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Examining the outcomes of the ‘Health 2 go’ project: A community health worker intervention program, 2016-2020

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Abstract

Objective: The primary objective of the study is to evaluate the outcome of the ‘Health 2 Go’ Program; a community-based health intervention focusing on improving the health of children under five years in selected rural Ghanaian communities.

Design: A retrospective cross-sectional study was employed.

Settings: Selected hard-to-reach rural communities in the Wawase and BCCDP Sites located in the Eastern and Ashanti Regions of Ghana.

Participants: Caregiver of children under five years of age diagnosed with malaria, pneumonia, and diarrhoea by Community Based Agents (CBAs) between November, 2016 and January, 2020.

Results: A total of 22,332 home visits (counts of child visits made by the health worker to assess the sick child) were conducted for the period under review. Malaria was the most frequent morbidity at both sites, followed by Acute Respiratory Infections (ARI) and Diarrhoea, with most disease conditions detected between May and September and peaking in October and November. The number of referrals were also positively correlated with the number of malaria cases in children under five.

Conclusion: Reported home visits by the CBAs was observed to positively correlate to case detection among children under five years. Malaria is the most frequent diagnosed morbidity among the reported diseases among children. We recommend an increase in the number of home visits conducted with volunteers heightening surveillance among children under five years during the rainy season and immediately thereafter.

Keywords: Community, based agents, malaria, Health 2 Go, Wawase, BCCDP

Introduction

The most frequent causes of child morbidity and mortality in Ghana are malaria, pneumonia and diarrhea and account for at least 40% of deaths of children under five ^{[1]-[3]}. Lack of access to healthcare that includes life-saving interventions at the community level and household poor-health practices have been identified as factors in these deaths ^[1]. ‘Health 2 Go’ (H2Go), is a program based on the World Health Organization’s strategy of Integrated Management of Children’s Illness (IMCI) and offers a component of Integrated Community Case Management (ICCM). The ICCM has been an effective and feasible strategy to save infants’ lives in hard-to-reach communities across several countries ^{[4], [5]}. The program’s premise is to train and equip Community-Based Agents (CBAs) to assess and treat childhood illnesses such as malaria, pneumonia, and diarrhea with readily available, inexpensive but efficacious medicines. Health 2 Go delivers the health system to communities by; building community capacity through education and health promotion, treating basic illnesses within communities for children aged 0-5 years and connecting complicated illnesses to health facilities using the referral method. “Cast-a-Pebble”, a US-based not-for-profit organization has over the past four (4) years supported the project’s goal of treating childhood illnesses within the communities, providing referrals linkages to health facilities for complicated and life-threatening conditions, and also offering health education to mothers on prevention of illness, health, promotion, and nutrition in the Wawase CHPS Zone and the Barekese

Sub-district as part of the Barekese Collaborative Community Development Project (BCCDP). This has been achieved through the collaboration between the Ensign College of Public Health, Ghana Health Service and the Kwame Nkrumah University of Science and Technology. Health 2 Go achieves these morbidity and mortality reductions through a set of processes and activities which are periodically undertaken. These activities include; provision of high-quality equipment and supplies for the CBAs to carry out their roles, rigorous and routine training of CBAs on; recognizing child danger signs, treating common illnesses (malaria, pneumonia and diarrhoea), effective disease prevention and health promotion, record-keeping and supportive supervision and monitoring of CBAs. It is imperative for a periodic assessment of the 'Health 2 Go' program by examining the outcomes while tracking its performance over time. The current study examines the health outcomes of the 'Health 2 Go' project at the current Wawase and BCCDP Sites between 2016 to 2020, specifically it sets out to examine the geographical distribution of cases examined across designated communities, carry out monthly trend analysis of cases for both sites and then examine the relationship between volunteer home visits and number of cases recorded.

Methods

Study Sites

Wawase CHPS Zone

The Wawase CHPS Zone is a cluster of six (6) rural communities located in the Lower Manya Krobo Municipality in the Eastern Region of Ghana. Mainly a hard-to-reach farming community. It is home to an estimated 200 children under five years. The communities in this area include; Aplah, Abobeng, Wawase, Piengua, Oblemanya and Atortosi. Health 2 Go activities began in this area in November, 2016 with a total of 10 Community-Based Agents (CBAs) enrolled.

