

Quantitative Analysis of Calls to Chipatala cha pa Foni

Report on Methods 2 and 5



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Acronyms

- CCPF** Chipatala cha pa Foni, or “Health Center by Phone”
- HLW** Hotline worker (nurses staffing the call)
- MOH** Ministry of Health in Malawi

Background

Despite recent progress, Malawi has one of the highest maternal mortality ratios in Sub-Saharan Africa, with 439 deaths per 100,000 live births¹. Postpartum hemorrhage (PPH) is the leading cause of maternal mortality, accounting for 25% of all direct maternal mortality in low-income countries like Malawi. Although maternal death due to PPH is a critical public health issue in Malawi, there is little evidence around the behavioral and structural factors that affect PPH prevention and treatment.

Access to mobile phones in Malawi provides a low-cost, effective opportunity to provide women and their families with health information and to refer them to seek care at a facility, when necessary. Chipatala cha pa Foni (CCPF), Chichewa for Health Center by Phone, is a national toll-free health hotline operated at all hours of the day by the Ministry of Health (MOH) in partnership with VillageReach.

While all calls are recorded for training and quality assurance purposes, detailed content analysis is not routinely conducted. The existing CCPF audio recordings present an opportunity to analyze existing data to inform improvements to CCPF, which may include capacity building for CCPF operators to elicit information from callers and to respond to obstetric emergencies. Such modifications have the potential to immediately improve the quality of this service nationwide, and provide decision-makers evidence to guide the design, targeting, and prioritization of all PPH prevention and treatment interventions to address both the behavioral factors (including women's lack of knowledge of PPH warning signs) and structural factors (including health provider's ability to recognize and treat PPH) that are identified.

This report summarizes results of:

1. Quantitative analysis (Method 2) of 143 call recordings captured between December 2018 and January 2020, of which 28 calls were selected for qualitative thematic analysis.
2. Quantitative analysis (Method 5) of call and demand patterns prior to and during the COVID-19 pandemic

Method 2: Quantitative analysis of potential obstetric emergency calls

Methodology

OBJECTIVES

This analysis was undertaken to reveal any potential patterns around obstetric emergency calls that may provide insights into how often and by whom is CCPF used in obstetric emergencies. By exploring the volume of calls by district, age, and symptoms presented, hotline management and the MOH can understand how and to what extent CCPF is being leveraged in maternal health emergencies, and use the results to inform marketing and training plans to provide quality care to women experiencing pressing danger signs.

SAMPLE SELECTION

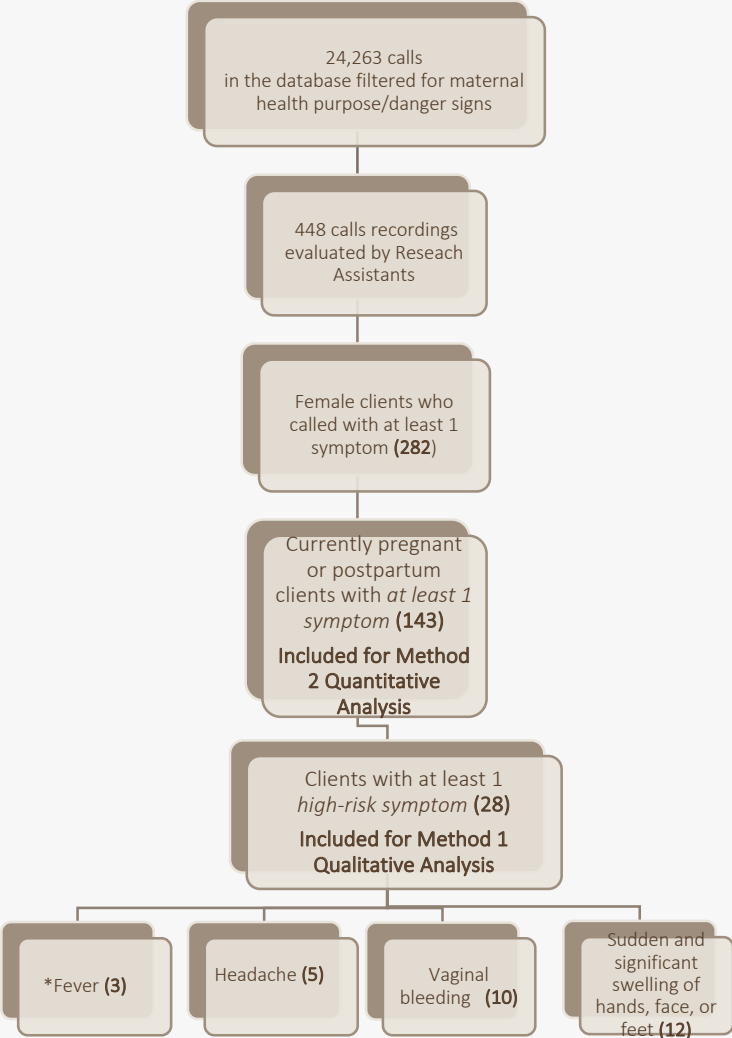
We employed a two-phase call selection procedure for identifying calls related to PPH hemorrhage and the subsequent quantitative analysis. Our sampling frame consisted of all calls captured in the CCPF automated database between December 2018 and January 2020. We first downloaded all call data from the Viamo server and then sorted by “purpose of call” and “danger signs,” which hotline workers are prompted by the system interface to record during the call, to identify calls likely to be about maternal health. Using this criteria, we identified 448 calls likely to be about maternal health concerns and to be potential obstetric emergencies. The VillageReach IT officer then retrieved the 448 call recordings from the CCPF call platform Viamo system.

Two research assistants listened to these 448 calls and completed a quantitative coding sheet (see appendix) for each call. We originally intended to select all calls related to PPH, but added other factors to the coding sheet in the event that there was a lack of PPH calls. The coding sheet included themes around symptoms cited by the caller, pregnancy status, and duration of call. In designing the coding sheet we collaborated with University Research Co. (URC) and University of California San Francisco (UCSF) representatives to ensure the coding sheet contained key technical variables of interest.

¹National Statistical Office (NSO) [Malawi] and ICF. (2017). 2015-16 Malawi Demographic and Health Survey Key Findings. Zomba, Malawi, and Rockville, Maryland, USA. NSO and ICF. <https://dhsprogram.com/pubs/pdf/SR237/SR237.pdf>

From the set of 448 calls, we did not identify any calls directly related to PPH. Therefore, we adjusted our criteria, and we first narrowed in on 282 calls of female clients who called with any symptoms, as some clients had called only to seek information about pregnancy-related danger signs, and this could only be determined by listening to the recordings. From there, we selected all calls of clients who had called with at least one symptom and were currently pregnant (139) or had recently given birth (4) at the time of the call. Of these 143 calls, there were 102 unique clients who made these calls over the 14-month period. To select the final set of calls for qualitative analysis (Method 1 collaboration with the Population Council), we prioritized calls in which clients presented with at least one high-risk symptom. We defined high risk symptoms as fever, headache, sudden and significant swelling of hands, face, or feet, and vaginal bleeding . Women were considered to have a non-high risk symptom if they reported a symptom which was not one of the high risk symptoms listed above (e.g. low back pain, nose bleeds, etc.). The full call selection process is outlined in Figure 1.

