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Frontier Health Markets (FHM) Engage

MARKET SIZING REPORT

An Innovative Approach to Identify Family Planning Market Opportunity by Measuring and Visualizing Sub-market Size in Ghana

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Contents

Tables

Figures

Acronyms

ADDOs	Accredited Drug Dispensing Outlets
A2IE	Asset to Income Estimator
CHAI	Clinton Health Access Initiative
CYP	Couple-Years of Protection
DHS	Demographic and Health Surveys
ECP	Emergency Contraceptive Pills
FP	Family Planning
FPET	Family Planning Estimation Tool
GPS	Global Positioning System
INLA	Integrated Nested Laplace Approximation
IUD	Intrauterine Device
LARC	Long Acting and Reversible Contraception
LEAP	Landscape and Projection of Reproductive Health Supply Needs
LMICs	Low- and middle-income countries
M4M	Metrics for Management
mCPR	Modern contraceptive prevalence
MICS	Multiple Indicator Cluster Survey
MSI	Marie Stopes International
OCPs	Oral Contraceptive Pills
RHSC	Reproductive Health Supplies Coalition
SAE	Small area estimation
SHOPS	Strengthening Health Outcomes of Private Sector
TMA	Total Market Approach
UN	United Nations
USD	U.S. Dollar
VAN	Visibility and Analytics Network
WRA	Women of reproductive age

Background

The Frontier Health Markets (FHM) Engage is a United States International Agency for Development (USAID) project that aims to strengthen health markets to improve health outcomes in mixed health systems. FHM Engage focuses on strengthening local health markets to optimize public and private sector engagement to contribute to sustainable market efficiencies and increased access to family planning, maternal and child health, and other health services, products, and information.

The project has two main result areas: 1) improved market environment for greater private sector participation in the delivery of health products and services, and 2) improved equal access to and uptake of high-quality consumer-driven health products, services, and information. Contributing towards the first result area, intermediate result 1.4 (IR1.4) aims to increase effective collection, integration, and utilization of private sector data and market intelligence to inform public and private-sector decision-making.

Year 1 activities under FHM Engage identified available global and country-specific data sources on private sector size and market functions. In year 2, under FHM Engage, Metrics for Management (M4M) developed and tested the subnational market sizing estimation approach and the national level volume and value estimation. These activities revealed a lack of reliable information to estimate contraceptive market size, particularly at sub-national levels.

In year 3, the FHM Engage team activities in Ghana focus on describing the overall demand, supply, and enabling environment of the family planning (FP) market as well as exploring the willingness to pay for contraceptive products. M4M expands on the previous work of market description to provide more detailed FP market size estimates with the aim of meeting the needs of private sector partners. The lack of detailed subnational market intelligence poses a major obstacle to strengthening the private sector's engagement in increasing access to and use of modern contraceptive products. Data pertaining to the supply and demand of contraceptive products and services is often unavailable, of poor quality, or too sparse from which to draw conclusions. Consequently, M4M applied small area estimation techniques to the FP market in Ghana to identify geographic areas of opportunity for market actors to improve the provision of modern contraceptives by understanding where demand for different contraceptive products and services exists and for better targeting of interventions and products. This analysis also provides market actors with a quantification of current and potential private sector contraceptive product volume and real dollar values to spur interest and action from a commercial perspective.

The Challenge

Private sector stakeholders face several challenges related to demand estimation. Due in large part to insufficient market intelligence, these private actors often struggle to accurately forecast demand. Despite manufacturers', importers', and large distributors' interest in satisfying future demand, as well as introducing new products into Ghana's contraceptive market, their inability to accurately forecast demand deters them from investing in these areas.

Overview of tools to estimate family planning market size

Various market size estimation approaches have been applied to family planning products. The Clinton Health Access Initiative (CHAI) Family Planning Market Report;[1] DKT's Contraceptive Social Marketing Statistics;[2] the Family Planning Estimation Tool (FPET);[3] Private Sector Counts;[4] the Health Market Analyzer (formerly Family Planning (FP) Market Analyzer[5]), and the Landscape and Projection of Reproductive Health Supply Needs (LEAP) / Commodity Gap Analyses[6] utilize estimation methods which primarily focus on quantifying the proportion or number of users by method and total volume of products at a **national level** across numerous countries.

