

ORIGINAL RESEARCH ARTICLE

Community-based distribution program's response to increased contraceptive demand in the Democratic Republic of Congo during COVID-19

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Abstract

In the Democratic Republic of Congo (DRC), the United States Agency for International Development (USAID) Integrated Health Program supports the Ministry of Health to strengthen family planning (FP) services through a Community-Based Distribution (CBD) program. As a part of this project, we investigated whether the CBD program responded to the increased need for contraceptives in nine provinces of the DRC during COVID-19 pandemic. Analysis compared distribution rates of contraception methods, uptake by new users, and renewal rates among women before and during the pandemic. Data sourced from women of childbearing age using modern contraceptives through CBD across 179 health zones were analyzed using chi-square tests in MedCalc software to examine proportion differences pre-COVID-19 versus during COVID-19. The CBD program distributed about 348,958 contraceptives during the pandemic, with 18.3% being new users, significantly higher than pre-pandemic levels (14.5%; $P < 0.0001$). Renewal rates were higher pre-pandemic overall (26.3% vs. 24.6%; $P < 0.0001$), but urban areas saw increased renewals during COVID-19 compared to before (34.8% vs. 24.1%; $P < 0.0001$). Despite pandemic-induced healthcare challenges, the CBD program effectively met escalated contraceptive demands. These findings underscore CBD's efficacy in crisis response, offering insights for governments on optimizing CBD services during health emergencies. (*Afr J Reprod Health 2024; 28 [9]: 122-134*).

Keywords: Family planning, community-based distribution program, Democratic Republic of Congo, USAID IHP, COVID-19

Résumé

En République Démocratique du Congo (RDC), le programme de santé intégré de l'Agence des États-Unis pour le développement international (USAID) soutient le Ministère de la Santé dans le renforcement des services de planification familiale (PF) par le biais d'un programme de distribution à base communautaire (DBC). Dans le cadre de ce projet, nous avons étudié si le programme DBC répondait au besoin accru de contraceptifs dans neuf provinces de la RDC pendant la pandémie de COVID-19. L'analyse a comparé les taux de distribution des méthodes de contraceptives, leur adoption par les nouvelles utilisatrices, ainsi que les taux de renouvellement parmi les femmes avant et pendant la pandémie. Les données provenant de femmes en âge de procréer utilisant des contraceptifs modernes via le DBC dans 179 zones de santé ont été analysées à l'aide de tests du chi carré dans le logiciel MedCalc pour examiner les différences de proportions avant et pendant la COVID-19. Le DBC a distribué environ 348 958 contraceptifs pendant la pandémie, dont 18,3 % ont été adoptés par de nouveaux utilisateurs, un chiffre nettement supérieur aux niveaux d'avant la pandémie (14,5 % ; $P < 0,0001$). Les taux de renouvellement étaient globalement plus élevés avant la pandémie (26,3 % contre 24,6 % ; $P < 0,0001$). Cependant, les zones urbaines ont enregistré une augmentation des renouvellements pendant la COVID-19 par rapport à avant (34,8 % contre 24,1 % ; $P < 0,0001$). Malgré les défis sanitaires induits par la pandémie, le DBC a su répondre efficacement à la demande croissante en matière de contraception. Ces résultats soulignent l'efficacité du DBC en période de crise, offrant aux gouvernements des informations précieuses sur l'optimisation des services DBC lors des urgences sanitaires. (*Afr J Reprod Health 2024; 28 [9]: 122-134*).

Mots-clés: Planification familiale, Programme de distribution à base communautaire, République démocratique du Congo, USAID IHP, COVID-19

Introduction

Lack of access to family planning (FP) is an important global issue, particularly in sub-Saharan Africa. The high fertility rate and rapid population growth in the region¹ pose considerable challenges to health, education, and economic development^{2,3}. During the COVID-19 pandemic, access to contraceptive methods was hindered due to pandemic-related health service disruptions and fear of contracting the virus⁴, while the proportion of women in need of contraception increased significantly in sub-Saharan African geographies^{5,6}. Additionally, a study of low- and middle-income countries (LMICs) showed that a 10% decrease in the use of short- and long-term reversible contraceptives due to reduced access would result in an additional 49 million women with an unmet need for modern contraception and 15 million additional unintended pregnancies in one year⁷. This is a great concern for countries like the Democratic Republic of Congo (DRC) where, even before the pandemic, access to contraceptive services was limited and contraception use rates were low (15.5%)⁸. The proportion of women with an unmet need for FP in the DRC was estimated at between 22% to 25%⁹. To address the issue of contraception access during the pandemic, many countries used community-based distribution (CBD) programs to provide contraceptive methods using targeted, community-focused strategies¹⁰⁻¹². With CBD, community members are trained to serve as advocates and providers of FP services. CBD is a low-cost approach for the distribution of modern contraceptives at the local level¹³. The approach ensures continuity in the use of FP services by clients in the community and facilitates access to FP services at home, especially for people who do not regularly attend health facilities.