FIGURE 1. STEPS TO SELECT CALLS FOR QUANTITATIVE AND QUALITATIVE ANALYSIS



**Note that the sum of the symptoms reported surpasses 28 since symptoms were not mutually exclusive, and two callers experienced more than one danger sign.*

¹ Through consultation with technical experts at UCSF.

ANALYSIS

We used Stata 14 to perform descriptive analysis on the set of 143 calls for which the woman was pregnant or post-partum and reported a symptom.

Findings

OVERVIEW

Of calls that involved at least one symptom (n=282), nearly half (49.3%, n=139) of calls were regarding a currently pregnant woman, and only 4 (1.4%) were of women who had a recent birth. Out of these 143 calls, the majority (93.7%) were aged between 20 and 39, and over half (61.4%) were from five districts (Balaka, Salima, Nkhotakota, Ntcheu, Dedza).

Most of the calls were about severe abdominal pain (41.0%), persistent lower back pain (21.5%) and sudden and significant swelling of hands, face, or feet (8.3%).

Regarding call duration, nearly 70% of calls lasted between 5 to 14 minutes. The results showed no significant association between nature of symptoms cited during the call (high-risk symptoms vs non-high-risk

symptoms) and client's age, pregnancy status, caller status, or call duration.

DEMOGRAPHIC CHARACTERISTICS OF CCPF CLIENTS

Pregnancy status

We assessed the distribution of calls according to pregnancy status among the 143 calls that constituted our quantitative analytical sample. Overall, there were 139 (97.2%) calls which were made by or on behalf of pregnant women, and only 4 (2.8%) calls were of women who had recently given birth.

For pregnant callers, the gestation period varied between one and ten months, with the highest percentage of calls made by women who had been pregnant for at least seven months (41.8%), followed by women who had been pregnant for four to six months (40.2%). There were no calls from women who were obviously in labor at the time of the call. As shown in Table 1, the distribution of calls by the gestation period does not differ significantly between calls which were related to high-risk symptoms and those related to non-high-risk symptoms.

TABLE 1. DISTRIBUTION OF CALLS BY PREGNANCY STATUS

Pregnancy Status	High-Risk* Symptoms (%)	Non-High-Risk Symptoms (%)	All calls	
			N	%
Not Pregnant (Recent Birth)	0 (00.0)	4 (03.4)	4	2.8
Currently Pregnant	28 (100)	113 (95.6)	139	97.2
Gestational months				
0-3	5 (19.2)	17 (17.7)	22	18.0
4-6	10 (38.5)	39 (40.6)	49	40.2
7+	11 (42.3)	40 (41.7)	51	41.8
Missing**	2	15	17	
Total	28	115	143	

*High-Risk symptoms include fever, headache, sudden and significant swelling of hands, face, or feet, and vaginal bleeding

**Data may be missing due to Hotline Worker not asking, woman not responding, or system not properly saving the data.

Age of client

The age range of clients varied between 12 and 43 years-old, with a mean of 28.97 years [27.96, 29.97]. Most calls were from women aged 25-39 years, accounting for 69.9% of all calls. Youths (15-24) accounted for 28.0% of the 143 calls, while only 2.1% of the calls were regarding women aged 40+. Although there was no statistically significant age difference between women with and without high risk symptoms, women who called with high-risk symptoms were slightly younger (mean age of 28.21 [26.12, 30.31]) compared to women callers with non-high-risk symptoms (mean age of 29.15 [28.0, 30.30]).

TABLE 2: DISTRIBUTION OF CALLERS BY AGE

Age in years	High-Risk* Symptoms (%)	Non-High-Risk Symptoms (%)	All calls	
			N	%
< 20	1 (03.6)	5 (04.3)	6	4.2
20-29	13 (46.4)	54 (47.0)	67	46.7
30-39	14 (50.0)	53 (46.1)	67	46.7
40-49	0 (00.0)	3 (02.6)	3	2.1
Total	28	115	143	

*High-Risk symptoms include fever, headache, sudden and significant swelling of hands, face, or feet, and vaginal bleeding

Calls by District

Figure 2 summarizes calls by client's district of residence. Most calls were from Balaka (22) followed by Salima (21) Nkhotakota (18), Ntcheu (15) and Dedza (12). These five districts accounted for 61.4% of all calls.

In Figure 3 we also captured the total number of calls with a female client from each district over the same time period of December 2018 to January 2020. For example, in Ntcheu 2.8%, or 15 of the total 531 calls from that district, were calls from pregnant or postpartum women with symptoms.

