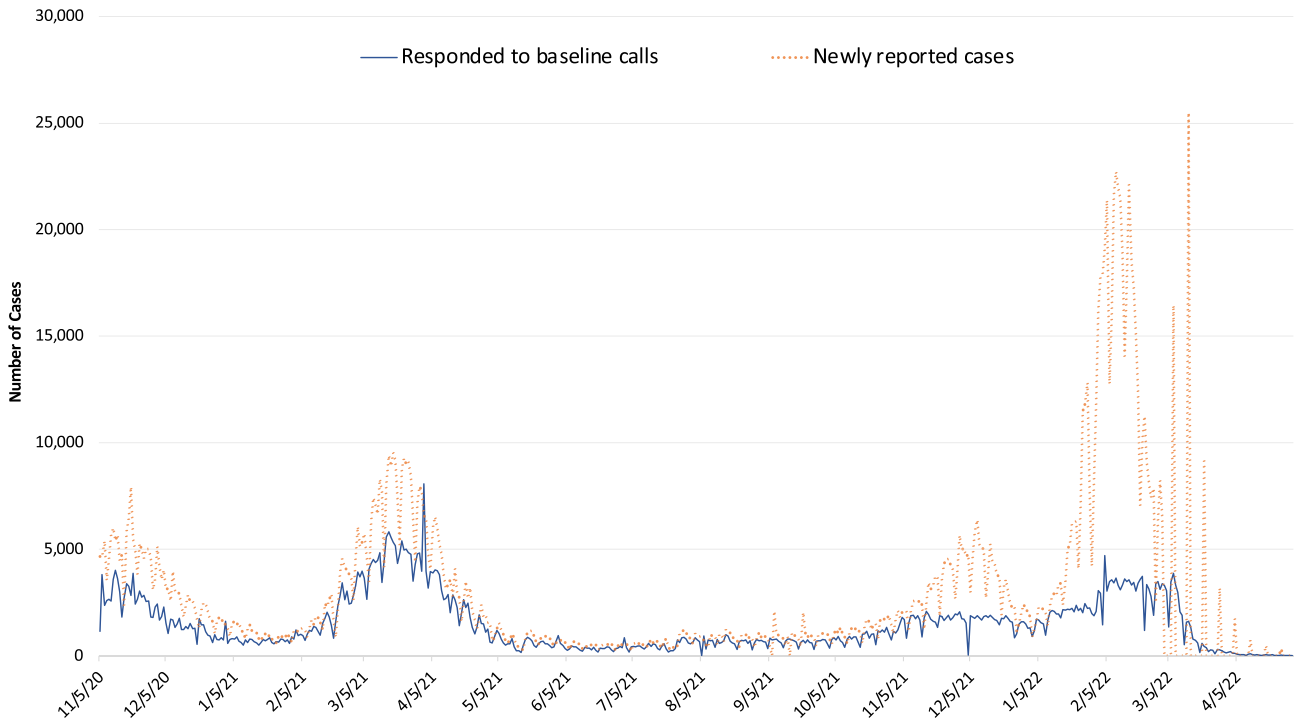

Figure 1 Number of Daily COVID-19 Calls Reached, Responded to Baseline Calls, vs Newly Reported Ministry of Health (MOH) Cases.