Some of these tools focus on the size of a specific sector and **not the total market** (which includes social marketing and the for-profit commercial sectors). For example, the CHAI Family Planning Market Report quantifies the total public sector FP procurement market in 83 low- and lower-middle-income countries,[1] and DKT's Contraceptive Social Marketing Statistics summarizes sales data reported by the social marketing sector.[2]

Other tools enable exploring patterns of public and private sector contraceptive use. The USAID-funded Private Sector Counts used Demographic and Health Survey (DHS) data to provide the relative contribution of the public and private sectors to FP service delivery.[4] The USAID-funded Health Market Analyzer (formerly FP Market Analyzer) combines data from the DHS and projections of modern contraceptive prevalence (mCPR) from FP2020 to take a total market approach by exploring how changes in public and private actors' market activities might alter mCPR.[5] The Reproductive Health Supplies Coalition (RHSC) has been conducting the LEAP / Commodity Gap Analyses, which provide estimates of the number of modern contraceptive users by methods and sector source (public vs. private), and the related costs nationally.[6] Their report provides results for 129 low- and middle-income countries (LMICs), and aggregated information on multiple countries by region or income group. While national-level estimates and utilization patterns by key demographic groups are crucial for understanding the overall market, market actors often need subnational information that is contextually and geographically relevant to their specific business activities to improve their decision-making around how to target interventions and products within a country.

TABLE 1: EXISTING FP MARKET SIZE TOOLS

Tools	Developer	Characteristics of market sizing	Type of market	Types of data	Methodology
Family Planning Market Report	CHAI	Volumes and values of public sector FP procurement market	Public	Supplier data	Descriptive summary
Contraceptive Social Marketing Statistics	DKT	Social marketing product sales and associated CYP by country	Private (non-profit)	Social marketing programs self-report sales data	Descriptive summary

Family Planning Estimation Tool	Track20	Use all available data to develop annual country-specific estimation for contraceptive prevalence and unmet need and projection	Total (contraceptive prevalence rate)	Model combines population data, survey data, and service statistics (when input by the user)	Bayesian hierarchical model
Private Sector Counts	USAID (SHOPS Plus)	Illustrates contribution of the public and private sector to FP service delivery	Public and private	DHS	Descriptive summary
FP Market Analyzer	USAID (SHOPS Plus)	Describes FP users by demographic group and method mix in each country, and allow users to explore potential scenarios for a TMA	Public and private	Combines data from DHS and FP2020's projections of mCPR	Descriptive summary combined with population estimates
LEAP / Commodity Gap Analyses	Reproductive Health Supplies Coalition	Estimates of number of users, method used, and related costs for selected country or region (multiple countries), and projects change	Public and private	Household surveys (DHS, MICS, other national surveys), projections developed by UN Population Division, data provided by SRH community, and data purchased from private sector entities	Estimations derived from a combination of specified primary data sources

Small area estimation approaches

Small area estimation (SAE) techniques are a family of statistical methodological approaches characterized by their focus on estimating parameters for small domains from survey data. Domains may refer to geographical area units, such as regions or districts, or demographic characteristics that the survey is not powered to measure with adequate precision. This technique is applied to address the challenge of not having a large enough sample size to attain a desired level of precision, often due to the sparseness of data in sub-populations. Small area estimation techniques have been applied across a wide

range of disciplines, including health, demography, agriculture, and environmental planning. In the field of health, SAE techniques have been used to estimate HIV prevalence, child mortality, malaria prevalence, vaccination coverage, and modern contraceptive prevalence at sub-national levels.[7–12]

While the technique has been applied to different health topics, including family planning, the approach of applying SAE techniques and customizing the estimates to meet the private sector's contraceptive market intelligence needs has not been explored. The novel application outlined below builds on two previous examples of SAE in family planning. Notably, the Family Planning Estimation Tool (FPET) and resources developed under the Sustaining Health Outcomes through the Private Sector (SHOPS) Plus.

FPET has been primarily used to track FP progress, combining multiple data sources to generate annual estimates for contraceptive prevalence, unmet contraceptive need, and satisfied demand for family planning.[3] While FPET can also be used at subnational levels,[13] users must manually input subnational data for the country, which requires a comprehensive understanding of the tool's functionalities and data requirements, including the specific structure of data needed to generate accurate small area estimations. Additionally, the tool can generate estimates only at the geographic level which is included in the survey data.

Another important resource developed during SHOPS Plus's five-year program tenure was its research into contraceptive use patterns at sub-national geographic levels for a number of its partner countries. Recognizing the importance of understanding geographic variations within a country, SHOPS Plus developed continuously scaled choropleth maps for Tanzania, Guinea, Kenya, Uganda, and Nepal. By using color to correspond with characteristics of modern contraceptive use within geography, these maps visualize key contraceptive use indicators, including rates of utilization in both the public and private sectors subnationally.[14] Although the maps generated are useful for advocacy, policy, and program planning, they do not quantify the number of current or potential modern contraceptive users or examine the relative popularity of different contraceptive methods within a particular administrative unit. These two examples of using SAE to estimate modern contraceptive utilization patterns provide valuable information; however, they each struggle to present existing data in a form that appropriately addresses private sector actors' market intelligence needs.