FIGURE 2. DISTRIBUTION OF CALLS BY CLIENT DISTRICT OF RESIDENCE FOR THE SET OF 143 CALLS

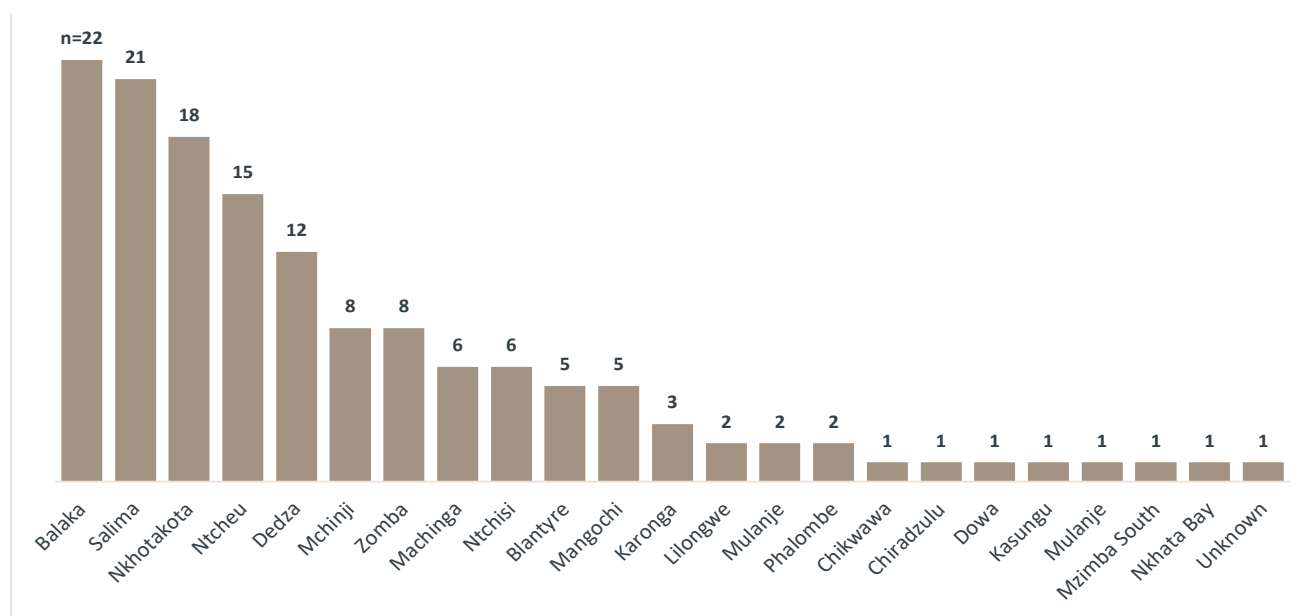
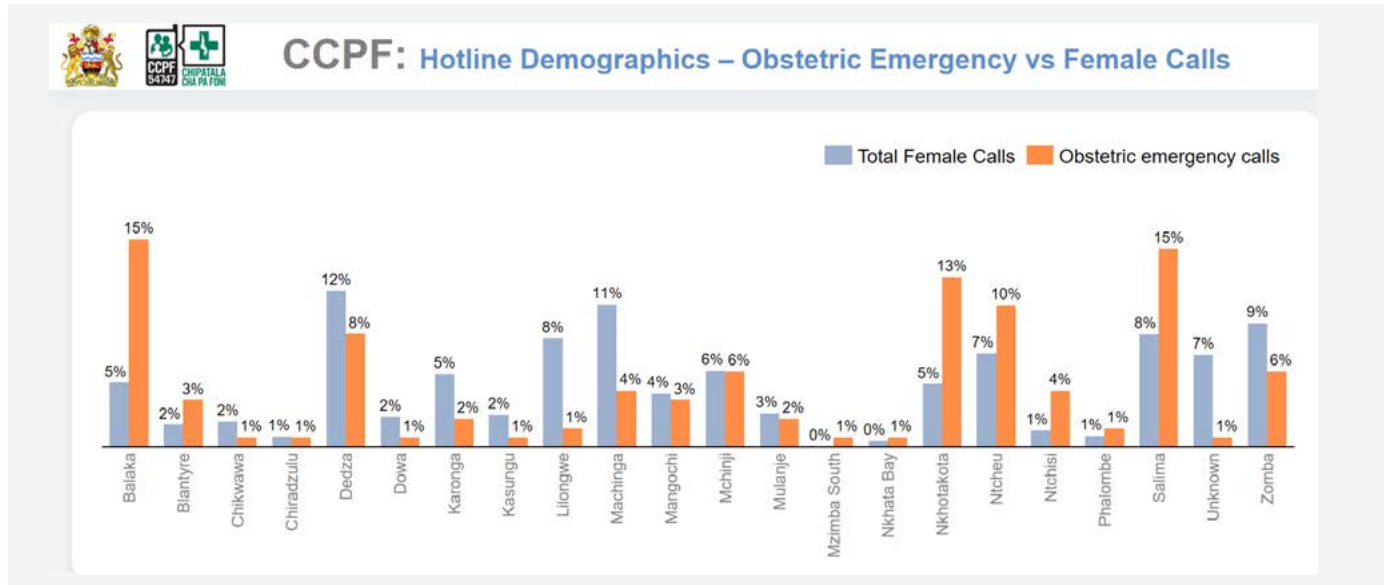


FIGURE 3. POSSIBLE OBSTETRIC EMERGENCY CALLS AND OVERALL CALLS FROM FEMALES BY CLIENT DISTRICT OF RESIDENCE



CHARACTERISTICS OF THE CALL INTERACTION

Calling for self or on another's behalf

We assessed whether calls were made by the client or by someone else on behalf of the client. Results in Table 3 reveal that in most cases (120 calls) the client called for themselves. Only 23 calls (16.1%) were made on behalf of someone else, of which 20 (14.0%) were made by males and the remaining three calls were made by females. There was no significant difference in caller status between calls related to high-risk symptoms and those related to non-high-risk symptoms—in other words, whether the woman was experiencing high-risk symptoms was not associated with whether she was likely to call for herself or whether someone called on her behalf.

TABLE 3. DISTRIBUTION OF CALLS BY CALLING FOR ONE'S SELF OR SOMEONE ELSE

Status of Caller	High-Risk* Symptoms (%)	Non-High-Risk Symptoms (%)	All calls	
			N	%
Self	21 (75.0)	99 (86.1)	120	83.9
Someone else	7 (25.0)	16 (13.9)	23	16.1
Male caller	6 (21.4)	14 (12.2)	20	14.0
Female caller	1 (03.6)	2 (01.7)	3	2.1
Total	28	115	143	

*High-Risk symptoms include fever, headache, sudden and significant swelling of hands, face, or feet, and vaginal bleeding

Distribution of calls by symptoms presented

Most of the calls were about severe abdominal pain (59), followed by persistent lower back pain (31), sudden and significant (12) swelling of hands, face, or feet, vaginal bleeding (11) and dizziness (11).

Table 4 is based on the pre-determined maternal health symptom options that were included in the coding sheet. Clients also called with many other symptoms including but not limited to heart palpitations, vomiting, painful legs and genital sores, which are combined under “other.” Note that the number of callers does not sum to 143 as the symptoms are not mutually exclusive, and some individuals cited multiple symptoms.

TABLE 4. DISTRIBUTION OF CALLS BY PRE-DETERMINED MATERNAL HEALTH SYMPTOM CATEGORIES

Symptoms	Number of callers experiencing the symptom	% of callers who experienced (N=143)
Severe abdominal pain	59	41.3
Persistent lower back pain	31	21.7
Sudden and significant swelling of hands, face, or feet	12	8.4
Vaginal bleeding	11	7.7
Dizziness	11	7.7
Painful contraction	5	3.5
Headache	5	3.5
Sudden release of water from the vagina before labor begins	3	2.1
Fever	3	2.1
Blurry vision	2	1.4
Baby's movements in utero decreased	2	1.4
Nose bleeds	1	0.7
Other	34	23.8

Distribution of call by duration

The call duration ranged from 3 minutes and 48 seconds to 43 minutes and 36 seconds, with a mean duration of 12 minutes and 46 seconds [11 minutes 44 seconds, 13 minutes 46 seconds]. For calls with a high-risk symptom, the largest percentage of calls lasted for 10-14 minutes (46.4%), followed by 5-9 minutes (21.4%). Only 5 calls lasted for less than five minutes, and another five calls had a duration of more than 25 minutes. The average call duration appears not to differ between calls related to high-risk symptoms (mean duration of 12 minutes 49 seconds [10 minutes 42 seconds, 14 minutes 55 seconds]) and those linked to non-high-risk symptoms (mean duration of 12 minutes 44 seconds [11 minutes 34 seconds, 13 minutes 53 seconds]). See Table 5 for additional data on call duration.

TABLE 5. DISTRIBUTION OF CALL BY DURATION AND TYPE OF SYMPTOMS

Call Duration (minutes)	High-Risk* Symptoms (%)	Non-High-Risk Symptoms (%)	All Calls	
			N	%
0-4	2 (07.1)	3 (02.6)	5	3.5
5-9	6 (21.4)	43 (37.4)	49	34.3
10-14	13 (46.4)	35 (30.4)	48	33.6
15-19	3 (10.7)	18 (15.7)	21	14.7
20-24	3 (10.7)	12 (10.4)	15	10.5
25-29	1 (03.6)	3 (02.6)	4	2.8
30-34	0 (00.0)	1 (00.9)	1	0.7
>34	0 (00.0)	0 (00.0)	0	0
Total	28	115	143	

*High-Risk symptoms include fever, headache, sudden and significant swelling of hands, face, or feet, and vaginal bleeding

Discussion

Through our review of 14 months of calls we identified no calls related to PPH, and relatively few possible obstetric emergency calls from pregnant or post-partum women. Future methods will leverage qualitative in-depth interviews to further explore why Chipatala cha pa Foni may not be utilized in an obstetric emergency such as during PPH.

