

Trends of Antenatal Care Visits in Kaoma District after Training of Safe Motherhood Action Groups from 2020 to 2021

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Abstract

Evidence has shown that an unacceptably high level of maternal mortality versus low attendance to antenatal has been feature of global health and development discussions since the 1980s. Inadequate human resource for health where practically a patient may never see a physician, has prompted Zambian Ministry of Health (MOH) in 2003, to establish Safe Motherhood Action Groups (SMAGs) as part of a national safe motherhood program in view to increase the utilization of maternal healthcare services (MHS). Currently, in Kaoma district of Western Province, it is unknown how the SMAG program effectively impacts the increase on utilization of facility-based MHS. Therefore, our study aims to assess the trends of antenatal care visits in Kaoma district after training of Safe Motherhood Action Groups from 2020 to 2021. The study was quantitative in design and used standard data collection tools. A Causal Comparative method was used to establish the impacts of SMAGs on utilization of facility-based MHS. The overall results indicate that we had 15% increase in pregnant women attending first antenatal clinic with a slight decline of 3% of them attending subsequent antenatal revisits. Based on these results, we concluded that SMAG program, as a community intervention, effectively impacts the increase on utilization of facility-based maternal health services. Number of factors could have contributed to these variations at different levels: individual, interpersonal, facility or community.

Keywords: Hospital Utilization, SMAGs, Safe Motherhood Action Groups.

Introduction

General Information on the Research Topic

The health of mothers has long been acknowledged to be closely related to the wellbeing of the child and a cornerstone of public health. A particular attention to unacceptably high level of maternal mortality versus low attendance to antenatal and postnatal visits has been feature of global health and development discussions since the 1980s [19].

In Zambia, maternal health indicators have remained constantly below national set targets: for example, Antenatal care coverage at least 4 times (55.5% versus 85%) [15] (Zambia

NHSP 2017-2021). Two contributing factors have been consistently identified: (i) a lack of knowledge about when to access health-care services, which leads to delays in care seeking; and (ii) difficulties with transportation, which lead to delays in reaching health-care facilities [3, 5, 11]. The problem of dragging behind maternal health indicators has probably been exacerbated by a counter-urbanization trend, with people moving to more remote areas [12]. Although most of the rural population of Zambia lives less than 8 km from a health center, the average distance to a health-care facility equipped for safe delivery is more than 15 km [16]. The 2007 Demographic and Health Survey (DHS) in the country reported

that 57% of women in rural areas regarded distance as a barrier to accessing health care when sick [20].

In January 2004, an expanded Partnership for Safe Motherhood and Newborn Health was established with the aim of promoting the health of women and newborns, especially the most vulnerable. Expanding the scope of the global Safe Motherhood Initiative and building on the work of the Safe Motherhood Inter-Agency Group, the Partnership aims to strengthen maternal and newborn health efforts at the global, regional, and national levels, in the context of equity, poverty reduction and human rights

In Zambia, Safe Motherhood Action Groups, as part of a national safe motherhood program, were supported by the United Nations Population Fund in North-West Province before being adopted by the Government of Zambia in a national program. Each group serves a cluster of villages and is encouraged to meet regularly in a communal area. The aim was to mobilize communities to improve the health of women, men and children and reduce the number of human immunodeficiency virus infections. In Kaoma, district of Western Province in Zambia, Safe Motherhood Action Groups (SMAGs) were further additionally trained in advanced essential newborn care in view to achieve the alluded goals. The aim was to incorporate new evidence-based information and other emerging issues to enhance the skills and knowledge of the Community Based Volunteers in the delivery of health services, especially in the rural areas where skilled health workers may not be readily available.

Previous research conducted in Zambia and other developing countries including Ethiopia, Bangladesh and Pakistan has shown that community-centered interventions, such as SMAGs, that focus on community members' involvement and participation are likely to be more accepted by local communities than vertical top – down interventions, which are

planned by health workers at the national level and “imposed” on the community for adoption and implementation. Furthermore, community-based interventions are more likely to lead to desired health behavioral change and favorable health outcomes [14, 17, 18].

Ensor and colleagues (2014) [14] reported that a community intervention in Zambia that focused on community participation led to an increased awareness of pregnancy-related complications and improved utilization of MHS.

Nevertheless, few studies have explored the effectiveness of SMAGs in improving the utilization of maternal and newborn health care services in low-income countries, including rural Zambia [1, 4, 7]. Currently, in Kaoma, it is unknown how the SMAG program effectively impacts the increase on utilization of facility-based MHS.

Therefore, our study aims to assess trends of antenatal care visits in Kaoma district after training of Safe Motherhood Action Groups from 2020 to 2021. This understanding is important as it will provide evidence based for the design of national public health program and community interventions that focus on increasing use of facility-based delivery in the country.

Our approach will be based on the assumption that women require not only knowledge about when they should seek skilled help but also what they should know about wellbeing of a child. There is growing evidence that better utilization of maternal health-care services depends on mobilizing the entire community [8, 10].

Overview of Research and Research Gaps

Zambia as a country has a national average density of 0.6 physician per 10,000 people against 7.1 nurses and midwives per 10,000 people [13], where practically a patient may never see a physician, hence innovative

methods to bridge the clinician gaps have been initiated.