In this report, we present:

1) The application of a model-based SAE approach that offers estimates bounded within administrative regions. This allows users to estimate the size of both current and potential new users of private sector contraceptive products and several contraceptive methods of interest (i.e., injectables (DMPA-IM and DMPA-SC), oral contraceptive pills (OCPs), male condoms, emergency contraceptive pills (ECP), and implants) at a sub-national scale, and

2) National-level estimates of the current and potential private market volume and value of seven contraceptive methods. The contraceptive methods are injectables DMPA-IM, DMPA-SC, OCPs, male condoms, ECP, intrauterine device (IUD), and implants.

This report describes a new, multi-pronged analytical approach, tailored to meet the business intelligence needs of the private sector in Ghana.

Methodology

Process

Recognizing the private sector's desire for detailed contraceptive market information for business decision-making (e.g., improved targeting of existing products, strategy for new product entry, etc.), M4M conducted estimations that resulted in two complementary sets of analytic outputs: 1) maps visualizing subnational variations in estimates of modern contraceptive users and potential users, and 2) national level contraceptive market volume and value estimates.

Analytic outputs

Maps visualizing subnational estimates

National level volume and value estimates

Given the limitations in publicly available data, all potential sources of data on family planning in Ghana were identified through a desk review and consultation with FHM Engage staff. We consulted with FHM Engage staff focusing on Ghana and the Ghanaian Total Family Health Organization (TFHO)[15] to identify and understand the accessible data sources that contain relevant information about the family planning market, as well as through searching the available relevant literature.

Data

Our model utilized different types of data as described here. Table 2 describes data sources and various types of data collected.

1. Cross-sectional survey data

Cross-sectional survey data comes from Ghana Demographic and Health Surveys (DHS) from 2008, 2014, and 2022.[16–18] The DHS are nationally representative household surveys that serve as an important information source to gauge demand for contraceptive products. This survey data includes geographic position system (GPS) information which is required to accurately assign survey clusters to the current administrative boundaries (regions or districts) in Ghana.

We extracted individual-level data from each DHS survey, including information on modern contraceptive use, the source of modern contraceptives, traditional contraceptive use, and unmet contraceptive need, as well as age, wealth quintile and GPS location. We used the revised definition of unmet need for contraception.[19]

2. Administrative area shapefiles

We used administrative area shapefiles from the DHS Spatial Data Repository platform for administrative boundary levels (one and two) to create sub-national maps at the regional and district levels using the small area estimation technique.[20]

3. Population

The population size for women of reproductive age (WRA, age 15-49) and young women (age 15-24) were extracted for all regions and districts in Ghana from the DHS Spatial Data Repository.[20]

4. Health facility registry

Data on the location and ownership of various health facilities were extracted from Ghana Health Facilities Regulatory Agency (HeFRA).[21]

5. Data containing the geolocation of operating pharmacies were obtained from the Ghana Pharmacy Council.[22]

6. Data for benchmarking financial capacity to pay for a method was obtained from M4M's Asset to income Estimator.

TABLE 2: INFORMATION EXTRACTED BY DATA SOURCE

Data source	Information
1. DHS surveys	Individual level data on: Contraceptive use, by method Contraceptive need Contraceptive source Demographic information Wealth quintile Location information Age
2. Spatial Data Repository	Shapefile containing administrative level 1 (regions) and level 2 (districts) boundaries.
3.Spatial Data Repository (Population)	Population of women of reproductive age (age 15-49) and young women (15-24) by region and district
4.Ghana Health Facilities Regulatory Agency (HeFRA)	Private health facilities Location information
5.Ghana Pharmacy Council	Pharmacy and over-the-counter-medical sellers (OTCMS) Location information
6.Asset to Income Estimator (M4M)	Median daily household income (3rd wealth quintile) ~ $13.97 (USD)

Methodology and Analysis

Key analytic terms and definitions

We categorized the women who want to delay, space, or limit childbearing in our analyses into three groups: 1) current modern contraceptive users, 2) women with unmet FP needs, and 3) women using a traditional contraceptive method. By doing this, we divided women who are not currently using any modern method of contraception into two non-overlapping groups: women with unmet FP needs and women using a traditional contraceptive method. Women with unmet FP needs are defined as women who do not want to become pregnant and who are not currently using any contraception.[19]

We used household financial capacity as a proxy for a woman's ability to pay. We defined women living in a household within the third wealth quintile or above as having the financial means to potentially access contraceptive products from the private sector. We used M4M's Asset to Income Estimator (A2IE) tool,[23] which combines asset-based wealth rankings (from the DHS or Multiple Indicator Cluster surveys) and income distribution data[24] to estimate median individual and household incomes by wealth quintile. According to the A2IE tool for Ghana, these women live in households with a median daily income of at least $13.97 USD.

