Breakthrough ACTION Liberia: Baseline Report for Adolescents

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Breakthrough ACTION
FOR SOCIAL & BEHAVIOR CHANGE

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Acronyms

ANC	Antenatal care
CCP	Johns Hopkins Center for Communication Programs
CI	Confidence interval
FP	Family planning
GEM	Gender-equitable men
IFA	Iron and folic acid
IPTp	Intermittent preventive treatment of malaria during pregnancy
IPTp3+	Three or more doses of intermittent preventive treatment of malaria during pregnancy
LISGIS	Liberia Institute of Statistics and Geo-Information Services
OR	Odds ratio
RMNCAH	Reproductive, maternal, newborn, child, and adolescent health
SBC	Social and behavior change
TB	Tuberculosis
USAID	U.S. Agency for International Development
WASH	Water, sanitation, and hygiene
WHO	World Health Organization

Overall Study and Findings Summary

Breakthrough ACTION is a global social and behavior change (SBC) project funded by the U.S. Agency for International Development (USAID) to lead SBC programs around the world. The project promotes collective action and encourages people to adopt healthier behaviors. The work harnesses the demonstrated power of communication and integrates innovative approaches from marketing science, behavioral economics, and human-centered design.

In Liberia, the Breakthrough ACTION Liberia project is working to support increased adoption of health behaviors among individuals, families, and communities. Using an integrated health approach, the Breakthrough ACTION Liberia project promotes a full suite of healthy behaviors across the areas of malaria; reproductive, maternal, newborn, child, and adolescent health (RMNCAH); family planning (FP); nutrition; zoonotic diseases; and water, sanitation, and hygiene (WASH)—all areas that have been identified as priority areas by the Liberian Ministry of Health and USAID.

To assess relevant baseline indicators and inform SBC strategy across several health areas and audiences, Breakthrough ACTION Liberia conducted a household survey among men and women of reproductive age in three counties between September and October 2021. The baseline survey is cross-sectional in nature and has the following objectives:

- To identify **key determinants** of health behaviors in the areas of maternal health, maternal and child nutrition, malaria, COVID-19
- **To set benchmarks** for impact assessment of the integrated SBC Breakthrough ACTION Liberia program
- To assess the roles **of gender-equitable norms, social norms, couple communication, and decision making** in the adoption of health behaviors
- To inform a**n SBC strategy across several health areas** and audiences
- To establish baseline measures against which to eventually assess the effects of project activities

This report focuses on female youth who are married/in a union and on single male and female youth. Youth refers to participants who are 15- to 19-years-old. It defines baseline levels of the priority health behaviors along with intermediate outcomes that offer the potential to affect the priority behaviors in one or more health areas, including malaria, RMNCAH, WASH, zoonotic diseases, nutrition, COVID-19, and the Global Health Security Agenda. The intermediate outcomes include couple communication, decision making, knowledge, attitudes, and perceived norms around the priority behaviors, and patient-provider interaction experiences. In addition, the report captures the recall of Breakthrough ACTION Liberia program-related messages and describes how various demographic, psychosocial, cultural, and relational factors are associated with priority health behaviors. There are two other reports that also discuss findings gathered from the baseline study– one with baseline findings from adult men and

women in Liberia and one specifically focus on family planning baseline findings for adult men and women in Liberia.

Data and Methods

The study used a quasi-experimental design. As previously described, USAID supports Breakthrough ACTION's work in 12 of Liberia's 15 counties. Breakthrough ACTION Liberia and its research partner, Research Innovations Hub, collected data in two counties (Bong and Bomi) where USAID supports integrated reproductive, maternal, newborn, child, and adolescent health + malaria interventions, and in one county, Gbarpolu, with no planned Breakthrough ACTION Liberia programming, as a control. These three counties were selected based on their similar estimated contraceptive prevalence among married women: 24.1%–30% (LISGIS, Ministry of Health [Liberia], and ICF, 2021). In addition, Bong is a large county, whereas Bomi is small.

The Breakthrough ACTION Liberia baseline study is a quantitative, cross-sectional household survey that includes the following two respondent groups:

- Married/in union adolescent girls (15–19 years) and
- Unmarried adolescents (girls and boys 15–19 years)

Married/in union adolescent boys were not included in the study because this constitutes a very small percentage of the population and sampling for this group proved difficult. Households were selected through systematic stratified random sampling. Data collected from these surveys were then triangulated to develop a deeper understanding of household practices, preferences, and barriers.

This report focuses on cohabitating female and male adolescents in Liberia. It is one of three baseline study reports that will be submitted to USAID. The other two are a general report on the baseline study findings for adult women and men in Liberia and another general report on the baseline FP and long-acting reversible contraceptives study findings for adult women and men in Liberia.

Sample Size

The adolescent sample was calculated on a maximum variance basis for an integrated approach covering many health areas. UNICEF reports that 36% of girls in Liberia aged 15–19 years are married. Thus, 35% of the sample included married adolescent girls (Liberia Institute of Statistics and Geo-Information Services, Liberia Ministry of Health, & ICF, 2021). Using a maximum variance of p=0.50, alpha of 0.05, and 80% power, we calculated 407 participants per county for a total sample size of 1,221 (407 × 3 counties). We rounded this up to **1,550 adolescent survey participants** (775 girls and 775 boys). Among the 775 girls, 258 were married or in a union.

Bong County composes 75% of the overall population of the three counties, with the other two counties accounting for 12.5% each. Thus, 50% of the respondents were from Bong County, and 25% each from Bomi and Gbarpolu counties. The effect size for the sample was kept low at 0.06 as Breakthrough

ACTION Liberia was planned as a two-year project. With a small effect size, the sample would be larger. The 2019–2020 Demographic and Health Survey sample for Gbarpolu was 337, and Breakthrough ACTION Liberia had a sample of 627 women in Gbarpolu. We therefore concluded the sample was sufficiently powered to detect differences at endline. See Table 0.1 for a summary of the sample characteristics.

Table 0.1. Sample Sizes for Different Respondent Groups, per County

County	Married/in-union adolescent girls (16–19 years)	Unmarried adolescent girls (15–19 years)	Unmarried adolescent boys (15–19 years)
Bong	135	252	375
Bomi	68	126	190
Gbarpolu	68	126	192
Total	**271**	**504**	**757**

Analysis

Bivariate and multivariate analyses were conducted for key background characteristics and influencing factors such as knowledge, social norms, gender norms, access to health services, self-efficacy, and so forth. In addition, determinants of all the key behaviors were further analyzed using logistic regression analysis to identify common determinants among health behaviors as well as locate the specific behavioral determinants. The data will inform program design and assist in the development of SBC strategies focusing on adolescents.

For analysis, the research team is focused on the following:

- Identifying the audience
- Identifying gateway behaviors
- Identifying determinants of each accelerator behavior
- Identifying cross-cutting issues across health areas
- Assessing the role of gender equity norms in the context of health behavior change

Key Findings

Demographics

The distribution of age groups for this sample was relatively normal, although slightly skewed towards older adolescents, as a slightly smaller percentage of participants were 14–15 years old. Furthermore, about 90% or more of female and male participants across all counties had completed primary, secondary, or higher education. Among female and male adolescents, more participants in Gbarpolu had

high vulnerability compared with the intervention counties. Finally, across both gender groups and the three counties, most participants had a low standard of living.

Water, Sanitation, and Hygiene

Ensuring proper hygiene at critical times is an important area for promoting behavior change. Among respondents, washing hands after cleaning children's feces and after cooking were perceived as the least important behavior. Also, while most participants expressed that it is important to wash their hands after using the toilet, many reported either not washing their hands at all or washing them less than seven times after using the toilet in the past week. However, most participants reported using soap and water when washing their hands and keeping the soap in their house. Additionally, many more male adolescents than females reported that their main source of drinking water was a hand pump, regardless of county.

Based on these findings, WASH recommendations include:

- When handwashing is done, people commonly use soap, so programs should focus more on washing hands at the right times (e.g., after using the toilet.)
- Programming could increase knowledge of where to locate hand pumps and self-efficacy of adolescents.
- Programming should look to increase available time for female adolescents to retrieve or utilize pump waters through shifting gender and other related norms.

Lifestyle Factors

Couple Communication

Couple communication was only measured among participants who were in a union or married. Therefore, for adolescents, couple communication was only measured for female adolescents who were in a union or married. Communication was highest when malaria, nutrition, and sanitation were discussed; it was lowest when maternal health and child health were discussed. FP was moderately discussed among couples. Compared with female adolescents, male adolescents perceived higher couple communication around most health topics. Furthermore, more male adolescents perceived more difference of opinion with their partner than did female adolescents.

Decision Making

In Gbarpolu, more male adolescents identified as the primary decision maker for minor decisions than did female adolescents. However, in Bong and Bomi, more female adolescents identified as the primary decision maker for minor decisions than did their male counterparts. Additionally, more females in Bong and Bomi identified as the primary decision maker for major decisions than males.

Among the three counties, Bong had the highest proportion of highly inequitable gender views about sexual relationships, as reported by female adolescents. Whereas for male adolescents, Bong had the lowest proportion of highly inequitable gender views about sexual relationships. Among females, Bong had the highest proportion of gender-inequitable views around reproductive health. For men, Bong had the lowest. A much higher percentage of female adolescents in the intervention counties had highly inequitable gender views around domestic chores and daily life than in the control county. The opposite

was true for male adolescents. Bomi had the highest percentage of male adolescents with highly inequitable gender views around partner violence of the three counties, whereas Bomi had the highest percentage of female adolescents with *equitable* gender views around partner violence of the three counties.

With regard to household support during pregnancy, most female adolescents and even more male adolescents thought that women's daily workload during pregnancy was less than normal. Most female and male adolescents felt that pregnant women received general support during pregnancy. Finally, anywhere from 11.33% to 37.37% of participants across gender and county groups thought that pregnant women in their community had a low supportive environment at home.

Based on these findings, recommendations include:

- The lower levels of couple communication around FP, maternal health, and child health suggest potential areas for stronger or more effective couple communication messaging.

Media Exposure

Mass media consumption among survey respondents was relatively low across all three counties. Among female adolescents, radio and TV exposure was slightly higher in Gbarpolu County than in Bong and Bomi counties. Among male adolescents, radio and TV exposure was slightly higher in Bong County compared with Gbarpolu and Bomi counties. Cell phone use among survey respondents was relatively low across counties, and it was slightly lower among female compared with male adolescents. Across all three counties, male and female adolescents reported a similar likelihood of having one or more phones in the household. Social media use was quite low among survey respondents. Fewer female adolescents used social media than male adolescents.

Family planning campaign exposure appeared to be higher in females in Gbarpolu County than in the intervention counties (34.2% versus 28.1%, respectively), but higher in males in the intervention counties than in Gbarpolu County (34.4% versus 16.3%, respectively). This trend was evident in exposure to both the "Share it, Act it" and Healthy Life campaigns as well. Common sources of exposure of messaging about antenatal care (ANC), postnatal care, respectful maternity care, FP, nutrition, WASH, "Share it, Act it," and the Healthy Life campaign are discussed further in Chapter 5.

Based on these findings, media-related recommendations include:

- Low reported use of mass and social media among adolescents means programs will need to reach this group in other ways, including interpersonal and community-level interventions. These efforts can be combined with mass and social media efforts while recognizing that not all young people have consistent access to phones, radio, and TV.

Malaria

Descriptive statistics show that 68% of female and 52% of male adolescents reported daily use of bed nets the week preceding the survey, highlighting a large discrepancy in use by sex. Among female adolescents who gave birth in the last two years, 82% reported that they slept under a net every night during their previous pregnancy. Among the same group of female adolescents, only 51% in the intervention counties reported completion of three or more doses of intermittent preventive treatment of malaria during pregnancy (IPTp) during their most recent pregnancy. Results from the multivariate model suggest that exposure to the Healthy Life campaign is positively associated with daily bed net use for female adolescents.

Based on these findings, malaria-related recommendations include:

- Programming should focus on better addressing gender inequalities related to bed net use.
- Programming should also focus on increasing the uptake of three or more doses of IPTp during pregnancy.
- The Healthy Life campaign and radio messages were positive predictors of bed net use. These initiatives to prevent malaria seem to be working, and SBC programs should continue to promote bed net use via these channels, emphasizing the importance of every member of the household sleeping under a net.

Maternal Health

This section applied to adolescent girls who had already begun their childbearing journey and had at least one surviving child. Almost all antenatal services such as early ANC and four or more ANC visits, hospital delivery, and postnatal care have very high service uptake. However, respondents reported that they were not told about danger signs and birth complications during their antenatal visits. Additionally, findings from this study demonstrate low levels of birth preparedness, which is a basic preventive step to avert the worst outcomes of an emergency during pregnancy.

Furthermore, both dietary intake and iron and folic acid (IFA) supplementation were low compared with other ANC indicators. Data indicate that many respondents ate less throughout their pregnancy relative to their food consumption prior to pregnancy. In addition, the consumption of IFA tablets for 90 or more days during pregnancy was also low.

Finally, both multivariate models showed the important role of social norms. Adolescents especially feel the pressure of prevalent norms. The study has specified in detail which norms are significantly tied to better maternal outcomes such as birth preparedness and consumption of IFA tablets.

Based on these maternal health findings, recommendations include:

- Given Liberia's high maternal mortality rate, danger signs and birth complications are issues that need to be discussed with the pregnant adolescent at each visit. An overall assessment of the content of the ANC visit should be conducted.

- Birth preparedness needs to be prioritized by facility-based health workers as well as community-based health workers.
- Food insecure households need to be identified and appropriate interventions should be considered. Every SBC effort should be made to ensure that pregnant young women get adequate iron supplementation.

Family Planning

The results of the regression of modern FP use demonstrate a clear relationship between autonomy, couple partnership, and modern contraceptive use. Adolescent females who had high FP self-efficacy were 3.66 times more likely to use a modern contraceptive method than those who reported having low self-efficacy (95% confidence interval [CI]: 1.1, 12.24). Similarly, adolescent females who reported high levels of couple communication were 6.62 times more likely to use a modern FP method than those who reported low levels of communication (95% CI: 3.01, 14.59). A relationship also existed between exposure to FP messages and the use of modern contraception; adolescent females who had been exposed to FP messaging were 2.01 times more likely to use modern contraception than those who had not (95% CI: 1.11, 3.63).

Additionally, this analysis found a significant relationship between services and modern contraceptive use. For example, adolescent females who reported visiting a provider in the last 12 months were 2.55 times more likely to use modern FP than those who did not visit a provider (95% CI: 1.25, 5.2).

Demographically, multiple factors were associated with modern FP use. Female adolescents from urban areas were 1.96 times more likely to use a modern contraceptive method than those from rural areas (95% CI: 1.02,3.70). Adolescent females who had already given birth were similarly 2.20 times more likely to use a modern FP method than those who had not given birth (95% CI: 1.18, 4.08). Finally, those who lived in a household with at least one cell phone were over three times more likely to use a modern contraceptive method (OR: 3.18; 95% CI: 1.15, 8.78).

Based on these findings, FP recommendations include:

- Exposure to FP messages and seeing a FP provider in the past year increase the likelihood of modern FP use among female adolescents. SBC programs should ensure female adolescents know how and where to access FP information and services.

Menstrual Health Management

The results of the multivariate analysis show that older, more formally educated female adolescents with a higher standard of living were more likely to use a sanitary pad during their periods.

Interestingly, female adolescents who more frequently listened to the radio were more likely to use a sanitary pad during their periods than those who never listened to the radio. The relationship was the opposite for TV exposure; female adolescents who watched TV very frequently were less likely to use a

sanitary pad during their periods than those who less frequently or never watched TV. Finally, communication with family members were more likely to use a sanitary pad during their periods than those with low communication with family members.

Based on these findings, menstrual hygiene management recommendations include:

- Menstrual health hygiene varies according to age, standard of living, and education, and SBC programs should ensure that female adolescents know how to manage their periods, even if they cannot afford store-bought products. Radio and interpersonal communication with family members are associated with higher product use and should be harnessed to communicate menstrual hygiene management messages.

COVID-19

More female adolescents washed their hands and wore a mask most times or sometimes because of COVID-19 than did male adolescents. Very few respondents received a COVID-19 vaccine. Among the unvaccinated, less than 40% of female and male adolescents would have probably or definitely gotten the vaccine if they could, except for the over 50% of male adolescents in Gbarpolu County who would have probably or definitely gotten the vaccine if they could.

Multivariate analyses were conducted to determine potential predictors of participating in more than one of the three COVID-19 behaviors (i.e., handwashing, mask-wearing, and physical distancing). For female adolescents, degree of vulnerability, standard of living, radio exposure, and domestic chores/daily life gender norms were significant potential predictors. For male adolescents, education level, radio exposure, and reproductive health gender norms were significant potential predictors. Multivariate analyses were conducted to determine potential predictors of getting a vaccine and being willing to get a vaccine. For female adolescents, education level, domestic chores/daily life gender norms, and practicing more than one prevention behavior were significant potential predictors. For male adolescents, county and domestic chores/daily life gender norms were significant potential predictors.

Based on these findings, COVID-19-related recommendations include:

- Considering the low proportion of people who have received a COVID-19 vaccine and the low willingness of the unvaccinated to get the COVID-19 vaccine, persuasive and audience-specific messaging around COVID-19 vaccination and around COVID-19 prevention behaviors is critical. Breakthrough ACTION could be used to determine what messages would persuade adolescents to get vaccinated.
- The implications of the data are that gender is a cross-cutting issue that should be included in all programming for adolescents. This aspect is also important to consider as participating in at least one COVID-19 prevention behavior was a significant predictor of vaccine acceptance among female adolescents.

Lassa Fever, Rabies, and Bovine Tuberculosis

Overall, the univariate and bivariate analyses highlight the low knowledge and awareness of Lassa fever, rabies, and bovine tuberculosis (TB) across all counties and gender groups in these counties. Bivariate analysis did not demonstrate many factors that were significantly associated with the correct identification of disease transmission, demonstrating that it is essential to improve awareness of these diseases and sources of transmission. One particularly important finding is that a large majority of respondents either did not know the source of bovine TB or associated this with smoking (a pulmonary irritant). This result highlights a need for campaigns to focus on how bovine TB differs from other more commonly known forms of TB.

Based on these findings, recommendations include:

- The overall low awareness of bovine TB, Lassa fever, and rabies demonstrates that the need to improve awareness of these diseases and sources of transmission is widespread.

Recommendations for Integrated Health Programming

Based on all the models conducted in this report, it is evident that there are very important cross-cutting factors to consider when creating integrated programming.

Observations across all the health areas of interest and related analyses demonstrate:

- **Importance of targeted messaging.** All these multivariate analyses have many sociodemographic factors that are predictors of outcomes of interest. These predictors (e.g., urban/rural, education, age group, marital status) can help to better understand what adolescent groups are less likely to participate in health behaviors of interest. Segmented messaging that is responsive to these factors can help to reach these adolescents and make a greater impact on health behaviors and outcomes of interest. Urban/rural residence, educational attainment, and standard of living are common predictors of many outcomes of interest and should be considered when designing messages to improve health behaviors and outcomes among adolescents in Liberia.
- **The importance of family communication when it comes to menstrual hygiene management.** Family communication about menstrual cycles is shown to be a positive predictor of use of sanitary pad among female adolescents, likely because such discussions would destigmatize menstrual health management and encourage parents to support their daughters in accessing and using menstrual hygiene products. As such, menstrual health management programming should consider integrating family involvement and discussion to encourage uptake of sanitary pads among female adolescents in Liberia rather than cloth use or use of other products for menstrual health management.
- **Importance of addressing gender norms.** This study demonstrates the importance of addressing gender norms among adolescents, especially when it comes to COVID-19.

Among female adolescents, those who have more gender-inequitable views around domestic chores, daily life are more likely to accept the COVID-19 vaccine and participate in COVID-19 prevention behaviors. This association could be due to the fact that women who have more gender inequitable views around domestic chores and daily life are more likely to participate in unpaid-caregiving. which puts them at an increased risk of COVID-19 infection and loss of livelihood (UN Women, 2022). As such, they might be more likely to participate in COVID-19 prevention behaviors and be more willing to get the COVID-19 vaccine. Additionally, male adolescents who have more gender-inequitable views around reproductive health are more likely to participate in at least one COVID-19 prevention behavior, which is an association that should be explored to better understand underlying factors. These analyses highlight the impact gender norms have on health outcomes and the need to consider the relationship between gender norms and health behaviors when creating related programs, aiming to create gender transformative programs/activities.

- **Importance of factoring in media exposure.** This study clearly demonstrates the effect of media use on health behaviors and outcomes among adolescents in Liberia. For male adolescents, radio exposure was a positive predictor of bed net use and COVID-19 vaccine acceptance. For female adolescents, it was a positive predictor of using a sanitary pad during periods and participation in at least one COVID-19 prevention behavior. Interestingly, radio exposure was a negative predictor of COVID-19 prevention behaviors for male adolescents, and TV exposure was a negative predictor of using a sanitary pad during periods for female adolescents. Cell phone usage, on the other hand, was a positive predictor for female adolescents using modern FP methods. These varying relationships between media exposure and health outcomes for adolescents in Liberia highlight the importance of knowing what channel to use to reach a specific audience and what messaging to use in these different channels.
- **Effectiveness of mass media messages messaging.** Findings from the bed net multivariate analysis found that recall of the Healthy Life campaign was positively associated with bed net use for adolescent females (OR: 1.7, 95% CI: 1.1–2.3) in the sample. Furthermore, adolescent females who had been exposed to FP messaging were 2.01 times more likely to use modern contraception than those who had not (95% CI: 1.11, 3.63). This finding highlights the effectiveness of past health messaging and programming in improving health behaviors and consequently health outcomes among adolescents in Liberia. It also highlights the importance of considering mass media programming strategies and techniques to optimize current and future programming among adolescents in Liberia.

Introduction

Overview of the Breakthrough ACTION Liberia Integrated SBC Project

Breakthrough ACTION is a global social and behavior change (SBC) project funded by the U.S. Agency for International Development (USAID) to lead SBC programs around the world. Breakthrough ACTION promotes collective action and encourages people to adopt healthier behaviors—from using modern contraceptive methods to sleeping under bed nets and beyond. The work harnesses the demonstrated power of communication and integrates innovative approaches from marketing science, behavioral economics, and human-centered design.

The Johns Hopkins University Center for Communication Programs (CCP) under the Breakthrough ACTION Liberia project supports the increased adoption of health behaviors among Liberian individuals, families, and communities. Using an integrated health approach, Breakthrough ACTION Liberia promotes a full suite of healthy behaviors related to malaria; family planning (FP); reproductive, maternal, neonatal, child, and antenatal health (RMNCAH); menstrual health management; water, sanitation, and hygiene (WASH); zoonotic diseases; COVID-19; and nutrition. These areas have been identified as priority areas by the Liberian Ministry of Health and USAID.

Breakthrough ACTION Liberia primarily works in 12 of Liberia's 15 counties where USAID is active. Breakthrough ACTION Liberia works in both a vertical (only in one health area and/or one messaging channel) and integrated (across multiple health areas and multiple channels) manner. Integrated programs have the advantage of strengthening health systems by delivering multiple health programs, whereas standalone or vertical programs offer rapid implementation in a focused approach.

In Liberia, adopting healthy behaviors remains a critical barrier to improved health outcomes. USAID Liberia has invested in social mobilization and community health and engagement, including outreach activities and facility strengthening. The need for household-level change continues, along with strengthened engagement of traditional leadership structures. To address these needs and contribute to USAID/Liberia's Development Objective 3, Breakthrough ACTION Liberia delivers effective, high-quality SBC activities in Liberia to effect behavior change across a variety of health sectors. Breakthrough ACTION builds on and complements existing knowledge, information, and partner efforts where possible while building capacity of Liberian institutions in SBC.[1]

As described in the next chapter, this study, along with an endline study to be conducted at the conclusion of Breakthrough ACTION Liberia's project, was conducted in three counties. We compared

[1] For more details, see https://thecompassforsbc.org/sites/default/files/BA-Liberia-Urban-Water-Study-Report-2021.pdf.

data on various health areas from two intervention counties (Bong and Bomi) where Breakthrough ACTION will be working with data from a control county (Gbarpolu) where no Breakthrough ACTION work is ongoing.

Report Outline

This study aimed to establish baseline priority health behavior levels for adolescents, along with intermediate outcomes that can affect these priority behaviors in one or more health areas, including malaria, FP, RMNCAH, menstrual health management, WASH, zoonotic diseases, COVID-19, and nutrition. These intermediate outcomes might include couple communication, knowledge, attitudes, care-seeking behaviors, patient–provider interaction experiences, and seeking health information. The baseline also measured underlying factors related to social and gender norms, decision making, and media exposure that promote or constrain key health behaviors among adolescents, as well as perceived norms around priority behaviors. The activity also captured recall of Breakthrough ACTION Liberia program messaging.

Breakthrough ACTION can use the results to determine how various demographic, psychosocial, cultural, and relational factors are linked to the health outcomes of interest among adolescents across all health areas. This information will help in the design of tailored programs for specific counties and audiences. The results also can help assess long-term effects of Breakthrough ACTION Liberia project activities on its target audiences and related shifts over time.