To increase the utilization of maternal healthcare services (MHS), in 2003 the Zambian Ministry of Health (MOH) established Safe Motherhood Action Groups (SMAGs) as part of a national safe motherhood program. SMAGs exist to help foster safer pregnancies to women in their villages and go further in promoting women within communities.

The SMAG program exists to help women, and their families overcome these obstacles through identification, registration and referrals, and education. The SMAGs are elected at the community level, and the designation is seen as a sign of honor and recognition.

Their first task involves identifying those women in the community who are pregnant and logging information in two registers: the pregnancy registers and the birth register. The SMAGs will then refer pregnant women to health facilities for antenatal check-ups. Along the way, the SMAGs hold community education sessions where they educate not only the women in the community, but also men, who often use their power in the highly patriarchal Zambian culture to prevent women from seeking care that would lead to their children's wellbeing.

Although the SMAG program has its own set of challenges such as lack of monitoring and evaluation, lack of consistent refresher courses and inadequate financial support; however, its institution has served to expand healthcare utilizing low-level providers to increase utilization of facility-based skilled care and subsequently improve maternal and newborn health outcomes.

In Kaoma, district of Western Province in Zambia, Safe Motherhood Action Groups (SMAGs) were further additionally trained in advanced essential newborn care. Training was conducted in eight health centers with participants selected from their respective

communities: Longe HP, Mulamba RHC, Namaloba HP, Lunyati RHC, Shibanga HP, Mayukwayukwa 1&2 RHC.

Overall Purpose of the Research and Research Site

The aim of this study is to assess the impact of SMAG program in increasing utilization of maternal health services especially antenatal visits in the rural areas in general and Kaoma district in particular where skilled health workers may not be readily available.

The study was conducted in Kaoma district situated west of Lusaka but east of Mongu town the district lays 400 km from Lusaka and 200 km east of Mongu. The district surface area is 8742 square kilometers. The district has no international boundaries but shares boundaries with Mongu, Limulunga to the West, Luampa to the south, Lukulu and Mufumbwe to the North and Nkeyema to the east.

Kaoma district population for 2021 was 125,508 with an average density of 13.66 per square kilometer (2010 CSO projection) and an annual growth rate of 1.68%. Majority of the population are women and children. The annual expected pregnancies are 6,777 and expected live births are 6,401. Teenage pregnancies are common, and fertility rate is high. Based on these estimates, maternal and child health services constitute the bulk of health services provision in the district.

Kaoma is a developing district with its township and Mangango areas connected to the National Electricity Grid, though most of the health facilities are not yet connected to the power supply; being a rural district, the health centers depend on solar power for lighting and running medical equipment. Inadequate social amenities have limited availability and retention of skilled labor posing challenges in health service provision. The District has two hospitals, Kaoma District Hospital and Mangango Mission Hospital, one Mini Hospital, 18 Health Centers and 9 Health

Posts. District health services are essentially centered on provision of the primary health care services with first referral services provided at the two hospitals and basic health care in the frontline health facilities.

Statement of the Problem

Background of the Problem

According to ZDHS 2018, the percentage of women who had at least four ANC visits has been fluctuating over the years. The percentage increased from 69% in 1992 to 71% in 1996 and 72% in 2001-02 and then decreased markedly to 60% in 2007. The percentage decreased again to 56% in 2013-14 before increasing to 64% in 2018. The percentage of women who had ANC in the first trimester increased from 10% in 1992 to 37% in 2018 [20].

On the other hand, research has shown that Zambia as a country has a national average density of 0.6 physician per 10,000 people against 7.1 nurses and midwives per 10,000 people [19], where practically a patient may never see a physician.

Yet for geographic, economic, and religious reasons many women do not go to delivery facilities. Geographically, while most of Zambia's rural population lives less than 8 kilometers from a health center, the average distance to a safe delivery equipped health-care facility is more than 15 kilometers, and some women need to travel 40 kilometers over sandy, flooded or gravel roads [16]. Economically, many of these women have direct or indirect fiduciary family responsibilities that prevent them from going to health centers for prenatal or ante natal check-ups, or even for delivery. Lastly, some local religious and traditional leaders discourage women from going to health facilities, and instead encourage prayer or traditional medicine.

The SMAGs are community-based volunteer groups that aim to reduce critical delays – including the delay for women to

seek maternal health services, delay to reach the healthcare facility, and delay to access or receive quality maternal health services from a skilled provider. These prevent women from seeking and accessing life-saving maternal health services provided at health facilities.

SMAGs comprise various community volunteers such as traditional birth attendants (TBAs), community health workers (CHWs), neighborhood health committee (NHC) members, and women and husbands who are involved in maternal health programs in the community.

The SMAG members are specifically selected and trained to function as health promoters to deliver essential information on maternal health services to men and women in the community in order to create awareness and personal risk perception of pregnancy, labor and newborn health complications. Moreover, they encourage pregnant women to go for regular antenatal care (ANC) visits, delivery, and postnatal care (PNC) in a health facility. They are also trained to identify maternal and newborn complications during pregnancy, delivery, and the postnatal period, and to refer women with complications to health facilities for management. Furthermore, the SMAG program attempts to ensure involvement of husbands in maternal health services by encouraging men to participate as SMAG members. Since SMAG members are selected by community members, specifically trained by healthcare staff to serve their local communities and interact with both community members and healthcare facility staff, the SMAG program aims to strengthen relationships between pregnant women and the healthcare facility staff.