Benefits of CBD support and advocacy for FP include community ownership of FP services, greater availability of FP services in health zones (geographic areas defined by the Government of the DRC for health service provision) and health facilities, and more effective follow-up with clients on methods and feedback¹⁴. In the DRC, the Ministry of Health (MOH), in collaboration with the

Directorate of Specialized Programs and alongside the National Reproductive Health Program, developed a CBD program and additional guidelines for the provision and use of reproductive health services to ensure continuity of FP services¹⁴. They have also supported FP outreach programs¹⁵.

Several studies have assessed the effectiveness of CBD programs in providing FP services and increasing the use of contraception methods in communities^{10, 20}. For example, a study conducted in Malawi demonstrated that CBD programs were effective in increasing use of contraception, especially in rural areas¹¹. However, studies identified challenges in implementing effective CBD programs during the COVID-19 pandemic. A study in Nigeria, South Africa, and Bangladesh described FP service disruptions due to lockdowns, fear of contracting the disease, prioritization of other pandemic-related health issues, and resource constraints¹⁶. Throughout the pandemic, CBD programs in the DRC were hampered by logistical problems, such as supply chain disruptions and pandemic-related closures that hindered training and distribution¹⁷. International donors are working with the DRC to improve access to FP services through the integration of community-based health care providers to health care staff at facilities¹⁸.

Study intervention

In the DRC, the United States Agency for International Development (USAID) Program de Santé Intégré (Integrated Health Program [IHP]) supports the MOH to strengthen the country's health care system, including by promoting FP through a CBD approach across nine provinces (Haut Katanga, Haut Lomami, Kasai Central, Kasai Oriental, Lomami, Lualaba, Sankuru, South Kivu, and Tanganyika). Community-based distributors have been trained by nurses, doctors, teachers, and professors. These community-based distributors were responsible for educating the community about FP, administering non-clinical contraceptive methods, conducting home visits and follow-ups, ensuring renewals of contraceptive methods, and referring clients with more complex needs to nearby

health facilities. The contraceptive methods that were distributed included cycle beads, combined and progestin pills, and male and female condoms. Distributors were equipped with a kit and easily identified in their respective communities. They worked in collaboration with health facility teams.

Study objective

Conducted as part of USAID IHP, this study aims to examine the effectiveness of CBD in distributing modern contraceptives during the COVID-19 pandemic by answering the following research question: Did the CBD program respond to the need for contraceptives in nine Program-supported provinces in the DRC during the COVID-19 pandemic? In this study, we compare the number of contraceptives distributed, new users of modern contraceptive methods, and the number of women who renewed their FP methods before and during the COVID-19 pandemic by place of residence (rural and urban). The results of this study are essential for understanding the successes and limitations of CBD and identifying populations that could benefit the most from these services during a health emergency. Furthermore, this study may inform policymakers and program implementers about areas of intervention to meet the needs of vulnerable populations and strengthen health systems to ensure continued access to these essential services during health emergencies.

Methods

Study design and data source and sampling

Our study is an observational study using data from the DRC's national District Health Information System 2 (DHIS2) digital platform, which manages health data from every health facility in the country. DHIS2 serves as a robust platform for managing and analyzing healthcare data in the DRC, supported by strong data quality assurance measures and comprehensive data analysis capabilities. Data on the use of contraceptive methods by women of childbearing age in the community were recorded by the community health distributors and health facility team members in their data management registers.