In the absence of a set of post-partum hemorrhage calls to analyze, we expanded our inclusion criteria to any high-risk symptom that may be indicative of an obstetric emergency occurring during pregnancy or in the post-partum period. Interestingly, many of these potentially life-threatening situations had call durations less than 14 minutes. Qualitative analysis of the call recordings should explore whether the situations were handled appropriately, and callers were swiftly referred to care, or whether there was some sort of challenge preventing hotline nurses from fully counseling the caller (e.g. line disconnected, hotline nurse does not fully explain why the caller may be at risk, etc.).

Call patterns by district revealed five districts with a higher number of calls. CCPF had been actively marketed in all five of these districts by 2016 and did not reach the majority of the remaining districts until 2018. Although it is thus unsurprising to see higher numbers of calls, we did find that a higher percentage of calls from several of these districts were regarding potential obstetric emergencies, as compared to other districts. For example, 6% of the total female calls from Balaka during the overall time period were for potential obstetric emergencies, while only 0.3% of the calls from Lilongwe were for potential obstetric emergencies. In addition to emphasizing the small sample size, further investigation is warranted to explore what might contribute to districts having a higher or lower percentage of emergency calls than expected—for instance, a high percentage could indicate a higher prevalence, or could indicate that women in those districts are well sensitized to the service, and thus more likely to call in challenging situations involving high risk symptoms. It could also simply be due to the fact that the service is widely marketed to maternal groups in those districts and thus maternal calls with symptoms will naturally exceed number of calls from younger and older females in those regions.

We did not explore patterns in whether callers were more likely to be from rural or urban areas, given that

district was the only readily available proxy, and all districts (except for Blantyre and Lilongwe) have at least 80% of their total residents living in rural areas of the districtⁱⁱ. Future targeted investigation could look into the proportion of callers who live more than 5 kilometers from the nearest health facility, an indicator that could be illuminating but does not exist in the given data set.

Method 5: Quantitative analysis of call trends and demand prior to and during COVID-19 pandemic

Method 5 was added to the original study design in order to explore call data captured before and after the start of the COVID-19 pandemic, and the subsequent potential implications for current and future needs and service provision.

We sought call-log data to describe overall call volume trends, including number of calls, number of callers requesting a hotline operator, and number of callers requesting to listen to pre-recorded health messages through Interactive Voice Responses (IVR).*

OBJECTIVES

This quantitative analysis aimed to examine how overall demand may have shifted with the pandemic—specifically, to understand how many callers would like to talk to a hotline operator about maternal health, and/or listen to pre-recorded messages on maternal health topics, and to what extent this demand was being met.

Understanding demand and possible challenges will prepare the CCPF platform to be able to better meet the needs of callers with respect to maternal health services in the context of COVID-19.

*IVR is the automated technology which allows callers to navigate a phone system—in this case, callers can press a key on their phone key pad to select to listen to health, and can specify which topic of messages they would like to listen to by following the automated recordings (e.g. press 1 if you would like to listen to messages on pregnancy) and using their key pad to select accordingly.

Methodology

SAMPLE SELECTION

The research team determined a “Pre-COVID-19” reference period defined as September 22, 2019–March 21, 2020, and a “COVID-19” timeframe defined as March 22, 2020–October 21, 2020 (the date that the data was extracted). The team decided on these demarcations based on when COVID-19 entered the national conversation in Malawi and when CCPF added COVID-specific resources, such as COVID-related IVR messages.

Analysts exported call data from the Viamo server and cleaned the data for September 2019 through October 2020

ANALYSIS

We used Microsoft Excel, think-cell, and Tableau to perform descriptive analyses on and visualizations from the call and IVR data.

Findings

OVERVIEW

After COVID-19 entered the national spotlight in Malawi, there was a tremendous increase in demand for the service, increasing by 449%. The raw number of female callers per day grew significantly, but accounted for a smaller percentage of all calls in the COVID-19 period compared to Pre-COVID.

CCPF struggles to meet ongoing demand, with only a small percentage of those who want to speak to an HLW actually getting through, although the percentage who successfully listen to IVR messages is much higher. The number of pregnancy messages listened to Pre-COVID and during COVID increased by 213% per day, on average.

DEMOGRAPHICS OF CCPF CLIENTS

Age

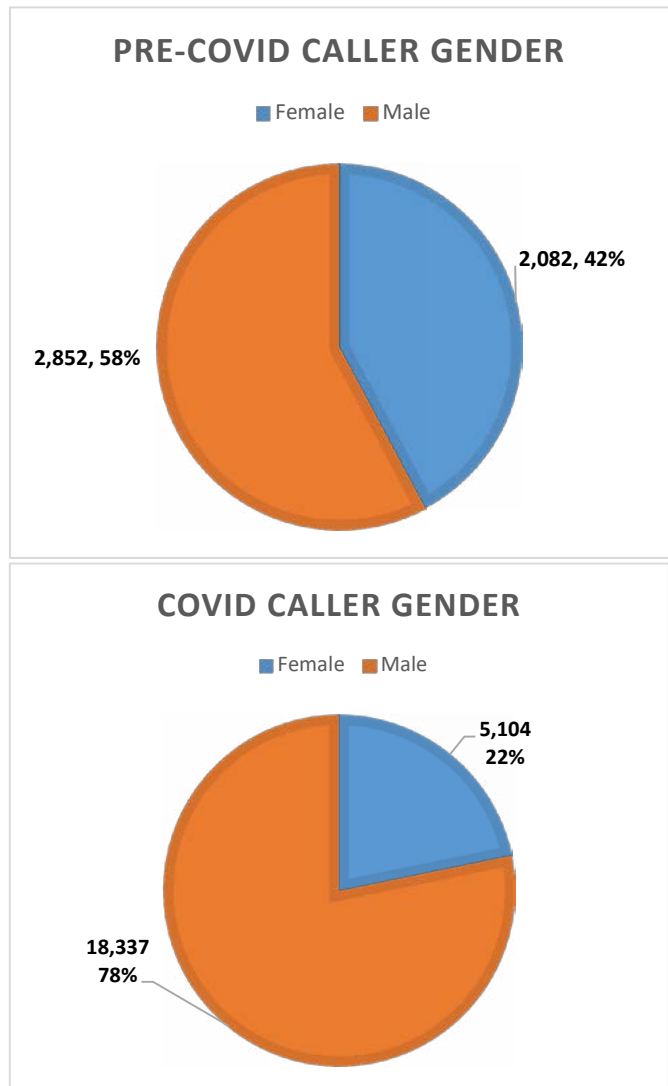
An analysis of caller age found no meaningful differences between average caller age Pre-COVID (24 years-old) and during COVID (26 years-old).