CCP led this activity in close collaboration with Research Innovations Hub, a local research firm that collected data for the baseline survey. The baseline survey is part of a social and behavioral study assessing determinants, prevalence, adoption, and maintenance of key health behaviors. In addition, the survey included in-depth exploration of intermediary factors, such as knowledge, social and gender norms, attitudes, couple communication, access, and utilization of health services. The objectives of the overall baseline study were as follows:

- To measure Breakthrough ACTION Liberia project-related benchmarks in knowledge, attitudes, norms, and practices influencing the adoption and maintenance of priority health behaviors among individuals and communities
- To inform the adaptive management of Breakthrough ACTION Liberia county-specific and audience-specific programs through inputs on the demographic profile of key target audiences, determinants of health behavior, and identification of gateway behaviors and common predictors across health behaviors
- To assess the comparative effectiveness of vertical versus integrated Breakthrough ACTION Liberia SBC health programs in Liberia by comparing one county with malaria-only programming, another with an integrated intervention (RMNCAH plus malaria), and a control county and then examining the level of integration in each county in relation to its performance

- To inform future integrated health SBC programming in Liberia through peer-reviewed publications

The objectives of this specific report are as follows:

- To provide a contextual landscape of various social, cognitive, and behavioral factors related to the health areas of interest among adolescents in Liberia
- To identify predictors of accelerator behaviors by modeling and identifying specific determinants of behaviors that can improve health outcomes in all health areas of interest among adolescents in Liberia
- To provide evidence-based recommendations for integrated adolescent SBC program strategy and assess baseline indicators among adolescents in Liberia

Background: Current Status of Health Areas in Liberia

Malaria

Malaria continues to be a leading cause of morbidity and mortality in Liberia, particularly among adolescents. For childbearing adolescents, the Maternal and Child Survival Program Expansion of Malaria Services project was implemented across 359 health facilities in 11 counties in Liberia to strengthen county health teams' implementation, management, and monitoring of malaria programming and improve national-level support to optimize delivery of critical services (USAID, 2019). This project decreased malaria risk among pregnant women by 40%–50% in five of the 11 counties, but after concluding in 2019, no further efforts seem to have been made in this area. The 2016 Liberia Malaria Indicator included adolescents in its survey data (National Malaria Control Program [Liberia], Ministry of Health, Liberia Institute of Statistics and Geo-Information Services [LISGIS], and ICF, 2017). The report assessed malaria prevention and response methods (e.g., how insecticide-treated net usage affects pregnancy and postnatal care for Liberian women). However, it focused more on adult populations than adolescents.

Family Planning

FP is one of the most cost-effective interventions to prevent maternal, infant, and child deaths (Ndyanabangi, 2020). Adolescents make up 22.5% of the population of Liberia (World Health Organization [WHO], 2019). Furthermore, according to the 2019 Liberia Demographic Health Survey, the birth rate among adolescents is 47.8 per 1,000 women (LISGIS, Liberia Ministry of Health, and ICF, 2021). As such, it is important to educate adolescents in Liberia on sexual behavior and reproductive health. The National Malaria Control Program in Liberia estimates the current rate of contraceptive use to be 21.5% among 15- to 19-year-olds and 39.9% among 20- to 24-year-olds. The most popular places to get contraceptives in Liberia are health clinics and government health centers. A joint report by LISGIS, The Liberia Ministry of Health and Social Welfare, National AIDS Control Program/Liberia, and ICF International (2014) found that the most common reasons for not using contraceptives are

breastfeeding (for married couples) and lack of sexual activity (for unmarried couples). Underlying factors for the reproductive health situation in Liberia include the prevalence of gender-based violence, limited access to sexual reproductive health and FP information/services, poverty, traditional cultural practices, lack of enforcement of existing laws outlawing marriage under the age of 18, and poor awareness of general sexual and reproductive health.

A study conducted in Monrovia found that individual perceptions and attitudes, social networks, and community norms and values contribute to the utilization (or lack thereof) of reproductive health services in Liberia. In addition, the study indicated that education, resistance to peer pressure, and perceived consequences of sexual activity discourage sexual activity (Kpangbala, 2020). Additionally, the belief that contraceptives cause infertility leads to decreased use of sexual and reproductive health services. In terms of social networks, most adolescents in Liberia discuss their sexual activity with peers or siblings in their age group, but encouragement of sexual reproductive health services was mixed among peer groups. Positive parental support was a contributing factor for utilizing sexual reproductive health services, along with community norms and values (e.g., the desire to alleviate poverty and the risk of sexual violence and exploitation) related to adolescents' sexual activity and reproductive health. Finally, gender norms in the country deem men as "decision makers," which limits women's access to sexual reproductive health services and the ability to negotiate for safe sexual practices (Kpangbala, 2020).

Childbearing and Pregnancy

The median age for childbearing adolescents in Liberia is 19 years old. Overall, 30% of women aged 15–19 have given birth, and 25% have had a live birth. Rates of childbearing increase rapidly from 4% at age 15 to 55% at age 19 (LISGIS, Ministry of Health [Liberia], & ICF, 2021)). Rural teenagers tend to start childbearing earlier than other teenagers, which is understandable given the previously discussed risk factors for early pregnancy. Overall, 47% of teenagers in Liberia have no education, making them 20%–31% more likely to start childbearing earlier than their educated peers, and childbearing is 40% more common among those in the three lowest wealth quintiles (Wreh, 2020). The total fertility rate for rural areas (5.5 births per woman) means two more children per mother than in urban areas (3.4 births). Among both urban and rural women, total fertility peaks in the 20- to 24-year-old age group. In 2016, UNFPA (2016) and the Swedish government signed an agreement to increase sexual and reproductive knowledge and skills among adolescents who are pregnant or of childbearing age. This agreement is especially important when considering the potential negative health outcomes of female adolescents who experience early childbearing. Wreh (2020) found that pregnant adolescents, compared with adolescents who delay childbearing, are more likely to experience complications and adverse outcomes, be more restricted in their ability to pursue educational opportunities, and have children who are at increased risk of illness and death. Wreh (2020) also found that the adolescent fertility rate in Liberia is higher among rural (185 per 1,000) versus urban residents (98 per 1000 women).

Nutrition

Malnutrition continues to be a major public health problem in Liberia, exacerbated by structural problems of inequality, poverty, unemployment, food insecurity, and past civil conflicts. While food security status has consistently improved over the years, food intake of 41% of the population still remains below acceptable, meaning people consume minimal to no protein-rich foods, such as legumes, fish, and meat, and high amounts of grains, such as cereals (Government of Liberia, 2010). Additionally, chronic malnutrition affects nearly one-third of all children under five. And anemia among Liberian children aged 6–35 months is high, at 70.8% (LISGIS, Liberia Ministry of Health, and ICF, 2021). Among pregnant women, including pregnant adolescents, anemia is prevalent at 52%. A revised national nutrition policy (2019–2024) seeks to improve and promote SBC for adopting positive attitudes and behaviors to improve nutrition (United Nations, n.d.). The World Food Programme also is attempting to provide safety nets to strengthen food and nutrition security through school feeding and social protection measures to strengthen Liberia's capacity to own and implement hunger solutions and improve nutrition and food security for adolescents (United Nations, n.d.).

Water, Sanitation, and Hygiene

A challenge facing health facilities in Liberia is the lack of basic WASH services. Poor sanitation, hygiene, and lack of water are issues for most schools and communities, putting Liberians at risk for cholera and diarrhea outbreaks (Ministry of Education, 2016). As such, there has been an increase in prevention methods, such as education about water-washed and water-borne disease. However, a lack of access to clean water, toilets, and proper handwashing facilities remain key challenges. Liberian schools can improve sanitation practices by having an organized system for safe drinking water, clean and functional toilet facilities, and proper hygiene before eating and using the latrine. Improving sanitation and hygiene practices can increase school attendance and reduce medical costs and use of health services (Ministry of Education, 2016).

COVID-19 and the Global Health Security Agenda

COVID-19 has affected global health, including the Liberian adolescent population. Adolescent girls attending school had three times the risk of dropout during the COVID-19 pandemic compared with the pre-pandemic period. Consequently, sexual activity increased by 66%, and the adolescent pregnancy rate doubled (Zulaika et al., 2022). Schools also faced closures during the pandemic. To help address this issue, UNICEF and the Global Partnership for Education (2022) supported a $7 million grant for COVID-19 relief. Schools in Liberia have since distributed health kits to students and developed protocols surrounding school health and well-being, allowing schools to reopen and increase WASH-related SBC communication for adolescents, particularly girls. The incidence of minor illnesses and diarrhea among students subsequently decreased, and students were more likely to stay home when ill. This initiative shows how improved access to WASH services can combat serious health issues in Liberian communities.

In terms of other communicable diseases highlighted by the Global Health Security Agenda, such as Lassa fever, rabies, and bovine tuberculosis (TB), no literature was found focusing specifically on the impacts of these diseases on adolescents. Future research could focus on these areas.

Menstrual Health

Similar to other areas of WASH, improved menstrual health can benefit the physical and mental health of Liberian teenagers. According to the Paramount Young Women Community Health Initiative, a community-based organization in Liberia dedicated to educating girls about proper menstrual hygiene practices, period stigma can lead to child marriages and sexual violence, as well as banishment to menstruation tents, loss of education due to missing school, and loss of dignity due to lack of menstrual hygiene products (Miapue, 2021). Girls Excel Liberia reports that one in every four girls in the country misses school owing to menstruation complications, and they can lose up to two weeks per school year, which can lead to dropping out of school entirely (Konton, 2021),

Statistics on how cost and lack of access to menstrual products create barriers for Liberian adolescents are scarce. However, ample personal testimonies indicate that many cannot afford to maintain a sufficient supply (Wleh, 2021). Organizations such as The Borgen Project support initiatives such as the Kennedy-Lugar Youth Exchange and Study Program and the Miss Philanthropy Africa Initiative to deliver free menstrual products to adolescents, educate them about menstrual health, and reduce period poverty (Jones, 2021). This effort is supported by First Lady Clar Weah. Implementing menstrual health interventions through SBC can help improve outcomes for adolescent girls in Liberia.

Methodology

Study Goals

The Breakthrough ACTION Liberia baseline survey collected data on various health behaviors, including those related FP, RMNCH, maternal and child nutrition, malaria, COVID-19, and the Global Health Security Agenda. The survey also assessed the sociodemographic and psychosocial determinants of the behaviors. The goal of the survey was three-fold:

- To provide a better understanding of the factors associated with relevant health behavioral outcomes in Liberia
- To determine the appropriate focus of programmatic activities designed to improve behavioral outcomes
- To yield baseline indicators against which the effects of programmatic activities can be measured

Study Design and Populations of Interest

The Breakthrough ACTION Liberia baseline study used a quasi-experimental design to conduct a quantitative, cross-sectional household survey that included two respondent groups:

- Adolescent girls (15–19 years) in a marriage or union
- Unmarried adolescent girls and boys aged 15–19 years

Married/in union adolescent boys were not included in the study because this constitutes a very small percentage of the population and sampling for this group proved difficult. Data were collected in two intervention counties, Bong and Bomi, where USAID supports integrated programming for RMNCAH plus malaria, and in one control county, Gbarpolu, with no planned USAID or Breakthrough ACTION Liberia programming. These three counties were selected based on their similar rates of contraceptive prevalence (24%–30.0%) among married women (Liberia Demographic and Health Survey, 2019). There are some differences between the two intervention counties: Bong is a larger county than Bomi and is primarily Christian (95%), whereas Bomi has a substantial Muslim population (55%).

The survey specifically targeted in-union women of reproductive age (20–49 years), their spouse (ages 20–55 years), unmarried female adolescents (ages 15–19 years), unmarried male adolescents (ages 15–19 years), and in-union female adolescents (16–19 years). This report presents findings from the female and male adolescents.

Households were selected via systematic, stratified, random sampling. Data collected from these surveys were triangulated to develop a deeper understanding of household practices, preferences, and barriers.

Sample Size

The adolescent sample was calculated on a maximum variance basis for an integrated approach covering many health areas. The gender and county proportions of this overall sample size were determined using existing and current gender and county proportions. Using a maximum variance of p=0.50, alpha of 0.05, and 80% power, we calculated 407 participants per county for a total sample size of 1,221. We rounded this up to **1,550 adolescent survey participants** (775 girls and 775 boys). According to UNICEF, 36% of girls in Liberia aged 15–19 years are married (UNICEF, 2019). Thus, 35% of the female adolescent sample initially included married adolescent girls to ensure good representation of childbearing female adolescents (LISGIS, Liberia Ministry of Health, & ICF, 2021). Among the 775 girls, 258 were expected to be married. However, during recruitment, we found that "marriage" norms and "cohabiting" norms cross over to single individuals; that is, we can find childbearing occurring in any of these three categories. As such, distribution of married/in-union female adolescents and single female adolescents differed from our original intended sample to ensure representation of childbearing female adolescents.

Bong County accounts for 75% of the overall population of the three counties, with the other two counties accounting for 12.5% each. Thus, 50% of respondents in the sample were from Bong County and 25% were from Bomi and Gbarpolu counties each. See Table 2.1 for a summary of the sample characteristics.

Table 2.1 Achieved Sample Sizes for Different Respondent Groups, by County

County	Adolescent Girls in Marriage or Union (16–19 years)	Unmarried Adolescent Girls (15–19 years)	Unmarried adolescent boys (15–19 years)	TOTAL
Bong	215	170	375	760
Bomi	105	98	190	393
Gbarpolu (control)	108	85	192	385
Total	**428**	**353**	**757**	**1,538**

The achieved sample sizes were 781 female adolescents (a little higher than the target of 775) and 757 male adolescents (very close to the target of 775.

Questionnaire Development and Pretesting

CCP developed the survey instruments and provided them to the local research firm, Research Innovations Hub. Many questions had been previously used in the Demographic and Health Surveys, while others were original to the baseline study, such as questions on social norms, couple communication, decision making, and household environment. Before data collection began, Research Innovations Hub pretested the survey instruments in a community outside Monrovia, made any necessary modifications, and then translated and back-translated the instruments.

Recruitment and Data Collection

CCP and Research Innovations Hub trained data collectors in the first week of June 2021. However, owing to a delay in institutional review board approval from Johns Hopkins University, data were collected from August to September 2021. The study also received local institutional review board approval in Liberia from the University of Liberia-PIRE Africa.

Enumerators used a recruitment script to conduct a short screening with prospective participants to determine their age and eligibility. Consent and data collection were conducted in private using the appropriate approach (see Annex 2: Checklist for Selection of Consent Procedures). For unmarried participants aged 15–17 years, a parent or guardian was identified, and the data collector gave the parent or guardian the option of reading the informed parental consent form or having it read aloud. If the parent provided informed consent, the child was given the opportunity to provide oral informed assent.

Surveys took 60–90 minutes to conduct. Participants received USD 1 in phone credit for the time they spent responding to the surveys.

Data Management

The research team used a Google app installed on encryption-protected electronic devices to collect data. Personal identification information was collected on paper during household listing and recruitment in the enumeration areas. The research team destroyed all personal identifying information at the end of each day of data collection and after completing all interviews in that area. The data were fully de-identified before analysis. The dataset will be available in the USAID online data repository.

Data Analysis

The analysis focused on the following goals for the sample populations (girls aged 15–19 and unmarried boys aged 15–19 years):

- Identify key determinants of bed net use, modern FP use, birth preparedness, use of IFA tablets, use of sanitary napkins or Kotex during periods, knowledge of zoonotic diseases, COVID-19 prevention behaviors, and COVID-19 vaccine acceptance
- Set benchmarks for evaluation of impact
- Assess the roles of gender-equitable norms, social norms, and couple communication in the adoption of priority behaviors
- Identify selected audience groups for promotion of different health behaviors areas

Bivariate and multivariable analyses were conducted. The bivariate analyses involved comparisons of priority behaviors across age, sex, education level, marital status, region, and other key groupings. Using multivariable logistic regression, we first examined the strength of associations between program participation, reach or recall, and key variables (e.g., knowledge, attitudes, norms, access to health

services efficacy, and practice of priority behaviors). Subsequently, we estimated multivariable logistic regression models to assess the association of priority behaviors with sociodemographic, social, and exposure variables.

The results will inform program design and assist in the development of SBC strategies. All analyses were performed using STATA16.

Characteristics of Study Participants

Overall, 781 female adolescents (385 from Bong, 203 from Bomi, and 193 from Gbarpolu), and 757 male adolescents (190 from Bomi, 375 from Bong, and 192 from Gbarpolu) were interviewed.

Demographics

We observed notable differences between girls and boys. Across all three counties, distribution of age groups was relatively similar. However, compared with other age groups, a slightly larger percentage of adolescents were aged 16 to 17 years; the 14–15 age group had the lowest percentage of participants.

Most participants had completed their primary education. Among male adolescents, Gbarpolu had the highest rate (31.8%) of completing secondary schooling, compared with Bong (24.3%) and Bomi (20.5%). Among female adolescents, Bomi had the highest rate (34.0%), compared with Bong (21.3%) and Gbarpolu (15.5%).

Most female adolescents in all three counties identified as Christian (90.6% in Bong, 53.2% in Bomi, and 85.0% in Gbarpolu). A noticeably higher percentage of female adolescents in Bomi (46.8%) identified as Muslim, compared with Bong (3.1%) and Gbarpolu (18.2%). Most male adolescents in Bong (90.7%) and Gbarpolu (82.3%) identified as Christian, whereas most in Bomi (64.7%) identified as Muslim.

A vulnerability index was constructed using four circumstances experienced in the 12 months prior to the survey: lack of enough food to eat, lack of shelter, unable to afford to send children to school, and lack of money to buy medicines or medical treatment. This index was divided into low, medium, and high vulnerability groups. Participants in Gbarpolu had the highest vulnerability (66.8% among females and 77.6% among males), compared with the intervention counties (38.8% among females and 50.6% among males).

The Standard of Living Index was constructed based on household ownership of 13 items: electricity; working radio; working television; nonmobile telephone; mobile telephone; iron; refrigerator; table; chair; bed with cotton, sponge, or spring mattress; flush or pour flush toilet; pit latrine; and the vulnerability index. This index was divided into three categories of low, medium, and high standards of living. Across both gender groups and the three counties, most participants had a low standard of living. Participants in Bomi had the smallest percentage of participants with a low standard of living (62.6% female and 65.8% male) out of the three counties. Table 3.1 summarizes the results.

Table 3.1 Demographics of Study Respondents for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=192 %
Age								
14–15	27.5	22.7	25.9	24.4	23.2	22.1	22.8	12.5
16–17	41.3	37.4	40	37.8	40.0	40.5	40.2	52.6
18–19	31.2	39.9	34.2	37.8	36.8	37.4	37.0	34.9
Education								
No formal education	10.9	4.9	8.8	8.8	8.3	10.00	8.9	6.3
Primary	67.8	61.1	65.5	75.6	67.5	69.5	68.1	62.0
Secondary or higher	21.3	34	25.7	15.5	24.3	20.5	23.0	31.8
Religion								
Christian (Orthodox, Protestant, Catholic, etc.)	90.6	53.2	77.7	85	90.4	35.3	71.8	82.3
Muslim	3.1	46.8	18.2	14	3.7	64.7	24.3	15.6
Other (traditional)	6.2	0	4.1	1	5.9	0.0	3.9	2.1
Marital status								
Single/never married	2.3	2.5	2.4	1.6	100.0	100.0	100.0	100.0
Cohabitating	15.8	6.9	12.8	25.9	0.0	0.0	0.0	0.0
Married or in union	81.8	90.6	84.9	72.5	0.0	0.0	0.0	0.0
Vulnerability index[a]								
Low	6.5	18.2	10.5	4.1	1.8	18.4	7.4	5.7
Moderate	45.7	60.1	50.7	29	41.3	43.4	42.0	16.7
High	47.8	21.7	38.8	66.8	56.8	38.4	50.6	77.6

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=192 %
Standard of living index[b]								
Low	75.8	62.6	71.3	79.3	79.2	65.8	74.7	76.7
Moderate	23.1	35.5	27.4	19.2	20.3	34.2	25.0	19.8
High	1	2	1.4	1.6	0.5	0.0	0.4	1.6

[a] The vulnerability index (low, ≤4; moderate, 5–7; and high, 8–12) was constructed using the following four circumstances experienced by the participant in past 12 months: lack of enough food to eat, lack of shelter, unable to afford to send children school, and lack of money to buy medicines or medical treatment.

[b] The standard of living index (low, ≤6; moderate, 7–8; and high, ≥9) was constructed based on household ownership of 13 items (electricity, working radio, working television, nonmobile telephone, mobile telephone, iron, refrigerator, table, chair, a bed with mattress, flush or pour toilet, pit latrine, and the vulnerability index).

Water, Sanitation, and Hygiene

Regardless of county, gender, and marital status, most people did not have a handwashing station within or near the household. In a comparison of all three counties, more female (11.9%) and male adolescents (12.5%) in Gbarpolu had nearby handwashing stations, compared with those in Bong and Bomi. Of the small percentage who reported having a handwashing station at or near their house, most had only one station at their house, and almost none reported having two or more stations (Table 3.2).

Table 3.2 Handwashing Stations Around House for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=192 %
112. Do you have a handwashing station within/near the household?								
No	96.6	91.6	94.9	88.1	93.9	94.2	94.0	87.5
Yes	3.4	8.4	5.1	11.9	6.1	5.8	6.0	12.5
119. How many hand washing stations do you have at your house?								
0	96.6	95.1	84.4	89.1	95.2	93.7	94.7	88.0
1	3.1	3.9	8.2	10.4	4.5	6.3	5.1	10.9

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=192 %
2	0.3	1	1.9	0.5	0.3	0.0	0.2	1.0

Regardless of whether participants had a handwashing station near or at their household, most used water and soap when washing their hands. Among female adolescents, more participants from the intervention counties washed with soap and water (87.8%) than in Gbarpolu (75.1%). The opposite was true for male adolescents; more boys in Gbarpolu (88.0%) washed their hands with water and soap than in the intervention counties (77.5%). Most participants kept the soap for washing hands after using the toilet inside their house. Among unmarried female adolescents, a higher percentage in the intervention counties kept soap inside their house (84.4%), compared with the control county (75.1%). Among male adolescents, a higher percentage in Gbarpolu kept their soap inside their house (74.5%), compared with those in the intervention counties (68.3%). Table 3.3 summarizes the results.

Table 3.3 Handwashing with Soap for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=192 %
113. What do you normally use to wash your hands?								
Water and soap	88.6	86.2	87.8	75.1	76.3	79.5	77.5	88.0
Other	11.5	13.8	12.3	24.9	23.7	20.5	22.6	12.0
120. Where do you keep the soap that you used to wash your hands after using the toilet?								
Inside house	84.4	84.2	84.4	75.1	66.7	71.6	68.3	74.5
Outside house	9.6	5.4	8.2	7.8	12.3	10.0	11.5	15.6
Both	1	3.4	1.9	0.5	4.8	0.0	3.2	1.6
Don't use soap	4.7	6.9	84.4	16.1	14.7	18.4	15.9	6.3

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=192 %
Other	0.3	0	8.2	0.5	1.6	0.0	1.1	2.1

A notably higher percentage of unmarried female adolescents in Gbarpolu (15.3%) never washed their hands after using the toilet in the seven days prior to the survey, compared with those in the intervention counties (7.4%). The opposite was true for male adolescents: a higher percentage of male adolescents in the intervention counties (16.6%) did not wash their hands after using the toilet than those in Gbarpolu (7.3%).

Only female adolescents were asked about their handwashing habits after cooking; again, a much higher percentage of those in Gbarpolu (32.6%) never washed their hands after cooking in the seven days prior to the survey, compared with those in the intervention counties (18.3%). More female adolescents in Bomi (69.9%) washed their hands one to seven times after cooking in the past seven days than in Bong (52.1%) and Gbarpolu (42.5%).

A notably higher percentage of female adolescents in Gbarpolu (32.1%) never washed their hands before eating in the seven preceding days, compared with the intervention counties (13.6%). Relatively similar percentages of male adolescents in all three counties did not wash their hands before eating in the past seven days. Among female adolescents, more in Bong (39.7%) washed their hands more than seven times before eating within the past seven days than in Bomi (22.5%) and Gbarpolu (28.5%). Among male adolescents, a higher percentage of those in Bomi (40.6%) washed their hands more than seven times before eating in the past seven days than in Bong (29.9%) and Gbarpolu (32.3%). Table 3.4 summarizes the results.

Table 3.4 Handwashing Habits for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=192 %
114. In the last seven days, how many times	(371) %	(193) %	(564) %	(189) %	(375) %	(190) %	(565) %	(192) %

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=192 %
did you wash your hands with soap after using the toilet?								
0	8.6	5.2	7.4	15.3	15.2	20.2	16.6	7.3
<7	65.2	67.9	66.1	66.1	62.7	44.3	57.2	77.6
7+	26.1	26.9	26.4	18.5	22.1	35.5	26.2	15.1
116. In the last seven days, how many times did you wash your hands with soap before cooking?	(380) %	(173) %	(553) %	(193) %	—	—	—	—
0	20.5	13.3	18.3	32.6	—	—	—	—
<7	52.1	69.9	57.7	42.5	—	—	—	—
7+	27.4	16.8	24.1	24.9	—	—	—	—
117. In the last seven days, how many times did you wash your hands with soap before eating?	(380) %	(173) %	(553) %	(193) %	(375) %	(190) %	(565) %	(192) %
0	16.3	7.5	13.6	32.1	19.5	23.5	20.7	20.8
<7	43.9	69.9	52.1	39.4	50.7	35.8	46.0	46.9
7+	39.7	22.5	34.4	28.5	29.9	40.6	33.3	32.3

Most participants thought it was important to wash their hands after using a toilet, ranging from 85.1% of male adolescents in Bong to 97.0% of female adolescents in Bomi. The lowest percentages of participants who thought it was important to wash their hands after cleaning child's feces ranged from 2.1% of male adolescents in Gbarpolu to 53.9% of female adolescents in Gbarpolu, a noticeable gender difference (Table 3.5).