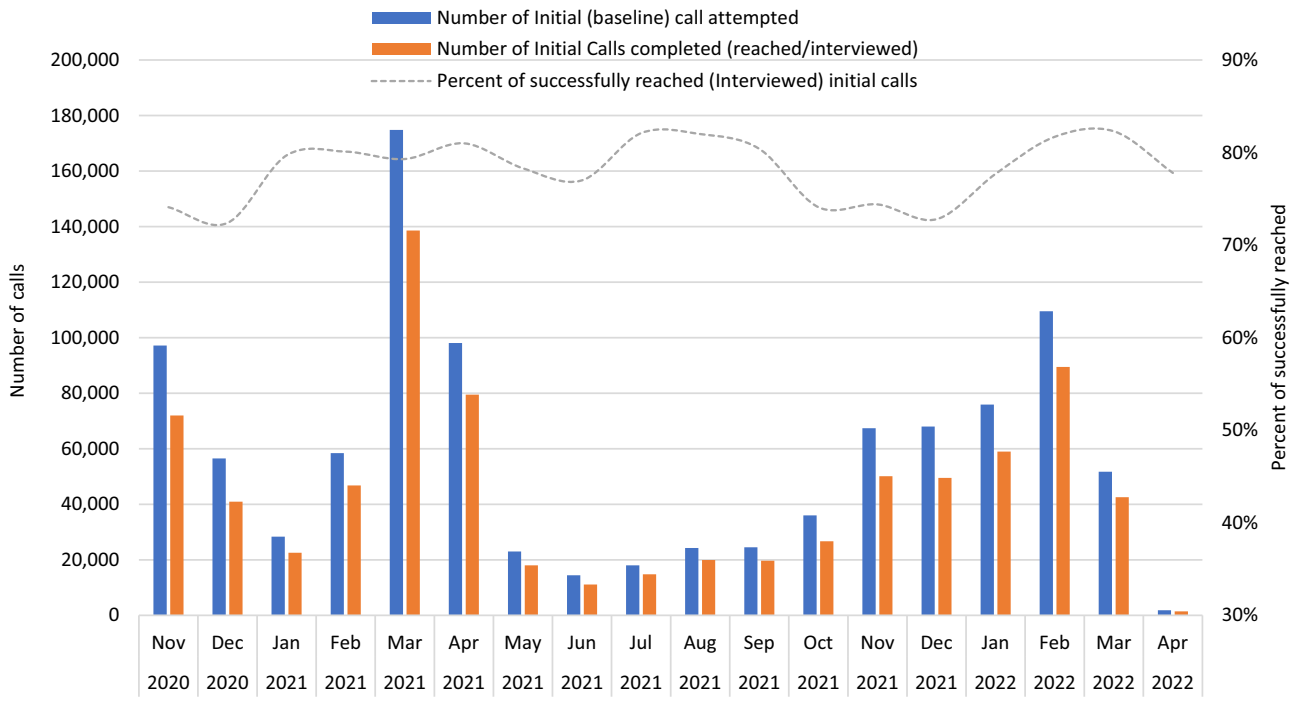

Figure 2 Number of calls attempted, completed, and percent of reached calls.

8.5% were 60 years or older. Overall, 7.3 COVID-19 cases per 100 individuals in the total population of Jordan were reached and interviewed. Among females, the number of interviewed COVID-19 case per 100 females living in Jordan was 6.8, whereas the rate among males was 7.7 per 100 males. The overwhelming majority of reached cases (96.0%, or 767,146) were Jordanian citizens and only 35,379 (4.0%) were not. Of those reached, 91.5% (753,148) self-reported that they had already received their positive test result, while 6.0% (49,377) had not.

Table 1 shows the baseline and follow-up calls attempted, by month. A total of 1,126,334 follow-up calls were attempted. Seventy-four percent (842,096) of follow-up call attempts were successfully completed. This completion rate fluctuated, ranging from 50.8% in November 2020 to over 81% in June 2021 and April 2022. Of all completed follow-up calls, 44.7% (376,417) were completed on day five, 9.1% (76,631) on day seven, 32.3% (271,997) on day ten, and 13.9% (117,051) on day 14. On average, 1.4 follow-up call attempts were made per initial call, compared to the target of three follow-up calls per initial call. The number of follow-up calls made for each initial call varied significantly over time, reaching a high of 374 follow-up calls per 100 initial calls in June 2021 and dropping to a low of 2.5 follow-up calls per 100 initial calls in March 2021 (Table 1).

Of the five case detection modes, contact tracing was the most significant contributor to the referral of identified COVID cases for testing. Among those reached at baseline call, 33.3% (266,967) reported contact tracing as their mode of detection, followed by medical visits (29.7% or 237,969), and self-presentation to laboratories (24.1% or 193,806). Contact tracing appeared to have played a particularly important role during waves 1 and 3, whereas medical visits were more prominent between waves and during Wave 4. Testing as part of random population surveillance accounted for 7.8% (62,392) of cases, with a notable role during early 2021. Identification at the point of entry into the country contributed to 5.2% (41,391) of the cases, with a more significant share of cases from October 2021 to April 2022, following the lifting of some COVID-19 travel and other restrictions on September 1, 2021.