The aim of this study is to explore the impact of SMAG program in increasing utilization of maternal health services especially antenatal visits in the rural areas in general and Kaoma district in particular where skilled health workers may not be readily available.

Importance of Relevance of the Research

The study will provide evidence based for the design of national public health program and community interventions that focus on increasing use of facility-based delivery services and improving maternal and newborn health outcomes in the country.

Rationale/Justification

Contribution of the study to body of Knowledge

The SMAG program might have potential to be an important community intervention for increasing utilization of facility-based skilled maternal health services and improving maternal and newborn health outcomes in rural area of Zambia.

Changes to be made by the Study

Findings of the study might provide a basis for the design of community centered interventions focusing on increasing pregnant women's demand for and utilization of facility-based skilled maternal health services in rural Zambia

Evidence Supporting the Justification

Following research, Zambia as a country has a national average density of 0.6 physician per 10,000 people against 7.1 nurses and midwives per 10,000 people [19], leading to less probability for a patient to see a physician, hence innovative methods to bridge the clinician gaps.

Conceptual Framework

We used facility-based evaluation with standard approaches and comparable indicators to measure outcome and impact, and to allow comparison at baseline and after training of SMAGs in selected health facilities. Key maternal indicators for this study included 1st ANC booking and antenatal revisits.

Materials and Methods

Study Design

The study was quantitative in design and used standard data collection tools. The quantitative approach provided an in-depth understanding of the acceptability and use of SMAGs in their respective communities which would in turn provide detailed understanding of the outcome under investigation.

In our study, we used a causal-comparative design is a research design that seeks to find relationships between independent and dependent variables after an action or event has already occurred. The researcher's goal is to determine whether the independent variable affected the outcome, or dependent variable, by comparing two or more groups of individuals. The relationship between the independent variable and dependent variable is usually a suggested relationship (not proven) because the researcher does not have complete control over the independent variable [2].

The Causal Comparative method seeks to establish causal relationships between events and circumstances. In other words, it finds out the causes of certain occurrences or non-occurrences. This is achieved by comparing the circumstances associated with observed effects and by noting the factors present in the instances where a given effect occurs and where it does not occur.

In our study, collected data included information on women attending antenatal visits from 01st January 2020 to 31st December 2020 prior to SMAG's training, data extracted from Kaoma district Health Information Management System (HIMS).

This data was compared with similar data extracted from the same HIMS but for the following year starting 01st January 2021 to 31st December 2021 after training of SMAGs. Data was collected from eight health facilities of Kaoma district (Longe HP, Mulamba RHC, Namaloba HP, Lunyati RHC, Kasimba RHC, Shibanga HP, Mayukwayukwa 1 RHC and

Mayukwayukwa 2 RHC). We used standard approaches with country standard data collecting tools: Health Centre service aggregation form (HIA2) (Appendix 1). Our focus in this study was on section 2: Maternal Health and New-born Care. Collected data was aggregated in the district health information management system (HIMS).

Key maternal indicators for this study included first antenatal booking and antenatal revisits.

Furthermore, we calculated first antenatal visits coverage using first antenatal visits against expected deliveries. An average antenatal visit was equally calculated for each facility. Comparison was in term of frequency of visits in perinatal period at specific gestational age, proportion of women reaching recommended WHO standard antenatal visits in selected facilities.

Study site and Population

The study was conducted in Kaoma district situated west of Lusaka but east of Mongu town the district lays 400 km from Lusaka and 200 km east of Mongu. The district surface area is 8742 square kilometers. The district has no international boundaries but shares boundaries with Mongu, Limulunga to the West, Luampa to the south, Lukulu and Mufumbwe to the North and Nkeyema to the east.

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Selection of Participants, Sampling Methods and Sample Size

The study population consisted of SMAGs, nurses/midwives, clinical officers, pregnant women and mothers in their respective community areas.

First, all health centres which had trained, and functional SMAGs were identified with the help of the district managers at the District Health Office (DHO). Only eight out of twenty-six health centres in the district had functional SMAGs and all eight health centres were purposefully selected and included in the study.

Next, health centre in-charges were then tasked to fill in the data reporting tool (health centre service aggregation form) timely, accurately and complete as guided by Ministry of health. The forms were to be submitted monthly to district health office for aggregation and compilation of the report and onward submission to Provincial health office (PHO) and Headquarter (HQ-MoH).