Table 3.5 Handwashing Attitudes for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=192 %
118.1 Do you think it's important to wash your hands after using the toilet?								
No	8.3	3	6.5	10.9	14.9	14.7	14.9	8.9
Yes	91.7	97	93.5	89.1	85.1	85.3	85.1	91.2
118.2 Do you think it's important to wash your hands after cleaning child's feces?								
No	84.7	62.1	76.9	62.2	89.1	97.4	91.9	97.9
Yes	15.3	37.9	23.1	37.8	10.9	2.6	8.1	2.1
118.3 Do you think it's important to wash your hands before cooking?								
No	59	61.1	59.7	46.1	84.8	91.1	86.9	95.8
Yes	41	38.9	40.3	53.9	15.2	9.0	13.1	4.2
118.4 Do you think it's important to wash your hands before eating?								
No	45.2	39.9	43.4	40.4	33.9	57.9	42.0	58.9
Yes	54.8	60.1	56.6	59.6	66.1	42.1	58.1	42.1
118.5 Do you think it's important to wash your hands after other work?								
No	35.1	24.6	31.5	35.8	34.1	43.7	37.4	37.5
Yes	64.9	75.4	68.5	64.2	65.9	56.3	62.7	62.5

A much higher percentage of male adolescents than female adolescents reported getting their drinking water mainly from a hand pump. Among female adolescents, a much higher percentage in Bong (30.9%) got their water from a hand pump than in Bomi (22.1%) or Gbarpolu (21.2%). Among male adolescents, a noticeably higher percentage in Bomi (23.7%) got their water from a hand pump than in Bong (19.7%) and Gbarpolu (13.0%). In Gbarpolu and Bong, a much higher percentage of male adolescents (64.4% and 56.5%, respectively) than female adolescents (37.8% and 41.0%) used toilets. The biggest discrepancies in toilet use were found in Bomi, where 72.9% of female adolescents used toilets, compared with only 29.1% of male adolescents (see Table 3.6).

Table 3.6 Water Source and Toilet Facility Use for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=192 %
122. Where is the main place you get your drinking water?								
Hand pump, tube well, or borehole	30.9	22.7	28.1	21.2	80.3	76.3	78.9	87.0
Other	69.1	77.3	71.9	78.8	19.7	23.7	21.1	13.0
123. What kind of toilet facility do members of your household usually use?								
Bush	59	27.1	48	62.2	43.5	70.9	52.7	35.6
Toilet	41	72.9	52	37.8	56.5	29.1	47.3	64.4

Conclusions and Recommendations

The age group distribution in the sample was relatively normal, although it was slightly skewed because there was a somewhat smaller percentage of participants aged 14–15 years old. Furthermore, about 90% or more of female and male participants across all counties had completed primary, secondary, or higher education. Among female and male adolescents, more participants in Gbarpolu had high vulnerability than in the intervention counties. Finally, across both gender groups and the three counties, most participants had a low standard of living.

Washing hands after cleaning children's feces and after cooking are perceived as the least important handwashing behaviors. In addition, while most participants considered it important to wash their hands after using the toilet, many reported either not washing their hands at all or washing them less than seven times after using the toilet in the past week. This discrepancy could be explained by a disconnect between attitude/knowledge and behavior; knowledge is usually not sufficient for behavior change. Furthermore, a comprehensive, theory-based approach that targets other social and cognitive factors related to handwashing could prove effective. Additionally, most participants reported washing their hands with soap and water when handwashing, and keeping the soap in their house. These responses suggest that programming might not need to focus too much on soap use during handwashing, but rather place greater focus on washing hands at the right times (e.g., after using the toilet).

Compared with female adolescents, many more male adolescents reported that their main source of drinking water was a hand pump, regardless of county. Male adolescents might be able to spend more of their day in areas closer to hand pumps than female adolescents. Research could examine where hand pumps are located in communities relative to where female and male adolescents spend most of their day. If a significant difference is found, programs could work to place hand pumps in locations more accessible to female adolescents. Furthermore, programming could increase knowledge of where to locate hand pumps and self-efficacy of adolescents, especially female adolescents, to access water when needed.

Factors Associated with Health Behaviors—Couple Communication, Household Decision Making, Gender and Social Norms, and Household Environment

Examining the role of social factors in determining health behaviors is crucial for countries with cohesive social networks and where community and family are prioritized over the individual. Social factors are complex, multidimensional, and challenging to measure. The Breakthrough Action Liberia baseline survey aimed to include a range of social factors to measure various social dimensions, including household (e.g., couple communication, decision making, and household environment) and community (e.g., social norms, gender restrictive norms, and social capital) factors.

Couple Communication

The survey asked 428 married or in-union female adolescents about their communication patterns with their partners. Since single male adolescents did not have partners, this question did not apply to them. We gauged couples' general pattern and quality of communication by asking three main questions:

1. From 0 to 100, how much do you talk with your partner? (Frequency of communication)
2. From 0 to 100, how freely do you talk with your partner? (Open communication)
3. From 0 to 100, how much of a difference of opinion do you have with your partner?

We also asked to what extent they discussed six health areas (FP, pregnancy, sanitation, nutrition, malaria, and child health) with their partners. These responses were then combined to determine couple communication (see Table 4.1).

Table 4.1. Rates of Frequent Couple Communication, by Topic for Female Adolescents

	Female Adolescents			
	Intervention			**Control**
	Bong N=215 %	Bomi N=215 %	Total N=320 %	Gbarpolu N=108 %
Couple communication index of all topics among those who are married or in union				
Low communication	31.2	47.6	36.6	25.9
Medium communication	25.6	38.1	29.7	42.6
High communication	43.3	14.3	33.8	31.5

Overall Couple Communication

Overall, more than two-thirds of married female adolescents reported high partner communication frequency and many perceived this communication to be open (freely communicated). When asked about differences of opinion, most female adolescents in the intervention group (64.8%) reported very few, and about half of female adolescents in the control group (53.1%) reported a low level of disagreement with their partners (Table 4.2).

Table 4.2 Overall Couple Communication for Female Adolescents

	Female Adolescents			
	Intervention			**Control**
	Bong N=215 %	Bomi N=215 %	Total N=320 %	Gbarpolu N=108 %
Q502: How much do you talk with your partner	(182) %	(77) %	(259) %	(96) %
0–33 (Low)	9.4	11.7	10.4	10,4
34–66 (Medium)	17.5	18.2	17.8	17.7
67–100 (High)	73.1	70.1	72.2	71.9
Q503: How much do you talk freely with your partner	(182) %	(77) %	(259) %	(96) %
0–33 (Low)	11.0	11.7	11.2	5.2
34–66 (Medium)	14.3	14.3	14.2	16.7
67–100 (High)	74.7	74.0	74.5	78.1
Q504: Difference of opinion with partner	(182) %	(77) %	(259) %	(96) %
0–33 (Few differences)	64.8	75.3	68.0	53.1
34–66 (Some)	23.1	20.8	22.4	20.8
67–100 (Many)	12.1	3.9	9.7	26.0

Data Conclusions

- Female adolescents reported high communication with partners and perceived open communication with their partner.

Household Decision Making

Respondents were asked to identify the primary and secondary decision maker for eight household decisions (four minor and four major decisions). Both female and male adolescents were asked about household decision making in this survey as this question was not dependent on marital status.

CCP has been working on improving measurements for couple communication and decision making since 2016, beginning with a baseline survey for the Communication for Health Project in Ethiopia. The qualitative data on couple communication and decision making from this study indicated that couple communication and decision making were gendered, with male dominance for both processes.

One of the problems with decision making scales used by the Demographic and Health Survey and other surveys is that they do not predict behavioral or other outcomes owing to a lack of variance. This lack of variance is due to the "both" category or the joint decision-making category when the processes of both couple communication and decision making are likely gendered.

Therefore, we modified the response scale for decision making by asking participants to select the primary and secondary decision makers for minor and major household decisions. They had the option of picking themselves, their partner (if relevant), or other. This approach resulted in better measurement and prediction of health behaviors in the Liberia data.

Minor Decision Making

The four minor decisions involved buying soap for the house; buying fish, meat, or vegetables; buying new clothes for their children; and what to cook for dinner. Table 4.3 summarizes the results.

Table 4.3 Female and Male Adolescent Participants Who Identified Themselves as Primary or Secondary Household Minor Decision Maker

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=388 %	Bomi N=190 %	Total N=785 %	Gbarpolu N=196 %
Buying soap for the house								
Primary decision maker	6.5	8.9	7.3	33.7	9.8	35.3	17.4	10.9
Secondary decision maker	26.2	21.2	24.5	24.4	11.2	8.4	10.3	12.0
Buying fish/meat/vegetables								
Primary decision maker	6.5	9.4	7.5	31.6	2.9	32.6	12.9	9.4

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=388 %	Bomi N=190 %	Total N=785 %	Gbarpolu N=196 %
Secondary decision maker	26.0	21.7	24.5	23.3	12.3	7.9	10.6	9.9
Buying new clothes for the children								
Primary decision maker	5.5	11.3	7.5	31.1	6.4	30.5	14.5	9.4
Secondary decision maker	25.5	20.7	23.8	20.2	9.3	3.7	7.4	5.2
Deciding what to cook for dinner								
Primary decision maker	9.1	17.2	11.9	39.4	4.0	30.5	12.9	5.7
Secondary decision maker	32.5	20.7	28.4	17.6	9.3	6.8	8.5	5.7

Buying Soap for the House

Very few female adolescents in the intervention group (7.3%) identified themselves as the primary decision maker for buying soap for the house in contrast to the control county (33.7%). Few male adolescents in Bong (9.8%) and Gbarpolu (10.9%) identified as the primary decision maker for buying soap, compared with a much higher percentage in Bomi (35.3%).

Buying Fish, Meat, or Vegetables

Very few female adolescents in the intervention group (7.5%) identified as the primary decision maker for buying fish, meat, and vegetables, compared with the control group (31.6%). Few male adolescents in Bong (2.9%) and Gbarpolu (9.4%) identified as the primary decision maker, compared with male adolescents in Bomi (32.6%), for this decision.

Buying New Clothes for Children

Very few female adolescents in the intervention group (7.5%) identified as the primary decision maker regarding buying new clothes for their children, whereas a much higher percentage of female adolescents in the control group (31.1%) identified as such. Few male adolescents in Bong (6.4%) and Gbarpolu (9.4%) identified as primary decision makers for children's clothing, whereas a much higher percentage of male adolescents in Bomi (30.5%) identified as such.

Deciding What to Cook for Dinner

Very few female adolescents in the intervention group (11.9%) identified as the primary decision maker for what to cook for dinner, compared with female adolescents in the control group (39.4%). A low

percentage of male adolescents in Bong (4.0%) and Gbarpolu (5.7%) identified as the primary decision maker, compared with a notably higher percentage of male adolescents in Bomi (30.5%).

Major Decision Making

The four major decisions involved how many children to have, whether to use contraceptives, going to the primary health center if ill, and taking a child to the primary health center if they are ill. Table 4.4 summarizes the results.

Table 4.4 Female and Male Adolescent Participants Who Identified Themselves as Primary or Secondary Household Major Decision Maker

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=388 %	Bomi N=190 %	Total N=785 %	Gbarpolu N=196 %
How many children to have	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
Primary decision maker	9.4	27.1	15.5	42.0	7.7	31.6	15.8	16.2
Secondary decision maker	25.5	16.3	22.3	18.1	4.0	4.2	4.1	3.1
Deciding whether to use a contraceptive method	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
Primary decision maker	13.5	24.6	17.4	48.2	7.2	30.0	14.9	17.7
Secondary decision maker	24.9	14.8	21.4	17.1	6.1	6.8	6.4	4.7
Going to the health center if you're ill	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
Primary decision maker	5.5	12.8	8.0	38.9	10.7	33.2	18.2	13.0
Secondary decision maker	30.4	19.2	26.5	17.6	8.3	6.3	7.6	4.2
Taking the child to the health center if they are ill	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=388 %	Bomi N=190 %	Total N=785 %	Gbarpolu N=196 %
Primary decision maker	7.0	13.3	9.2	37.3	2.9	25.8	10.6	7.3
Secondary decision maker	24.2	18.2	22.1	15.5	7.7	6.8	7.4	4.2

How Many Children to Have

Very few female adolescents in Bong (9.4%) identified themselves as the primary decision maker regarding how many children to have, whereas a much higher percentage of female adolescents in Bomi (27.1%) and an even higher percentage in Gbarpolu (42.0%) identified as such. A low percentage of male adolescents in Bong (7.7%) and Gbarpolu (16.2%) identified as the primary decision maker regarding how many children to have, whereas a notably higher percentage of male adolescents in Bomi (31.6%) identified as such.

Using a Contraceptive Method

Very few female adolescents in Bong (13.5%) identified as the primary decision maker on the use of a contraceptive method, whereas a much higher percentage of female adolescents in Bomi (24.6%) and an even higher percentage in Gbarpolu (48.2%) identified as such. Very few male adolescents in Bong (7.2%) identified as the primary decision maker regarding the use of a contraceptive method, whereas a much higher percentage of male adolescents in the Gbarpolu (17.7%) and an even higher percentage in Bomi (30.0%) identified as such.

Going to the Health Center if Ill

Very few female adolescents in the intervention group (8.0%) identified as the primary decision maker about going to a health center if they are ill, whereas a much higher percentage in Gbarpolu (38.9%) identified as such. A low percentage of male adolescents in Bong (10.7%) and Gbarpolu (13.0%) identified as the primary decision maker on going to a health center if they are ill, whereas a notably higher percentage of male adolescents in Bomi (33.2%) identified as such.

Taking a Sick Child to a Health Center

Very few female adolescents in Bong (7.0%) identified as the primary decision maker for taking a child to the health center if they are unwell, whereas a much higher percentage of female adolescents in Bomi (13.3%) and a much higher percentage in Gbarpolu (37.3%) identified as such. Very few male adolescents in Bong (2.9%) identified as the primary decision maker for taking a child to the health center if they are unwell, whereas a slightly higher percentage of male adolescents in the Gbarpolu (7.3%) and a much higher percentage in Bomi (25.8%) identified as such.

Data Conclusions

- In the intervention group, more male adolescents than female adolescents identified as the primary decision maker for minor decisions, whereas in the control group, more female adolescents than male adolescents identified as the primary decision maker for minor decisions.
- In the control group, more female adolescents than male adolescents identified as the primary decision maker for major decisions.
- Examining how these two data points change over time may provide important insights on behavior change approaches implemented in this project and future programming.

Gender and Social Norms

The baseline study measured gender norms among adolescents using the gender-equitable men (GEM) scale. The GEM scale has 24 items divided into four subdomains. It has been extensively validated (Kapadia-Kundu, 2022; Pulerwitz & Barker, 2008). Gender equity is a critical cross-cutting variable in behavioral research that is associated with crucial health behaviors. The 24-item GEM scale measures perceived norms related to gender inequity. Responses are captured using a ten-point Likert scale. For example, a participant who agrees 80% with the statement, "There are times when a woman deserves to be beaten," shows high support (67–100) for gender-inequitable norms, whereas 10% agreement indicates low support for the inequity. Subdomains are violence, sexual relationships, reproductive health, and domestic chores and daily living (Table 4.5). Married and unmarried female adolescents and unmarried male adolescents were asked GEM scale questions regardless of marital status because having attitudes around gender norms is not only applicable to individuals who are married or in a union.

Table 4.5 Statements and Subdomains of the GEM Scale Used to Measure Discriminatory Gender Norms in Liberia

	GEM Scale Statement
Sexual relationships	1. It is the man who decides what type of sex to have.
	2. Men are always ready to have sex.
	3. Men need sex more than women do.
	4. A man needs other women even if things with his wife are fine.
	5. You don't talk about sex, you just do it.
	6. It disgusts me when I see a man acting like a woman.
	7. A woman should not initiate sex.
	8. A woman who has sex before she marries does not deserve respect.
Reproductive health	9. Women who carry condoms on them are easy.
	10. Men should be outraged if their wives ask them to use a condom.

	11.	It is a woman's responsibility to avoid getting pregnant.
	12.	Only when a woman has a child is she a real woman.
	13.	A real man produces a male child.
Domestic chores and daily life	14.	Changing diapers, giving a bath, and feeding kids is the mother's responsibility.
	15.	A woman's role is taking care of her home and family.
	16.	The husband should decide to buy the major household items.
	17.	A man should have the final word about decisions in his home.
	18.	A woman should obey her husband in all things.
Violence	19.	There are times when a woman deserves to be beaten.
	20.	A woman should tolerate violence to keep her family together.
	21.	It is alright for a man to beat his wife if she is unfaithful.
	22.	A man can hit his wife if she won't have sex with him.
	23.	If someone insults a man, he should defend his reputation with force if he has to.
	24.	A man using violence against his wife is a private matter that shouldn't be discussed outside the couple.

The Liberia Proportional Piling Scale

This Liberia Proportional Piling Scale was suggested by Liberian research colleagues and ratified by the Liberian research agency Research Innovations Hub. This culturally relevant scale has been in use in Liberia for several years as a statistically powerful continuous-response scale. Respondents select from ten pebbles (we used beans for this study) to indicate agreement with a statement. Each pebble represents 10%. Thus, selecting one to three pebbles indicates low support, four to six indicates moderate support, and seven to ten shows strong support. Liberians find it easier to respond to gender norms-related questions using this approach compared to asking for a percentage number.

Figure 4.1: Liberian Proportional Piling Scale (Ten Pebbles)

Following previous literature, we added the items into four subdomains and created four subscales. An overall GEM scale was then created by adding the 24 items and dividing them into low, medium, and high categories based on tertiles. We present the gender norms data according to each subscale and the overall GEM scale.

Perceived Gender Norms

Sexual Relationships Subscale

Among adolescent females, gender-inequitable norms related to sexual relationships varied moderately across sites. Women in Bomi were the least likely to report high rates of inequitable norms (27.1%), while higher rates were reported in both Bong (34.6%) and Gbarpolu (32.0%). Adolescent males' reported scores also varied, but the range was wider than women's scores, as depicted in Table 4.6. Among men, the highest rates for inequitable norms were reported in Bomi (43.7%), followed by Gbarpolu (39.1%) and notably lower rates in Bong (23.2%).

Table 4.6 Support for Gender-Equitable Sexual Relationships Based on the GEM Scale

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=388 %	Bomi N=190 %	Total N=785 %	Gbarpolu N=196 %
Tertile group	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(578) %	(196) %
Low	33.5	34.0	33.7	35.2	42.4	21.6	35.4	31.8
Medium	32.0	38.9	34.4	33.2	34.4	34.7	34.5	29.2
High	34.6	27.1	32.0	31.6	23.2	43.7	30.1	39.1

Reproductive Health Subscale

A much higher percentage of female adolescents in Bong (41.6%) reported gender-inequitable norms related to reproductive health than in Bomi (22.2%) or Gbarpolu (26.9%). An even bigger percentage of male adolescents in Bomi (48.4%) reported gender-inequitable norms related to reproductive health than in Gbarpolu (38.5%); Bong had the lowest percentage of male adolescents (17.1%) with high gender-inequitable views around reproductive health (Table 4.7).

Table 4.7 Support for Gender-Equitable Reproductive Health Based on the GEM Scale for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=388 %	Bomi N=190 %	Total N=785 %	Gbarpolu N=196 %
Tertile group	(385) %	(203) %	(588) %	(193) %	(388) %	(190) %	(578) %	(196) %

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=388 %	Bomi N=190 %	Total N=785 %	Gbarpolu N=196 %
Low	30.1	31.5	30.6	42.0	45.6	20.5	37.2	28.1
Medium	28.3	46.3	34.5	31.1	37.3	31.1	35.2	33.3
High	41.6	22.2	34.9	26.9	17.1	48.4	27.6	38.5

Domestic Chores and Daily Life Subscale

A much higher percentage of female adolescents in the intervention counties (36.1%) reported high gender-inequitable norms related to domestic chores and daily life than in the control county (16.1%). Conversely, a notably larger percentage of female adolescents in Gbarpolu had low gender-equitable norms (48.7%) related to domestic chores and daily life than in the intervention counties (29.3%). For male adolescents, such a notable difference was not detected (Table 4.8).

Table 4.8 Support for Gender-Equitable Domestic Chores and Daily Life Based on the GEM Scale for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=388 %	Bomi N=190 %	Total N=785 %	Gbarpolu N=196 %
Tertile group	(385) %	(203) %	(588) %	(193) %	(388) %	(190) %	(578) %	(196) %
Low	33.5	21.2	29.3	48.7	36.8	31.6	35.0	38.0
Medium	32.5	38.9	34.7	35.2	31.7	33.7	32.4	32.3
High	34.0	39.9	36.1	16.1	31.5	34.7	32.6	29.7

Partner Violence

An exceptionally higher percentage of female adolescents in Bomi County (60.6%) reported gender-equitable norms related to partner violence than in the other counties (Bong 30.4% and Gbarpolu 16.1%). Interestingly, a much higher percentage of female adolescents in Gbarpolu reported medium (41.5%) or high (42.5%) gender-inequitable norms related to partner violence. Results were not the same among male adolescents. An exceptionally larger percentage of male adolescents in Bong (50.4%) reported gender-equitable views than male adolescents in Bomi (21.6%) or Gbarpolu (19.2%). A notably higher percentage of men in Bomi (43.2%) and Gbarpolu (39.6%) reported high support for gender-inequitable views around partner violence (Table 4.9).

Table 4.9 Support of Partner Violence Using the GEM Scale for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=388 %	Bomi N=190 %	Total N=785 %	Gbarpolu N=196 %
Tertile group	(385) %	(203) %	(588) %	(193) %	(388) %	(190) %	(578) %	(196) %
Low	30.4	60.6	40.8	16.1	50.4	21.6	40.7	19.2
Medium	30.6	25.6	28.9	41.5	26.1	35.2	29.2	41.2
High	39.0	13.8	30.3	42.5	23.5	43.2	30.1	39.6

Data Conclusions for Gender Norms

- Among female adolescents, Bong had the highest proportion of women reporting high gender-inequitable norms about sexual relationships of the three counties. Whereas for male adolescents, Bong had the lowest proportion of high gender-inequitable norms about sexual relationships of the three counties.
- Among female adolescents, Bong had the highest proportion of gender-inequitable views around reproductive health. For male adolescents, Bong had the lowest.
- A much higher percentage of female adolescents in the intervention counties has high reported gender-inequitable norms around domestic chores and daily life than in the control county. The opposite was true for male adolescents.
- Bomi had the highest percentage of male adolescents reporting highly inequitable gender norms around partner violence of the three counties, whereas Bomi had the highest percentage of female adolescents with equitable gender norms around partner violence of the three counties.

Social Norms Around Partner Violence

Physical violence perpetrated by a partner was measured at the neighborhood level. Respondents were asked how many women out of ten in their neighborhood faced physical violence; zero to three indicated low violence, four to six indicated moderate violence, and seven to ten indicated high violence.

Overall, about half of the adolescents or more thought their neighborhood had low physical violence. A much higher percentage of female adolescents in Bomi thought they had low physical violence in their neighborhood (86.2%), compared with female adolescents in Bong (46.2%) and Gbarpolu (55.4%). Table 4.10 summarizes the results.

Table 4.10 Perceived Social Acceptance of Partner Violence for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=388 %	Bomi N=190 %	Total N=785 %	Gbarpolu N=196 %
Q507: Perceived social norm of physical violence in neighborhood	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(578) %	(196) %
0–3 (Low)	46.2	86.2	60.0	55.4	43.7	56.8	48.1	47.9
4–6 (Medium)	26.8	10.3	21.1	23.3	34.7	24.2	31.2	30.7

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=388 %	Bomi N=190 %	Total N=785 %	Gbarpolu N=196 %
7–10 (High)	27.0	3.5	18.9	21.2	21.6	19.0	20.7	21.44

Social Norms

Partner Violence in Pregnancy

More adolescents thought their neighborhood had low physical violence against pregnant individuals, compared with those who thought their neighborhood had generally low physical violence. Distributions were similar across gender and county groups (Table 4.11).

Table 4.11 Perceived Social Acceptance of Partner Violence in Pregnancy, by Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=388 %	Bomi N=190 %	Total N=785 %	Gbarpolu N=196 %
Q508: Perceived social norm of physical violence during pregnancy	(385) %	(203) %	(588) %	(193) %	(388) %	(190) %	(578) %	(196) %
0–3 (Low)	82.3	96.6	87.2	79.3	84.3	77.9	82.1	83.3
4–6 (Medium)	11.4	3.0	8.5	15.5	12.8	14.7	13.5	13.0
7–10 (High)	6.2	0.5	4.3	5.2	2.9	7.4	4.4	3.7

Family Planning

Norms related to FP are discussed in Chapter 7.

Household Environment

Household environment was measured by asking respondents multiple questions about stressful aspects of home environment during a woman's pregnancy, as well as the level of household supportiveness during pregnancy. We asked the question in the form of a social norm: Out of ten women in the respondent's neighborhood, how many face a stressful environment at home? Conversely, out of ten women in the respondent's neighborhood, how many have a supportive and compassionate environment? Married and unmarried female adolescents and unmarried male

adolescents were both asked these questions because these questions did not rely on whether participants were single, married, or in a union.

Most female adolescents and even more male adolescents thought that a woman's daily workload during pregnancy was less than normal. Furthermore, most felt that pregnant women received general support during pregnancy (Table 4.12).