They also recorded data on new and continuing FP users, client age, and FP methods provided. At the end of each month, the supervising nurse transcribed these data into the health facility's health management information system. These data were then sent to the health zone's central office for entry into the DHIS2 platform. To ensure data quality, community health distributors were trained in accurate data collection, verification, validation, and data security. Additionally, data monitoring and validation meetings were held first at the health area level, led by the head nurse and supported by the health zone management team, to check the conformity of the data entered in the reporting template with those in the service registers. Meetings were then held at the health zone level, led by the head doctor with the participation of service providers and technical partners, to ensure the quality of the data entered in DHIS2.

In addition, the program's research team analyzed the consistency of data from new acceptors with the commodities distributed, to ensure data consistency. In the DRC, data must meet at least 80% completeness to make the results generalizable to the larger population. The average completeness of our analyzed data was 93.6%. Our research team was able to extract DHIS2 data for specific periods, and entities for our study, through authorization from the MOH.

Data were collected from all women of childbearing age (categorized in DHIS2 as less than 20 years or over 20 years old) who used modern contraceptive methods administered by community health distributors during the 12-month period before the start of COVID-19 (March 2019 - February 2020) and for 12 months during the pandemic (March 2020 - February 2021). Data were collected in the 179 health zones within the nine USAID IHP intervention provinces, including Kasai Central, Kasai Oriental, Lomami, Sankuru, Haut Katanga, Haut Lomami, Lualaba, Tanganyika, and Sud Kivu. Data on the number of contraceptive methods distributed and the number of users varied from a few hundred to a couple of thousand based on each province's population size and type of residence (rural vs. urban). After the intervention, which occurred from March 2019 to February 2021,

this study was conducted from September to December 2023. During the data collection period for this article, national guidelines for CBD had not yet incorporated injectable methods nor did the DHIS disaggregate data for injectable methods between Community health distributors and nurses. For this reason, injectables are not included in this study.

Data measurement and analysis

New users of modern contraceptive methods were defined as women of childbearing age who were first-time users of contraceptive methods after receiving consultations from health workers. Women renewing their FP methods were defined as women of childbearing age who were already using some type of modern contraceptive method and who were reaching the end of their existing FP method. Renewal depends on the lifetime of the contraceptive method (such as one month in the case of oral contraceptives). The place of residence was either rural or urban.

First, we examined the number of contraceptive methods distributed and the count of new and continuing users of contraceptive methods before and during the COVID-19 pandemic by place of residence (rural and urban). Second, we examined the proportional differences in the distribution of each variable pre-COVID-19 vs. during COVID-19. For data analysis, we used chi square tests in MedCalc software to calculate P-value for statistical comparisons of proportions before and after COVID 19. In Table 2, the proportion of new users before and during COVID-19 was calculated by dividing the number of new users of FP methods through community health distributors (numerator) by the total number of new users through both health facilities and community health distributors (denominator).

Results

Through community health distributors, about 191,863 contraceptives, including cycle beads, and combined, progestin-only, and emergency contraceptive (EC) pills were distributed before the pandemic and about 348,958 during the pandemic.

Among them, combined and progestin-only pills were the most widely distributed contraceptive methods both before and during COVID-19 (Table 1). At the provincial level, combined pills were the most widely distributed contraceptive method before the pandemic. However, during the pandemic, progestin-only pills were the most widely distributed method in the majority of provinces except for Haut Lomami, Kasai Central, and Tanganyika. In terms of distribution area overall, the various contraceptive methods (cycle beads, progestin-only, combined, and emergency contraceptive pills) were more widely distributed by community health distributors in rural than in urban areas prior to COVID-19 (136,170 vs. 55,693), and during COVID-19 (193,808 vs. 155,150). However, when comparing the different provinces, the data show that community health distributors in Haut Katanga, Kasai Oriental, and Tanganyika distributed combined pills more widely in urban than in rural areas before and during the pandemic. Table 2 presents comparisons of new users of contraceptive methods distributed through CBD before and during the COVID-19 pandemic by place of residence. Out of a total of 1,451,121 new users of contraceptive methods during the COVID-19 period, community health distributors resulted in 265,486 new users (18.3%), which is significantly higher than the proportion observed before the COVID-19 pandemic (14.5%); $P < 0.0001$. This difference between the two periods was observed in all provinces except Lomami and Lualaba. In rural areas, the proportion of new users enrolled by community health distributors before COVID-19 was slightly higher than that observed during COVID-19 (63.6% vs. 54.1%; $P < 0.0001$). Overall, and at the provincial level, the difference between the two periods was statistically significant in all rural provinces except in Sankuru province. Notably, in urban areas, the proportion of new users was higher during COVID-19 than before the pandemic (45.9% vs. 36.4%; $P < 0.0001$). Table 3 presents comparisons of renewals of contraceptive methods distributed through CBD before and during the pandemic by place of residence. Over all, the proportion of women who had renewed their