Gender

In the Pre-COVID period, 42% of 4,934 total callers who spoke to an HLW were female. After the onset of

COVID-19, the percentage of female callers decreased to 22% of 23,441 total callers.

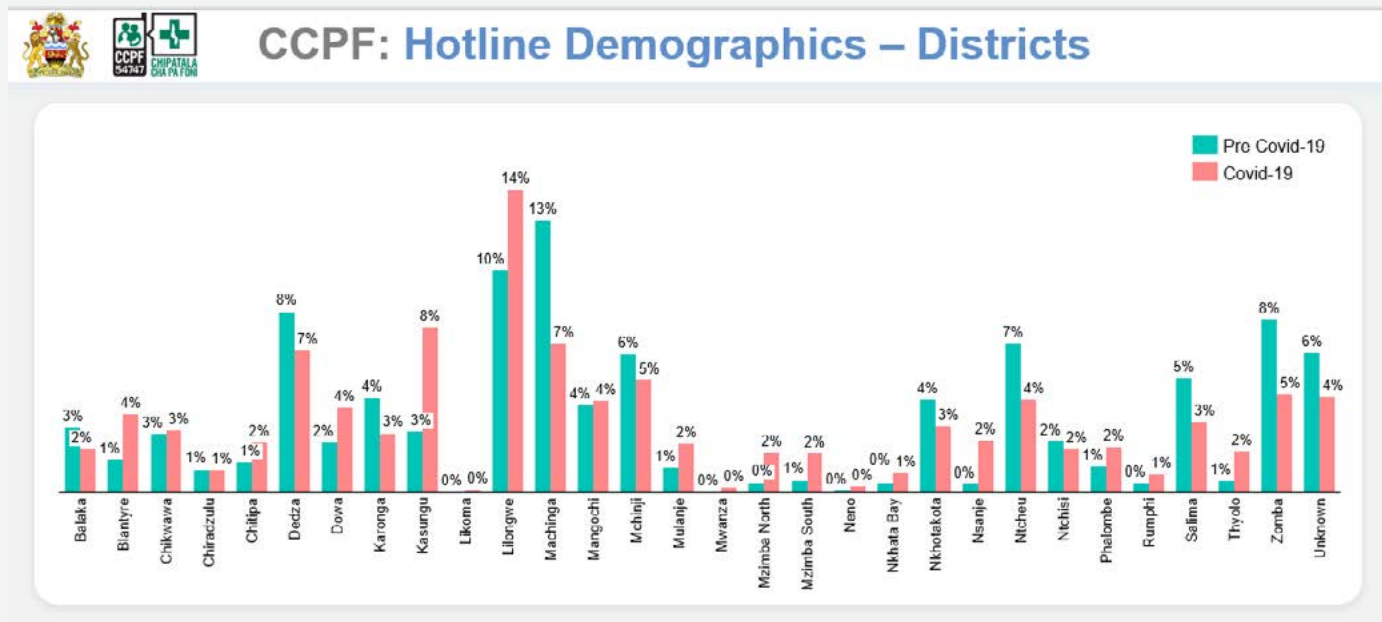
FIGURE 4. DISTRIBUTION OF FEMALE AND MALE CALLERS WHO SPOKE WITH AN HLW, PRE- AND DURING COVID



Client district of residence

Generally speaking, most districts represented a similar percentage of the calls prior to and after the onset of COVID-19, with no more than a 3 percentage point increase or decrease. However, Kasungu made up only 3% of calls before COVID, but 8% of calls after COVID onset. Conversely, Machinga went from 13% of calls before COVID-19 to making up only 7% of total calls after COVID onset. Figure 5 depicts how percentages shifted between the two time periods for each district.

FIGURE 5. PERCENTAGE OF CALLS FROM EACH DISTRICT ACROSS THE TWO TIME PERIODS



TOTAL ATTEMPTS

Total attempts refers to how many people, regardless of whether they are actually connected with a hotline worker or IVR message, attempt to get through to the hotline.

Demand for CC PF increased by 449% from Pre-COVID to COVID time periods—before COVID-19, 2,407 callers attempted to access the hotline each day, as compared to 14,624 average callers after the onset. Demand for the hotline was highest in April and May 2020, and the maximum number of attempts was recorded on Friday April 17, 2020, with 26,934 attempts. While demand in October 2020 has decreased in relation to the average for the COVID-19 time period, it still far exceeds the demand observed in pre-COVID times. See Figure 6 for total attempts per day across both time periods.

FIGURE 6. TOTAL ATTEMPTS PER DAY FOR PRE-COVID AND COVID

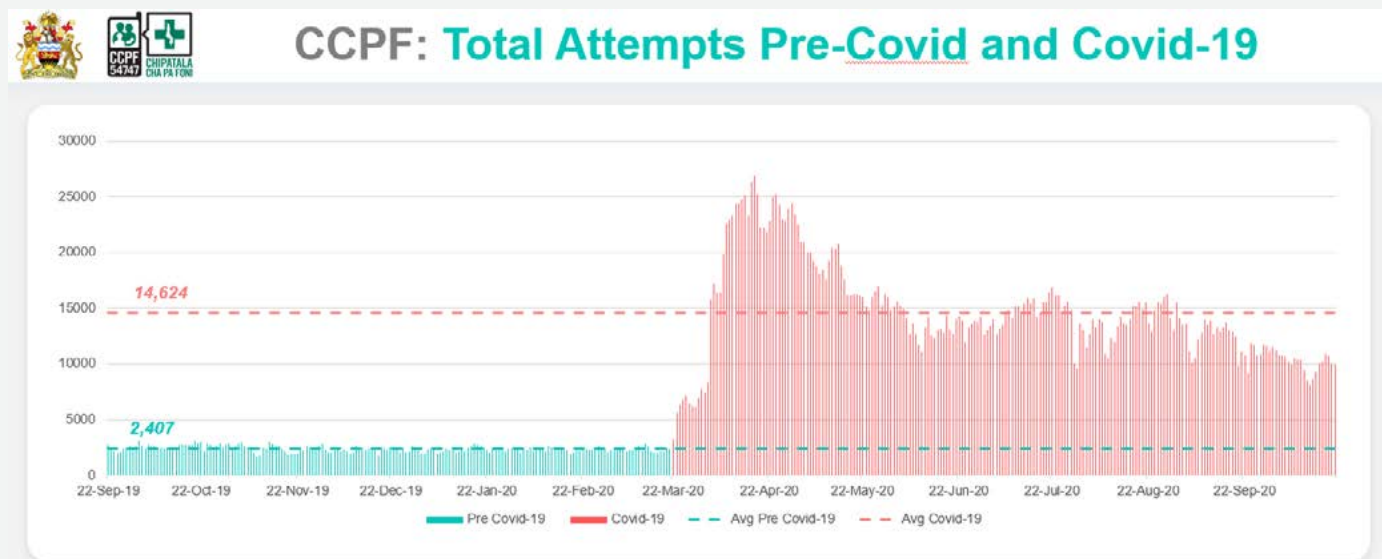
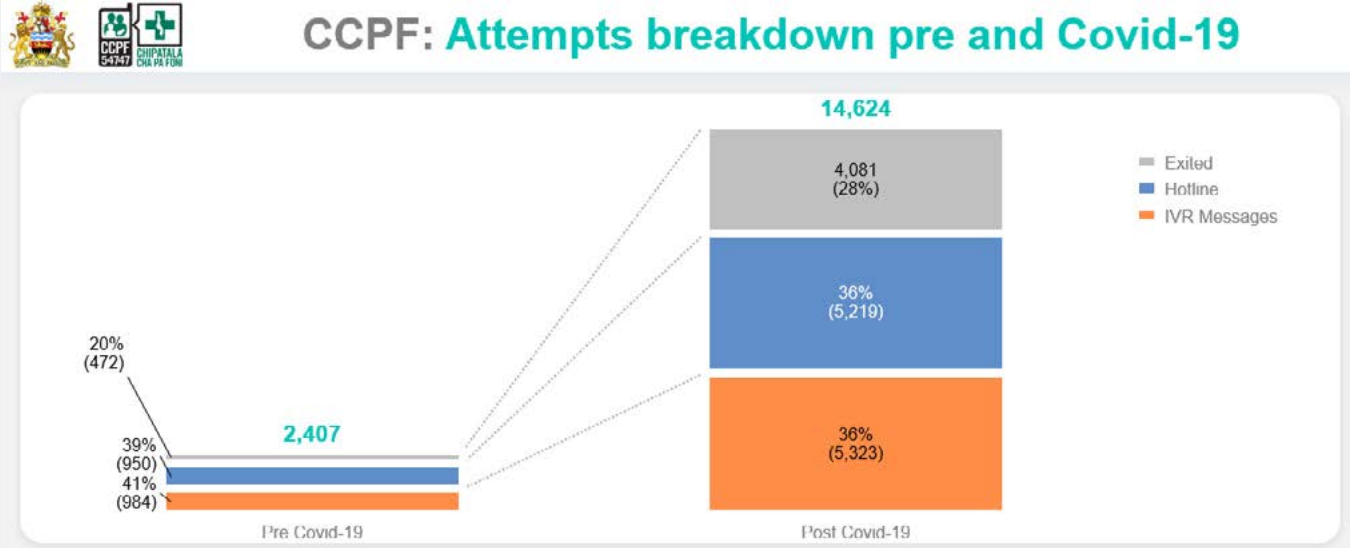