Table 4.12 Perceptions of Household Support for Pregnant Women in Community, by Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=388 %	Bomi N=190 %	Total N=785 %	Gbarpolu N=196 %
Q510: Workload during pregnancy during a typical day	(385) %	(203) %	(588) %	(193) %	(387) %	(183) %	(570) %	(195) %
Less than typical day	80.8	76.9	79.4	76.2	92.5	80.9	88.7	89.5
Same as typical day	8.8	13.3	10.4	20.2	6.2	15.3	9.2	4.7
More than typical day	10.4	9.9	10.2	3.6	1.3	3.8	2.2	5.8
Q511: Received general support during pregnancy	(382) %	(202) %	(584) %	(193) %	(387) %	(183) %	(570) %	(195) %
No	19.6	7.9	15.6	20.2	11.7	15.1	12.8	5.8
Yes	80.4	92.1	84.4	79.8	88.3	84.9	87.2	94.2
Q513: How much did your spouse help during this pregnancy	(382) %	(201) %	(583) %	(193) %	(387) %	(183) %	(570) %	(195) %
0–33 (Low)	14.1	10.0	12.7	20.7	16.4	25.8	19.5	19.8
34–66 (Medium)	27.2	39.3	31.4	40.9	31.4	26.84	28.6	13.0
67–100 (High)	58.6	50.8	55.9	38.3	48.8	47.4	48.3	67.2
Q515: Bounded norm: Supportive	(385) %	(203) %	(588) %	(193) %	(387) %	(183) %	(570) %	(195) %

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=388 %	Bomi N=190 %	Total N=785 %	Gbarpolu N=196 %
environment at home								
0–33 (Low)	26.2	16.2	22.8	26.4	22.1	37.4	27.3	11.5
34–66 (Medium)	32.7	45.3	37.1	42.5	37.6	32.1	35.8	29.2
67–100 (High)	41.0	38.4	40.1	31.1	40.3	30.5	37.0	59.4

Supportive Household Environment during Pregnancy

Among female adolescents, a notably higher percentage of those in the intervention group (40.1%) versus the control group (31.1%) thought most pregnant women in their neighborhood had a highly supportive home environment. A much higher percentage of male adolescent respondents in Gbarpolu (59.4%) thought most pregnant women in their neighborhood had a highly supportive environment at home, compared with those in Bong (40.3%) and Bomi (30.5%).

Data Conclusions

- Most female adolescents and even more male adolescents thought that a woman's daily workload was less than normal during pregnancy.
- Most adolescents felt that pregnant women received general support during pregnancy.
- Anywhere from 11.33% to 37.37% of participants across gender and county groups thought that pregnant women in their community had low support at home.

Media, Program, and Message Exposure

This chapter outlines media consumption across the three study settings. It also outlines participants' self-reported exposure to key messages on certain topics. Exposure to or participation in different activities and messages, recall of specific messages, and communication about the content are also described.

Media Consumption

TV and Radio Exposure

Mass media consumption among survey respondents was relatively low overall and slightly lower among female versus male adolescents. Female adolescents in Gbarpolu reported higher radio consumption (75.6% reported listening to the radio at all) and television consumption (61.7% reported watching TV at all), compared with their counterparts in the other two counties. Male adolescents in Bong reported the highest radio (52.0% listened more than once a week) consumption, whereas male adolescents in Gbarpolu reported the highest television (35.9%) consumption (Table 5.1).

Table 5.1 TV and Radio Exposure for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
901. How often do you listen to the radio (anywhere, not just at home)?	(385) %	(203) %	(588) %	(193) %	(388) %	(190) %	(578) %	(196) %
More than once a week	41.8	36.4	40	43.5	52.0	42.1	48.7	46.9
Once per week or less	28.6	36	31.1	32.1	35.2	33.7	34.5	34.4
Never	29.6	27.6	28.9	24.4	12.8	24.2	18.8	18.8
902. How often do you watch TV (anywhere, not just at your home)?	(385) %	(203) %	(588) %	(193) %	(388) %	(190) %	(578) %	(196) %
More than once a week	17.1	8.9	14.3	42.5	27.5	21.1	25.3	35.9
Once per week or less	25.2	33.5	28.1	19.2	40.0	19.5	33.1	29.2
Never	57.7	57.6	57.6	38.3	32.5	59.5	41.6	34.9

Cell Phone Use and Exposure

Cell phone use among survey respondents was relatively low overall and slightly lower among female versus male adolescents (Table 5.2). Adolescents reported similar likelihoods of having one or more phones in the household. In Gbarpolu, 13.5% of female adolescents reported having no smartphones, compared with 14.5% in the other two counties. Among male adolescents in Gbarpolu, 7.8% reported having zero versus an intervention county average of 11.0%.

Overall, less than half of the adolescents reported they are the primary user of the cell phone, which is often shared across family members. Girls requesting permission to use cell phones varied widely between intervention and control communities. Interestingly, within the intervention communities, males reported that women or small girls need permission to use the phone at much higher rates than females (25.5% versus 9.1%).

Finally, no marked differences were observed in frequency of phone use. Phones were mainly used for calls and text messaging, with males reporting this use about 5% to 6% more frequently than females across all counties. Respondents in Gbarpolu were much more likely to use phones for Facebook and sending money, compared with those in the intervention counties. Facebook use was highest among males in Gbarpolu at 24.9%; in comparison, average Facebook use in the intervention counties was 12.8%. However, this rate was much higher than average Facebook use reported by females (2.8% in intervention counties and 6.8% in Gbarpolu). Table 5.2 summarizes the results.

Table 5.2 Cell Phone Use and Exposure for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			**Control**	**Intervention**			**Control**
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
903. How many cellphones do you have in your household?	(385) %	(203) %	(588) %	(193) %	(388) %	(190) %	(578) %	(196) %
Zero	14.6	14.3	14.5	13.5	10.1	12.6	11.0	7.8
One	31.7	65	43.2	36.8	24.0	33.7	27.3	23.4
Two or more	53.8	20.7	42.4	49.7	65.9	53.7	61.8	68.8
904. How many of the following types of cell phones do you have in your household?								
Basic button phone	(329) %	(174) %	(503) %	(166) %	(348) %	(166) %	(514) %	(180) %
Zero	3	2.3	2.8	10.2	2.9	3.2	3.0	19.8

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
One	41	74.7	52.7	45.2	30.9	35.3	32.4	30.2
Two or more	56	23	44.5	44.6	66.1	61.6	64.6	50.0
Feature phone that can access multimedia and internet but is not Android or iOS	(316) %	(170) %	(486) %	(166) %	(348) %	(166) %	(514) %	(180) %
Zero	87.3	96.5	90.5	88.4	80.5	73.7	78.2	71.9
One	10.4	3.5	8	9	6.9	11.6	8.5	5.7
Two or more	2.2	0	1.4	2.6	12.5	14.7	13.3	22.4
Smart phone	(315) %	(171) %	(486) %	(158) %	(348) %	(166) %	(514) %	(180) %
Zero	82.9	95.3	87.2	71.5	66.9	77.4	70.4	52.1
One	12.1	3.5	9.1	17.1	16.8	9	14.2	18.8
Two or more	5.1	1.2	3.7	11.4	16.3	13.7	15.4	29.2
905. Who is the main person that can use a cell phone(s) in the household?	(329) %	(174) %	(503) %	(166) %	(337) %	(166) %	(503) %	(177) %
Respondent and/or spouse/ partner	42.9	55.8	47.3	53.6	42.7	39.8	41.8	57.1
Other relative	53.2	41.4	49.1	45.2	55.5	59.6	56.9	42.4
Adolescent	3	0.6	3.0	0.6	0	0	0	0
Other	0.9	0.6	0.6	0.6	1.8	0.6	1.4	0.6
906. Do women/ small girls need permission to use this/these cell phones?	(329) %	(174) %	(503) %	(166) %	(337) %	(166) %	(503) %	(177) %
Yes	9.4	8.6	9.1	23.5	30.0	16.3	25.5	23.2

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
No	90.6	91.4	90.9	76.5	70.0	83.7	74.6	76.8
907. How often do you use the cell phone?	(329) %	(174) %	(503) %	(166) %	(348) %	(166) %	(514) %	(180) %
Never	12.2	9.8	11.3	9.6	10.7	11.5	10.9	4.0
Sometimes	39.6	32.7	37.2	38	32.9	33.7	33.2	40.1
Most of the time or every time	48.3	57.4	51.5	52.4	56.4	54.8	55.9	55.9
908. When the phone is with you, what do you use it for? *[Multiple responses possible]*	(345) %	(186) %	(531) %	(177) %	(339) %	(171) %	(510) %	(185) %
Phone call or text message	79.7	82.3	80.6	80.2	87.0	84.2	86.1	85.4
Use Facebook and/or the internet	2.9	2.7	2.8	6.8	13.3	12.3	12.9	24.9
Send or receive money	2.2	.9	1.3	3.4	14.2	0.6	9.6	13.5
View short films, listen to radio, or play games	22.6	9.7	18.1	45.2	50.4	20.5	40.4	56.2

Social Media Use

Social media consumption seemed to be quite low among survey respondents, and female social media use (10.9%–17.6%) was lower than that of males (21.1%–39.1%). Overall, more participants in Gbarpolu used social media (17.6% of females and 39.1% of males) than in the intervention counties (11% of females and 21.6% of males). Among participants using social media, Facebook was the most widely consumed platform; nearly all respondents reported using Facebook, Snapchat, Instagram, or YouTube. Reported use of WhatsApp, IMO, Viber, or Skype was much higher among female adolescents in Gbarpolu (35.3%) than in the intervention counties (6.2%). Table 5.3 summarizes the results.

Table 5.3 Social Media Use and Exposure for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
909. Have you ever used social media such as Facebook, Instagram, Snapchat, WhatsApp?	(385) %	(203) %	(588) %	(193) %	(388) %	(190) %	(578) %	(196) %
Yes	10.9	11.3	11	17.6	21.1	22.6	21.6	39.1
No	89.1	88.7	89	82.4	78.9	77.3	78.4	60.9
910. Have you used any of the following types of social media platforms? (multiple responses possible)	(42) %	(23) %	(65) %	(34) %	(82) %	(43) %	(125) %	(77) %
Facebook, Snapchat, Instagram, YouTube	97.6	95.7	96.9	100	97.5	97.7	97.5	98.7
WhatsApp, IMO, Viber, Skype	7.1	4.4	6.2	35.3	7.6	14.0	9.8	1.3

Engagement With Community Health Workers and Health Facilities

Engagement with community health workers was low. Bomi had the highest number of individuals who reported zero visits from a community health volunteer in the past six months (84.7% and 84.2% for females and males, respectively). Respondents from Bomi also reported very low engagement with community health services supervisors (90.6% of females and 87.9% of males reported no visits). Male adolescents in Gbarpolu reported significantly higher satisfaction with services provided by community health assistants or health volunteers than those in the intervention counties (56.1% versus 47.6% were very satisfied, respectively).

Overall, very high satisfaction was reported for community health service supervisors. Notably, male respondents in Gbarpolu were much more likely to be “very satisfied” than those in the intervention counties (69.1% versus 62.6%, respectively). However, higher satisfaction was reported in the intervention counties for females (71.5%) than for Gbarpolu (45.2%). Similarly, satisfaction ratings for

doctor or nurse services was higher among females but not males: higher satisfaction was reported in the intervention counties for females (81.2%) than for Gbarpolu (61.6%). See Table 5.4 for a summary.

Table 5.4 Community Health Worker and Facility Engagement for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
911. In the past six months, how many times has a community health volunteer visited you?	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
Zero	71.7	84.7	76.2	68.4	61.3	84.2	69.0	68.2
One to three	25.5	12.3	20.9	23.8	31.3	13.7	26.0	26.6
Four or more	2.9	3	2.9	7.8	6.4	2.1	5.0	5.2
912. In the past six months, how many times have a community health service supervisor visited you?	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
Zero	76.6	90.6	81.5	70.5	69.9	87.9	75.9	70.3
One to three	21.2	9.4	17.2	25.9	26.9	9.5	21.1	24.0
Four or more	2.1	0	1.4	3.6	3.2	2.6	3.0	5.7
913. From zero to ten beans, how satisfied are you with the services provided by the community health assistant or volunteer?	(114) %	(30) %	(144) %	(66) %	(129) %	(34) %	(163) %	(57) %
Not very satisfied (0–3)	22.8	13.3	20.8	21.2	17.1	41.2	22	24.6

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
Somewhat satisfied (4–6)	25.4	10.0	22.2	30.3	34.9	11.8	30.4	19.3
Very satisfied (7–10)	51.8	76.7	56.9	48.5	49.1	47.1	47.6	56.1
915. From zero to ten beans, how satisfied were you with the community health service supervisor the last time you visited a health facility?	(143) %	(43) %	(186) %	(73) %	(82) %	(41) %	(123) %	(55) %
Not very satisfied	7.7	23.2	11.3	16.4	14.6	17.1	15.5	14.6
Somewhat satisfied	19.6	9.3	17.2	38.4	26.8	12.2	22.0	16.4
Very satisfied	72.7	67.4	71.5	45.2	58.5	70.7	62.6	69.1
916. From zero to ten beans, how satisfied were you with the doctor or nurse's services the last time you visited a health facility?	(143) %	(43) %	(186) %	(73) %	(82) %	(41) %	(123) %	(55) %
Not very satisfied	6.3	4.7	5.9	5.5	3.7	9.8	5.7	18.2
Somewhat satisfied	11.9	16.3	12.9	32.9	22.0	19.7	21.1	10.9
Very satisfied	81.8	79	81.2	61.6	74.4	70.7	73.2	70.9

Exposure to Messaging

FP Messaging

FP campaign exposure appeared higher among females in Gbarpolu than in the intervention counties (34.2% versus 28.1%, respectively) but higher among males in the intervention counties than in Gbarpolu (34.2% versus 16.7%, respectively). This trend was evident in exposure to both the "Share it,

Act it" and Healthy Life campaigns: 16.1% of females in Gbarpolu had seen information about "Share it, Act it" in the past six months versus just 3.6% of females in the intervention counties, and 66.3% of females in Gbarpolu had seen information about the Healthy Life campaign versus only 23.8% in the intervention counties. The trends were reversed for males: 13.1% of males in the intervention counties had seen information about "Share it, Act it" versus just 6.3% of males in Gbarpolu, and 26.6% of males in the intervention counties had seen information about the Healthy Life campaign versus just 16.2% in Gbarpolu.

FP media exposure appeared to be higher in intervention counties than in Gbarpolu County for females, with 59.9% of females in the intervention counties reporting no exposure to FP media compared with only 40.9% of females in Gbarpolu. This trend was reversed for males, with a high proportion of males in the intervention counties reporting no exposure to FP media; 50.4% of males in the intervention counties reported no exposure versus 63.8% of males in Gbarpolu. Among female adolescents, reported exposure to this type of media through friends and relatives was higher in Gbarpolu (30.5%) than in the intervention counties (21.4%). This type of exposure was higher for males in the intervention counties (29.1%) than males in Gbarpolu (18.1%). See Table 5.5 for a summary of FP media exposure for female and male adolescents.

Table 5.5 FP Message Exposure for Female and Male Adolescents

FP media exposure	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
920.4. Where did you see or hear about the topic of family planning in the past six months?	(385) %	(203) %	(588) %	(193) %	(213) %	(158) %	(371) %	(160) %
None, don't get info	58.3	62.4	59.9	40.9	53.5	46.2	50.4	63.8
Doctor, nurse, registered nurse, certified midwife, trained traditional midwives	21.2	11.5	17.6	39.4	5.2	13.9	8.9	10.0
Pharmacist and, or store owner, mobile shopkeeper	2.1	1.0	1.7	1.6	0.5	2.5	1.4	0.0

FP MEDIA EXPOSURE	FEMALE ADOLESCENTS				MALE ADOLESCENTS			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
Community groups, religious organizations	0.8	0.0	0.5	0.0	1.4	1.3	1.4	3.1
TV, print, radio, billboards, car promos	4.2	8.3	5.7	21.3	11.3	12.7	11.9	5.0
Friends, relatives	19.7	24.2	21.4	21.3	30.5	27.2	29.1	18.1
Community volunteer, community health assistant, community health volunteer, community health service supervisor	1.9	0.0	1.2	0.8	8.0	3.2	5.9	3.1

Antenatal Care Message Exposure

Antenatal care (ANC) media exposure appeared to be higher in the intervention counties than in Gbarpolu for both females and males, with 62.7% of females from Gbarpolu reporting exposure to ANC media in Gbarpolu versus 40.5% of females in the intervention counties, and 50.0% of males in Gbarpolu reporting exposure to ANC media compared with 28.7% of males in the intervention counties. Exposure to this media was highest via doctors, nurses, and other trained medical providers; however, these sources appeared to be a more prominent among females than males, as exposure to this media via health care providers was higher for females in Gbarpolu and the intervention counties than for males. Exposure to ANC media for males in Gbarpolu was notably higher from friends and relatives (24.5%) than for the male intervention counties (6.9%) or any of the female groups (Table 5.6).

Table 5.6 ANC Message Exposure for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
920.1. Where did you see or hear about the topic of ANC in the past six months?	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
None, don't get info	55.8	66.5	59.5	37.3	81.9	50.5	71.3	50.0
Doctor, nurse, registered nurse, certified midwife, trained traditional midwives	30.9	29.1	30.3	48.7	8.5	29.5	15.6	12.5
Pharmacist, store owner, mobile shopkeeper	4.2	1.5	3.2	5.2	0.5	5.8	2.3	3.1
Community groups, religious organizations	0	0.5	0.2	0	0.5	0.5	0.5	0.5
TV, print, radio, billboards, car promos	2.9	3	2.9	17.6	3.7	3.2	3.5	4.2
Friend, relative	3.4	2.5	3.1	8.3	5.1	10.5	6.9	24.5
Community volunteer, community health assistant, community health volunteer, community health service supervisor	6.5	0.0	4.3	8.8	4.8	2.1	3.9	8.9

Postnatal Care Message Exposure

Postnatal care media exposure appeared to be higher in Gbarpolu than in the intervention counties for both females and males, with 67.9% of females reporting exposure to postnatal care media in Gbarpolu versus 37.1% of females in the intervention counties, and 44.8% of males in Gbarpolu reporting exposure to postnatal care media compared with 23.7% of males in the intervention counties. Exposure to this media was also highest via doctors, nurses, and other trained medical providers; however, this again appeared to be a more prominent source of information among females than males, as exposure to this media via health care providers was higher for females in Gbarpolu and the intervention counties than for males. Nearly twice as many females report exposure via doctors, nurses, or other trained medical providers in Gbarpolu (54.4%) than in the intervention counties (27.9%). Exposure to postnatal care media for males in Gbarpolu was notably higher from friends and relatives (19.8%) than for the male intervention counties (3.9%) or any of the female groups (Table 5.7).

Table 5.7 Postnatal Care Message Exposure for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			**Control**	**Intervention**			**Control**
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
920.2. Where did you see or hear about the topic of postnatal care in the past six months?	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
None, don't get info	5.5	.5	3.7	8.8	3.5	1.1	2.7	9.4
Doctor, nurse, registered nurse, certified midwife, trained traditional midwives	59.2	70	62.9	32.1	84.0	61.1	76.3	55.2
Pharmacist, store owner, mobile shopkeeper	28.8	26.1	27.9	54.4	7.5	29.0	14.7	9.4
Community groups, religious organizations	5.2	2	4.1	4.7	1.1	6.3	2.8	1.6

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
TV, print, radio, billboards, car promos	.5	0.0	0.3	1.0	0.8	0.0	0.5	1.0
Friend, relative	3.4	3.9	3.6	19.7	3.7	0.5	2.7	3.7
Community volunteer, community health assistant, community health volunteer, community health service supervisor	2.6	1.0	2.0	7.8	4.8	2.1	3.9	19.8

Respectful Maternity Care Message Exposure

Respectful care media exposure appeared to be higher in Gbarpolu than in the intervention counties for both females and males, similar to trends observed in media exposure for antenatal and postnatal care. Specifically, 61.7% of females reported exposure to respectful care media in Gbarpolu versus 43.4% of females in the intervention counties, and 45.8% of males in Gbarpolu reported exposure to respectful care media compared with 32.0% of males in the intervention counties. Exposure to this media was also highest via doctors, nurses, and other trained medical providers. In Bomi, more males (26.3%) reported exposure to this campaign via medical providers than females (24.1%); however, in all other counties, females reported substantially higher exposure via health care providers. Finally, females in Gbarpolu reported significant exposure via television, print, radio, car promotions, and billboards—21.2% reported exposure via these sources; no more than 7.7% of males or females in any other group reported exposure via these means (Table 5.8).

Table 5.8 Respectful Maternity Care Message Exposure for female and male adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
920.3. Where did you see or hear	(385)	(203)	(588)	(193)	(375)	(190)	(565)	(192)

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
about the topic of respectful maternity care in the past six months?	%	%	%	%	%	%	%	%
None, don't get info	53.8	62.1	56.6	38.3	80.0	44.2	68.0	54.2
Doctor, nurse, registered nurse, certified midwife, trained traditional midwives	33	24.1	29.9	40.4	6.7	26.3	13.3	13.0
Pharmacist, store owner, mobile shopkeeper	7.5	3.5	6.1	4.2	0.5	9.0	3.4	0.5
Community groups, religious organizations	0.3	0.5	0.3	0	1.1	0.0	0.7	3.1
TV, print, radio, billboards, car promos	2.6	5.9	3.7	21.2	7.7	3.2	6.2	5.2
Friend, relative	3.9	12.3	6.8	12.4	6.7	11.1	8.1	19.3
Community volunteer, community health assistant, community health volunteer, community health service supervisor	5.7	0	3.7	6.7	6.7	3.7	5.7	8.3

Nutrition Message Exposure

Nutrition media exposure appeared to be much higher in Gbarpolu than in the intervention counties for both females and males, with 78.8% of females reporting exposure to nutrition media in Gbarpolu versus 53.1% of females in the intervention counties, and 60.4% of males in Gbarpolu reporting exposure to nutrition media compared with 52.4% of males in the intervention counties. In most

counties, exposure to this media was highest via doctors, nurses, and other trained medical providers; however, this source of information appeared to be much more prominent among females than males (49.2% of females in Gbarpolu versus 12.5% of males in Gbarpolu, and 32.7% of females in the intervention counties versus 8.9% of males in the intervention counties). Exposure to nutrition media was notably high for males in Gbarpolu from friends and relatives (21.4%) and for males in Bong for television, print, radio, billboards, and car promotions (20.0%; Table 5.9).

Table 5.9 Nutrition Message Exposure for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
920.5. Where did you see or hear about the topic of nutrition in the past six months?	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
None, don't get info	40	60.1	46.9	21.2	45.1	52.6	47.6	39.6
Doctor, nurse, registered nurse, certified midwife, trained traditional midwives	36.6	25.1	32.7	49.2	4.8	16.8	8.9	12.5
Pharmacist, store owner, mobile shopkeeper	4.2	1.5	3.2	2.6	0.8	4.2	2.0	1.0
Community groups, religious organizations	.8	.5	.7	0	1.3	1.6	1.4	2.6
TV, print, radio, billboards, car promos	6.0	7.4	6.5	23.8	20.0	6.3	15.4	10.9
Friend, relative	9.6	3.5	7.5	14.5	10.1	8.4	9.6	21.4
Community volunteer, community health assistant,	3.1	0	2.0	14	5.6	4.2	5.1	4.7

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
community health volunteer, community health service supervisor								

WASH Message Exposure

WASH media exposure appeared to be much higher in Gbarpolu than in the intervention counties for both females and males; 71.5% of females reported exposure to WASH media in Gbarpolu versus 51.7% of females in the intervention counties, while 77.6% of males in Gbarpolu reported never having been exposed to WASH media compared with 49.4% of males in the intervention counties. Exposure to this media was relatively high via doctors, nurses, and other trained medical providers as well as through television, print, radio, billboards, and car promotions. In all counties, exposure via medical providers was higher for females than males (20.4% for females versus 5.8% for males in the intervention counties, and 25.9% for females versus 13.0% for males in Gbarpolu). Exposure via television, print, radio, billboards, and car promotions was higher for females in Gbarpolu (22.8%) than females in the intervention counties (17.7%), but this difference was not observed for males. Finally, 25.5% of males in Gbarpolu reported exposure via friends and relatives that was much higher than for other groups (Table 5.10).

Table 5.10 WASH Message Exposure for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
920.6. Where did you see or hear about the topic of WASH in the past six months?	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
None, don't get info	39.2	65.5	48.3	28.5	54.1	43.7	50.6	22.4
Doctor, nurse, registered nurse,	21.6	18.2	20.4	25.9	4.0	9.5	5.8	13.0

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
certified midwife, trained traditional midwives								
Pharmacist, store owner, mobile shopkeeper	2.6	0	1.7	0.5	0.3	0.5	0.4	0.5
Community groups, religious organizations	1.8	0.5	1.4	1.6	3.5	5.3	4.1	7.8
TV, print, radio, billboards, car promos	20.5	12.3	17.7	22.8	15.5	24.7	18.6	18.2
Friend, relative	12.2	3.0	9.0	8.8	8.5	9.5	8.9	25.5
Community volunteer, community health assistant, community health volunteer, community health service supervisor	17.7	0.5	11.7	24.4	6.9	4.7	6.2	9.9

COVID-19 Message Exposure

COVID-19 media exposure appeared to be much higher overall than for other media categories. The largest sources of this information appeared to be television, print, radio, billboards, and car promotions and via friends and relatives. For the category including television and so forth, 58% of females in Gbarpolu and 52.2% of females in the intervention counties reported exposure; 51.6% of males in Gbarpolu report exposure via this medium versus 70.1% of males in the intervention counties. Reported exposure via friends and relatives was higher for females in the intervention counties (50.2%) than females in Gbarpolu (37.3%) and was higher for males in the intervention counties (51.2%) than males in Gbarpolu (34.4%; Table 5.11).