Barekuma Collaborative Community Development Program (BCCDP)

The BCCDP is a cluster of communities located in the Barekese sub-district in the Atwima Nwabiagya North District of the Ashanti Region-Ghana [6]. These are predominantly farming communities with close to 60% of the population residing in "hard-to-reach" rural areas. The estimated under-five population is 2,200. The communities in the area include; Esaaso, Kumi, Aninkruma, Maban, Asikem, Achina, Fufuo, Sikayena, Ataase, Kwame Marfo, Achiase, Boahenkwa, Atamso, Adegya and Worapong. Health 2 Go activities began in this area in May, 2018 with a total of 30 community volunteers enrolled to offer basic health services to children under five years.

Study Design

A retrospective cross-sectional study was employed. Data were abstracted from the monthly 'Health 2 Go' data records and stored digitally in Microsoft Excel 2020 (Microsoft Company, USA) between the periods of November, 2016 to February, 2020. Variables such as the number of malaria cases, pneumonia, and diarrhoea by community for both the Wawase (6 communities) and BCCDP Sites (30 communities) were obtained. The stored data were then exported into State (version 14) for analysis. The analysis was based on set objectives; descriptive analyses were expressed in frequencies and percentages. Number of cases for each of the specified disease conditions (malaria, diarrhoea and ARI) were generated for the period under review. Number of cases for each disease condition per community was also calculated to examine the geographical distribution of cases across designated communities. Trend analysis of cases for both sites versus months was conducted, and the relationship between volunteer home visits and the number of cases recorded was also analysed.

Ethical Consideration

Ethical approval was acquired from Ensign Global College (ENSIGN/IRB/EL002/H2G) Ethical Review Board. Participants were informed orally about the objective of the study to seek their consent. They were told that they have the liberty to withdraw from the research whenever they wished, and moving forward their identity would be given the necessary security.

Results

A total of 22,332 home visits were conducted over the study period, with the majority (12,085) representing 54.1% conducted within the BCCDP site. For the same period under review, 7,933 children under five years were registered (A child registry denotes the health record kept of children visited by CBAs within a defined period, i.e. a child can be home visited multiple times depending on the number of times a CBA identifies a danger sign) during these home visits for both sites; 2141 in Wawase and 5,792 in the BCCDP. Malaria was the most frequent morbidity at both sites, followed by ARI and Diarrhoea. The total number of cases referred to health facilities was 156 and 166 for the Wawase and BCCDP sites, respectively. Maban reported the highest number of referred cases within the BCCDP site. The Abobeng community in Wawase recorded the highest number of morbidities and home visits within the period under review. The Fufuo, Maban and Atamso communities in BCCDP were the three communities with the highest number of morbidities between 2018 and 2020 [Table 1&2].

Table 1: Community Distribution of Under-five Morbidities and Hospital Referrals against Home visits and Children Registered in Wawase, November 2016-February-2020

Name of Community	Number of Child Registries (counts of child visits made by the health worker)	Home Visits	Malaria	Diarrhoea	ARI	Referrals
Aplah	394	1730	314	77	18	37
Abobeng	673	2463	376	132	286	24
Wawase	414	1785	275	70	83	44
Piengua	175	1237	166	32	29	14
Oblemanya	117	987	65	29	17	26
Atortosi	368	2045	236	119	123	11
Total	2141	10247	1432	459	556	156

A child registry denotes the health record kept of children visited by CBAs within a defined period, i.e. a child can be

home visited multiple times by a CBA depending on the number of times a danger sign is identified by a caregiver

Table 2: Community Distribution of Under-five Morbidities and Hospital Referrals against Home visits and Children Registered in BCCDP, May-2018-February-2020

Name of Community	Number of Child Registries (counts of child visits made by the health worker)	Home Visits	Malaria	Diarrhoea	ARI	Referral
Esaaso	463	763	95	125	126	24
Kumi	400	799	111	80	73	35
Aninkruma	463	689	161	133	203	20
Maban	523	1026	131	208	182	23
Asikem	247	432	125	58	117	7
Achina	525	698	299	77	100	4
Fufuo	504	1074	198	123	177	6
Sikayena	470	585	268	69	96	7
Ataase	277	1033	134	45	37	6
Kwame Marfo	180	734	85	36	40	2
Achiase	94	390	45	9	12	5
Boahenkwa	235	832	106	60	17	1
Atamso	466	802	225	134	134	6
Adegya	443	847	256	58	44	16
Worapong	502	1381	265	155	135	4
Total	5792	12085	2504	1370	1493	166

A child registry denotes the health record kept of children visited by CBAs within a defined period, i.e. a child can be home visited multiple times by a CBA depending on the number of times a danger sign is identified by a caregiver
The monthly trend of under-five morbidities recorded

revealed that cases were highest between the May and September period for both project sites with cases peaking in November for Wawase [Figure 1] and October for the BCCDP [Figure 2].