More than half (52.5%) of reached cases reported that "all family members" (their potential contacts) had been tested for COVID-19. This percentage ranged from 44.2% in June 2021 to 62.4% in December 2021 (Table 2). When asked about the total number of family members living within the same household, cases reached during the initial call reported a total of 3.9 million family members (contacts). Of these, 2.7 million (68.4%) were reported to have already been tested

Table 1 Number and Percentages of Calls Made at Baseline and at Follow-Up

Year	Month	Wave	Positive Cases Reported by MOH	Initial/Baseline Calls					Follow-up Calls			
				Call Attempts		Calls Completed		SUCCESSFULLY Conducted Calls	Call Attempts	Calls Completed	Successfully Conducted Calls	Follow up Calls Per 100 Completed Initial Calls
2020			N	n	% of all cases	n	% of all cases	% of call attempts	n	n	% of call attempts	
	Nov	1	127,731	97,170	*76.1*	71,974	*56.3*	*74.1*	98,667	50,090	*50.8*	69.6
	Dec	1	78,760	56,528	*71.8*	40,916	*52.0*	*72.4*	94,341	59,753	*63.3*	146.0
2021	Jan	1	32,607	28,325	*86.9*	22,568	*69.2*	*79.7*	63,691	47,085	*73.9*	208.6
	Feb	2	60,822	58,418	*96.0*	46,784	*76.9*	*80.1*	86,990	70,608	*81.2*	150.9
	Mar	2	218,511	174,833	*80.0*	138,599	*63.4*	*79.3*	4,431	3,435	*77.5*	2.5
	Apr	2	104,810	98,082	*93.6*	79,469	*75.8*	*81.0*	12,073	9,348	*77.4*	11.8
	May	2	25,322	22,974	*90.7*	17,998	*71.1*	*78.3*	81,541	65,059	*79.8*	361.5
	Jun		15,075	14,432	*95.7*	11,108	*73.7*	*77.0*	51,018	41,484	*81.3*	373.5
	Jul		19,264	17,998	*93.4*	14,782	*76.7*	*82.1*	41,351	31,350	*75.8*	212.1
	Aug		26,109	24,276	*93.0*	19,913	*76.3*	*82.0*	47,848	35,154	*73.5*	176.5
	Sep		26,633	24,499	*92.0*	19,687	*73.9*	*80.4*	57,192	44,213	*77.3*	224.6
	Oct	3	37,926	36,008	*94.9*	26,685	*70.4*	*74.1*	84,911	66,020	*77.8*	247.4
	Nov	3	88,148	67,415	*76.5*	50,129	*56.9*	*74.4*	62,117	48,287	*77.7*	96.3
	Dec	3	112,594	68,017	*60.4*	49,509	*44.0*	*72.8*	93,165	73,268	*78.6*	148.0
2022	Jan	4	147,523	75,887	*51.4*	58,989	*40.0*	*77.7*	101,128	79,896	*79.0*	135.4
	Feb	4	414,391	109,496	*26.4*	89,447	*21.6*	*81.7*	86,488	69,020	*79.8*	77.2
	Mar	4	69,011	51,710	*74.9*	42,534	*61.6*	*82.3*	56,609	45,783	*80.9*	107.6
	Apr	4	3,260	1,843	*56.5*	1,434	*44.0*	*77.8*	2,710	2,243	*82.8*	156.4
Total			***1,608,497***	***1,027,911***	***63.9***	***802,525***	***49.9***	***78.1***	***1,126,271***	***842,096***	***74.8***	

Abbreviation: MOH, Ministry of Health.