Table 5.11 COVID-19 Message Exposure for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
920.7. Where did you see or hear about the topic of COVID in the past six months?	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
None, don't get info	3.4	22.7	10.0	4.2	3.2	2.6	3.0	10.4
Doctor, nurse, registered nurse, certified midwife, trained traditional midwives	27.0	30.1	28.1	45.1	8.5	7.9	8.3	13.5
Pharmacist, store owner, mobile shopkeeper	4.2	0.5	2.9	2.6	7.5	2.6	5.8	0.5
Community groups, religious organizations	10.4	1.0	7.1	8.3	19.2	5.3	14.5	13.5
TV, print, radio, billboards, car promos	57.7	41.9	52.2	58.0	74.7	61.1	70.1	51.6
Friend, relative	47.3	55.7	50.2	37.3	57.3	41.1	51.2	34.4
Community volunteer, community health assistant, community health volunteer, community health service supervisor	21.6	2.0	14.8	21.2	20.3	6.3	15.6	11.5

"Share it, Act it" Message Exposure

"Share it, Act it" media exposure was reported as very low overall. Males in Bomi were the only group reporting more than 10% exposure to this media (82.4% of males in Bomi reported no exposure to this media). In all other groups, more than 90% of respondents reported no exposure to "Share it, Act it."

Males in Bomi reported exposure to this media primarily through doctors, nurses, and other medical providers (10.3%; Table 5.12).

Table 5.12 "Share it, Act it" Message Exposure for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
920.8. Where did you see or hear about the topic of "Share it, Act it" in the past six months?	(385) %	(203) %	(588) %	(193) %	(324) %	(165) %	(489) %	(180) %
None, don't get info	96.4	99.5	97.5	95.0	96.0	82.4	91.4	94.4
Doctor, nurse, registered nurse, certified midwife, trained traditional midwives	3.0	0.5	2.1	5.0	0.9	10.3	4.1	0.6
Pharmacist, store owner, mobile shopkeeper	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.0
Community groups, religious organizations	0.0	0.0	0.0	0.0	1.2	0.6	1.0	1.1
TV, print, radio, billboards, car promos	0.0	0.0	0.0	1.2	1.2	0.0	0.8	2.2
Friend, relative	0.0	0.0	0.0	0.0	1.5	2.4	1.8	1.7
Community volunteer, community health assistant, community health volunteer, community health service supervisor	0.6	0.0	0.4	0.0	0.9	3.0	1.6	0

Healthy Life Campaign Message Exposure

Healthy Life campaign media exposure was reported as very low overall. Females in Gbarpolu and males in Bomi were the only groups reporting more than 10% exposure to this media (71.2% of females in Gbarpolu and 81.5% of males in Bomi reported no exposure to this media). In all other groups, more than 90% of respondents reported no exposure to "Share it, Act it." Females in Gbarpolu reported exposure to this media primarily through television, print, radio, billboards, and car promotions (12.5%). Males in Bomi reported exposure to this media primarily through doctors, nurses, and other medical providers (9.6%; Table 5.13).

Table 5.13 Healthy Life Campaign Message Exposure for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
920.9. Where did you see or hear about the topic of Healthy Life Campaign in the past six months?	(385) %	(203) %	(588) %	(193) %	(268) %	(146) %	(414) %	(160) %
None, don't get info	91.3	93.2	91.9	71.2	94.4	81.5	89.9	90.0
Doctor, nurse, registered nurse, certified midwife, trained traditional midwives	5.4	2.7	4.5	7.8	1.1	9.6	4.1	2.5
Pharmacist, store owner, mobile shopkeeper	0.3	0.0	0.2	0.0	0.0	1.4	0.5	0.6
Community groups, religious organizations	0.5	0.0	0.3	0.0	1.6	2.1	1.8	0.5
TV, print, radio, billboards, car promos	1.0	2.7	1.6	12.5	2.6	0.0	1.7	4.4
Friend, relative	1.4	0.7	1.1	4.7	1.9	3.4	2.4	1.3

	Female Adolescents				Male Adolescents			
	Intervention			**Control**	**Intervention**			**Control**
	Bong N=385 %	Bomi N=203 %	Total N=588 %	Gbarpolu N=193 %	Bong N=375 %	Bomi N=190 %	Total N=565 %	Gbarpolu N=196 %
Community volunteer, community health assistant, community health volunteer, community health service supervisor	1.0	0.0	0.7	14.1	1.1	1.4	1.2	1.9

Maternal Health

In low- and middle-income countries, complications of pregnancy and childbirth are the leading causes of death among adolescent girls ages 15–19. Liberia has a high rate of teenage pregnancies, and 33.5% of young women from 15 to 19 years of age have begun childbearing (Liberia DHS, 2019). Teenage pregnancy often occurs in rural areas, where it is much higher than in urban areas. Generally, teenagers residing in rural areas who have no to limited education and who are part of the lower wealth quintile are more likely to begin childbearing compared with adolescents who are from urban areas, have higher education, and belong to the wealthier quintiles. Liberia is characterized by high adolescent fertility.

Adolescent Childbearing Sample

The adolescent baseline survey interviewed 781 adolescent girls aged 15–19 years. Of these respondents, 54.4% were either married or living in a union and 45.5% were single. Of the total 781 girls, 213 (27%) had already started their childbearing journey. Of these, 202 had surviving children and 10 had babies that did not survive. As a result, the denominator for our sample of childbearing adolescents and their pregnancy experiences is 202. Of these adolescents, 24% were from Bomi, 48% from Bong, and 28.2% from Gbarpolu.

Antenatal Care

Among childbearing female adolescents, about three-fourths reported attending their first ANC visit three months or less, whereas 24.8% reported attending their first ANC visit after four or more months. A large majority of childbearing female adolescents (86.6%) reported having four or more ANC visits. Finally, close to half of the childbearing female adolescents (45.5%) reported receiving ANC from certified midwifes; nurses/registered nurses (32.2%) were the second most common ANC provider (see Table 6.1)

Table 6.1 Antenatal Services Utilized by Childbearing Female Adolescents

	TOTAL N=202 (%)
Q217 First antenatal visit<12 weeks (or<3 months)	
≤3 Months	75.3
≥4 Months	24.8
Q218 Number of ANC visits	
≤3 Visits	13.4
≥4 Visits	86.6

Services Received During an ANC Visit

The trend for women receiving maternal health services during an ANC visit was high for childbearing adolescents too. We asked women about six services they received during an ANC visit: abdominal check-up, blood sample testing, urine sample testing, nutrition counseling, HIV counseling, and counseling on danger signs and birth complications.

For abdominal check-up, coverage was 98% and for blood sample testing it was 95.5%. The coverage was almost 90% or higher for most ANC services. Only HIV counseling received lower reported coverage, at 73.9% (Table 5.2). Urine sample testing and nutrition counseling were also very high.

Very few childbearing adolescents (6.4%) stated they received counseling related to danger signs or birth complications during their ANC visits. Given the vulnerability of childbearing adolescents, counseling related to danger signs and birth complications should be an essential component of all four ANC visits (Table 6.2).

Table 6.2 Childbearing Adolescents and Maternal Services Received During an ANC Visit

	TOTAL N=202 (%)
Abdominal examination	98.5
Blood sample testing	95.0
Urine sample testing	82.1
Nutrition counseling	89.1
HIV counseling	73.9
Counseling about complications during pregnancy and childbirth	6.4

Birth Preparedness Index

We used a five-indicator WHO birth preparedness index to assess the planning and preparations undertaken for delivery by the woman and/or her family. Surprisingly very few women knew their due date, with only 10.4% of the childbearing adolescents reported that they knew their date of delivery (Table 6.3). Adolescent mothers are at high risk because of their young age. Further, barely one-tenth of them knowing their due date does not bode well for young adolescent mothers who deserve a safe delivery.

The second birth preparedness indicator was about the decision related to place of delivery. As many as 52% of the childrearing adolescents had not made a prior decision as to where to deliver their baby (Table 6.3). Planning where to deliver is a crucial component of birth preparedness. In a medical

emergency, access to a health facility is far easier if the individual has had prior contact or has previously registered at a health facility.

The third birth preparedness indicator was arranging emergency transport to take the pregnant woman to a health facility in case of a crisis. Here again, the preparation for emergency transport was reported by only 34% of childbearing adolescents.

Saving money for a medical emergency during pregnancy was the fourth birth preparedness indicator. This was the one indicator with high responses from the childbearing responses. About 73% childbearing adolescents reported saving money for any emergency that may occur during the pregnancy (Table 6.3).

The final indicator of birth preparedness was keeping an emergency contact number that can be accessed easily by the woman and/or her family. Only 24% of childbearing adolescents reported saving an emergency number. Time is of the essence during a medical emergency. Birth preparedness enables being ready to handle an emergency so that a childbearing adolescent loses as little time as possible in receiving help (Table 6.3).

We developed a birth preparedness index based on these five indicators with a score of 0–2 indicating low birth preparedness and a score of 3–5 denoting high birth preparedness. In this sample of childbearing adolescents, only 30% childbearing adolescents had high birth preparedness.

Table 6.3 Birth Preparedness in Childbearing Adolescents Across Three Counties of Liberia

	Childbearing Adolescents N=202 (%)
1. Baby due date	
No	89.6
Yes	10.4
2. Decide where the baby will be delivered.	
No	52.7
Yes	47.3
3. Arrange emergency transport	
No	65.5
Yes	34.5
4. Save money that could be used for emergencies	
No	26.1
Yes	73.9
5. Emergency contact number	

	Childbearing Adolescents N=202 (%)
No	75.8
Yes	24.2

Delivery and Postnatal Care

As Table 6.4 shows, about 87.8% childbearing adolescents delivered at a health facility, including public clinic (60.5%), public hospital (21.6%), private hospital (2.3%), and public health center (0.94%). Almost 98% of the childbearing adolescents had someone accompanying them for their delivery. Only 4.8% of the childbearing adolescents were accompanied by their partners. Mostly mothers (31%), other female relatives (32.2%), and mothers-in-law (20%) accompanied pregnant adolescents to the health facility.

Table 6.4 Place of Delivery for Childbearing Adolescents

	Childbearing Adolescents N=202 (%)
Home	12.2
Public hospital	21.6
Private hospital	2.3
Public health center	1.8
Public clinic	60.5
Private clinic	0.94
Other	0.4

From the sample of 12.2% home deliveries, some of reasons for not opting for a health facility delivery were:

- Cost too much
- No facility
- Too far/no transportation
- Don't trust facility/ poor quality services
- No female provider at the facility
- Not the first child
- Not necessary
- Spouse/partner didn’t think it was necessary
- Did not know where to go

- Afraid to go, afraid of cesarean delivery
- Afraid of sterilization
- Long waiting time

Table 6.5 Postnatal Care in the First 48 Hours After Birth in Liberia

	Childbearing Adolescents N=202 (%)
Attended baby in less than 24 hours	99
Visited home in less than 48 hours	92.4

The data indicate very high levels of postnatal visits (Table 6.5). Almost all (99%) childbearing adolescents reported that their baby was attended to within 24 hours. Also, most of these childbearing adolescents (92.4%) were visited at home within 48 hours of birth, indicating that they did receive postnatal services.

Nutrition

An area that requires urgent attention for childbearing adolescents is nutrition, both IFA supplementation and diet during pregnancy. Only 55% childbearing adolescents reported consumption of IFA tablets on 90 or more days during their pregnancy. Adolescent pregnancy is high risk, and when IFA tablets are not fully consumed, the iron status of the pregnant adolescent is compromised and can affect maternal and newborn outcomes (Table 6.6).

Table 6.6 Childbearing Adolescents IFA Consumption and Diet During Pregnancy in Liberia

	Childbearing Adolescents N=202 (%)
IFA consumption (90+ days)	55.0
Ate less than usual or same during pregnancy	40.6
Ate less than usual during last trimester	40

As many as 40% of the childbearing adolescents did not increase their diet during pregnancy; in fact, 32% adolescents reduced their diet compared with their pre-pregnancy state. Again, 40% of childbearing adolescents stated that they either reduced their diet or kept at the pre-pregnancy stage in their third trimester. Some sort of food security net should be provided to food insecure households and situation-specific SBC around diet and nutrition is required. However, it is also important to consider that food

security may not always be the driving factor in eating habits, and therefore motivations behind reduced or maintained diets among childbearing adolescents in Liberia should be further explored.

Multivariate Model: Consumption of IFA Tablets During Pregnancy

A multivariate model on IFA consumption by childbearing adolescents was run because low hemoglobin is a big risk during childbirth and sufficient iron stores help the in utero growth of the baby. In addition, sufficient iron stores keep the mother healthy.

Of the three socio-demographic variables, only the vulnerability index was significantly associated with complete consumption of the IFA dose. It showed that adolescents who were highly vulnerable were more likely to take a full dose compared with economically better off adolescents. Unfortunately, the number of adolescents with low vulnerability was small. Education and age were significantly associated with consumption of IFA tablets on 90 or more days during pregnancy.

Two social norms were significantly associated with IFA use, highlighting the importance of norms in this particular age group. The first was the social norm related to early ANC visit. Adolescents thought a high number (70%-100%) of pregnant women sought out early ANC (<12 weeks) were 2.8 times more likely to complete their IFA dose compared with adolescents in communities where very few women go for early ANC. The second norm was related to giving a child under two nutritious food. Here, even if there is a moderate level norm in childbearing adolescents (4–6) where mothers are perceived to be giving their children nutritious food, there's a 4.2 times likelihood that they will complete this IFA dose. Another norm related to prompt health-seeking behavior for a child under two was significantly associated with complete IFA consumption at the bivariate stage.

The other major facilitating factors for a complete IFA dose were couple communication, here in the context of nutrition. High partner communication on nutrition during pregnancy was associated with consumption of IFA tablets on 90 or more days during pregnancy (OR: 3.5; 95% CI: 1.55, 7.89). Partner or couple communication appeared on several of the multivariate models from the baseline data. Couple communication should be promoted in a gender-equitable and nuanced manner.

The partner violence subscale of the GEM scale was significant at the bivariate level. Childbearing adolescents who had highly inequitable norms towards partner violence were less likely to complete their IFA dose. The association was not sustained at the multivariate level (Table 6.7).

Table 6.7 Determinants of IFA Tablet Consumption Among Childbearing Adolescents Across Three Counties of Liberia—Logistic Regression Model

	Female adolescents (14–19 years)	
	Odds ratio	95% CI
Education Level		

	Female adolescents (14–19 years)	
	Odds ratio	95% CI
No formal schooling	1.00	
Primary	0.74	(0.29, 1.88)
Secondary or higher	1.73	(0.55, 5.50)
Age		
15–17 years	1.00	
18–19 years	1.73	(0.41, 2.84)
Vulnerability Index		
Low	1.00	
Moderate	0.38	(0.13, 1.14)
High	0.31*	(0.10, 0.94)
Social norm related to early ANC visit (<12 weeks)		
Low (0–3)	1.00	
Moderate (4–6)	1.75	(0.67, 4.59)
High (7–10)	2.81**	(1.06, 7.43)
Social norm related to nutritious food for a child under two		
Low (0–3)	1.00	
Moderate (4–6)	4.26***	(1.81, 10.05)
High (7–10)	1.84	(0.81, 4.19)
Couple communication about nutrition		
Low	1.00	
Moderate	3.37**	(1.34, 8.47)
Frequent	3.50***	(1.55, 7.89)
Social norm around prompt health care seeking within 24 hours		
Low (0–3)	1.00	
Moderate (4–6)	1.59	(0.67, 3.80)
High (7–10)	2.91	(1.22, 6.91)
Gender inequitable norms (GEM Scale, Partner Violence)		
Low (RC)	1.00	
Moderate	0.74	(0.32, 1.68)
High	0.59	(0.24, 1.42)

	Female adolescents (14–19 years)	
	Odds ratio	95% CI
Primary decision maker if female adolescent girl is unwell		
Low (self) (RC)	1.00	
Moderate (partner)	0.86	(0.34, 2.17)
High (other relatives)	2.86**	(1.23, 6.66)
Number of Observations	202	

Notes: *** p<0.01, ** p<0.05; RC, reference category; pseudo r^2=11.55.

The final factor associated with IFA consumption was parents' decision making in the childbearing adolescent's life. If the decision to seek health care when the adolescent is unwell lay with her parents or relatives, she was more likely to complete her IFA dose. The overall data indicated that the female adolescents' decision-making power was very low. Childbearing adolescents' decision-making capacity needs to be strengthened.

Birth Preparedness Among Childbearing Adolescents: Multivariate Model

Birth preparedness emerged as a possible area that could be strengthened and could help reduce both maternal morbidity and mortality. We chose birth preparedness for multivariate analysis for this reason.

Table 6.8 shows the multivariate model. Neither education nor age were associated with the outcome of high birth preparedness. Once again, the vulnerability index showed that those in the middle to high vulnerability categories were significantly more likely to opt for high birth preparedness. This result was found in both models for the childbearing adolescents. It was quite possible in this sample that the high-income adolescents had very low levels of birth preparedness.

Couple communication significantly predicted birth preparedness, and couple communication on sanitation was most associated with this outcome. Those with moderate couple communication on sanitation were three times more likely to have high birth preparedness.

The survey asked childbearing adolescents how satisfied they were with the services of health workers (supervisors and community health agents). The childbearing adolescents that were treated well by the health workers were 3.9 times more likely to have high birth preparedness.

Childbearing adolescents who felt they had to ask for their partner's permission to go for ANC were significantly less likely to opt for full birth preparedness. The GEM scale also showed how gender norms need to improve in both female and male adolescents.

Finally, childbearing adolescents who had strong son preference attitudes were more likely to adopt birth preparedness behaviors (see Table 6.8).

Table 6.8 Determinants Birth Preparedness Among Childbearing Adolescents in Three Counties of Liberia—Logistic Regression Model

	Female adolescents (14–19 years)	
	Odds ratio	95% CI
Education Level		
No formal schooling	1.00	
Primary	1.58	(0.60, 4.183)
Secondary or higher	1.42	(0.43, 4.638)
Age		
15–17 years	1.00	
18–19 years	0.62	(0.23, 1.67)
Vulnerability Index		
Low	1.00	
Moderate	4.99*	(1.03, 24.15)
High	6.77**	(1.43, 32.0)
Health workers: Treated you well		
Low (0–50)	1.00	—
High (60–100)	3.93**	(1.26, 12.1)
Requires husband's permission for ANC check-up		
Low (0–33)	1.00	—
Moderate (34–66)	0.83	(0.32, 2.08)
High (67–100)	0.28***	(0.12, 0.65)
Couple communication about sanitation		
Low	1.00	—
Moderate	3.207**	(1.34, 8.47)
Frequent	3.50***	(1.55, 7.89)
Attitude of son preference		
Low (0–33)	1.00	—
Moderate (34–66)	2.15	(0.59, 7.84)
High (67–100)	2.84	(1.02, 7.91)

	Female adolescents (14–19 years)	
	Odds ratio	95% CI
Number of observations	202	

Notes: *** p<0.01, ** p<0.05; RC, reference category; pseudo r^2=16.30

Conclusions and Recommendations

- With such high coverage of all ANC services, the time has come to focus on quality of how to reduce maternal morbidity and mortality. Birth preparedness needs to be promoted during ANC visits, during mass media campaigns, and through community health agents and community volunteers. It needs to be at the center of maternal health campaigns.
- Breakthrough ACTION Liberia community engagement efforts should raise the issue of birth preparedness in their interactions with the community.
- The overall community needs to know what birth preparedness is and how they can promote it.
- A feasible, acceptable meal plan should be worked out for every pregnant adolescent when she comes for her ANC check-up.
- A special campaign on adolescent nutrition should include completing the IFA dose.
- Gender norms, male involvement, and women's decision making are common themes in all three reports of the baseline study. Gender-equitable norms are cross-cutting and every opportunity must be taken to promote them.
- Integrating couple communication activities or messaging in maternal child health programs between pregnant adolescent girls and their partners could increase birth preparedness and IFA tablet consumption, improving both maternal and child health.
- Social norms should be promoted at the community level as they are the drivers of health behaviors.

Family Planning

This chapter describes the univariate (frequency distribution) and bivariate analyses of factors shown to be associated with use of FP services, as well as the results of a multivariate regression model for use of FP services among female adolescents, based on main FP predictors and sociodemographic variables.

Univariate Analysis

The following tables present the results for each survey question measuring contraceptive knowledge, ideational variables (perceived risk of pregnancy, self-efficacy, bounded descriptive social norms, attitudes, and couple communication), use of FP services, and perceived quality of FP services. The section on lifestyle includes questions on gender norms, decision making, and household environment. All highlighted variables have been shown to influence FP decisions and use.

Knowledge of Contraceptive Methods

Two questions explored respondents' knowledge of contraceptives. The first question assessed unprompted knowledge of contraceptive methods. Overall, among unmarried sexually active female adolescents, injectables were most frequently reported (65.2%), followed by the implants and the pill (51.3% and 35.3%, respectively; Table 7.1). Among female adolescents in a union or marriage, a similar pattern was observed: the injectable, implant, and pill were most well-known (80.8%, 68.4%, and 50.0%, respectively). Male adolescents were most aware of injectables (45.8%), the pill (34.8%), and implants (32.9%). However, a notably high percentage (40.4%) were unable to cite any method.

The second question explored prompted contraceptive knowledge by verbally listing the methods not mentioned in the first question. The results shown in Table 7.1 indicate that among all three populations, the male condom was the most recognized method when prompted (57.8% among unmarried sexually active female adolescents, 54.0% among married female adolescents, and 73.1% among male adolescents). Unmarried sexually active female adolescents also commonly recognized the pill (37.4%) and the calendar method (33.7%). Among female adolescents in a union or marriage, the second and third most known methods were the calendar (41.8%) and withdrawal (40.4%) methods. Finally, among male adolescents, other well-known methods included implants (37.1%) and the pill (32.3%).

Three aggregate indices of FP knowledge were developed for traditional, short-acting, and long-acting reversible contraceptives. Table 7.1 shows that overall, respondents could identify both short- and long-acting methods. For example, 86.6% of unmarried sexually active female adolescents could identify a short-acting method, along with 93.2% and 91.9% of female adolescents in marriage or union and male adolescents, respectively. A smaller percentage of adolescents could name a traditional method (43.3% of unmarried sexually active female adolescents, 53.4% of married female adolescents, and 29.7% of male adolescents.

Table 7.1 Knowledge of FP Methods for Female and Male Adolescents

	Female Adolescents		Male Adolescents
	Unmarried and Sexually Active N=187 %	Married or in a Union N=354 %	All N=310 %
Which FP methods have you heard of?			
Implant	51.3	68.4	32.9
Injectable	65.2	80.8	45.8
Male condom	7.0	13.6	9.0
Pill	35.3	50.0	34.8
Don't Know	28.3	13.0	41.3
Have you heard about these FP methods?			
Breastfeeding	31.6	38.7	—
Calendar	33.7	41.8	—
Female condom	32.1	37.6	31.9
Implant	—	—	37.1
Injectable	—	—	30.6
Male condom	57.8	54.0	73.2
Pill	37.4	—	32.3
Withdrawal	—	40.4	—
Which subcategories of contraception do you know?			
Traditional	43.3	53.4	29.7
Short-acting	86.6	93.2	91.9
Long-acting reversible contraceptives	81.3	89.8	70.0

Social and Behavioral Variables

Several questions explored social and behavioral variables among respondents. To answer the questions, respondents were asked to use the previously described Liberia proportional piling scale, in which they choose up to ten beans to indicate agreement. That is, respondents were asked, "From zero to ten beans, how many beans do you feel/agree that …?" The results were aggregated at three risk levels: low (zero to three beans), medium (four to six beans), and high (seven to ten beans).

FP Self-Efficacy

Confidence about being able to use FP to avoid an unwanted pregnancy was very high among all respondents (Table 7.2). Married female adolescents indicated very high confidence in avoiding an unwanted pregnancy (72.6%), compared with 65.8% of unmarried sexually active female adolescents and 64.8% of male adolescents. Male adolescents and unmarried sexually active female adolescents were most likely to report low confidence (21.6% and 20.9%, respectively).

Table 7.2 FP Self-Efficacy for Female and Male Adolescents

	Female Adolescents		Male Adolescents
	Unmarried and sexually active N=187 %	Married or in a union N=354 %	All N=310 %
From zero to ten beans, how many beans do you feel sure that you can use FP to avoid an unwanted pregnancy?			
0–3 (Low)	20.9	11.9	21.6
4–6 (Medium)	13.4	15.5	13.5
7–10 (High)	65.8	72.6	64.8

Bounded Descriptive Social Norms Around FP

To assess perceptions of FP use in their neighborhood (bounded descriptive norm), respondents were asked to guess how many neighbors (zero to ten people) were using FP. A small majority of all three populations thought that FP method use was high in their neighborhood (Table 7.3). In contrast, 23.0% of unmarried sexually active female adolescents, 14.1% of married female adolescents, and 17.1% of male adolescents thought that contraceptive use was low in their community.

Table 7.3 FP Bounded Descriptive Social Norms for Female and Male Adolescents

	Female Adolescents		Male Adolescents
	Unmarried and sexually active N=187 %	Married or in a union N=354 %	All N=310 %
From zero to ten women in your neighborhood, how many do you think use an FP method?			
0–3 (Low)	23.0	14.1	17.1
4–6 (Medium)	34.2	31.6	40.0
7–10 (High)	42.8	54.2	42.9

Use of FP Services and Perceived Quality of FP Services

The results on use of FP services indicate that use of FP health services was low among all three subpopulations (Table 7.4). Male adolescents had the lowest use (17.4%), and married female adolescents had the highest (37.3%). Among unmarried sexually active female adolescents, 26.7% reported using FP services. For those who did use FP health services, across all three subgroups, most reported learning about the different types of FP, side effects, and what to do in case of side effects.