Fig 1: Monthly Trend of Under-five Morbidities in Wawase, November-2016- February-2020

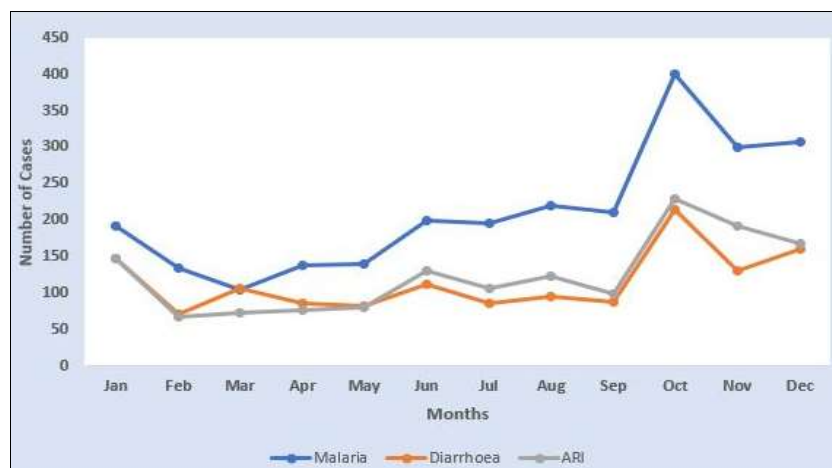


Fig 2: Monthly Trend of Under-five Morbidities in BCCDP, May-2018-February-2020

The number of home visits conducted positively correlated with the number of malaria, diarrhoea and ARI cases recorded among children under five for the BCCDP site. At the Wawase site, the number of children registered correlated positively with the number of malaria cases. Malaria and diarrhoea cases amongst children under five

correlated positively for both study sites. At the same time, malaria -ARI, and diarrhoea- ARI also correlated positively at the BCCDP site. A strong positive correlation was found between the number of Malaria cases recorded amongst children under five years and the number of referrals at the BCCDP site [Table 3&4].

Table 3: Pearson's Correlation (R) test between variables in Wawase, November 2016-February-2020

Variable	Home Visit	Children Registered	Malaria	Diarrhoea	ARI	Referrals
Home Visits	1.000					
<i>p-value</i>						
Children Registered	0.503	1.000				
<i>p-value</i>	0.096					
Malaria	0.312	0.9072*	1.000			
<i>p-value</i>	0.324	0.000				
Diarrhoea	0.071	0.517	0.7160*	1.000		
<i>p-value</i>	0.827	0.085	0.009			
ARI	0.276	0.439	0.454	0.017	1.000	
<i>p-value</i>	0.386	0.153	0.139	0.958		
Referrals	0.103	0.359	0.420	0.029	0.267	1.000
<i>p-value</i>	0.750	0.251	0.174	0.929	0.401	

Table 4: Pearson's Correlation (R) test between variables in BCCDP, May-2018-February-2020

Variable	Home Visit	Children Registered	Malaria	Diarrhoea	ARI	Referrals
Home Visits	1.000					
<i>p-value</i>						
Children Registered	0.001	1.000				
<i>p-value</i>	0.999					
Malaria	0.699*	0.259	1.000			
<i>p-value</i>	0.011	0.441				
Diarrhoea	0.808*	-0.021	0.839*	1.000		
<i>p-value</i>	0.001	0.950	0.001			
ARI	0.840*	0.174	0.950*	0.900*	1.000	
<i>p-value</i>	0.001	0.589	0.000	0.000		
Referrals	0.297	0.359	0.657*	0.395	0.570	1.000
<i>p-value</i>	0.349	0.253	0.020	0.204	0.053	

Discussion

Summary of findings

Malaria, pneumonia, diarrhoea and malnutrition are the majority contributors of under-five morbidity and mortality in Sub-Saharan Africa. The 'Health 2 Go' program's overall goal is to reduce morbidity and mortality in children under five years by empowering trained CBAs in hard-to-reach communities to assess and offer very basic but effective treatment and subsequently link complicated cases to health facilities using the referral system. The current study highlights the outcomes of the Health 2 Go program using evidence from routine monthly data collected by the CBAs. Malaria was the most frequent disease condition recorded in children under five for the period under review, followed by diarrhoea and ARI. For the years under review, the majority of disease conditions detected were recorded between May and September. A positive correlation was observed between the number of home visits conducted and the number of cases of childhood illnesses recorded (i.e. Malaria, diarrhoea and ARI). The number of referrals were also positively correlated with the number of malaria cases in children under five. It was observed that communities (Wawase and Maban) in close geographical proximity to functional facilities tend to have the highest number of referred cases.