Table 2 Household COVID-19 Contact Testing Status as Reported by Reached Cases

Year	Month	Wave	Number of Cases Reached	Cases Who Reported All family Members Tested		Number of Family Members Reported	Number of Family Members Tested	
			n	n	%	n	n	%
OVERALL (Total)			***802,525***	***421,244***	***52.5%***	***3,949,370***	***2,701,127***	***68.4%***
2020	Nov	1	71,974	38,056	*52.9%*	393,582	253,107	*64.3%*
	Dec	1	40,916	21,267	*52.0%*	218,148	145,224	*66.6%*
2021	Jan	1	22,568	10,875	*48.2%*	108,927	70,836	*65.0%*
	Feb	2	46,784	23,432	*50.1%*	213,330	141,042	*66.1%*
	Mar	2	138,599	71,010	*51.2%*	665,260	449,411	*67.6%*
	Apr	2	79,469	39,305	*49.5%*	393,379	257,873	*65.6%*
	Mar	2	17,998	7,952	*44.2%*	88,014	53,599	*60.9%*
	Jun		11,108	4,890	*44.0%*	52,734	32,012	*60.7%*
	Jul		14,782	7,749	*52.4%*	72,850	50,099	*68.8%*
	Aug		19,913	10,398	*52.2%*	99,296	66,281	*66.8%*
	Sep		19,687	10,349	*52.6%*	100,291	68,044	*67.8%*
	Oct	3	26,685	13,802	*51.7%*	134,603	93,147	*69.2%*
	Nov	3	50,129	28,569	*57.0%*	256,072	190,560	*74.4%*
	Dec	3	49,509	30,873	*62.4%*	247,203	191,745	*77.6%*
2022	Jan	4	58,989	33,984	*57.6%*	272,515	197,863	*72.6%*
	Feb	4	89,447	45,842	*51.3%*	421,311	290,529	*69.0%*
	Mar	4	42,534	22,146	*52.1%*	206,297	145,964	*70.8%*
	Apr	4	1,434	745	*52.0%*	5,558	3,791	*68.2%*
OVERALL (Total)			***802,525***	***421,244***	***52.5%***	***3,949,370***	***2,701,127***	***68.4%***

during contact tracing efforts (Table 2). This percentage fluctuated between 60.9% in May 2021 (the end of the second wave) and 77.6% in December 2021, during the third wave.

Discussion

This study addressed both the operations and the effectiveness of the national COVID-19 call center activity implemented in Jordan, focusing on reaching cases and identifying contacts. Call center activity represents the significant role of non-state actors in supporting governmental efforts to mobilize resources and accelerate containment of the disease. In the current study, such role focused on facilitating contact tracing using advanced information technology (IT) and digital initiatives implemented within the scope of surveillance activities.[31] The results suggest that supporting the Jordan MOH with IT infrastructure and enhancing electronic surveillance activities were critical in reaching and interviewing newly diagnosed cases and identifying contacts.

For every ten COVID-19 cases reported by the MOH between November 2020 and April 2022, the call center attempted to call six cases and successfully interviewed five. This indicates that, in general, the call center was able to successfully reach a significant portion of MHO-reported COVID-19 cases within the period provided. Reached cases provided valuable information regarding their infection and up-to-date case management information on how to deal with their symptoms, how to isolate them, and where to access medical care if needed. Jordan's contact tracing success, with a reach of 83.3% of cases and 33.3% identified through contact tracing, compares favorably with other countries. For instance, Rwanda achieved an 89.9% success rate in contact tracing, relying on community health worker teams and leveraging technology like cell phone tower data for tracing efforts. While, in Uganda, the completion rate for follow-up among contacts was 97%, with a contact-to-case ratio of six.[34]

The success rate of the call center in reaching COVID-19 cases fluctuated across different waves of the pandemic. Higher success rates were recorded during the initial waves, while the rate of reaching cases declined after the third wave, suggesting that the effectiveness of the call center was limited after this specific period. This may reflect the strain on the call center's capacity as it also supported the immunization safety-monitoring campaign during this time, combined with a surge in the number of COVID-19 cases. The call center was particularly valuable during the early stages of the pandemic but became overwhelmed by the more transmissible Omicron variant. Similar future activities should incorporate ongoing/live quality assurance and control measures using collected data to assess the success of the call center in reaching cases. Comparatively, more technologically advanced systems, such as those in South Korea, utilized digital tracing and advanced technologies like artificial intelligence and global positioning system to enhance efficiency, an approach Jordan could consider for future public health crises.[29]

Notably, only a small proportion of the attempted calls (2.1%) refused to participate in contact tracing. This may reflect the Jordanians' trust in health authorities, contrasting with much higher rates of refusal to participate in contact tracing – up to 78%[35]– have been reported in the United States, which has been attributed to a lack of social trust in the government and in health authorities.[36] In Jordan, in contrast, the population – at least those with valid phone numbers – trusted JNMC nurses and were willing to assist. This is a positive sign for the feasibility of future public health campaigns.