Table 1: Number of contraceptives distributed through the CBD program before and after the COVID-19 pandemic, disaggregated by place of residence

Province	Number of contraceptives distributed through CBD before COVID-19				Number of contraceptives distributed through CBD during COVID-19			
	Cycle Beads	Progestin Pill Pack	Combined Pill Pack	EC Pill Pack	Cycle Beads	Progestin Pill Pack	Combined Pill Pack	EC Pill Pack
Total	14545	60063	111614	5641	19424	119560	204297	5677
Haut Katanga	872	7851	10239	897	2074	12128	7720	2433
Haut Lomami	575	1484	4397	667	146	2348	4519	349
Kasai Oriental	3533	7025	10708	446	3540	15995	14517	698
Kasai Central	3178	20515	41696	688	3835	48829	140721	362
Lualaba	1816	5795	5893	625	2670	8822	5900	345
Lomami	2 942	10915	29432	253	4979	20357	19817	501
Sud Kivu	1144	5332	6654	1554	1562	6815	6133	817
Sankuru	291	604	877	321	484	1238	730	69
Tanganyika	194	542	1718	190	134	3028	4240	103
In rural areas	9951	41004	81005	4210	14305	76696	99713	3094
Haut Katanga	505	2577	2549	539	772	4357	2375	838
Haut Lomami	545	1392	4388	655	107	2341	4500	317
Kasai Oriental	364	777	728	27	1570	7750	5383	314
Kasai Central	2824	14810	32050	499	3127	29475	56921	193
Lualaba	1454	4703	4 909	417	2111	4854	3929	204
Lomami	2931	10713	29235	245	4786	19762	19423	388
Sud Kivu	942	5038	5793	1 377	1362	6407	5562	684
Sankuru	254	553	629	291	340	889	583	54
Tanganyika	132	441	724	160	130	861	1037	102
In urban areas	4594	19059	30609	1431	5119	42864	104584	2583
Haut Katanga	367	5274	7690	358	1302	7771	5345	1595
Haut Lomami	30	92	9	12	39	7	19	32
Kasai Oriental	3169	6248	9980	419	1970	8245	9134	384

Kasai Central	354	5705	9646	189	708	19354	83800	169
Lualaba	362	1092	984	208	559	3968	1 971	141
Lomami	11	202	197	8	193	595	394	113
Sud Kivu	202	294	861	177	200	408	571	133
Sankuru	37	51	248	30	144	349	147	15
Tanganyika	62	101	994	30	4	2167	3203	1

Table 2: Comparison of new contraceptive method users before and during the COVID-19 pandemic, disaggregated by place of residence

Province	All new users <i>before</i> COVID-19	New users only from CBD <i>before</i> COVID-19	P1=Proportion of new users from CBD <i>before</i> COVID-19	All new users <i>during</i> COVID-19	New users only from CBD <i>during</i> COVID-19	P2=Proportion of new users from CBD <i>during</i> COVID-19	Calculated Z Value	P value
Total	1100 713	159997	14.5%	1451121	265486	18.3%	79.8	< 0,0001
Haut Katanga	157431	25150	16.0%	196944	49945	25.4%	67.9	< 0,0001
Haut Lomami	132870	2816	2.1%	200068	5545	2.8%	11.8	< 0,0001
Kasai Oriental	103705	28168	27.2%	143904	41840	29.1%	10.4	< 0,0001
Kasai Central	173667	38748	22.3%	225419	68396	30.3%	56.8	< 0,0001
Lualaba	102267	17549	17.2%	149538	23023	15.4%	11.8	< 0,0001
Lomami	72800	33470	46.0%	107309	44841	41.8%	17.6	< 0,0001
Sud Kivu	225486	7767	3.4%	259466	14883	5.7%	37.7	< 0,0001
Sankuru	98533	3702	3.8%	111985	6956	6.2%	25.6	< 0,0001
Tanganyika	33954	2627	7.7%	56488	10057	17.8%	42.2	< 0,0001
New Users Exclusively through CBD by Place of Residence								
Province	Total CBD new users <i>before</i> COVID-19	Rural new users <i>before</i> COVID-19	P1=Proportion of rural new users <i>before</i> COVID-19	Total CBD new users <i>during</i> COVID-19	Rural new users <i>during</i> COVID-19	P2=Proportion of rural new users <i>during</i> COVID-19	Calculated Z Value	P value
Total	159997	101758	63.6%	265486	143628	54.1%	61.04	< 0,0001
Haut Katanga	25150	6111	24.3%	49945	11537	23.1%	3.57	= 0,0004