Table 7.4 FP Service Use and Quality for Female and Male Adolescents

	Female Adolescents		Male Adolescents
	Unmarried and sexually active N=187 %	Married or in a union N=354 %	All N=310 %
Have you seen any FP provider in the last 12 months?			
No	73.3	62.7	82.6
Yes	26.7	37.3	17.4
Did the person who gave you the FP information tell you about the different types, including ones you already know about?			
No	7.5	13.8	8.1
Yes	19.3	23.4	9.4
Didn't see FP provider	73.3	62.7	82.6
Did the person who gave you the FP information tell you about problems you could have or that it may delay you from getting pregnant?			
No	3.2	5.4	6.1
Yes	23.5	31.9	11.3
Didn't see FP provider	73.3	62.7	82.6
Did the person who gave you the FP information tell you what to do if you experience problems?			
No	7.0	9.9	6.5
Yes	19.8	27.4	11.0
Didn't see FP provider	73.3	62.7	82.6

Bivariate Analysis (Female Adolescents Only)

In this section, the results of the statistical associations (bivariate analysis) between modern FP use and each of the main modern FP predictors described in the previous section are explored. The results of the bivariate analysis of modern FP use and sociodemographic variables are also included. As standard practice for this analysis, aggregate measures (e.g., indices) are used instead of each individual variable

measured in the questionnaire. The bivariate analysis results correspond only to the subsample of female adolescent respondents.

Modern FP Use and Main Bivariate FP Predictors

Current use of any FP method among female adolescents was positively associated with the following main modern FP predictors:

- Knowing short-acting methods
- Knowing long-acting reversible contraceptives
- Knowing more than five (median number) contraceptive methods
- Reporting self-efficacy to use FP
- Perceiving norms of FP use
- Engaging in frequent communication with partner about FP
- Using FP services in the 12 months prior to the survey
- Receiving high-quality FP services
- Exposure to FP messages in the six months prior to the survey

Modern FP Use and Sociodemographic Variables

The results of the bivariate analysis of the sociodemographic variables indicate that modern FP use was positively associated with the following female adolescent characteristics:

- Age
- Area of residence (urban vs. rural)
- Marital status (in a union vs. never married)
- History of childbirth
- County of residence
- Having at least one cellphone in the house

Table 7.5 summarizes the results for the FP cognitive and social predictors of modern FP use.

Table 7.5 Bivariate Statistical Analysis of FP Cognitive and Social Predictors with Modern FP Use for Female Adolescents

	Current Modern FP user (N=225)	
	Any FP method %	Statistical significance
Knows traditional methods		
No	34.3	
Yes	38.5	n.s.
Knows short-acting method		

	Current Modern FP user (n=225)	
	Any FP method %	Statistical significance
No	4.1	
Yes	39.6	p<0.001
Knows long-acting reversible contraceptive method		
No	15.5	
Yes	39.6	p<0.001
Knows more than 5 of 14 methods (median)		
No	29.1	
Yes	40.9	p<0.01
Perceived risk of pregnancy		
Low	32.1	
Medium	35.6	
High	38.4	n.s.
Perceived self-efficacy to use FP		
Low	9.9	
Medium	36.3	
High	42.1	p<0.001
Perceived norms of FP use		
Low	39.8	
Medium	27.3	
High	41.2	p<0.01
Favorable FP attitudes (above median)		
No	33.7	
Yes	39.1	n.s.
Frequency of couple communication about FP		
Low	24.8	
Medium	49.2	
High	74.4	p<0.001
Used FP services in last 12 months		
No	22.3	
Yes	64.3	p<0.001

	Current Modern FP user (N=225)	
	Any FP method %	Statistical significance
Overall FP service quality (all three items)		
No	29.9	
Yes	65.0	p<0.001
Used FP services and quality received		
Did not use FP in last 12 months	22.3	
Used and poor quality received	52.0	
Used and high quality received	65.0	p<0.001
Norms on stressful environment		
Low (0–3 beans)	37.0	
Medium (4–6 beans)	38.9	
High (7–10 beans)	30.8	n.s.
Norms on compassionate environment		
Low	33.3	
Medium	31.9	
High	42.9	p<0.05

Note. n.s.=not statistically significant

Table 7.6 summarizes the results for the analysis of gender equity, decision making, media use, and exposure predictors of modern FP use.

Table 7.6 Bivariate Statistical Analysis of Gender Equity, Decision Making, Media Use, and Exposure Predictors to Modern FP Use for Female Adolescents

	Current Modern FP user (N=225)	
	Any FP method %	Statistical significance
GEM scale: Partner violence index		
Low	46.9	
Medium	48.8	
High	50.5	n.s.
GEM scale: Reproductive health index		
Low	41.7	

	Current Modern FP user (N=225)	
	Any FP method %	Statistical significance
Medium	45.9	
High	53.7	p<0.01
GEM scale: Partner violence index		
Low	33.2	
Medium	38.8	
High	38.0	n.s.
GEM scale: Reproductive health index		
Low	33.3	
Medium	41.8	
High	34.9	n.s.
GEM scale: Sexual relationships index		
Low	32.4	
Medium	38.6	
High	38.5	n.s.
GEM scale: Domestic chores/life index		
Low	35.1	
Medium	39.3	
High	34.6	n.s.
Decides number of children to have		
No	36.5	
Yes	36.1	n.s.
Decides whether to use FP		
No	35.7	
Yes	38.5	n.s.
Decides going to health center if ill		
No	35.8	
Yes	39.5	n.s.
Number of three decisions		
None	36.5	
One	34.9	

	Current Modern FP user (N=225)	
	Any FP method %	Statistical significance
Two	28.1	
All three	45.6	n.s.
Exposed to FP messages		
No	24.6	
Yes	56.8	p<0.001
Listens to radio once per week or more		
No	34.6	
Yes	38.0	n.s.
Watches TV less than once a week		
No	35.1	
Yes	40.0	n.s.
Has at least one cellphone in house		
No	20.3	
Yes	39.2	p<0.001

Note. n.s., not statistically significant.

Table 7.7 summarizes the results for the analysis of sociodemographic predictors of modern FP use.

Table 7.7 Bivariate Statistical Analysis of Sociodemographic Characteristics with Modern FP Use for Female Adolescents

	Current Modern FP user (N=225)	
	Any FP method %	Statistical significance
Age category		
14–16	29.2	
17–19	40.5	p<0.01
Education level		
Primary	37.8	
Some secondary or more	38.1	n.s.
Area of residence		

	Current Modern FP user (n=225)	
	Any FP method %	Statistical significance
Rural	33.4	
Urban	46.4	p<0.01
Religion		
Christian	38.8	
Muslim	28.9	
Traditional/other	23.8	n.s.
Marital status		
Married/cohabitating	28.3	
Single/never married	40.7	p<0.05
Given Birth		
No	33.2	
Yes	43.9	p<0.05
Vulnerability index		
Low	44.4	
Medium	32.5	
High	38.6	n.s.
Standard of living index		
Low	34.0	
Medium	42.7	
High	42.9	n.s.
County of residence		
Bomi	27.1	
Bong	38.8	
Gbarpolu	41.6	p<0.05

Note. n.s., not statistically significant.

Multivariate Analysis (Modern FP Use Among Female Adolescents)

In this section, the results of the multivariate regression of FP use are presented in Table 7.8. Different from the bivariate results, all main FP predictors and sociodemographic variables are included to assess the independent effect of each, after accounting for all other variables.

Table 7.8 Multivariate Regression of Sociodemographic Determinants of Modern FP Use for Female Adolescents who are married or in a union

	Adjusted OR	P-value	95% CI
Residence			
Urban	1.00		
Rural	0.51	0.042*	(0.27, 0.98)
County			
Gbarpolu	1.00		
Bomi	0.40	0.068	(0.15, 1.07)
Bong	0.68	0.320	(0.32, 1.46)
Age			
14–16	1.00		
17–19	1.19	0.670	(0.54, 2.65)
Marital status			
Married/cohabitating	1.00		
Single/never married	1.06	0.890	(0.46, 2.47)
Given birth	2.20	0.013*	(1.18, 4.08)
Education			
Primary	1.00		
Some secondary or more	0.75	0.404	(0.39, 1.47)
Religion			
Christian	1.00		
Muslim	1.06	0.894	(0.48, 2.34)
Other/traditional	0.84	0.840	(0.15, 4.57)
Knows long-acting reversible contraceptive methods	1.19	0.789	(0.34, 4.22)
Knows more than the medium number of methods	1.16	0.641	(0.63, 2.14)
FP self-efficacy			
Low	1.00		
Medium	3.32	0.081	(0.86, 12.77)

	Adjusted OR	P-value	95% CI
High	3.66	0.035*	(1.1, 12.24)
Perceived FP norms			
Low	1.00		
Medium	0.62	0.258	(0.27, 1.42)
High	0.74	0.424	(0.35, 1.55)
Couple communication			
Low	1.00		
Medium	1.56	0.226	(0.76, 3.22)
High	6.62	< 0.001***	(3.01, 14.59)
Visited a provider in the last 12 months	2.55	0.010**	(1.25, 5.2)
Received Quality Services	1.22	0.648	(0.52, 2.87)
Exposed to FP messaging in the last 6 months	2.01	0.021*	(1.11, 3.63)
Has at least one cell phone	3.18	0.025*	(1.15, 8.78)
GEM scale: Partner violence index			
Low	1.00		
Moderate	0.63	0.214	(0.31, 1.3)
High	0.57	0.171	(0.25, 1.28)
GEM scale: Reproductive health index			
Low	1.00		
Moderate	1.40	0.362	(0.68, 2.88)
High	1.41	0.405	(0.63, 3.16)
GEM scale: Sexual relationship index			
Low			
Moderate	0.83	0.627	(0.4, 1.74)
High	0.69	0.400	(0.3, 1.61)
Decides whether to have children	1.15	0.736	(0.52, 2.54)
Decides whether to use contraception	0.92	0.844	(0.41, 2.07)
Decides to go to the health center if ill	1.34	0.538	(0.53, 3.38)
Couple communication index			
Low	1.00		
Moderate	1.20	0.700	(0.48, 3.03)
Frequent	1.06	0.911	(0.39, 2.86)

	Adjusted OR	P-value	95% CI
Listens to the radio more than once a week	0.89	0.25678	(0.51, 1.55)
Watches TV more than once a week	0.80	0.489	(0.42, 1.52)
Constant	0.15	0.151	(0.01, 1.98)

Notes: number of observations=365; LR $\chi^2(34)=138.59$; Prob > $\chi^2=0$; log likelihood=−176.752; pseudo $R^2=0.2816$; OR, odds ratio

Determinants of Current Modern FP Use

The results of the regression of modern FP use (any method) on main modern FP predictors and sociodemographic variables indicate that, holding all else constant, adolescent females who currently use any method of contraception and are in a union or married are more likely to report the following:

- High FP self-efficacy
- High levels of couple communication
- Visited a provider in the last 12 months
- Exposed to FP messaging in the last six months
- Live in rural area
- Given birth
- Own at least one cell phone in their household
- Have at least one cell phone

Conclusions and Recommendations

The results demonstrate a clear relationship between autonomy, couple partnership, and modern contraceptive use. Adolescent females with high FP self-efficacy were 3.66 times more likely to use a modern contraceptive method than those who reported low self-efficacy (95% CI: 1.1, 12.24). Similarly, adolescent females who reported high levels of couple communication were 6.62 times more likely to use a modern FP method than those who reported low levels of communication (95% CI: 3.01, 14.59). A relationship was also found between exposure to FP messages; adolescent females who had been exposed to FP messaging were 2.01 times more likely to use modern contraception than those who had not (95% CI: 1.11, 3.63). These findings highlight the importance of integrating self-efficacy messaging and opportunities for individuals to learn and practice effective couple communication in FP programming.

A relationship was also found between services and modern contraceptive use. For example, adolescent females who reported visiting a provider in the last 12 months were 2.55 times more likely to use modern FP than those who did not visit a provider (95% CI: 1.25, 5.2). This finding highlights the importance of utilizing FP services and the need for a structural change to improve accessibility and use of FP services and/or shift cognitive factors that could improve uptake of FP services.

Demographically, multiple factors were associated with modern FP use. Adolescent females from urban areas were 1.96 times more likely to use a modern contraceptive method than those from a rural area

(95% CI: 1.02 ,3.70). Those who had already given birth were similarly 2.20 times more likely to use a modern FP method than those who had not (95% CI: 1.18, 4.08). Finally, those who lived in a house with at least one cell phone were over 3.0 times more likely to use a modern contraceptive method (OR: 3.18; 95% CI: 1.15, 8.78). These results demonstrate a need to better target female adolescents from rural areas, those who have never given birth, and those who live in a household with no cell phones to increase modern FP use among female adolescents.

Menstrual Health Management

This chapter describes the univariate (frequency distribution) and bivariate analyses of factors shown to be associated with the use of sanitary pads for menstrual health management, as well as the results of a multivariate regression model for use of such products based on main menstrual hygiene management predictors and sociodemographic variables.

Exploratory Analysis of

Among the female adolescents who were interviewed, most in the intervention counties (83.8%) and control county (75.7%) reported having a period (Table 8.1).

Table 8.1 Respondents who Reported Menstruating

	Intervention			Control
	Bong n=385 %	Bomi n=203 %	Total N=588 %	Gbarpolu n=193 %
301. Do you have a period?				
No	15.6	17.2	16.2	24.4
Yes	84.4	82.8	83.8	75.7

Menstruating adolescents were asked questions about their menstrual health management. Most reported starting their periods around 12 to 15 years old (85.6% in intervention counties and 77.4% in the control county). A notably higher percentage of participants in Bomi reported having regular periods (94.6%) than in Bong (84.6%); both intervention counties reported more regular periods than Gbarpolu (80.8%). Almost all participants reported having short (two to three days) or typical periods (four to five days). More participants reported either having a heavier or lighter flow, with the lowest percentage of participants reporting a regular period flow (Table 8.2).

Table 8.2 Period Regularity, Length, and Flow

	Intervention			Control
	Bong n=325 %	Bomi n=168 %	Total N=493 %	Gbarpolu n=146 %
302. How old were you when your period started?				
9–11	2.5	3.0	2.6	6.9
12–15	84.6	87.5	85.6	77.4
16–18	12.9	9.5	11.8	15.8

	Intervention			Control
	Bong n=325 %	Bomi n=168 %	Total N=493 %	Gbarpolu n=146 %
303. Are your periods regular?				
No	10.5	5.4	8.7	19.2
Yes	89.5	94.6	91.3	80.8
304. Before your period, how many days do you have no period?				
Short (20–26 days)	48.3	69.1	55.4	40.4
Typical (27–29 days)	50.2	28.0	42.6	58.2
Long (30–35 days)	1.5	3.0	2.0	1.4
305. What is your period flow like?				
Light	36.3	22.0	31.4	39.0
Moderate	22.5	18.5	21.1	24.7
Heavy	41.2	59.5	47.5	36.3
306. How long does your period generally last?				
Short (2–3 days)	53.2	45.8	50.7	55.5
Typical (4–5 days)	42.2	43.5	42.6	37.0
Long (6–7 days)	4.6	10.7	6.7	7.5

A notably higher percentage of female adolescents from Bomi (56.0%) and Gbarpolu (56.2%) used sanitary pads than those in Bong (48.6%), as shown in Table 8.3.

Table 8.3 Materials Used for Menstrual Health Management

	Intervention			Control
	Bong n=325 %	Bomi n=168 %	Total N=493 %	Gbarpolu n=146 %
308. What product do you use during your period?				
Cloth/underwear	49.5	44.1	47.7	43.2
Sanitary napkin/Kotex	48.6	56.0	51.1	56.2
Other	1.9	0.0	1.2	0.7

The most reported period symptom was pain in the lower abdomen (79.5% in the intervention counties and 54.8% in the control). Lower backache was the second most common symptom in the intervention

counties (9.3%) and third most common in Gbarpolu (12.3%). The second most common symptom in Gbarpolu was body ache (19.2%). Table 8.4 summarizes the results.

Table 8.4 Period Symptoms and Care-Seeking

	Intervention			Control
	Bong n=325 %	Bomi n=168 %	Total N=493 %	Gbarpolu n=146 %
313. Period symptom	(325) %	(168) %	(493) %	(146) %
None	16.0	4.2	12.0	14.4
Low backache	6.8	14.3	9.3	12.3
Leg cramp	0.3	1.2	0.6	0.7
Pain in lower abdomen	76.6	85.1	79.5	54.8
Body ache	2.8	3.6	3.0	19.2
Clots in bleeding	0.0	3.0	1.0	0.0
Enlarged/tender breasts	2.8	6.0	3.9	2.7
314. Have you ever been for treatment of any period problems?	(325) %	(168) %	(493) %	(146) %
No	86.2	89.9	87.4	85.6
Yes	13.8	10.1	12.6	14.4
315. How many times have you received menstrual treatment in last year?	(45) %	(17) %	(62) %	(21) %
Zero	4.4	0.0	3.2	9.5
1–2 times	53.3	82.4	61.3	61.9
Over 2 times	42.2	17.7	35.5	28.6

Participants were asked how much they agree with various statements about menstrual hygiene management. Most highly agreed that the cost of period materials was an important factor in deciding whether to use them; a notably higher percentage of female adolescents in the intervention counties (74.2%) strongly agreed with this statement, compared with those in the control group/Gbarpolu (64.4%).

In Bong, a notably higher percentage of female adolescents felt very comfortable talking to friends (63.7%) rather than parents or other family members (59.5%) about their periods. In Bomi, a much

higher percentage felt very comfortable talking to family (43.4%) rather than friends (31.0%). No such differences were observed in Gbarpolu. Finally, about three-fourths of female adolescents overall either agreed somewhat or strongly that most girls in their community change clothes more than twice a day when they have their period (see Table 8.5).

Table 8.5 Menstrual Hygiene Management Attitudes

	Intervention			Control
	Bong n=325 %	Bomi n=168 %	Total N=493 %	Gbarpolu n=146 %
316. From zero to ten beans, how much do you agree that the price of clean/healthy materials is an important factor in your decision to use them?				
Low (0–3)	6.2	7.7	6.7	10.3
Medium (4–6)	16.9	23.2	19.0	25.3
High (7–10)	76.9	69.1	74.2	64.4
317. From zero to ten beans, how much do you agree that you feel comfortable speaking to your parents or other family members about your period?				
Low (0–3)	25.0	38.7	34.1	32.2
Medium (4–6)	15.5	17.9	17.0	22.6
High (7–10)	59.5	43.4	48.9	45.2
318. From zero to ten beans, how much do you agree that you feel comfortable speaking with your friends about your period?				
Low (0–3)	25.9	51.8	34.7	31.5
Medium (4–6)	10.5	17.3	12.8	21.2
High (7–10)	63.7	31.0	52.5	47.3
319. From zero to ten beans, how much do you agree that most girls like you in your community change clothes more than twice a day during their periods?				
Low (0–3)	28.6	22.8	24.8	28.1
Medium (4–6)	50.6	29.5	36.7	24.0
High (7–10)	20.8	47.7	38.5	48.0

Most female adolescents got their information about periods from family, followed by their community (see Table 8.6).

Table 8.6 Menstrual Health Information Source

	Intervention			Control
	Bong n=325 %	Bomi n=168 %	Total N=493 %	Gbarpolu n=146 %
307. Where is the main place you can get information about your period?				
Family	69.9	72.0	70.6	74.7
Community	18.8	16.7	18.1	19.2
Health worker	2.2	7.1	3.9	4.8
Other	9.2	4.2	7.5	1.4

Bivariate Analysis to Determine Factors Associated with Use of Sanitary Napkins among Female Adolescents

In this section, the results of the statistical associations (bivariate analysis) between use of sanitary pads during a period and each of the main predictors described in the previous section are explored. The results of the bivariate analysis between use of sanitary pads during a period, and sociodemographic variables are also included. As standard practice for this analysis, aggregate measures, such as indices, are used instead of each individual variable measured in the questionnaire. The bivariate analysis results presented correspond to female adolescent respondents.

For female and adolescents, using sanitary pads during a period is significantly associated with the following predictors:

- Age group
- Education level
- Marital status
- Standard of living index
- Radio exposure
- TV exposure
- Social media use
- Couple communication
- Gender-equitable views around reproductive health

Table 8.7 summarizes the results for the bivariate analyses of sociodemographic, cognitive, and social predictors of using sanitary pads during a period.

Table 8.7 Bivariate Statistical Analysis of Sociodemographic Characteristics and Social, Cognitive, and Behavioral Factors Related to Sanitary Napkin Use

	Do you use a sanitary PAD for your period?	Statistical significance
Age group		
14–15	37.0	
16–17	54.2	
18–19	60.5	<0.001
Education level		
No education	34.6	
Some primary	46.5	
Some secondary or more	73.6	<0.001
Area of residence		
Urban	53.3	
Rural	52.0	n.s.
Religion		
Christian	53.3	
Muslim	50.0	
Traditional/other	38.1	n.s.
Marital status		
Single	43.9	
Cohabitating/in a union	59.4	
Married	50.0	<0.001
Vulnerability index		
Low	57.8	
Medium	50.2	
High	53.2	n.s.
Standard of living index		
Low	49.9	
Medium	56.2	
High	90.p	<0.05
County of residence		
Gbarpolu	56.2	
Bomi	56.0	
Bong	48.6	n.s.
Radio exposure		

	Do you use a sanitary pad for your period?	Statistical significance
Never	38.8	
Once a week or less	55.5	
More than once a week/always	59.2	<0.001
TV exposure		
Never	49.1	
Once a week or less	63.2	
More than once a week/always	50.0	<0.05
Social media use		
No	49.4	
Yes	72.0	<0.001
GEM scale: Domestic chores/daily life		
Low	48.7	
Medium	56.2	
High	51.9	n.s.
GEM scale: Reproductive health		
Low	46.5	
Medium	58.4	
High	51.7	<0.05
GEM scale: Sexual relationships		
Low	39.7	
Medium	60.6	
High	56.5	<0.001
GEM scale: Partner violence		
Low	49.3	
Medium	53.9	
High	53.8	n.s.
Days with no period		
Early (20–26 days)	49.7	

	Do you use a sanitary PAD for your period?	Statistical significance
Normal (27–29 days)	55.3	
Late (30–35 days)	50.0	n.s.
Length of period		
Short (2–3 days)	55.3	
Normal (4–5 days)	48.9	
Long (6–7 days)	50.0	n.s.
Main source of menstrual hygiene information		
Family	53.6	
Community	48.7	
Health worker	42.3	
Other	53.8	n.s.
Believe price of menstrual materials is important		
0–33 (Low agreement)	47.9	
34–66 (Medium agreement)	52.7	
67–100 (High agreement)	52.6	n.s.
Feel comfortable speaking to your family members about your period		
0–33 (Low agreement)	44.2	
34–66 (Medium agreement)	51.3	
67–100 (High agreement)	58.3	<0.01
Feel comfortable speaking to your friends and/or other family members about your time/period		
0–33 (Low agreement)	55.3	
34–66 (Medium agreement)	46.8	
67–100 (High agreement)	51.8	n.s.
Believe most girls in the community change clothes more than twice a day when they have their period		
0–33 (Low agreement)	46.0	
34–66 (Medium agreement)	52.3	
67–100 (High agreement)	56.2	n.s.

Note. GEM, gender-equitable men; n.s., not statistically significant

Multivariate Regression

This section summarizes the results of the multivariate regression of sanitary pad use (Table 8.8). Unlike the bivariate results, all main social, cognitive, and sociodemographic variables are included to assess the independent effect of each, after accounting for all other variables.

Table 8.8 Multivariate Regression of Sociodemographic, Social, Cognitive, and Behavioral Determinants of Sanitary Pad Use

	Adjusted OR	95% CI	P>z
Age group			
14–15	1.00		
16–17	1.77	(1.10 , 2.84)	0.02 *
18–19	1.87	(0.97 , 3.61)	0.06
Education level			
No formal education	1.00		
Primary	2.16	(1.11 , 4.20)	0.02 *
Secondary or higher	6.31	(2.95 , 13.49)	0.00**
Residence			
Urban	1.00		
Rural	0.95	(0.61 , 1.48)	0.82
Religion			
Christian	1.00		
Muslim	0.70	(0.41, 1.19)	0.18
Traditional/other	0.77	(0.28 , 2.07)	0.60
Marital status			
Single	1.00		
Cohabitating	1.26	(0.76 , 2.11)	0.37
Married	1.33	(0.33 , 5.46)	0.68
Vulnerability index			
Low	1.00		

	Adjusted OR	95% CI	P>z
Moderate	0.88	(0.43 , 1.82)	0.78
High	0.84	(0.37 , 1.94)	0.69
Standard of living index			
Low	1.00		
Moderate	1.30	(0.77 , 2.17)	0.34
High	8.79	(0.99 , 77.69)	0.05 *
County of residence			
Gbarpolu	1.00		
Bomi	0.82	(0.45 , 1.48)	0.51
Bong	0.74	(0.46 , 1.21)	0.23
Radio exposure			
Never	1.00		
Once a week or less	1.92	(1.20 , 3.06)	0.01 *
More than once a week/every day	2.73	(1.67 , 4.45)	0.00**
TV exposure			
Never	1.00		
Once a week or less	1.09	(0.66 , 1.81)	0.72
More than once a week/every day	0.65	(0.42 , 1.01)	0.06
Have used social media			
No	1.00		
Yes	1.47	(0.82 , 2.63)	0.20
GEM scale: Reproductive health			
Low	1.00		

	Adjusted OR	95% CI	P>z
Medium	1.20	(0.76 , 1.90)	0.44
High	0.95	(0.58 , 1.56)	0.84
GEM scale: Sexual relationship			
Low	1.00		
Medium	2.34	(1.46, 3.76)	0.00**
High	1.90	(1.15 , 3.12)	0.01 *
Comfort speaking to family about menstruation			
Low agreement	1.00		
Medium agreement	1.22	(0.74 , 2.02)	0.44
High agreement	1.69	(1.13 , 2.52)	0.01 *
Constant	0.08	(0.03, 0.28)	0.00

Note. Number of observations=639, LR $\chi^2(19)=126.35$, Prob > $\chi^2=0.0000$, Log likelihood=−379.08897 , pseudo $R^2=0.1428$; GEM: gender-equitable men

In sum, holding all else constant, using sanitary pad during periods can be predicted by the following:

- **Age.** Female adolescents aged 16–17 years were 1.77 times (95% CI: 1.10, 2.84) more likely to use a sanitary pad than female adolescents who were 14–15 years old.
- **Education level.** Female adolescents who completed primary school were 2.16 times (95% CI: 1.11, 4.20) more likely to use a sanitary pad than those who did not. Additionally, female adolescents who completed secondary school or higher were 6.31 times (95% CI: 2.95, 13.49) more likely to use a sanitary pad than those who did not.
- **Standard of living.** Female adolescents with a high standard of living were 8.79 times (95% CI: 0.99, 77.69) more likely to use a sanitary pad than those with a low standard of living.
- **Radio exposure.** Female adolescents who listened to the radio once a week or less were 1.92 times (95% CI: 1.20, 3.06) more likely to use a sanitary pad than those who never listened to the radio. Additionally, female adolescents who listened to the radio more than

once a week or every day were 2.73 times (95% CI: 1.67, 4.45) more likely to use a sanitary pad than those who never listened to the radio. .