Inclusion criteria

1. Every pregnant woman attending ANC visit
2. Every institutional delivery
3. Every post-natal mother attending any PNC visit till 42 days
4. Pregnant women, perinatal and postnatal mothers residing in communities of the eight selected health facilities
5. Exclusion criteria
6. Non pregnant woman
7. Any delivery apart from institutional delivery and women who gave birth through caesarean section
8. Post- natal mother not attending PNC visit
9. Pregnant women, perinatal and postnatal mothers residing in communities other than the eight selected health facilities

Data Management: Collection Plan and Tools

The study used Health Management Information System (HMIS) platform for data collection. The HMIS was established in the Ministry of Health (MoH) in 1996 and at the moment it covers all the health facilities that are found in all the 116 districts of Zambia. The HMIS currently captures data on disease morbidity and mortality, maternal and child health services, service delivery (staff workload, health facilities utilization, availability of essential drugs etc.), surveillance and financial services. Environmental health and administrative data are also captured on an ad hoc basis. HMIS data collection is conducted at the health facility level using a paper-based system and is aggregated and computerized from district to national level. It has four (4) sections as follows:

1. Child Health nutrition
 - i. Children under-five attendance
 - ii. Growth monitoring and nutrition
 - iii. Vaccination
2. Maternal health and newborn care
 - i. Antenatal care
 - ii. Post-natal care
 - iii. Family planning
 - iv. Obstetric care
3. HIV prevention care and treatment
 - i. HIV testing services
 - ii. Elimination of mother-to-child transmission of HIV
 - iii. Care and treatment
 - iv. Voluntary medical male circumcision
 - v. Gender based violence
 - vi. Exposure prophylaxis
4. General and curative care
 - i. Malaria services and cases
 - ii. Ophthalmology services
 - iii. Out patients
 - iv. In patients
 - v. In patient utilization
 - vi. Cancer screening and diagnosis
5. Our focus in this study was on section 2: maternal health and new-born care.

Data Analysis Plan

For this study we have one predictor variable which is categorical whilst the outcome variable is quantitative, and groups come from the same population. Hence, we proceeded as follow:

1. Construct frequency polygons.
2. Means and standard deviations.
3. T-test (Paired T-test) for differences between means.
4. Analysis of covariance

Data set

Table 1. Basic data for 2020

	1st ANC	ANC Revisits	Total ANCs
Mulamba RHC	616	1373	1989
Kasimba	195	383	578
Longe	143	368	511
Lunyati	173	399	572
Mayukwayukwa 2	156	466	622
Mayukwayukwa 1	209	427	636
Namaloba	202	454	656
Shibanga	136	303	439

Kaoma district - (HIMS) [20]

Table 2. Basic data 2021

	1st ANC	ANC Revisits	Total ANCs
Mulamba RHC	658	1341	1999
Kasimba	185	265	450
Longe	152	429	581
Lunyati	244	460	704
Mayukwayukwa 2	154	434	588
Mayukwayukwa 1	179	464	643
Namaloba	216	506	722
Shibanga	133	276	409

Kaoma district - (HIMS) [20]

Results

Table 3 (fig 1) below describes first antenatal visits in selected facilities. It shows differences in absolute number between the two consecutive years of the study and subsequent percentage of change. The total sample for the analysis was 1830 and 1921 women who attended first ANC respectively in year 1 and 2 of the study (Table 1&2). First antenatal visits varied from facility either in increase or decrease in attendance regardless of facility being in urban or rural set up. Four facilities (Longe HP, Lunyati RHC, Mulamba

RHC and Namaloba HP) out of eight (50%) recorded an increase in first ANC visits, more notable in Lunyati (71) and Mulamba RHC (42). On the other hand, four facilities (50%) recorded a decrease on first ANC visits, notably in Mayukwayukwa 1 RHC (30). But overall, it shows a slight increase of 91 in absolute figures giving a positive percentage of change of 0.146%. Statistical paired T-test applied to first antenatal visit data in the eight selected facilities provides a P value of 0.892879.

Table 3. ANC First Visit

ANC first visit					P-Value:
Facility	2020	2021	Difference	%Change	0.892879
Kasimba	195	185	-10	-0.026316	
Longe	143	152	9	0.0305085	
Lunyati	173	244	71	0.1702638	
Mayukwayukwa1	209	179	-30	-0.07732	

Mayukwayukwa2	156	154	-2	-0.006452	
Mulamba RHC	616	658	42	0.032967	
Namaloba	202	216	14	0.0334928	
Shibanga	136	133	-3	-0.011152	
Grand Total	1830	1921	91	0.1459927	

Kaoma district - (HIMS) [20]