Figure 7 depicts the average number and percentage of callers per day who use the IVR prompts to 1. Request to speak to a hotline worker, 2. Request to be routed to the pre-recorded health messages, or 3. Are disconnected or hang up before they are able to make a selection.

From the Pre-COVID reference period to COVID-19 timeframe, on average, 950 callers attempting to reach an HLW increased to 5,219 per day, the 984 selecting to hear IVR messages grew to 5,323 per day, and 472 who disconnected or hung up before selecting increased to 4,081 exited callers. While the raw numbers for all categories increased significantly, the percentage of calls that were exited grew most dramatically compared to the pre-COVID period.

FIGURE 7. AVERAGE DAILY ATTEMPTS BY WHETHER THE CLIENT CHOSE TO SPEAK TO AN HLW, TO LISTEN TO AN IVR MESSAGE, OR IF THEY EXITED THE SYSTEM BEFORE MAKING A SELECTION



SPEAKING WITH A HOTLINE WORKER

Calls answered

The average number of calls answered per day also increased dramatically from 100 answered calls to 356 answered calls per day, or a 257% increase from Pre-COVID to COVID times. During the COVID period, the maximum number of calls answered per day was 811, and took place on July 20, 2020. Compared to when the pandemic first entered the national conversation in March 2020, the number of calls answered per day has trended upwards. This is likely due to the addition of new hotline workers to help staff the hotline.

FIGURE 8. HOTLINE CALLS ANSWERED PER DAY

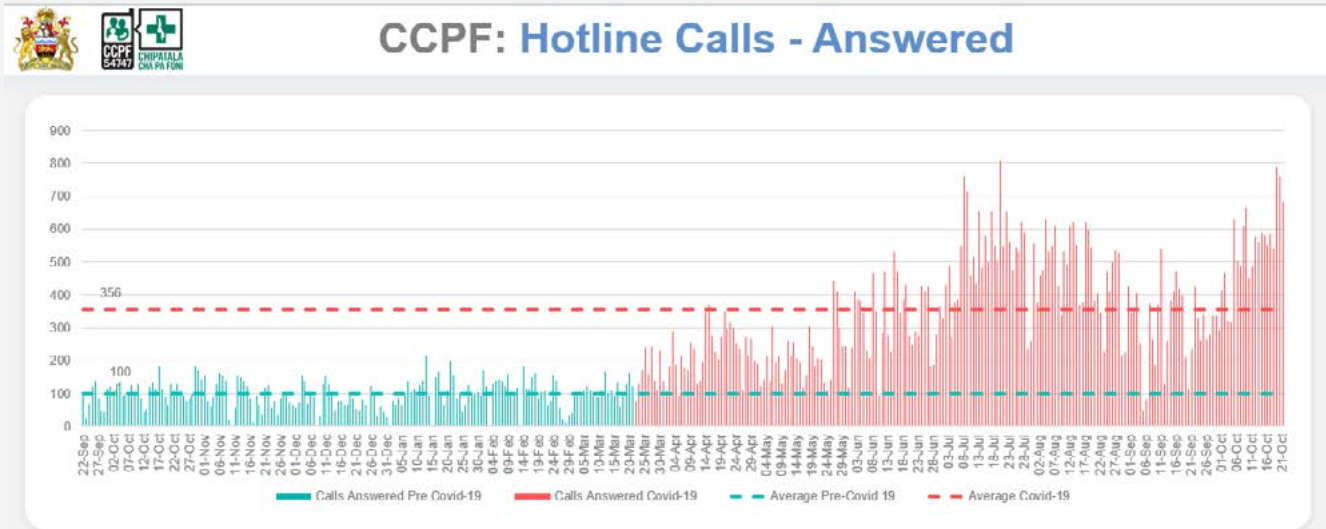
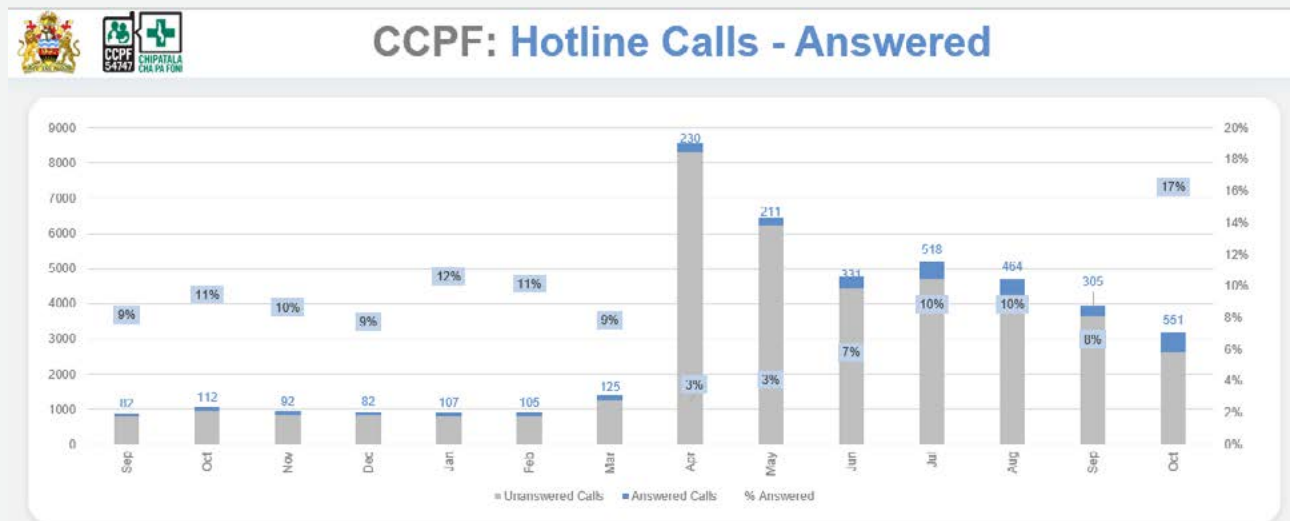