Haut Lomami	2816	2765	98.2%	5545	5406	97.5%	2.03	= 0,0423
Kasai Oriental	28168	3887	13.8%	41840	4770	11.4%	9.34	< 0,0001
Kasai Central	38748	32045	82.7%	68396	51092	74.7%	30.39	< 0,0001
Lualaba	17549	14636	83.4%	23023	16600	72.1%	26.79	< 0,0001
Lomami	33470	31797	95.0%	44841	37891	84.5%	46.27	< 0,0001
Sud Kivu	7767	6835	88.0%	14883	10001	67.2%	34.13	< 0,0001
Sankuru	3702	2536	68.5%	6956	4765	68.5%	0.03	= 0,9747
Tanganyika	2627	1219	46.4%	10057	1569	15.6%	33.92	< 0,0001
Province	Total CBD new users before COVID-19	Urban new users before COVID-19	P1=Proportion of urban new users before COVID-19	Total CBD new users during COVID-19	Urban new users during COVID-19	P2=Proportion of urban new users during COVID-19	Calculated Z Value	P value
Total	159997	58239	36.4%	265486	121858	45.9%	61.04	<0,0001
Haut Katanga	25150	19039	75.7%	49945	38408	76.9%	3.57	= 0,0004
Haut Lomami	2816	51	1.8%	5545	139	2.5%	2.03	= 0,0422
Kasai Oriental	28168	24281	86.2%	41840	37070	88.6%	9.34	< 0,0001
Kasai Central	38748	6703	17.3%	68396	17304	25.3%	30.39	< 0,0001
Lualaba	17549	2913	16.6%	23023	6423	27.9%	26.79	< 0,0001
Lomami	33470	1674	5.0%	44841	6950	15.5%	46.27	< 0,0001
Sud Kivu	7767	932	12.0%	14883	4882	32.8%	34.13	< 0,0001
Sankuru	3702	1166	31.5%	6956	2191	31.5%	0.03	=0,9747
Tanganyika	2627	1408	53.6%	10057	8488	84.4%	33.92	< 0,0001

Table 3: Comparison of renewals before and during the COVID-19 pandemic, disaggregated by place of residence.

Province	All renewals before COVID-19	Renewals from only CBD before COVID-19	Proportion of renewals from CBD before COVID-19	All renewals during COVID-19	Renewals from only CBD before COVID-19	Proportion of renewals from CBD during COVID-19	Calculated Z Value	P value	
Total	548963	144377	26.3%	775806	190848	24.6%	22.061	< 0,0001	
Haut Katanga	108467	23103	21.3%	160945	34281	21.3%	0.133	= 0,8912	
Haut Lomami	38862	816	2.1%	81318	1382	1.7%	5.020	< 0,0001	
Kasai Oriental	37054	11672	31.5%	47640	22581	47.4%	46.729	< 0,0001	
Kasai Central	105715	50637	47.9%	125960	62602	49.7%	8.735	< 0,0001	
Lualaba	58636	9499	16.2%	115456	11084	9.6%	40.294	< 0,0001	
Lomami	59217	43465	73.4%	78919	48614	61.6%	46.053	< 0,0001	
Sud Kivu	106 069	4031	3.8%	120144	4686	3.9%	1.292	= 0,1970	
Sankuru	25472	1146	4.5%	27934	1983	7.1%	13.158	< 0,0001	
Tanganyika	9471	114	1.2%	17490	3778	21.6%	45.372	< 0,0001	
Renewals Exclusively through CBD by Place of Residence									
Province	Total renewals before COVID-19	CBD renewals before COVID-19	Rural renewals before COVID-19	P1=Proportion of rural renewals before COVID-19	Total CBD renewals during COVID-19	Rural renewals during COVID-19	P2=Proportion of rural renewals during COVID-19	Calculated Z Value	P value
Total	144352	109563	75.9%	190878	124452	65.2%	66.82	< 0,0001	
Haut Katanga	23074	2423	10.5%	34272	5209	15.2%	16.51	< 0,0001	
Haut Lomami	808	799	98.9%	1356	1315	97.0%	2.86	= 0,0042	
Kasai Oriental	11666	1668	14.3%	22566	2302	10.2%	11.41	< 0,0001	
Kasai Central	50620	49253	97.3%	62608	55596	88.8%	54.27	< 0,0001	
Lualaba	9488	8160	86.0%	11069	6365	57.5%	44.64	< 0,0001	
Lomami	43468	42512	97.8%	48615	47011	96.7%	10.37	< 0,0001	
Sud Kivu	3978	3652	91.8%	4631	4117	88.9%	4.41	< 0,0001	