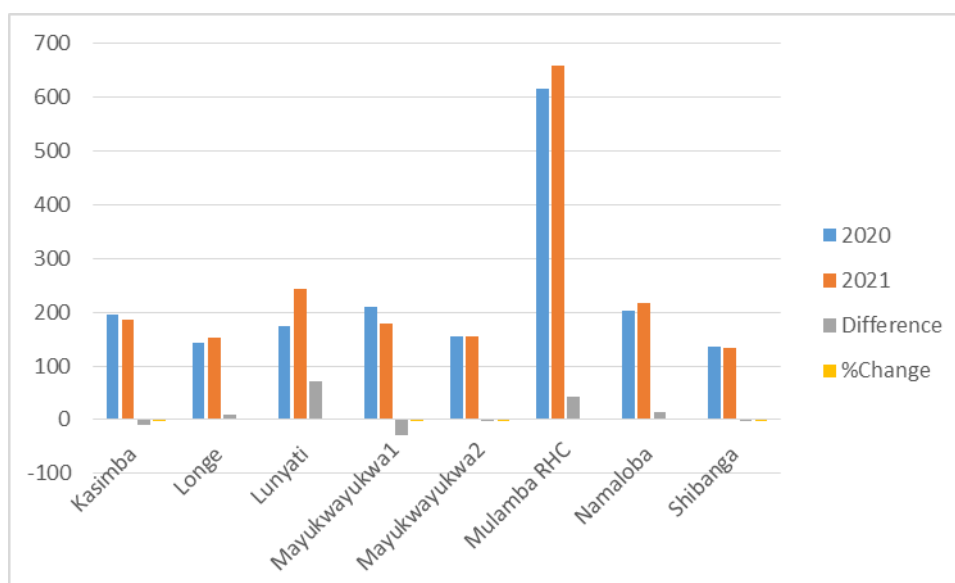


Figure 1. ANC First Visit

1st ANC coverage per expected pregnancy in the eight selected facilities is shown on table 4 (Fig 2) below. Differences in coverage were not significant both in reduction and increase though the overall for all selected facilities was a negligible increase of 0.04862985 giving 0.0182491 as percentage of change and a P value of 0.854782. Suffice to mention that disaggregated 1st ANC coverage per expected pregnancy in facilities was below the required standard of 85% except at Mulamba RHC and Namaloba HP during the

first year of the study. During the second year of the study, an improvement in 1st ANC coverage was noticed in three out of eight facilities, Mulamba RHC, Namaloba HP and Lunyati RHC (37.5%). Specifically, Namaloba HP 1st ANC coverage has been above target, nearly double, and still increased from 193% in 2020 to 206% in 2021. Performance in the last three facilities has positively impacted on the overall performance in facilities under study.

Table 4. 1st ANC Coverage

1st ANC Coverage per expected pregnancy					P-Value:
Facilities	2020	2021	Difference	%Change	0.854782
Kasimba	0.553751	0.525353	-0.0283975	-0.026316	

Longe	0.502191	0.533798	0.03160645	0.0305085	
Lunyati	0.682726	0.96292	0.28019385	0.1702638	
Mayukwayukwa1	0.498355	0.426821	-0.0715342	-0.07732	
Mayukwayukwa2	0.433213	0.427659	-0.005554	-0.006452	
Mulamba RHC	0.928382	0.991681	0.06329877	0.032967	
Namaloba	1.930723	2.064536	0.13381251	0.0334928	
Shibanga	0.652216	0.637829	-0.0143871	-0.011152	
Average	0.772695	0.821324	0.04862985	0.0182491	

Kaoma district - (HIMS) [20]

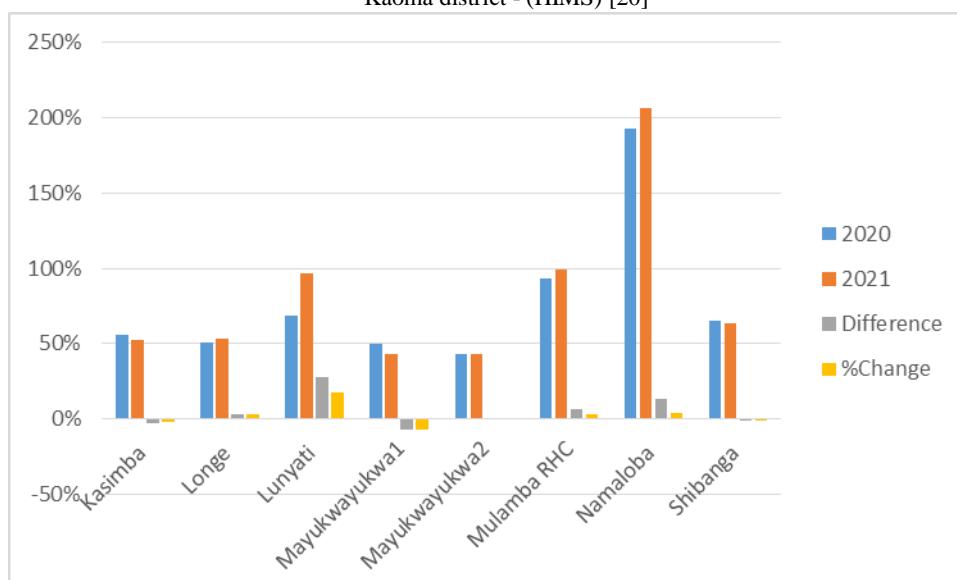


Figure 2. 1st ANC Coverage

Table 5 (Fig 3) below shows 1st ANC Coverage based on attendance in the eight selected facilities under study. For the two consecutive years, we noticed minimal variations with an overall increase of 0.01082719 giving 0.0140049 as percentage of

change and a P value of 0.604067. Worthy to notice, is that in nearly all facilities under the study, 1st ANC coverage based on attendance has been below the value of 40% throughout the years of study with basically negligible changes within the years.