Community Distribution of Morbidities

The highest number of cases were recorded in communities

that correspondingly conducted the highest number of home visits and as well registered the highest number of children. This was observed in the Abobeng community in Wawase and Fufuo, Maban and Atamso communities in the BCCDP area. The result highlights the potential effect community health workers will play in Ghana's disease surveillance system if continually and consistently empowered. An increase in the number of trained community-based health workers will likely have a cascading effect on the number of home visits conducted, which will increase case detection among children under-five in hard-to-reach areas. This has been demonstrated in studies conducted in parts of Africa and Asia [7]-[10]. Caregivers appreciated the role of the health volunteers because they treated them better and were readily accessible.

Monthly trends in Morbidities

The number of cases detected was high between May and September for the period under review, with malaria being the highest morbidity recorded. Cases peaked in October and November for the two different areas (Wawase and BCCDP). Malaria morbidity and mortality peaks are recorded in the rainy season [11], [12]. This marked increase could be attributed to higher parasitaemia levels in the rainy season than in the dry season [13]. A study that investigated the effects of climatic variables, particularly, rainfall and temperature, on malaria incidence in 2017 using time series analysis revealed that November recorded approximately

21% more malaria cases than the other months while September had a decreased effect of about 14%. The forecast model developed for this investigation again indicated that mean minimum and maximum monthly temperatures lagged at three months were significant predictors of malaria incidence while rainfall was not. Climatic factors may not have an instantaneous effect on malaria incidence; rather, they may have lagged effects. The changing climatic factors have had a complicated effect on the number of cases of tropical diseases recorded in recent times. Based on our current study's findings and the possible implications, during the rainy season and more importantly, immediately after the rainy season may be critically looked at in heightened surveillance by health volunteers by embarking on more home visits to enhance case detection among children under five.

Relationship between Morbidities, Home Visits and Child Registries

The effect of case detection in disease surveillance in recent times cannot be overemphasized. At the community level, the role of health volunteers through home visits is critical to case detection. Findings from our study revealed that the increasing number of home visits conducted by health volunteers corresponded to the increasing number of recorded morbidities, a development highlighting the need to increase the number of home visits to enhance case detection in designated Health 2 Go communities. This has been well documented in studies conducted in tuberculosis, especially in communities that cannot access health services [14, 15]. Malaria cases recorded were also found to be positively correlated with the number of hospital referrals. It is common knowledge that malaria is the leading cause of death amongst children and hence the need to pay critical attention to detection amongst children. The developments highlight the effort that should be channelled into caregiver health education on preventive measures for malaria amongst children under five years.

Conclusion and Recommendations

The study's findings on the outcomes of the Health 2 Go program underscores the critical role community health workers play in case detection amongst children under five years in hard-to-reach areas. Malaria was the most frequent morbidity recorded with most disease conditions detected between May and September and peaking in October and November. Home visits conducted by the CBAs corresponded to the increasing number of recorded morbidities. We recommend an increase in the frequency of home visits conducted by the CBAs as a way to heighten disease surveillance amongst children under five years during the rainy season and more importantly immediately after the rainy season. Efforts should as well be channelled to health education among caregivers on preventive measures for malaria, diarrhoea and ARIs amongst children under five years.

Summary Box

What is already known on this subject?

The Community-Based Agents (CBAs) play a very vital role in complementing the work of the regular health workers in communities that do not have an existing health facility. At the community level, CBA help in detection of cases and undertake home visit as a measure to check on the recipients of their treatment and also offer education how to prevent future

occurrences.

What does this study add?

The number of cases detected was high between May and September for the period under review, with malaria being the highest morbidity recorded. The 'Health 2 Go' program's empowers trained CBAs in hard-to-reach communities to assess and offer very basic but effective treatment and subsequently link complicated cases to health facilities using the referral system.

Conflict of Interest

Not available

Financial Support

Not available

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