Rationale for our definition of financial capacity

We approximated women's ability to pay for their choice of contraceptive methods by considering their household wealth quintile. Women living in a household in the top three wealth quintiles currently using a modern contraceptive method were significantly more likely to have obtained their method from a private sector source (29.2 percent) than those in the lowest two wealth quintiles (8.8 percent). Using the A2IE tool, household daily income in the lowest two wealth quintiles was below $11.66 USD, reflecting limited disposable income.

We examined where modern contraceptive users obtained their contraceptive products and categorized those sources into two groups: private sector and public sector (see Table 3). To maintain a binary definition that encompasses all respondents, women within the data set who reported receiving their contraceptive method from a friend, relative, or neighbor were categorized as belonging to the public sector. This classification is based on the premise that these women are current modern contraceptive users who, similar to public sector clients, have the potential to become private sector users. While imperfect, this classification served as a practical means to comprehensively account for all Ghanaian women who reported using a modern contraceptive method (Women who reported receiving their contraceptive method from a friend, relative, or neighbor were just 0.8% of modern contraceptive users in DHS 2022).

TABLE 3: ANALYTIC TERMS AND DEFINITIONS

Terminology	Definition applied
Private sector	Includes for-profit, non-profit, social-marketing, and faith-based organizations, shops/kiosks
Public sector	Government, friend/relative/neighbor
Short-term contraceptive methods	Condoms, oral contraceptive pills, injectables (DMPA-IM and DMPA-SC), emergency contraception
Long-acting reversible methods	Intrauterine device, implant
Financial capacity	Women living in a household in third, fourth and fifth wealth quintiles (median daily household income of at least $13.97 USD)

We conducted sub-analyses for users of specific long-acting reversible contraceptive (LARC) methods including implants and intrauterine device (IUD) and short-term contraceptive methods, which included injectables, oral contraceptive pills (OCPs), male condoms, and emergency contraceptive pills (ECP). For each method, we generated estimates of 1) women who obtained it from the private sector, and 2) women with financial capacity who obtained it from the public sector.

We applied the analytical model to calculate small area estimates for each of these indicators to both women of reproductive age (all women aged 15 to 49) and to just young women (aged 15 to 24).

Analytic model for sub-national estimation of indicators

We applied a Bayesian hierarchical model framework, as described by Mercer, Lu, and Proctor,[25] that integrates multiple surveys, survey designs, and levels of uncertainty and allows for a spatiotemporal smoothing of estimates. The model requires data from at least two surveys and assumes that there is an underlying value of the indicators and that the direct survey estimates are measurements with associated uncertainty. The logit transformed data assumed underlying true indicators were modelled linearly with independent spatially structured random effects, random walks of order 1, and temporally structured space-time interactions to account for subnational temporal trends. Survey-year and survey-geography random effects were also included to account for potential survey biases. We constructed twelve possible models with each of these components to fit each indicator for women of reproductive age (aged 15-49) and young women (aged 15-24). To identify the best-performing model for each indicator and demographic group, we calculated goodness of fit and model complexity indicators (the sum of the log conditional predictive ordinate (LCPO), the deviance information criteria (DIC), and the Watanabe-Akaike information criterion (WAIC)). The model with the lower DIC, WAIC, and the higher LCPO was selected. When different criteria pointed to different models, we used a majority rule. For instance, if the same model was identified by having the lowest DIC and the lowest WAIC, but a different model had the highest LCPO, we selected the model that met the criteria from two goodness of fit and model complexity indicators.

We fit the models using R computing language, adapting the analysis codes from the associated GitHub repository of the Mercer et al. article.[26] The hierarchical Bayesian space-time model was fit using the Integrated Nested Laplace Approximation (INLA) package in R.[27] We computed the median estimates for each indicator at the specified administrative level (Table 4).