Table 5. 1st ANC Coverage based on Attendance

Sum of first ANC_Cov_Total ANC					P-Value:
Facilities	2020	2021	Difference	%Change	0.604067
Kasimba	0.33737	0.411111	0.07374087	0.0985206	

Longe	0.279843	0.261618	-0.0182255	-0.03366	
Lunyati	0.302448	0.346591	0.04414336	0.0680135	
Mayukwayukwa1	0.328616	0.278383	-0.0502338	-0.082758	
Mayukwayukwa2	0.250804	0.261905	0.0111009	0.0216515	
Mulamba RHC	0.309703	0.329165	0.01946121	0.030462	
Namaloba	0.307927	0.299169	-0.0087579	-0.014426	
Shibanga	0.309795	0.325183	0.01538839	0.0242345	
Average	0.303313	0.314141	0.01082719	0.0140049	

Kaoma district - (HIMS) [20]

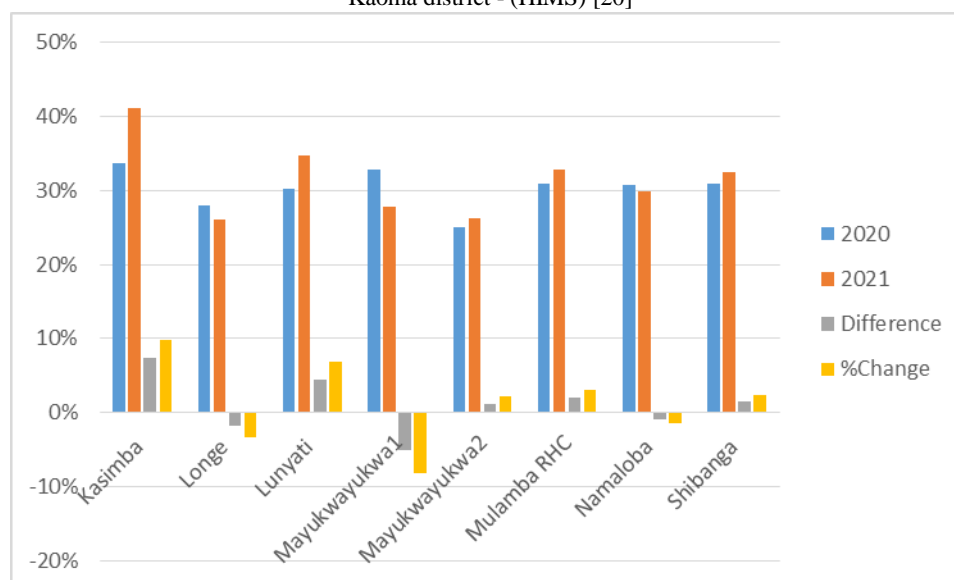


Figure 3. 1st ANC Coverage based on Attendance

Subsequent ANC Revisits in facilities under study for the two consecutive years are described on table 6 (fig 4). Absolute figures show both a notable increase in four facilities out of eight (50%) (Longe HP, Lunyati RHC, Mayukwayukwa 1 RHC and Namaloba HP) whilst the other four (Kasimba RHC, Mayukwayukwa 2 RHC, Mulamba RHC and Shibanga HP) show a decrease. The significant

drop of about 30% (from 383 in Year 1 to 265 in Year 2) on ANC Revisits in Kasimba might require further study to establish the reasons why. However, the sum of ANC revisits in the selected facilities and for both years shows an insignificant increase of 2 in absolute number giving a negative percentage of change of -0.032834 with a P value of -0.032834.

Table 6. ANC Revisits

ANC Revisits					P-Value:
Health Center	2020	2021	Difference	%Change	-0.032834

Kasimba	383	265	-118	-0.182099	
Longe	368	429	61	0.076537	
Lunyati	399	460	61	0.0710128	
Mayukwayukwa1	427	464	37	0.0415264	
Mayukwayukwa2	466	434	-32	-0.035556	
Mulamba RHC	1373	1341	-32	-0.011791	
Namaloba	454	506	52	0.0541667	
Shibanga	303	276	-27	-0.046632	
Grand Total	4173	4175	2	-0.032834	