We also note that about 20% of cases in which calls were attempted could not be reached due to problems with the validity of phone numbers provided, and many cases in which calls were not attempted had not provided phone numbers, according to call center officials. These cases were probably unable to obtain test results using a mobile phone text message, which was the primary method of disseminating results in a timely manner. It is likely that this group was disproportionately composed of immigrants. While 32%, or 3.5 million of Jordan's 11.1 million population is non-Jordanian,[37] their share of successfully interviewed COVID-19 cases was just 4%. Non-Jordanian participants may not have had access to cell phones, not provided a correct phone number, or were contacted but did not speak Arabic. As the 1.4 million Syrian refugees living in United Nations refugee camps have been reported to be comparatively well protected from SARS-CoV-2,[38,39] and the bulk of the unreached population likely represents immigrants living in host communities. The current results identify a critical need to provide outreach to these vulnerable population subgroups to further investigate the reported COVID-19 cases and identify contacts using methods other than mobile phones. Engaging non-state actors working directly with refugees can be considered in future interventions to address this gap.

The percentage of cases identified using contact tracing is the most important indicator of the success of a contact-tracing program.[40] In this study, 33.3% of cases were identified via contact-tracing activities. This percentage is much greater than that of US state programs (3% to 11%)[15] and Belgium (24%),[41] but less than that in Catalonia, Spain, where contact tracing identified 34% to 58% of new monthly cases,[13] and Oman, where contact tracing identified 56% to 76% of new monthly cases.[27]

Contact tracing played an important role during waves 1 and 3 of the pandemic when rapid case identification and isolation were critical to limiting widespread community transmission. In contrast, between waves and during Wave 4, medical visits became a more prominent mode of case detection. This shift likely reflects increased public awareness of symptoms and access to healthcare facilities, along with the healthcare system's adaptation to managing COVID-19 cases. Furthermore, the Omicron variant's milder symptoms during Wave 4 may have resulted in more cases being detected through routine medical visits rather than contact tracing.

Beyond the direct activities of the call center, the effectiveness of the contact tracing initiative can be observed through the identification of a significant proportion of COVID-19 cases via contact tracing and its likely role in reducing secondary transmission. Additionally, the call center's efforts to monitor and manage cases remotely helped relieve the burden on healthcare facilities, further highlighting its broader impact on Jordan's COVID-19 response.[29] Qualitative reports indicate that call center activity accelerated the identification of first-level contacts with MOH surveillance teams within a short period of time following the baseline call, resulting in their swift testing and isolation, thus preventing further epidemic spread. Before implementing the call center activity, contacts were reached within seven days of the initial case identification. This was believed to have been reduced to within 24 hours of the baseline call.

Evidence for this effect would have been much stronger if the time between the initial call date and contact tracing date(s) had been explicitly captured in the data. A case-control study comparing individuals who received follow-up calls with those who did not could have provided deeper insights into the impact of the call center on disease outcomes. We were also not able to directly link the call center's capture of information on contacts to their testing and isolation, since the number and identifiers of the identified contacts were not included in the call center dataset. It is possible that the percentage of cases referred for testing through contact tracing may be even greater than 33%, as some contacts may have reported their detection mode as self-referral to a laboratory rather than referral through MOH surveillance; an additional 24.1% of identified cases were reported to have been self-referred to a laboratory for testing. Jordan should further invest in health informatics and surveillance data collection systems to prepare for the management and monitoring of future public health threats.

Conclusion

This study demonstrates that Jordan's COVID-19 call center played a pivotal role in the national response to the pandemic by facilitating case investigation and contact tracing efforts. The call center was effective in reaching a significant proportion of confirmed cases, contributing to early detection, isolation, and reduced transmission. Despite the operational challenges, including fluctuating call volumes and difficulties in reaching certain population groups, the call center provided essential support in managing the spread of COVID-19, especially during critical waves of the pandemic. The lessons learned from this initiative can inform future public health strategies in Jordan and other resource-limited settings. Future efforts should focus on addressing gaps in reaching marginalized populations and refining contact tracing strategies for emerging health threats.

Acknowledgments

This study was developed by the Local Health System Sustainability Activity (LHSS) and made possible by the generous support of American People through the United States Agency for International Development (USAID). The LHSS is grateful for the stewardship of the Ministry of Health (MoH) Communicable Disease Directorate and acknowledges the contributions of its members. Special thanks go to Ms. Maysa Al-Khateeb Population and Family Health Management Specialist/USAID for her technical contributions and review.

Disclosure

The authors report no conflicts of interest in this work.

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