Figure 9 summarizes the average number of calls answered per day, and the average percentage of daily answered calls by month. In the Pre-COVID period, the percent of answered calls ranged from 9% to 12% per day across the months. After COVID began, the average percent of daily calls answered varied from 3% in April, to 17% in October. Even though HLWs fielded more calls in April, the percent of daily demand met plummeted due to inability for the then staffing structure to accommodate the extreme spike in demand. As staffing expanded and demand settled, CCPF began meeting a higher percentage of the demand as the months went on.

FIGURE 9. AVERAGE NUMBER AND PERCENT OF HOTLINE CALLS ANSWERED PER DAY, BY MONTH



Overall, when considering an average daily number of 5,219 callers requesting to speak to a hotline worker and that on average 356 calls are answered a day, only 6.8% of those who want to speak to an HLW actually end up speaking with them, on average.

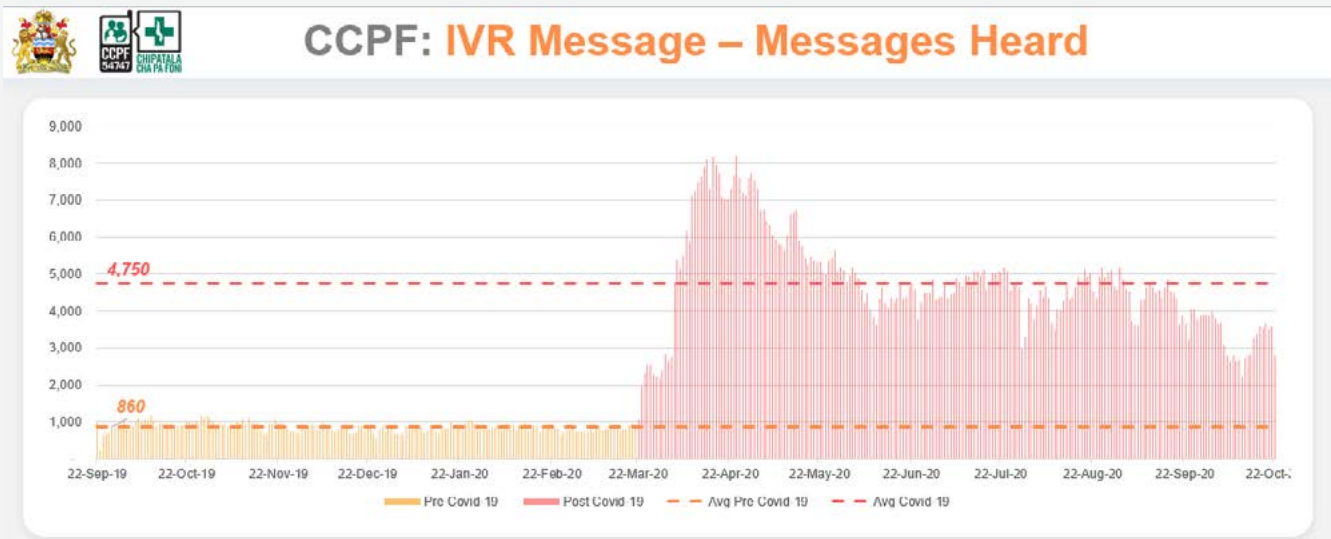
LISTENING TO PRE-RECORDED IVR MESSAGES

Messages heard

The number of pre-recorded health messages increased significantly after the onset of COVID-19. Whereas the daily average in Pre-COVID times was 860 messages heard per day, this jumped to 4,750 messages heard per day in COVID-19 times. This represents a 452% increase in the number of messages heard daily. In the COVID-19 period, the highest number of messages heard in one day was 8,178 on April 25, 2020. Figure 10 highlights the intense uptick in messages heard during April and May, and that although the number of callers requesting to listen to IVR messages has subsided in recent months, the number still far exceeds the pre-COVID average.

Overall, considering that an average of 5,323 callers a day select that they would like to hear a message and that an average of 4,750 callers per day hear a message, 89.2% of those who desire to listen to an IVR message do in fact listen to a message.

FIGURE 10. IVR MESSAGES HEARD PER DAY



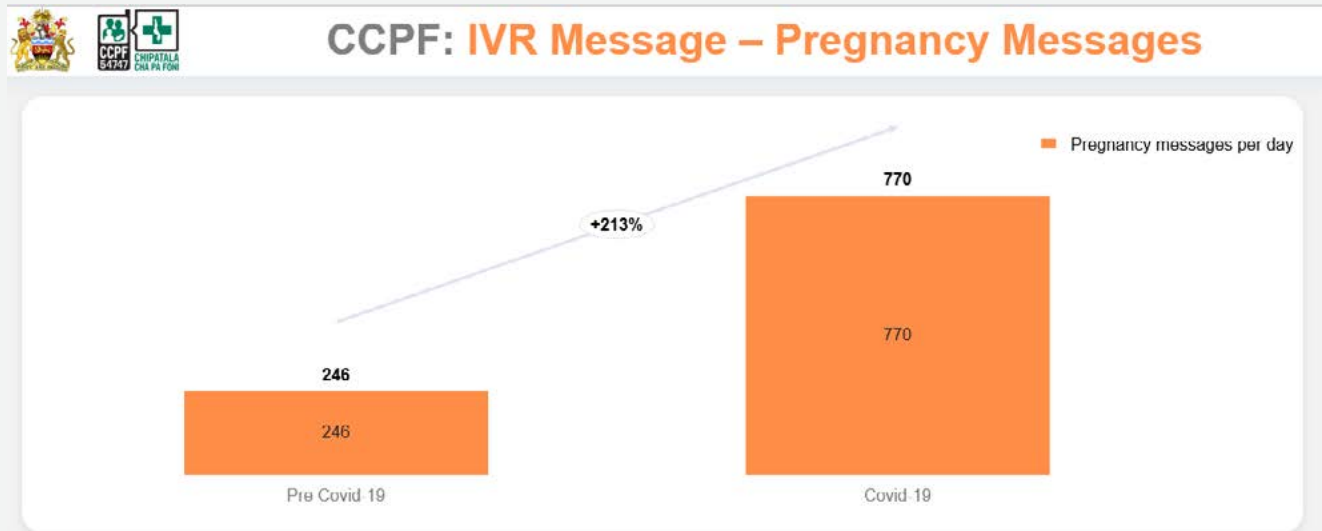
Message topics

Callers can choose from a variety of health topics to listen to, including adolescent health, COVID-19, pregnancy, child health, and general women of childbearing age topics.