- **GEM scale:** Sexual relationship. Interestingly, female adolescents with the moderate gender-inequitable views around sexual relationships were 2.34 times (95% CI: 1.46, 3.76) more likely to use a sanitary pad than those with low gender-inequitable views. This finding suggests that interventions focused on gender equity and norms will also benefit female adolescents and their menstrual hygiene management and other health issues.

- **Family communication.** Female adolescents who felt comfortable talking to family members about their periods were 1.22 times (95% CI: 0.74, 2.02) more likely to use a sanitary pad than those who felt less comfortable doing so.

Conclusion and Recommendations for Practice

These results show that older, more formally educated female adolescents with a higher standard of living were more likely to use a sanitary pad during their periods. As such, more menstrual health management messages could benefit from targeting younger female adolescents who have no formal education and lower standard of living.

Interestingly, female adolescents who more frequently listened to the radio were more likely to use a sanitary pad during their periods than those who never listened to the radio. The opposite pattern was found for TV exposure; female adolescents who watched TV very frequently were less likely to use a sanitary pad during their periods than those who less frequently or never watched TV. This result highlights the potential for different types of menstrual health management messages promoted on the radio versus on TV. Programs could focus on better tailoring TV menstrual health management messaging. Additionally, a content analysis could be conducted on the radio messaging of this topic to better understand how to improve TV messaging of this topic.

This analysis also highlights the importance of couple and family communication in increasing female adolescents' use of sanitary pads. Programs should focus on promoting and modeling effective couple communication and family communication around menstrual hygiene management.

Malaria

Over the past decade, malaria has remained the top cause of mortality in Liberia (Vos et al., 2020) despite the fact that its impact can be controlled by effective prevention strategies and treatments. This chapter focuses on daily use of bed nets among adolescents in the three counties of Liberia. Further attention is paid to malaria in pregnancy, with exploratory analyses of completing three doses of intermittent preventive treatment of malaria during pregnancy (IPTp) and of bed net use during pregnancy. A multivariate model of bed net use is presented to highlight the determinants of this outcome among adolescents. Compared with the adult samples in the baseline study, the number of adolescents that had children in the last five years is not large enough to explore meaningfully; thus, care-seeking for children has been omitted.

Research increasingly demonstrates the effective role that SBC programs play in promoting positive health behaviors, including those related to malaria prevention and treatment. To be effective, however, these programs must target the specific psychosocial variables, including perceptions and beliefs, that influence individuals' malaria-related behaviors, such as prompt care-seeking and use of bed nets. The 2016 Malaria Indicator Survey and 2019 Demographic and Health Survey in Liberia provide evidence on behavioral outcomes related to malaria, including use of mosquito nets and IPTp. Qualitative studies using focus groups and other unstructured assessments have identified several attitudes and beliefs that may contribute to these behaviors. These findings are useful to identify underlying behavior-related factors that program planners can address. In the area of malaria, however, quantitative research to help programs prioritize their messages is lacking.

Prevalence of Specific Priority Behaviors

Table 9.1 presents data on the prevalence of specific priority behaviors related to malaria prevention, care-seeking, testing, and couple communication in the study. Information on care-seeking and bed net use for children under five was limited to adolescent females, as the adolescent male sample included only single males. Among the adolescent male sample, only 14 were caregivers for children under 5, thus the sample size was too small to reliably present information on care seeking and net use for children under 5 with a fever the 2 weeks prior to the study. Daily bed net use varied between adolescent males and females, with approximately 15% more female adolescents reporting that they used a bed net each day during the week preceding the survey. Reporting of daily bed net use among children under five of adolescent females was relatively high, at 80%. This survey did not capture net characteristics or household and population ownership, access, or use. Thus, consistent net use is measured among all respondents.

Twenty percent of children under five were reported to have had a fever in the week preceding the survey. Among the 42 children with fever, 24 (57%) were reportedly taken for care within 24 hours of the onset of fever.

Among adolescents who gave birth in the last two years, daily bed net use during pregnancy was approximately 87%. Further, the completion rate of three doses of IPTp (IPTp3+) among female adolescents who gave birth in the last two years was 52%. Among adolescents who were either married, cohabitating, or in a serious relationship, 71% of females and 64% of males reported that they discussed malaria with their partners at a moderate or high frequency.

Table 9.1 Univariate Results for Key Malaria Indicators for Female and Male Adolescents

INDICATOR	FEMALE %	MALE %
Proportion of adolescents who used a bed net daily the week preceding the survey*	67.61 (781)	52.31 (757)
Proportion of children under five who used a bed net daily the week preceding the survey	80.29 (208)	—
Proportion of children under five with fever the week preceding the survey	20.19 (208)	—
Proportion of children with fever for whom care was sought within 24 hours	57.14 (42)	—
Proportion of pregnant adolescents who used a bed net daily during their current or prior pregnancy	86.59 (164)	—
Proportion of adolescents who received three or more doses of IPTp during their last pregnancy	52.44 (164)	—
Frequency of couple communication among married, cohabitating, and coupled adolescents about malaria	N=354	N=164
0–33 (Low)	29.10	35.98
34–66 (Medium)	22.03	19.51
67–100 (High)	48.87	44.51
*This survey did not capture household net characteristics and ownership, thus consistent net use is measured among all adolescents surveyed.		

Variations in Priority Behaviors

Table 9.2 summarizes the results with respect to use of bed nets. In Bomi and Bong, respectively, 86% and 89% of female adolescents stated they slept under a bed net every night during their last pregnancy. Daily net use during pregnancy was 7 percentage points higher in the intervention counties than in Gbarpolu, though this difference was not statistically significant.

Daily net use among adolescents was higher among female versus male adolescents in both the intervention and control counties, with the highest overall rates in Bong. Overall, respondents in the

intervention counties practiced daily bed net use more frequently than their counterparts in Gbarpolu, with rates among females and males 15 ($p<0.01$) and 11 ($p<0.01$) percentage points higher than their peers in Gbarpolu, respectively.

Table 9.2 Bivariate Results for Malaria Prevention and Care-Seeking

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bomi % (n)	Bong % (n)	Both % (n)	Gbarpolu % (n)	Bomi % (n)	Bong % (n)	Total % (n)	Gbarpolu % (n)
Proportion of women who slept under a bed net every night during their last pregnancy	86.1 (43)	89.2 (83)	88.1 (126)	81.6 (38)	-	-	-	-
Proportion of respondents who slept under a bed net every night	55.7 (203)	79.7 (385)	71.4 (588)	56.0 (193)	45.3 (190)	60.0 (375)	55.0 (565)	44.3 (192)

Though rates if IPTp3+ coverage are lower in the intervention (51%) counties than Gbaorpolu (58%), this difference is not statistically significant. Nonetheless, these results highlight the need for interventions targeting pregnant adolescent females across all counties. Surprisingly, IPTp3 completion based on ANC attendance was nearly the same between those who did and did not attend four or more ANC appointments. This may have been owing to the success of community-based outreach to pregnant women that allows women who do not attend ANC to receive IPTp doses.

Table 9.3 Percentage of Female Adolescents Who Completed All Three Doses of IPTp

	Intervention			Control	Those who Attended Four or More ANC Visits	
	Bomi % (n)	Bong % (n)	Total % (n)	Gbarpolu % (n)	Yes % (n)	No % (n)
Proportion of women who received three or more doses of IPTp during their last pregnancy	60.5 (43)	45.8 (83)	50.8 (126)	57.9 (38)	52.5 (143)	52.4 (21)

Determinants of Daily Use of Bed Nets

Table 9.4 shows the significant results (OR) for a regression of daily net use the week preceding the survey on demographic and ideational factors of interest. The model highlights a significantly increased likelihood of daily net use among cohabitating female adolescents (OR: 2.2, CI: 1.4–3.7) and females (OR: 5.1, CI: 3.2–8.2) and males (OR: 2.2, CI: 1.5–3.2) in Bong, compared with those in Gbarpolu. Recall of the Healthy Life campaign was positively associated with bed net use for female adolescents (OR: 1.7, CI: 1.1–2.3), but not among their male peers.

Table 9.4 Results (OR) for Logistic Regression of Daily Net Use the Week Preceding the Survey

	Male Adolescents		Female adolescents	
	OR	95% CI	OR	95% CI
Marital status				
Single/never married (reference)	—	—	1.00	—
Cohabitating	—	—	2.23***	1.35–3.67
Married	—	—	0.82	0.25–2.68
County of residence				
Gbarpolu (reference)	1.00	—	1.00	—
Bomi	0.91	0.55–1.48	1.18	0.69–2.02
Bong	2.17***	1.48–3.20	5.14***	3.22–8.20
Recalls Healthy Life campaign (yes)	1.37	0.96–1.97	1.74***	1.10–2.26

Notes. Further demographic variables (not shown) controlled for in this model include education, economic vulnerability, age, religion, labor force participation, and household size. Additionally, social and behavioral factors related to gender inequitable norms and communication with others about malaria were included. None of these variables were significant for either male or female adolescents. ***p<0.01, **p<0.05.

Conclusions and Recommendations

Univariate data suggest that care-seeking for fever among adolescents' children under five, IPTp3+ completion among pregnant adolescent females, and communication about malaria between adolescent couples are areas that may benefit from expanded intervention. These results further highlight a disparity in consistent net use, with adolescent females using nets more often than adolescent males. Bivariate results further cement the need to consider innovative ways to increase uptake of ANC among adolescent females. Of particular note is that there was no significant difference in IPTp3+ completion based on ANC attendance, suggesting that there may be scope to plan interventions that go beyond focus on only facility-based uptake of IPTp. Multivariate results highlight the positive effects that programming in Bong has had on consistent bed net use, and further highlight the correlation between the Healthy Life campaign and increased rates of consistent net use, particularly among adolescent females.

Continued efforts to improve uptake of IPTp among female adolescents should be prioritized. Bivariate analysis showed no significant difference in IPTp3+ completion based on formal ANC attendance, suggesting that there may be scope for improvement both in facility and community-based settings to increase uptake and awareness of IPTp. Given the stark difference in consistent net use between female and male adolescents, programming should focus on better addressing gender inequalities related to bed net use, with a particular focus on increasing net use among adolescent males. Multivariate results highlight an important achievement of the Healthy Life campaign in positively affecting bed net use in adolescent populations, signaling the importance of further maintaining and adapting this campaign to

extend its reach in Liberia. These results further highlight that Bong may serve as a successful example of intervention for malaria prevention, particularly bed net use, among adolescent males and females.

COVID-19

This chapter describes the univariate (frequency distribution) and bivariate analyses of factors that have been shown to be associated with COVID-19 vaccine acceptance and COVID-19 prevention behaviors among female and male adolescents, as well as the results of a multivariate regression model for use of such products among female adolescents based on main predictors and sociodemographic variables.

Exploratory Analysis of COVID-19 related factors

COVID-19 has affected global health, including the Liberian adolescent population (see Introduction Chapter). As such, this analysis seeks to look at what may be important factors that are associated with vaccine acceptance and COVID-19 prevention behaviors. As such, we conducted exploratory analyses to get a better sense of the prevalence of four COVID-19 prevention behaviors as well as experience with/acceptance of COVID-19 vaccines.

Handwashing

Participants were asked about four COVID-19 prevention behaviors—handwashing, wearing a face mask, avoiding direct contact, and physical distancing. Across all study sites, a higher percentage of female adolescents (range across sites: 90.2%–95.7%) reported washing hands with soap or sanitizer (most or some of the time) than male participants (range across sites: 74.5%–90.0%). Similarly, mask wearing rates were higher among female adolescents (range across sites: 72.6%–91.4%) than males (range across sites: 61.9%–75.3%) across study sites.

Physical Distancing

Participants were asked about their maintenance of a safe distance (2 m) from others as a COVID-19 prevention measure. Reported rates varied across the three study sites as more male adolescents in Bong and Bomi (range across sites: 41.1%–52.1%) reported maintaining a safe distance sometimes or most of the time than female adolescents (range across sites: 36.8%–52.7%). While female adolescents in Gbarpolu reported the highest rates of distancing (sometimes or most of the time: 57.9%). Overall, however, the two most practiced COVID-19 prevention behaviors were handwashing and mask wearing (see Table 10.1). Because avoidance of shaking hands/hugging people and physical distancing are similar (in that people who are physically distancing are inherently avoiding shaking hands/hugging people), the following three COVID-19 prevention behaviors were used in this analysis: handwashing with soap, mask wearing, and physical distancing.

Table 10.1 COVID-19 Prevention Behaviors for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong n=385 %	Bomi n=203 %	Total N=89 %	Gbarpolu n=193 %	Bong n=375 %	Bomi n=190 %	Total N=565 %	Gbarpolu n=192 %
Because of coronavirus, how often do you do the following nowadays?								
801. Clean hands with soap/sanitizer more often	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
Most times	38.4	49.8	42.3	47.2	17.9	42.1	26.0	32.8
Sometimes	54.3	40.9	49.7	47.2	60.8	47.9	56.5	41.7
Never	7.3	9.4	8	5.7	21.3	10.0	17.5	25.5
802. Wear a face mask when outside	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
Most times	20.3	24.6	21.8	34.2	10.7	21.6	14.3	25.0
Sometimes	67.3	63.1	65.8	43	51.2	53.7	52.0	49.0
Never	12.5	12.3	12.4	22.8	38.1	24.7	33.6	26.0
803. Avoid shaking hands/huggin g people	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
Most times	14.5	4.4	11.1	32.1	8.3	19.5	12.0	22.4
Sometimes	42.1	55.2	46.6	38.3	36.5	34.2	35.8	31.8
Never	43.4	40.4	42.3	29.5	55.2	46.3	52.2	45.8
804. Keep 2 m (6 ft) from people	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
Most times	12.5	2	8.8	18.7	5.6	18.4	9.9	17.7
Sometimes	30.6	49.3	37.1	36.3	35.5	33.7	34.9	29.7
Never	56.9	48.8	54.1	45.1	58.9	47.9	55.2	52.6

Vaccinations

Although a small percentage of participants reported receiving a vaccination (3.6%-4.4% females and 6.3%-15.8% males), a higher percentage of males (6.3%–15.8%) than females (3.5%–4.4%) identified as vaccinated. Of the participants who had not received a COVID-19 vaccine, over 60% of female participants reported that they were unlikely to get vaccinated (responses: probably would not or definitely would not get vaccinated). Among male adolescents, a much higher percentage of participants in Gbarpolu would probably or definitely get vaccinated than in the intervention counties, but there was no clear pattern across the sites within the male sample or in comparison with the women's sample (see Table 10.2).

Table 10.2 COVID-19 Vaccine Uptake and Hesitancy for Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong n=385 %	Bomi n=203 %	Total N=89 %	Gbarpolu n=193 %	Bong n=375 %	Bomi n=190 %	Total N=565 %	Gbarpolu n=192 %
805. Have you received a COVID-19 vaccine yet?	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
No	95.8	95.6	95.7	96.4	84.8	84.2	84.6	93.8
Yes	4.2	4.4	4.3	3.6	15.2	15.8	15.4	6.3
807. If a vaccine to prevent COVID-19 were offered to you today, would you choose to get vaccinated?	(369) %	(194) %	(563) %	(186) %	(375) %	(190) %	(565) %	(192) %
No, definitely not	41.8	35.8	37.8	37.6	55.2	59.0	56.5	31.3
No, probably not	24.7	24.1	24.3	29	9.6	14.7	11.3	16.7
Yes, probably	15.5	22.5	20.1	11.8	16.3	5.8	12.7	12.0
Yes, definitely	18	17.6	17.8	21.5	18.9	20.5	19.5	40.1

Bivariate Analysis to Determine Factors Associated with COVID-19 Prevention Behaviors and Vaccine Acceptance

In this section, the results of the statistical associations (bivariate analysis) between vaccine acceptance or COVID-19 prevention behaviors and each of the main predictors described in the previous section are explored. The results of the bivariate analysis between vaccine acceptance (defined as having received a COVID-19 vaccine or being willing to receive a COVID-19 vaccine if it becomes available to them) or COVID prevention behaviors and sociodemographic variables is also included. As standard practice for this analysis, aggregate measures (e.g., indices) are used instead of each individual variable measured in the questionnaire. The bivariate analysis results correspond to female and male adolescent respondents.

Vaccine Acceptance and Main Sociodemographic and Vaccine Acceptance Predictors

For female adolescents, vaccine acceptance was significantly associated with the following sociodemographic predictors: education level, couple communication, gender-equitable views around domestic chores and daily life, and participation in at least one COVID-19 prevention behavior. For males, it was associated with education level, county of residence, and radio exposure.

Table 10.3 summarizes the results for the bivariate analyses of sociodemographic, cognitive, and social predictors of vaccine acceptance.

Table 10.3 Bivariate Analysis of Sociodemographic, Cognitive, Behavioral, and Social Predictors of Vaccine Acceptance

	Female Adolescents		Male Adolescents	
	Would/did get vaccine (%)	Statistical significance	Would/did get vaccine (%)	Statistical significance
Age category				
14–15	36.7		43.8	
16–17	38.3		45.1	
18–19	42.3	n.s.	48.9	n.s.
Education level				
No education	49.3		38.7	
Some primary	39.7		45.0	
Some secondary or more	34.3	p< .01	51.8	n.s.
Area of residence				
Urban	44.1		49.4	

	Female Adolescents		Male Adolescents	
	Would/did get vaccine (%)	Statistical significance	Would/did get vaccine (%)	Statistical significance
Rural	38	n.s.	45.3	n.s.
Religion				
Christian	39.3		47.2	
Muslim	39.6		43.1	
Traditional/other	38.5	n.s.	46.2	n.s.
Marital status				
Single	37.7		—	
Cohabitating/In a union	40.9		—	
Married	35.3	n.s.	—	—
Vulnerability index				
Low	47.1		45.3	
Medium	41.2		42.0	
High	35.9	n.s.	49.0	n.s.
Standard of living index				
Low	38.1		46.9	
Medium	42.4		43.0	
High	45.5	n.s.	80.0	n.s.
County of residence				
Gbarpolu	35.8		53.1	
Bomi	36.5		38.9	
Bong	42.6	n.s.	46.4	$p<0.05$
Radio exposure				
Never	37.3		43.1	
Once a week or less	39.2		49.9	
More than once a week/always	41.2	n.s	42.7	n.s.
TV exposure				
Never	39.2		44.7	

	Female Adolescents		Male Adolescents	
	Would/did get vaccine (%)	Statistical significance	Would/did get vaccine (%)	Statistical significance
Once a week or less	38.6		50.5	
More than once a week/always	40.1	n.s.	44.4	n.s.
Social media use				
No	39.3		45.0	
Yes	39.4	n.s.	49.7	n.s.
Talk with spouse				
Low communication	37.93		—	
Medium communication	28.16		—	
High communication	33.91	n.s.	—	—
GEM scale: Domestic chores/daily life				
Low	34.2		45.8	
Medium	46.0		42.4	
High	37.5	$p<0.05$	50.6	n.s.
GEM scale: Reproductive health				
Low	35.3		49.2	
Medium	39.5		43.3	
High	43.2	n.s.	46.1	n.s.
GEM scale: Sexual relationships				
Low	33.8		47.5	
Medium	40.2		44.6	
High	44.2	$p=0.05$	46.5	n.s.
GEM scale: Partner violence				
Low	37.3		46.8	
Medium	38.8		45.1	
High	41.9	n.s.	46.7	n.s.
Participation in at least one prevention behavior				

	Female Adolescents		Male Adolescents	
	Would/did get vaccine (%)	Statistical significance	Would/did get vaccine (%)	Statistical significance
No	31.3		49.6	
Yes	40.7	P<0.10	44.6	n.s.

Note. n.s., not statistically significant

COVID-19 Prevention Behaviors and Main Sociodemographic and Prevention Behavior Predictors

For female adolescents, vaccine acceptance was significantly associated with the following main vaccine acceptance predictors: vulnerability index, standard of living index, county of residence, radio exposure, and gender-equitable views around domestic chores and daily life, reproductive health (i.e., condom use, FP, and childbirth), and sexual relationship. For males, it was associated with education level, religion, standard of living index, county of residence, radio exposure, social media use, couple communication, and gender-equitable views around domestic chores and daily life and reproductive health. Table 10.4 summarizes the results.

Table 10.4 Bivariate Analysis of Sociodemographic, Cognitive, Behavioral, and Social Predictors of COVID-19 Prevention Behaviors

	Female Adolescents		Male Adolescents	
	Would/did get vaccine (%)	Statistical significance	Would/did get vaccine (%)	Statistical significance
Age category				
14–15	88.9		64.1	
16–17	84.7		68.3	
18–19	83.2	n.s.	67.0	n.s.
Education level				
No education	81.2		46.8	
Some primary	85.5		63.7	
Some secondary or more	86.2	n.s.	82.2	p<0.001
Area of residence				
Urban	85.3		67.8	
Rural	85.3	n.s.	66.7	n.s.
Religion				

	Female Adolescents		Male Adolescents	
	Would/did get vaccine (%)	Statistical significance	Would/did get vaccine (%)	Statistical significance
Christian	84.5		66.0	
Muslim	90.3		75.4	
Traditional/other	76.9	n.s.	34.6	p<0.001
Marital status				
Single	86.4		—	
Cohabitating/in a union	83.9		—	
Married	94.1	n.s.	—	—
Vulnerability index				
Low	80		69.8	
Medium	88.1		64.3	
High	83.5	p<0.10	68.3	n.s.
Standard of living index				
Low	83.6		66.0	
Medium	89.9		71.5	
High	90.9	p<0.10	20.0	p<0.05
County of residence				
Gbarpolu	80.3		69.3	
Bomi	87.2		74.7	
Bong	86.8	p<0.10	61.9	P<0.01
Radio exposure				
Never	78.8		57.7	
Once a week or less	90.6		72.1	
More than once a week/always	84.1	p<0.001	64.5	p<0.01
TV exposure				
Never	83.5		64.9	
Once a week or less	85.5		71.7	

	Female Adolescents		Male Adolescents	
	Would/did get vaccine (%)	Statistical significance	Would/did get vaccine (%)	Statistical significance
More than once a week/always	88.6	n.s.	65.4	n.s.
Social media use				
No	84.9		63.7	
Yes	87.9	n.s.	76.1	p<0.001
Talk with spouse				
Low communication	86.8		83.3	
Medium communication	83.0		66.7	
High communication	84.1	n.s.	80.0	n.s.
GEM scale: Domestic chores/daily life				
Low	78.2		61.6	
Medium	89.0		71.8	
High	88.8	p<0.001	68.0	p>0.05
GEM scale: Reproductive health				
Low	82.8		58.0	
Medium	86.3		70.0	
High	86.8	n.s.	73.9	p<0.001
GEM scale: Sexual relationships				
Low	87.2		62.1	
Medium	81.2		71.7	
High	87.6	n.s.	67.3	n.s.
GEM scale: Partner violence				
Low	85.2		71.5	
Medium	85.2		66.4	
High	85.4	n.s.	62.6	n.s.

Note. GEM, gender-equitable men; n.s., not statistically significant

Multivariate Regression

This section presents the results of the multivariate regression of vaccine use and of COVID-19 prevention behaviors. Unlike the bivariate results, all main psychosocial and demographic variables are included to assess the independent effect of each, after accounting for all other variables.