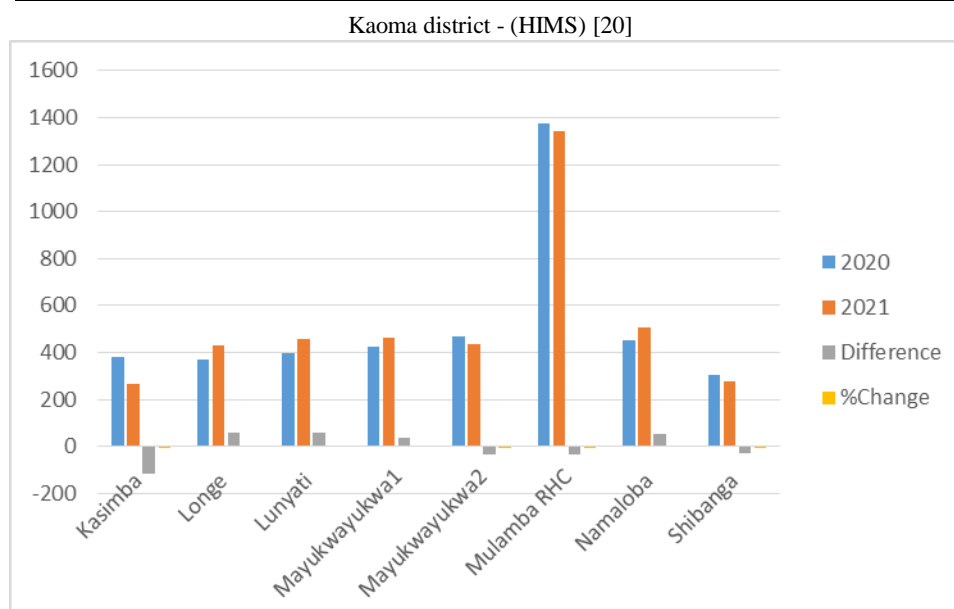


Figure 4. ANC Revisits

Ratio of ANC versus Expected Pregnancies in the selected facilities is displayed on table 7 (Fig 5) below. Similarly, with first antenatal visits, there was no significant difference overall with a percentage of change evaluated

at 0.0044296 and P value of 0.905168. Disaggregated to facilities, data has also depicted very minimal variations within both years.

Table 7. Ratio of ANC versus Expected Pregnancies

Sum of Tot_ANC_Exp. Preg.					P-Value:
Facilities	2020	2021	Difference	%Change	
Kasimba	1.580582	1.230557	-0.3500252	-0.124514	

Longe	1.728079	1.964803	0.23672321	0.0641026	
Lunyati	2.173731	2.675362	0.5016303	0.1034483	
Mayukwayukwa1	1.460357	1.47643	0.01607311	0.005473	
Mayukwayukwa2	1.663324	1.572403	-0.0909212	-0.028099	
Mulamba RHC	2.886625	2.901138	0.01451295	0.0025075	
Namaloba	6.037847	6.645313	0.60746631	0.0478955	
Shibanga	2.027339	1.888797	-0.1385425	-0.035377	
Average	2.444736	2.54435	0.09961462	0.0044296	

Kaoma district - (HIMS) [20]

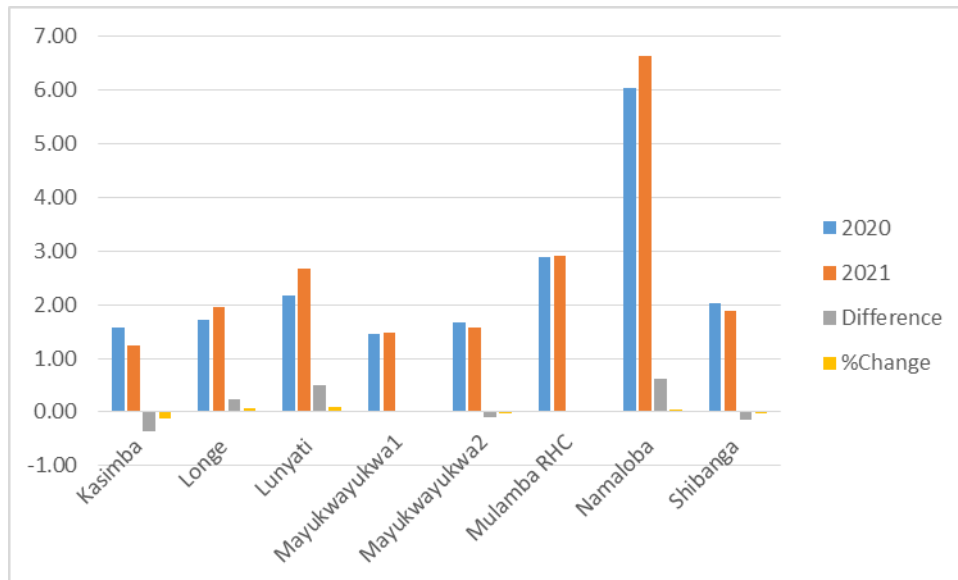


Figure 5. Ratio of ANC versus Expected Pregnancies

Table 8 (Fig 6) below shows the average ANC per facilities during the consecutive two years of study. Differences recorded in both

years show more of decline than increase with an overall negative percentage of change of -0.014005 and P value of 0.734918.

Table 8. Average ANC

Sum of Avg_ANC					P-Value:
Facilities	2020	2021	Difference	%Change	0.734918
Kasimba	2.964103	2.432432	-0.5316701	-0.098521	
Longe	3.573427	3.822368	0.24894185	0.0336599	
Lunyati	3.306358	2.885246	-0.4211125	-0.068013	

Mayukwayukwa1	3.043062	3.592179	0.54911657	0.0827576	
Mayukwayukwa2	3.987179	3.818182	-0.1689977	-0.021651	
Mulamba RHC	3.228896	3.037994	-0.1909022	-0.030462	
Namaloba	3.247525	3.342593	0.09506784	0.0144258	
Shibanga	3.227941	3.075188	-0.1527532	-0.024235	
Average	3.322311	3.250773	-0.0715387	-0.014005	