Prior to COVID-19, the three most popularly selected topics were adolescent health (67% of total requests), WCBA (17%), and pregnancy (14%). Although the proportion of requests for pregnancy messages decreased to 7% with the addition of an option to listen to information on COVID, the raw number of pregnancy messages requested increased by 213%.

Figure 11 underscores that the number of pregnancy messages heard per day jumped from an average of 246 pregnancy messages listened to per day pre-COVID, to 770 pregnancy messages per day during COVID.

FIGURE 11. IVR MESSAGES HEARD PER DAY



Surprisingly, the number of pregnant women who spoke to an HLW each month did not increase by much—during Pre-COVID, an average of 50 pregnant women spoke to an HLW each month. This slightly increased to 57 pregnant women a month during the COVID period.

Discussion

Several important findings emerged from analyzing pre-COVID and COVID call and IVR patterns. In addition to demand generated from community members’ need to get information on the emerging pandemic, on April 2, 2020, the President of Malawi announced CC PF as the place to go for accurate information on COVID-19 during his national address. His address was broadcast on both television and radio, and on April 3, 2020, a major spike in demand was observed.

While the sheer number of both male and female callers increased dramatically, the percentage of women callers decreased by 20%. This may be due to the mediums in which the President and MOH publicized CC PF—perhaps the television and radio spots used had predominantly male audiences, for instance. MOH should strategize on how to ensure women are also informed about the service. The exponential increase in male calls could also be due to higher rates of phone ownership among men (52.2% vs. 32.8%)ii, meaning other strategies would also be necessary to increase number of female callers (such as encouraging phone borrowing and investing in longer term solutions to improve phone ownership rates among women). Another possibility discussed at

the Risk Communication and Community Engagement and Health Promotion technical working groups is that men, who may be hesitant to be seen at health facilities or to discuss their health issues face to face, may be drawn to the anonymity of CC PF more so than women. Finally, because we only know the gender of callers who end up speaking with an HLW, it is possible that women have to end their calls before being connected at disproportionately higher rates than men. Although all conjecture that would need to be confirmed through further study, it is possible that women may need to abandon being on hold more so than men.

Demand by district holds important insights for MOH decision-makers—instances like Kasungu where the demand spiked in the COVID-19 period could suggest that concerns and fears may be more prevalent in that area, while districts with a decreasing proportion of the calls may suggest that additional sensitization efforts are needed in those areas to make sure the word gets out about this resource. In this particular case, it is likely that the disproportionate spike in Kasungu is due to low awareness of CC PF prior to the President’s address, which then sparked significant growth in calls from Kasungu due to its relatively large population compared to other districts. By continuing to monitor demand,

however, especially as initial spikes from the introduction of COVID settle, can indicate areas that the MOH may want to investigate further.

Another important finding is that regardless of time period, a relatively low percentage of actual demand is met each month. CCPF might meet 10% of demand in a given month, meaning that 90% of those who attempt to get through to the hotline never successfully reach an HLW or listen to a health message. During COVID, a larger percentage of callers are exiting before choosing whether to speak to an HLW or listen to IVR messages. This could indicate a need to make the welcome message and need for next steps clearer to callers, and could also indicate technological or network issues with calls dropping early.

A key limiter in improving ability to meet demand is the number of HLWs—there are simply not enough HLWs on staff and commensurate number of phone lines to answer all the calls received. It is encouraging to note, however, that when donors provided funds to hire additional temporary HLW to handle the surge, we saw percentage of calls answered increase (such as in July 2020, and again in October 2020 when these staff were re-instated after being temporarily released due to funding). The MOH can continue to use the demand data and the percentage of demand met to advocate for additional staffing resources internally and from outside donors.

While overall ability to meet demand is low, we do see that those who request to hear a message have a much higher likelihood of ultimately being connected with that audio message (89.2%), than those who request to speak with an HLW do of being connected to an HLW (6.8%). This suggests that in times of extreme demand, sensitization campaigns and introduction messages to callers may want to encourage callers with general information requests to trend towards selecting the IVR messages with key helpful tips (while those experiencing a particular health issue could attempt speaking with an HLW).

The low percentage of callers who actually speak to an HLW indicates that many people experiencing a pressing health issue, including women with PPH or obstetric emergencies, may call but do not get through to an HLW. This supports an ongoing conversation the MOH has been having about how emergency services could be integrated into the hotline, and whether a button on the keypad could be pressed to route callers to the top of the queue to be prioritized to speak to an HLW. Questions

remain around how to introduce the service and ensure that wide groups of callers who are not experiencing an emergency do not take advantage of the service.

A surprising finding was that while the number of pregnancy IVR messages listened to increased drastically, the number of pregnant women speaking to an HLW only increased by an average of 7 women per month. Perhaps pregnant women are more inclined to choose to listen to a message when they hear they can choose pregnancy messages than they are to choose to wait for an HLW. Further inquiry is needed to understand why the percentage jumped so dramatically for IVR messages and minimally for calls with HLWs.

Conclusion

While Method 2 only uncovered 143 calls over 14 months during which pregnant or post-partum women were experiencing symptom(s), Method 5 revealed that a high demand for pregnancy information does exist, with 770 Malawians per day listening to pregnancy information during COVID times. And while the COVID-19 situation may have been the initial introduction to CCPF for many, it is clear that users are leveraging CCPF for information beyond strictly COVID-19.

The subsequent qualitative methods will shed light on motivations and hesitations around using CCPF in an emergency situation, and to explore how COVID-19 has shifted the landscape of maternal health services and the questions and fears pregnant women may have, and any changes in care-seeking behavior.

Upon completion of the remaining methods, a final report with key findings and implications will be packaged for MOH and other stakeholders to inform CCPF's marketing, programming, staffing, and capacity building decisions.

Appendix

Final call recording form used by Research Assistants on the sample of 448 calls.



Worksheet in CCPF-Quant Analysis Report_updated

ⁱ National Statistical Office (NSO) [Malawi] and ICF. (2017). 2015-16 Malawi Demographic and Health Survey Key Findings. Zomba, Malawi, and Rockville, Maryland, USA. NSO and ICF. <https://dhsprogram.com/pubs/pdf/SR237/SR237.pdf>

ⁱⁱ National Statistical Office (NSO) [Malawi] and ICF. 2017. Malawi Demographic and Health Survey 2015-16. Zomba, Malawi, and Rockville, Maryland, USA. NSO and ICF.



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<https://iscollab.org/advancing-postpartum-hemorrhage-care/>

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