Vaccine Acceptance Multivariate Model with Main Sociodemographic and Vaccine Acceptance Predictors

Table 10.5 Multivariate Analysis of Sociodemographic, Cognitive, Behavioral, and Social Predictors of Vaccine Acceptance

	Female Adolescents			Male Adolescents		
	Adjusted OR	95% CI	P>z	Adjusted OR	95% CI	P>z
Age group						
14–15	1.0			1.00		
16–17	1.88	(0.65, 5.41)	0.24	0.95	(0.64, 1.42)	0.81
18–19	2.44	(0.86, 6.91)	0.09	1.08	(0.71, 1.65)	0.72
Education level						
No formal education	1.00			1.00		
Primary	0.60	(0.31, 1.15)	0.12	1.31	(0.75, 2.29)	0.34
Secondary or higher	0.46	(0.22, 0.97)	0.04*	1.68	(0.90, 3.14)	0.10
Residence						
Urban	1.00			1.00		
Rural	0.87	(0.52, 1.46)	0.61	0.95	(0.66, 1.37)	0.78
Religion						
Christian	1.00			1.00		
Muslim	1.26	(0.69, 2.31)	0.45	1.07	(0.69, 1.67)	0.77
Traditional/Other	0.51	(0.16, 1.57)	0.24	1.02	(0.45, 2.31)	0.96
Marital status						
Single				—		
Cohabitating	—			—	—	—
Married	0.58	(0.20, 1.71)	0.32	—	—	—
Vulnerability index						
Low	1.00			1.00		
Moderate	0.86	(0.38, 1.92)	0.71	0.78	(0.40, 1.54)	0.47
High	0.72	(0.28, 1.84)	0.49	0.92	(0.45, 1.91)	0.82

	Female Adolescents			Male Adolescents		
	Adjusted OR	95% CI	P>z	Adjusted OR	95% CI	P>z
Standard of living index						
Low	1.00			1.00		
Moderate	1.12	(0.62, 2.02)	0.70	0.93	(0.61, 1.41)	0.73
High	1.52	(0.35, 6.65)	0.58	3.70	(0.39, 34.84)	0.25
County of residence						
Gbarpolu	1.00			1.00		
Bomi	1.12	(0.56, 2.26)	0.74	0.61	(0.37, 1.00)	0.05*
Bong	1.53	(0.89, 2.64)	0.13	0.80	(0.55, 1.17)	0.25
GEM scale: Domestic chores and daily life						
Low	1.00			—		
Medium	1.98	(1.19, 3.28)	0.01*	—	—	—
High	1.43	(0.82, 2.49)	0.21	—	—	—
GEM scale: Reproductive health						
Low	1.00			—		
Medium	0.95	(0.56, 1.62)	0.85	—	—	—
High	0.96	(0.56, 1.66)	0.89	—	—	—
Couple communication						
Low	1.00			—		
Medium	0.66	(0.40, 1.09)	0.11	—	—	—
High	0.85	(0.50, 1.44)	0.54	—	—	—
Practice more than one COVID-19 prevention behavior						
No	1.00			1.00		
Yes	2.10	(1.12, 3.93)	0.02*	0.79	(0.57, 1.08)	0.14
Constant	0.30	(0.05, 1.79)	0.19	1.16	(0.34, 3.89)	0.81

Female adolescents: Number of observations=428, LR $\chi^2(19)=30.41$, Prob > $\chi^2=0.0841$, Log likelihood=−273.94358, pseudo $R^2=0.0526$; Male adolescents: Number of observations=757 LR $\chi^2(22)=17.55$, Prob > $\chi^2=0.2281$, Log likelihood=−513.78975, pseudo $R^2=0.0168$.

The results of the regression of vaccine acceptance on main social, cognitive, and sociodemographic variables (see Table 10.5) indicate that, holding all else constant, vaccine acceptance among female adolescents was predicted by the following:

- **Education level.** Female adolescents with secondary school education or higher were 54% less likely (95% CI: 0.22, 0.97) to get vaccinated or be willing to do so, compared with those with no formal education.
- **GEM scale for domestic chores/daily life.** Interestingly, female adolescents with medium gender-inequitable views around domestic chores and daily life were 1.98 times (95% CI: 1.19, 3.28) more likely to be vaccinated or willing to do so, compared with those with more gender-equitable views. No significant difference was found between high gender-inequitable views around domestic chores and daily life and low gender-inequitable views in this domain.
- **Participation in at least one COVID-19 prevention behavior.** Female adolescents who participated in at least one COVID-19 prevention behavior (i.e., washing hands, wearing a mask, physical distancing) were about two times more likely (95% CI: 1.12, 3.93) to be vaccinated or willing to do so, compared with those who did not.

The results of the regression of vaccine acceptance on main social, cognitive, and sociodemographic variables indicate that, holding all else constant, vaccine acceptance among male adolescents was predicted by the following:

- **County of residence.** Male adolescents from Bomi were 39% less likely (95% CI: 0.37, 1.00) to be vaccinated or willing to do so than those from Gbarpolu. No significant difference was found between Bong and Gbarpolu.

COVID-19 Prevention Behaviors Multivariate Model with Main Sociodemographic and Prevention Behavior Predictors

Table 10.6 Multivariate Analysis of Sociodemographic, Cognitive, Behavioral, and Social Predictors of COVID-19 Prevention Behaviors

	Female Adolescents			Male Adolescents		
	Adjusted OR	95% CI	P>z	Adjusted OR	95% CI	P>z
Age group						
14–15	1.00			1.00		
16–17	0.67	(0.37, 1.21)	0.18	0.84	(0.54, 1.32)	0.45
18–19	0.57	(0.26, 1.26)	0.16	0.66	(0.41, 1.06)	0.09
Education level						
No formal education	1.00			1.00		
Primary	1.86	(0.64, 2.56)	0.49	1.84	(1.06, 3.28)	0.03*
Secondary or higher	5.08	(0.64, 3.11)	0.40	4.95	(2.54, 10.13)	0.00***

	Female Adolescents			Male Adolescents		
	Adjusted OR	95% CI	P>z	Adjusted OR	95% CI	P>z
Residence						
Urban	1.00			1.00		
Rural	0.93	(0.55, 1.58)	0.80	0.95	(0.63, 1.43)	0.81
Religion						
Christian	1.00			1.00		
Muslim	1.82	(0.91, 3.64)	0.09	1.18	(0.70, 1.98)	0.53
Traditional/other	0.37	(0.13, 1.06)	0.07	0.44	(0.18, 1.06)	0.07
Marital status						
Single	1.00			—		
Cohabitating	1.03	(0.56, 1.90)	0.93	—	—	—
Married	3.25	(0.38, 27.78)	0.28	—	—	—
Vulnerability index						
Low	1.00			1.00		
Moderate	4.15	(1.50, 11.47)	0.01**	1.01	(0.46, 2.21)	0.98
High	3.22	(1.06, 9.84)	0.04*	1.06	(0.46, 2.46)	0.89
Standard of living index						
Low	1.00			1.00		
Moderate	3.13	(1.33, 7.39)	0.01**	1.21	(0.75, 1.94)	0.44
High	2.94	(0.33, 25.81)	0.33	0.14	(0.01, 1.38)	0.09
County of residence						
Gbarpolu	1.00			1.00		
Bomi	1.11	(0.56, 2.20)	0.77	1.37	(0.78, 2.40)	0.27
Bong	1.59	(0.96, 2.66)	0.07	0.85	(0.55, 1.31)	0.46
Radio exposure						
Never	1,00			1.00		
Once a week or less	2.45	(1.44, 4.17)	0.00***	1.87	(1.19, 2.95)	0.01**
More than once a week/every day	1.42	(0.87, 2.33)	0.17	1.49	(0.94, 2.37)	0.09

	Female Adolescents			Male Adolescents		
	Adjusted OR	95% CI	P>z	Adjusted OR	95% CI	P>z
Have used social media						
No	—			1.00		
Yes	—	—	—	1.29	(0.84, 1.98)	0.25
GEM scale: domestic chores and daily life						
Low	1.00			1.00		
Medium	2.20	(1.33, 3.64)	0.00***	1.30	(0.86, 1.97)	0.21
High	2.17	(1.28,3.69)	0.00***	0.97	(0.64, 1.47)	0.89
GEM scale: reproductive health						
Low	—			1.00		
Medium	—	—	—	1.41	(0.95, 2.09)	0.09
High	—	—	—	1.57	(1.00, 2.45)	0.05*
Constant	0.54	(0.10, 2.98)	0.48	0.53	(0.13, 2.13)	0.37

Female adolescents: Number of observations=781, LR $\chi^2(23)=57.61$, Prob > $\chi^2=0.0000$, Log likelihood=−297.58044, pseudo $R^2=0.0882$; Male adolescents: Number of observations=774, LR $\chi^2(24)=86.22$, Prob > $\chi^2=0.0000$, Log likelihood=−446.73355, pseudo $R^2=0.0880$; GEM: gender-equitable men

The results of the regression of participation in at least one COVID-19 prevention behavior (i.e., handwashing, mask wearing, and physical distancing; see Table 10.6) on main psychosocial and demographic variables indicate that, holding all else constant, participating in at least one COVID-19 prevention behavior (i.e., wearing a mask, washing hands, physical distancing) among female adolescents was predicted by the following:

- **Vulnerability index.** Female adolescents in the medium levels of the vulnerability index were 4.15 times (95% CI: 1.50, 11.47) more likely to participate in at least one COVID-19 prevention behavior than those in the lowest level. Additionally, those in the highest level of the vulnerability index were 3.22 times (95% CI: 1.06, 9.84) more likely to participate in at least one COVID-19 prevention behavior than those in the lowest level.
- **Standard of living index.** Female adolescents with a moderate standard of living were 3.13 times (95% CI: 1.33, 7.39) more likely to participate in at least one COVID-19 prevention behavior than those with a low standard of living.
- **Radio exposure.** Female adolescents who listened to the radio once a week or less were 1.81 times (95% CI: 1.44, 4.17) more likely to participate in at least one COVID-19 prevention behavior than those who never listened to the radio.
- **GEM scale:** Domestic chores and daily life. Interestingly, female adolescents with moderate gender-inequitable views around domestic chores and daily life were 2.20 times (95% CI: 1.33, 3.64) more likely to participate in at least one COVID-19 prevention behavior than

those with the lowest gender-inequitable views in this domain. Female adolescents with high gender-inequitable views around domestic chores and daily life were 2.17 times (95% CI: 1.28, 3.69) more likely to participate in at least one COVID-19 prevention behavior than those with the lowest gender-inequitable views in this domain.

The results of the regression of participation in at least one COVID-19 prevention behavior (i.e., handwashing, mask-wearing, and physical distancing) on main social, cognitive, and sociodemographic variables indicate that, holding all else constant, participating in at least one COVID-19 prevention behavior (i.e., wearing a mask, washing hands, physical distancing) among male adolescents was predicted by the following:

- **Education level.** Male adolescents who completed primary education were 1.84 times (90% CI: 1.06, 3.28) more likely to get vaccinated or be willing to do so, compared with those with no formal education. Male adolescents with secondary school education or higher were 4.95 times (90% CI: 2.54, 10.13) more likely to get vaccinated or be willing to do so, compared with those with no formal education.
- **Radio exposure.** Male adolescents who listened to the radio once a week or every day were 1.87 times more likely (95% CI: 1.19, 2.95) to participate in at least one COVID-19 prevention behavior than those who never listened to the radio.
- **GEM scale: Reproductive health.** Interestingly, male adolescents with high gender-inequitable views around reproductive health were 1.57 times (95% CI: 1.00, 2.45) more likely to participate in at least one COVID-19 prevention behavior than those with the lowest gender-inequitable views in this domain.

Conclusions and Recommendations

Considering the low proportion of people who have received a COVID-19 vaccine, persuasive messaging around COVID-19 vaccination and prevention is critical. COVID-19 prevention programs must promote gender-equitable norms, given their significance in predicting both vaccine acceptance and COVID-19 prevention behaviors. The data suggest that gender is a cross-cutting issue that should be included in all adolescent programming, especially as participating in at least one COVID-19 prevention behavior was a significant predictor of vaccine acceptance among female adolescents. Additionally, radio programming might prove effective for COVID-19 prevention behavior messaging targeted at male adolescents, and existing radio messaging around vaccine acceptance should be examined and perhaps improved to significantly influence COVID-19 vaccine acceptance.

These results demonstrate that female adolescents with secondary school education or more and male adolescents in Bomi had lower vaccine acceptance, therefore suggesting a need to target messaging to these groups especially to increase vaccine acceptance. These results also reveal that female adolescents with the lowest vulnerability and with the lowest standard of living were less likely to participate in at least one COVID-19 prevention behavior, and that male adolescents with no formal

education were the least likely to participate in at least one COVID-19 prevention behavior, suggesting a need to target COVID-19 prevention messaging to these groups especially to increase prevention behaviors.

Global Health Security Agenda

This chapter describes the univariate (frequency distribution) and bivariate analyses of factors that have been shown to be associated transmission knowledge of three different zoonotic diseases—Lassa fever, rabies, and bovine TB among female and male adolescents.

Univariate Results of Disease Awareness and Knowledge

Participants were asked about their awareness and knowledge of Lassa fever, rabies, and bovine TB. Across the sample, levels of self-stated knowledge of lassa fever, rabies, and bovine TB were 46%, 41%, and 56%, respectively. However, respondents were tested directly on their knowledge when they were asked to identify the cause of each disease. Along this domain, respondents correctly identified lassa fever, rabies, and bovine TB at rates of 30%, 31%, and 1%, respectively. A key observation made of the data were that two of the most common causes for bovine TB mentioned among respondents were smoking and person-to-person respiratory infection.

Most participants were aware of bovine TB. Female adolescents in Bong had a substantially higher level of awareness of Lassa fever (66%) than those in Bomi (16%) and Gbarpolu (24%). Among male adolescents, those in Bong were also much more aware of Lassa fever (71%) than those in Bomi (36%) and Gbarpolu (22%).

Among female adolescents, 35% in Bomi reported awareness of rabies, while those in Bong and Gbarpolu reported awareness rates of 40% and 42%, respectively. <60% of male adolescents in Bomi reported awareness of rabies, while male adolescents in the Bong and Gbarpolu reported awareness rates of 37% and 42%, respectively.

Among female adolescents, 35% of respondents in Gbarpolu and 58% of respondents in the intervention counties reported awareness of bovine TB. Knowledge of bovine TB among male adolescents was relatively high across all counties but lowest in Gbarpolu (53%) and highest in Bomi (66%). Table 11.1 summarizes the results.

Table 11.1 Awareness and Knowledge of Zoonotic Diseases Among Female and Male Adolescents

	Female Adolescents				Male Adolescents			
	Intervention			**Control**	**Intervention**			**Control**
	Bong n=385 %	Bomi n=203 %	Total N=588 %	Gbarpolu n=193 %	Bong n=375 %	Bomi n=190 %	Total N=565 %	Gbarpolu n=192 %
809. Have you heard of Lassa fever?	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
Yes	65.5	16.3	48.5	24.4	70.9	35.8	59.1	21.9

	Female Adolescents				Male Adolescents			
	Intervention			Control	Intervention			Control
	Bong n=385 %	Bomi n=203 %	Total N=588 %	Gbarpolu n=193 %	Bong n=375 %	Bomi n=190 %	Total N=565 %	Gbarpolu n=192 %
810. Who/what can give this sickness to humans?	(252) %	(33) %	(285) %	(47) %	(266) %	(68) %	(334) %	(42) %
Rat	62.7	42.4	60.4	68.1	71.8	66.2	70.6	33.3
Other	5.6	0.0	4.9	4.3	4.5	11.8	6.0	14.3
Don't know	31.7	57.6	34.7	27.7	23.7	22.1	23.4	52.4
811. Have you heard of rabies?	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
Yes	40.0	34.5	38.1	42.0	37.1	59.5	44.6	41.7
812. Who/what can give this sickness to humans?	(154) %	(70) %	(224) %	(81) %	(139) %	(113) %	(252) %	(80) %
Dog or other animal	67.5	85.7	73.2	90.1	68.4	76.1	71.8	75.0
Other	1.9	0	1.3	1.2	0.0	0.9	0.4	2.5
Don't know	30.5	14.3	25.4	8.6	31.7	23.0	27.8	22.5
813. Have you heard of bovine tuberculosis?	(385) %	(203) %	(588) %	(193) %	(375) %	(190) %	(565) %	(192) %
Yes	56.9	61.1	58.3	35.2	59.5	65.8	61.6	52.6
814. Who/what can give this sickness to humans?	(219) %	(124) %	(343) %	(68) %	(223) %	(125) %	(348) %	(101) %
Cow	1.4	0.8	1.2	11.8	2.2	10.4	5.2	0.0
Smoking	22.8	45.2	30.9	29.4	35.9	40.0	37.4	48.5
Cough, cold, person-to-person	14.6	0.8	9.6	36.8	10.8	12.8	11.5	11.9
Other	1.8	0	1.2	0	2.2	13.6	6.3	3.0
Don't know	59.4	53.2	57.1	22.1	48.9	23.2	39.7	36.6

Bivariate Analysis

While Table 11.1 highlighted the percentage of individuals who stated that they heard about each priority disease type, Tables 11.2–11.4 highlight the proportions of respondents in the study who properly identified the sources of each disease, which have additionally been disaggregated by sex and other sociodemographic factors of interest. Unless otherwise specified, all differences mentioned in-text are statistically significant ($p<0.05$).

Across the sample, correct identification of diseases was low. Correct identification of the disease source for lassa fever was lower among women (26%) than men (33%). Other disease identification was not significantly different based on respondent sex, but still remained low, with 30% of women and 32% of men correctly identifying the source of rabies, as well as only 1% of women and 2% of men correctly identifying the source of bovine TB. For Bovine TB, as seen in Table 11.1, It seems that a majority of respondents either did not know the source or mentioned pulmonary irritants such as smoking, or pulmonary transmission such as coughing and colds leading to person-to-person transmission.

Table 11.2 focuses on correct identification of Lassa fever. The highest proportion of respondents correctly identifying the source of Lassa fever was among female (41%) and male adolescents (51%) in Bong. Correct identification among female adolescents (7%) in Bomi and male adolescents in Gbarpolu (7%) was the lowest within the sample, indicating that these populations may be important to consider during future campaigns focused on Lassa fever. Overall, respondents in the intervention counties withheld higher rates of correct identification for the source of Lassa fever than respondents in Gbarpolu.

Correct identification of the source of Lassa fever, as expected, rose with the education level of female respondents. Interestingly, among female and male adolescents there also seemed to be different trends based on economic vulnerability, with more men in the low-vulnerability group correctly identifying the source of Lassa fever, compared with those with medium or high vulnerability groups.

With regard to religious differences of respondents, the results highlight that Christians correctly identified the source of Lassa fever most often, followed by those who claim faiths other than Christianity or Islam, regardless of respondent sex. Muslim respondents had the lowest rates of correct identification among the sample, particularly Muslim female adolescents (10%). Finally, male adolescents living in urban areas correctly identified the source of Lassa fever more often than those living in rural settings.

Table 11.2 Proportion of Female and Male Adolescent Respondents Who Correctly Identified the Source of Lassa Fever

Factors	Female adolescents %	Male adolescents %
County	***	***
Bomi	6.9	23.7
Bong	41.0	50.9
Gbarpolu	16.6	7.3
Intervention status	**	***
Intervention counties	29.3	41.8
Control county	16.6	7.3
Education	*	
No formal schooling	21.7	24.2
Primary	23.9	32.3
Secondary or higher	34.3	37.7
Vulnerability index		**
Low	18.6	43.4
Moderate	24.6	39.0
High	29.1	28.1
Standard of living index		*
Low	26.4	30.5
Moderate	25.3	40.8
High	27.3	40.0
Religion	***	***
Christian (Orthodox, Protestant, Catholic, etc.)	30.1	37.1
Muslim	9.7	21.0
Other/traditional	15.4	23.1
Marital Status		
Married	17.7	—
Cohabitating	23.8	—
Divorced/widowed/separated/single	28.5	33.0
Residence		*
Urban	30.0	40.8
Rural	25.0	31.0
Total (%)**	26.1	33.0

Note: Respondents who mentioned Rats as the source of lassa fever were considered to correctly identify the disease source.

*p<0.05, **p<0.01, ***p<0.001

Table 11.3 highlights the proportion of adolescents in the study who correctly identified the source of rabies. This indicator has been disaggregated by sex and other sociodemographic factors of interest. Correct identification of rabies was lowest among women (27%) and men (26%) in Bong and highest among women in Gbarpolu (38%) and men in Bomi (45%). Among men, there was no difference between the intervention and control counties; however, correct identification of the source of rabies was 10 percentage points lower among women in the intervention counties, compared with their peers in Gbarpolu, suggesting particular room for growth within both Bomi and Bong.

For both female and male adolescents, a positive gradient for correct identification was noticed with increased levels of education and standard of living (males only). However, no trend was apparent across the various levels of economic vulnerability except for particularly high correct identification rates among men reporting low economic vulnerability. With regard to respondents' religion, the results highlight that correct identification of the source of rabies was lowest among Muslim female adolescents (25%), as well as male adolescents who claimed to follow other religions besides Islam and Christianity (12%). Differences based on religion were significant among the male adolescent sample, but not among the female adolescents.

Correct identification based upon marital status of the respondents did not significantly differ across the sex-specific subsamples. In contrast to observations made about lassa fever recognition, it seems that respondent residence did not significantly correlate with correct identification of rabies.

Table 11.3 Proportions of Female and Male Adolescent Respondents Who Correctly Identified the Source of Rabies

Factors	Female adolescents %	Male adolescents %
County	*	***
Bomi	29.6	45.3
Bong	26.8	26.0
Gbarpolu	37.8	31.1
Intervention Status	**	
Intervention counties	27.7	32.0
Control county	37.8	31.3
Education	*	***
No Formal Schooling	29.0	17.7
Primary	27.5	29.6
Secondary or Higher	38.7	42.4
Vulnerability Index		*
Low	32.9	49.1
Moderate	27.7	30.9
High	32.2	30.3

Factors	Female adolescents %	Male adolescents %
Standard of Living Index		*
Low	28.5	29.3
Moderate	34.3	39.7
High	45.5	40.0
Religion		*
Christian (Orthodox, Protestant, Catholic, etc.)	31.1	31.4
Muslim	25.4	36.5
Other/Traditional	34.6	11.5
Marital Status		
Married	23.5	-
Cohabitating	24.4	-
Divorced/Widowed/Separated/Single	35.5	31.8
Residence		
Urban	25.9	27.0
Rural	31.4	33.3
Total (%)	30.2	31.8
Note: Respondents who mentioned dogs or other animals as the source of rabies were considered to correctly identify the disease source. *p<0.05, **p<0.01, ***p<0.001		

Table 11.4 highlights the proportion of respondents who correctly identified the source of bovine TB. This information has been disaggregated by sex, as well as additional sociodemographic factors of interest. As we saw in the univariate results section, correct identification of bovine TB was particularly low across the study, with many respondents either reporting that they did not know the source of bovine TB or reporting that smoking was the primary source of bovine TB. The latter point suggests that a clearer distinction of bovine TB from other more commonly known forms of TB (namely pulmonary TB) should be a key message in future health communication campaigns.

Across many of the disaggregation below, there do not seem to be particularly strong differences across the sample regarding this low identification rate of the source of bovine TB, though we do find interestingly that among the female adolescent sample, rates of identification are higher in Gbarpolu (4%) than in the intervention counties (0.3%), while this observation reverses among the male adolescent sample (3% in the intervention counties and 0% in Gbarpolu). Some standout observations and populations that may be of interest to target with information on bovine TB are among female adolescents in Bomi and Bong and males living with high economic vulnerability. Given the profile of those reporting the lowest correct identification rates, community-based activities may offer the most comprehensive way forward to reach those that may not have as readily available access to messaging that is administered via mass and social media. While there are differences observed across the sample,

correct identification of bovine TB is low across every sample sub-group, and thus clarification of bovine TB causes is warranted in all areas of implementation.

Table 11.4 Proportion of Female and Male Adolescent Respondents Who Correctly Identified the Source of Bovine TB

Factors	Female adolescents %	Male adolescents %
County	**	**
Bomi	0.5	6.8
Bong	0.3	1.3
Gbarpolu	3.6	0.0
Intervention status	***	*
Intervention counties	0.3	3.2
Control county	3.6	0.0
Education		
No formal schooling	1.5	0.0
Primary	1.1	3.2
Secondary or higher	1.1	1.1
Vulnerability index		*
Low	0.0	5.7
Moderate	1.4	3.4
High	1.1	1.4
Standard of living index		**
Low	1.2	1.6
Moderate	1.0	5.0
High	0.0	0.0
Religion		
Christian (Orthodox, Protestant, Catholic, etc.)	1.1	2.0
Muslim	1.5	4.2
Other/traditional	0.0	0.0
Marital status		
Married	0.0	—
Cohabitating	0.9	—
Divorced/widowed/separated/single	1.5	2.4
Residence		
Urban	1.8	2.9
Rural	1.0	2.2
Total (%)	1.2	1.7

Factors	Female adolescents %	Male adolescents %
Note: Respondents who mentioned cows as the source of bovine TB were considered to correctly identify the source of the disease. *p<0.05, **p<0.01, ***p<0.001		

Overall, the univariate and bivariate analyses highlight the low knowledge and awareness of Lassa fever, rabies, and bovine TB across all counties and gender groups in these counties. Bivariate analysis did not demonstrate many factors that were significantly associated with correct identification of disease transmission, demonstrating that the need to improve awareness of these diseases and source of transmissions is widespread.

Conclusion and Recommendations

Of the three zoonotic diseases, the highest proportion of female respondents correctly identified the source of rabies (30%), followed by Lassa fever (26%) and bovine TB (1%). Male respondents most frequently correctly identified lassa fever (33%), followed by rabies (32%) and bovine TB (2%). Correct identification of bovine TB was low across the sample. However, overall, knowledge of all three zoonotic diseases was low, with less than half of participants being able to identify the correct source of rabies, Lassa fever, or bovine TB. This finding demonstrates a strong overall need to increase accurate and effective messaging to increase knowledge of disease sources in an effort to consequently improve prevention behaviors around these zoonotic diseases.

Recommendations for subgroups of interest are primarily relevant for targeting efforts around lassa fever and rabies, as, though there were some noted differences among respondents in identification of bovine TB, the low identification rate across the sample warrants site-wide focus on increasing knowledge of bovine TB.

Overall, female adolescents seemed to hold lower knowledge of the sources of Lassa fever, compared with male adolescents. Among the intervention counties, it seems like an opportunity to increase knowledge of Lassa Fever exists in Bomi, particularly among female adolescents. Other considerations for practice may be to center outreach to female adolescents through their mosque or religious leaders so that improvement may be made among the subset of Muslim female adolescents who reported low rates of correct identification. Finally, an enhanced focus of campaigns in rural areas may aid in increasing knowledge of Lassa fever among both female and male adolescents.

Comparatively, there did not seem to be a sex-specific trend in identification of the source of rabies as observed in the section focused on Lassa fever, although there does seem to be a particular opportunity to target female adolescents living in Bong and Bomi. Males living with high economic vulnerability are also a key population to consider for outreach. Additionally, there seems to be scope for enhanced focus of campaigns around rabies among both male and female adolescents with lower levels of education in urban centers.

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