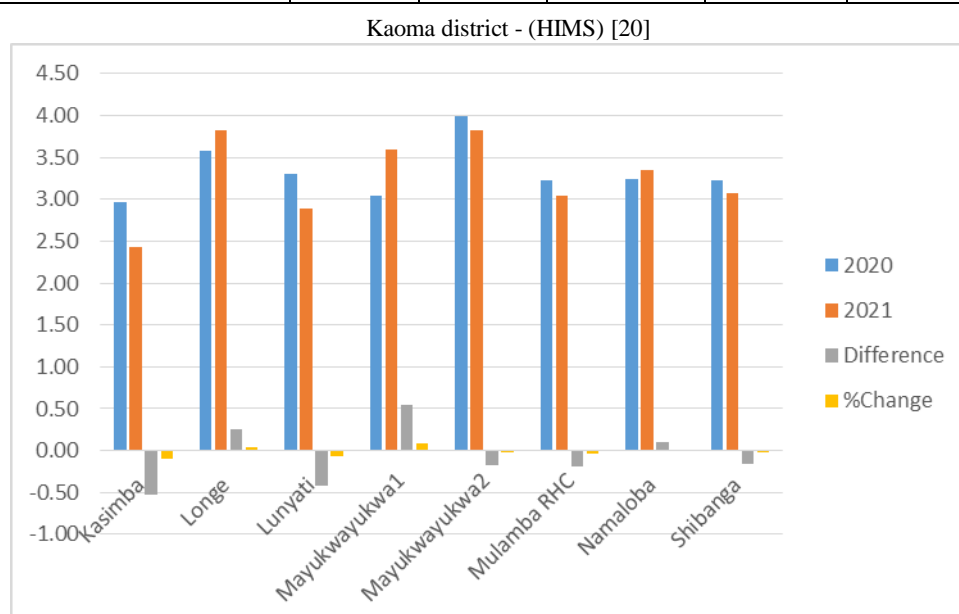


Figure 6. Average ANC

Table 9 provides comparison of percentage changes for first ANC and ANC revisits between the two years of study.

Table 9. Comparison of Percentage Changes in Selected Indicators

Health Facility	Percentage change between 2020 and 2021	
	First ANC	ANC revisit
Kasimba	-3%	-18%
Longe	3%	8%
Lunyati	17%	7%
Mayukwayukwa1	-8%	4%
Mayukwayukwa2	-1%	-4%

Mulamba RHC	3%	-1%
Namaloba	3%	5%
Shibanga	-1%	-5%
Grand Total	15%	-3%

Kaoma district - (HIMS) [20]

Table 10 provides comparison of ANC indicators between 2020 and 2021

Table 10. Comparison of ANC Indicators between 2020 and 2021

Health Facility	2020				2021			
	Avg ANC	1st ANC Cov of Ex Preg	1ANC Cov of Total ANC	Total ANC of Exp Pre	Avg ANC	1st ANC Cov of Ex Preg	1ANC Cov of Total ANC	Total ANC of Exp Pre
Kasimba	2.96	55%	34%	1.58	2.43	53%	41%	1.23
Longe	3.57	50%	28%	1.73	3.82	53%	26%	1.96
Lunyati	3.31	68%	30%	2.17	2.89	96%	35%	2.68
Mayukwayukwa1	3.04	50%	33%	1.46	3.59	43%	28%	1.48
Mayukwayukwa2	3.99	43%	25%	1.66	3.82	43%	26%	1.57
Mulamba RHC	3.23	93%	31%	2.89	3.04	99%	33%	2.90
Namaloba	3.25	193%	31%	6.04	3.34	206%	30%	6.65
Shibanga	3.23	65%	31%	2.03	3.08	64%	33%	1.89
Total	3.32	77%	30%	2.44	3.25	82%	31%	2.54
P-Values of the diff	0.73491	0.8548	0.6041	0.90516				

Kaoma district - (HIMS) [20]

Discussion

The research aim of this study was to explore the impact of SMAG program in increasing utilization of maternal health services especially antenatal visits in the rural areas in general and Kaoma district in particular where skilled health workers may not be readily available.

The specific objective was to increase the rate of antenatal visits to 85% as national standard.

Antenatal Visits

Our study found that, overall, we had 15% increase in pregnant women attending first antenatal clinic with a slight decline of 3% of

them attending subsequent antenatal revisits (Table 3, Fig 1). This speaks to our research question of SMAGs having a positive impact in increasing pregnant women attending ANC visits at health facility. However, substantial variations were observed by facility where these women were attending antenatal clinic. A significant increase of 17% was noted in Lunyati RHC in women attending their first antenatal visit whilst Mayukwayukwa 1 RHC recorded 8% decrease in first antenatal visits. On the other hand, our study found that there was an increase in subsequent antenatal revisit in Lunyati RHC (7%) whilst Kasimba RHC showed 18% reduction for the same indicator (Table 6, Fig 4).

This finding is supported by similar studies conducted elsewhere [4, 6, 20, 10]. The difference may be attributed to the fact that many factors contribute to health facility visitation during antenatal period.

Conclusion

This study demonstrates that SMAG program, as a community intervention, effectively impacts the increase on utilization of facility-based maternal health services. The current findings show that SMAG program has led to an increase of antenatal visits. The study has also shown that number of factors could have contributed to these variations at different levels: individual, interpersonal, facility or community.

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Conflict of Interest

The author declares no conflict of interest.

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