Province	Total renewals COVID-19	CBD renewals before COVID-19	Urban renewals before COVID-19	P1=Proportion of urban renewals before COVID-19	Total CBD renewals during COVID-19	Urban renewals during COVID-19	P2=Proportion of urban renewals during COVID-19	Calculated Z Value	P value
Sankuru	1134	1031		90.9%	1991	1651	82.9%	6.16	< 0,0001
Tanganyika	116	81		69.8%	3770	901	23.9%	11.21	< 0,0001
Total	144352	34789		24.1%	190878	66426	34.8%	66.82	< 0,0001
Haut Katanga	23074	20651		89.5%	34272	29063	84.8%	16.51	< 0,0001
Haut Lomami	808	9		1.1%	1356	41	3.0%	2.86	= 0,0042
Kasai Oriental	11666	9998		85.7%	22566	20264	89.8%	11.41	< 0,0001
Kasai Central	50620	1367		2.7%	62608	7012	11.2%	54.27	< 0,0001
Lualaba	9488	1328		14.0%	11069	4704	42.5%	44.64	< 0,0001
Lomami	43468	956		2.2%	48615	1604	3.3%	10.37	< 0,0001
Sud Kivu	3978	326		8.2%	4631	514	11.1%	4.41	< 0,0001
Sankuru	1134	103		9.1%	1991	340	17.1%	6.16	< 0,0001
Tanganyika	116	35		30.2%	3770	2869	76.1%	11.21	< 0,0001

contraceptive methods through CBD before the pandemic was higher than the proportion of women who had renewed contraceptive methods during the pandemic (26.3% vs. 24.6%, $P < 0.0001$). However, there were important differences at the provincial level: the proportions of cases of renewal of contraceptive methods through the CBD program during the pandemic were higher than those before the pandemic in Kasai Oriental, Kasai Central, Sankuru, and Tanganyika. In contrast, there was no statistically significant difference in Haut Katanga ($P = 0.8912$) and Sud Kivu ($P = 0.1970$) between the two periods. Among cases of renewal of contraceptive methods through CBD, the proportion of women who had renewed contraceptive methods in rural areas before the pandemic was higher than during the pandemic (75.9% vs. 65.2%; $P < 0.0001$). This situation was observed in all provinces except for Haut Katanga. In contrast to rural areas, overall, there was a higher proportion of renewal cases during COVID-19 than before the pandemic in urban areas (34.8% vs. 24.1%; $P < 0.0001$). All provinces show this pattern except for Haut Katanga, where a higher proportion of renewal cases are observed before the COVID-19 period.

Discussion

In this observational study, we aimed to investigate whether the CBD program responded to the need for contraceptives in nine provinces of the DRC during the COVID-19 pandemic. We compared the number of contraceptive methods distributed, new contraceptive users, and the number of women renewing their FP methods before and during the COVID-19 pandemic. During the COVID-19 pandemic, the need for contraception among women in the DRC was in part met through the CBD program, which distributed 55% more contraceptive methods during the pandemic than before. This shows that, despite the many health care challenges that arose during the pandemic, community health distributors were successful in meeting the increased demand for contraceptives. The higher demand for contraception during COVID may be due to economic instability that made some families

concerned about having more children; for instance, Karp *et al* found that in Burkina Faso, loss of income and food insecurity was associated with increased use of contraception during COVID¹⁹.

In our study, pills and not cycle beads were among the most distributed methods as per demand. This increase in demand for pills is consistent with previous studies that showed a higher use of pills and condoms (when accessible) than other types of contraception among women in sub-Saharan Africa²⁰ and South Asia²¹. Therefore, interventions and aid programs should concentrate on making contraceptive pills readily available to women, especially in rural areas. Our study shows that higher demand in rural areas of most provinces led to a larger distribution of contraceptive methods in rural than urban areas. However, there were a few provinces such as Katanga, Kasai Oriental, and Tanganyika, where the distribution of combined pills was higher in urban areas than in rural areas. This indicates that each region in the DRC may have unique needs regarding contraceptive use during a health crisis such as COVID-19. This study illustrates that interventions and programs need to be tailored not only to the country's context but also to each province's unique needs. In addition to the increased distribution of contraceptive methods, the CBD program also resulted in an increased number of new users. This increase may be due to the education about contraception that community health distributors offered to communities. Previous studies show that community-based education on FP led to an increased use of contraception among women in the DRC²². Therefore, educational programs should remain an essential part of CBD programs and should not be neglected during a health crisis.

Our findings also show that in rural areas, the proportion of new users was higher before the COVID-19 pandemic than during. However, in urban areas, the proportion of new users was higher during the COVID-19 period than before. This is because in urban areas the community health distributors were able to meet the population's need for contraceptives despite the restrictions imposed by the pandemic such as limited access to health

clinics, economic vulnerability, and fear of contracting COVID-19 by traveling to distant health facilities^{16,19}.

Furthermore, the CBD program contributed to an increased renewal of contraception among women in the DRC, particularly pre-pandemic. This indicates that the presence of community health distributors in the community can motivate women to adhere to and renew their FP methods. In the DRC, women face several obstacles when trying to access FP services and products, namely due to accessibility at the national level and insecurity and political instability^{23,24}. Nevertheless, scaling up of community health distributors has ramped up significantly in recent years¹⁷, which has enabled women to access FP methods.

We also observed that in most provinces, cases of FP renewal were higher before the COVID pandemic than during, particularly in rural areas. But, in urban areas, there was a higher proportion of renewal cases during the pandemic than before, except for Haut Katanga. This may be due to better access to contraception in urban areas than in rural areas during COVID. Contrary to our finding, Moreau *et al.* found that during the pandemic regardless of sociodemographic, including place of residence (rural vs. urban), adoption of contraception was more common than discontinuation in Burkina Faso, Kenya and Lagos²⁵.

In conclusion, community health distributors were successful in responding to the increased need for contraceptives in the DRC during the COVID-19 pandemic. Community health distributors increased the distribution of contraceptive methods and the number of renewals and new users. Overall, although there was a higher demand for contraception in rural areas during COVID-19, some provinces differed and had a higher demand for specific types of contraception in urban areas. These findings can inform governments and development programs about the success of CBD as well as identifying populations that can benefit the most from these services during a health emergency. Access to FP services during health emergencies is pertinent beyond COVID-19, and

therefore, lessons learned from interventions during COVID-19 can be used to inform interventions in future health emergencies. One limitation that we identified in our study is that DHIS2 did not have sociodemographic data, and therefore, we could not conduct multivariate analysis to control the effect of demographic variables such as age and education. However, these preliminary results provide important insights into the overall success of the CBD program during a health emergency. Future studies should consider qualitative methods and include interviews with beneficiaries to better understand how effectively CBD programs meet their needs and areas for improvement.

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Competing interests

The authors report no competing interests.

Author's contribution

Jacque Bapura and Joseph Fataki. M contributed to the conception and design of the work, as well as data analysis, interpretation, and manuscript drafting. Sahra Ibrahimy restructured the study design, interpreted the data, and revised and wrote the manuscript. Jack Hazerjian, Marie-Claude M. Kabulepa, Anna Williams, Narcisse N. Embeke, Modeste N. Kasereka, and Willy Ngoy contributed to data acquisition, analysis, interpretation, and drafting. Houleymata Diarra, Alice Mbuyi, and Bettina Brunner supervised the article's development, critically reviewed it, and made changes to enhance the manuscript. All authors approved the final version to be published. All authors are also in agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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