The model yields a proportion that we then converted to absolute population estimates for each category. To determine the population value associated with each indicator rate (Table 4), we multiplied the estimated indicator rate by the appropriate sub-population value (e.g., all women of reproductive age), as described in the 2022 population data of Ghana DHS Spatial Data Repository, for the same geographic area. Finally, we displayed results on maps at the region or district level as appropriate. Maps were generated using open-source R computing language.

As the precision of indicator estimates relies heavily on the quantity of data available within the underlying data sources, indicators with more data can be estimated at smaller geographic regions, while those with relatively less data must be estimated at larger geographic levels to capture the greater amounts of available data. The more data that are available, the more reliable and precise the estimate is likely to be. Not all indicators will have the same amount of available data, as some indicators include questions that follow a skip pattern. For example, a woman who reports not using a modern contraceptive method will not then be asked what type of method she uses. Consequently, we estimated indicators with greater amounts of data, such as mCPR, at the district level, while those with less data, such as the source or type of method (e.g., injectables, IUD, ECP), at the regional level. Injectable includes both DMPA-IM and DMPA-SC for the sub-national analysis. Due to the very low number of IUD users in the DHS data, we could not produce sub-national use estimates for this method.

TABLE 4: SUB-NATIONAL ESTIMATION OF CONTRACEPTIVE USERS, POTENTIAL USERS AND ASSOCIATED INDICATORS

Type of users	Indicator	Level
Current modern method users	WRA/young women using a modern contraceptive method • All • By method type: private source vs. public source with financial capacity	District Region
Women with unmet FP needs	WRA/young women with an unmet need for contraception • All • Those with financial capacity	District District
Women using a traditional contraceptive method	WRA/young women using a traditional contraceptive method • All • Those with financial capacity	District District

National estimation of volume and value by types of contraceptive product

In addition to estimating the number of current users, women with unmet FP need, and women using a traditional modern method at region and district levels, we calculated the current and potential market size of the Ghanaian private sector, considering the number of clients, volume, and revenue for a full year's protection for the seven contraceptive products of interest (i.e., injectable DMPA-IM, DMPA-SC, OCPs, male condoms, ECP, IUD, and implants). Unlike the sub-national analysis, which combined DMPA-IM and DMPA-SC injectables, they were separated for the national-level estimations.

Estimating the number of clients of the private sector for the seven methods

We began by combining the national-level population data of Ghanaian women aged 15 to 49 from the 2022 population data from DHS Spatial Data Repository with family planning use and need proportions in the 2022 Ghana DHS. We used these data to estimate the absolute population values of the following groups:

Group 1 – modern contraceptive users who are private sector consumers
: The number of WRA currently using one of the seven modern contraceptive methods of interest who last obtained their method from a private sector source.

Group 2 – modern contraceptive users who are public sector consumers
: The number of WRA currently using one of the seven modern contraceptive methods who last obtained their method from a public sector source.

Group 3 – women with an unmet need
: The number of WRA defined as having an unmet need for contraception.

Group 4 – women who are traditional method users
: The number of WRA currently using a traditional method of contraception.

Our estimates focused on the current private sector market size for the seven contraceptive methods of interest – injectable DMPA-IM, DMPA-SC, OCPs, male condoms, ECP, IUD and implants.
Next, we estimated potential market growth with a more favorable enabling environment for private sector engagement in Ghana's contraceptive market. We considered women belonging to Groups 2 through 4 as potential new private clients. However, we know that not all of these women will become new private sector clients for contraception. In order to produce credible estimates of the number of women from each group that could be expected to become new private sector clients, we answered the following four key questions with a series of informed assumptions.

Key Questions and Assumptions

Question: What segments of the population are more likely to seek contraceptive care from private sector sources?

Assumption 1: Women belonging to households in top 3 wealth quintiles are more likely to seek private sector sources.

Question: How many contraceptive users currently obtaining their method from a public sector source who, under different circumstances, would be willing to obtain it from a private sector source?

Assumption 2: If Ghana had a private sector utilization rate similar to some of its peer countries, some women who are currently obtaining their product from the public sector would instead be obtaining it from the private sector.

Question: How many women considered as having an unmet need for contraception who would be willing to adopt a modern contraceptive method?

Assumption 3: The implementation of a well-designed community engagement and health systems strengthening intervention would convince a proportion of women with an unmet need to adopt a modern method.

Question: How many women currently using a traditional contraceptive method who would be willing to adopt a modern contraceptive method?

Assumption 4: The implementation of a well-designed community engagement and health systems strengthening intervention would convince a proportion of traditional method users to adopt a modern method.

Assumption 1: Women belonging to households in top 3 wealth quintiles are more likely to seek private sector sources.

We defined those belonging to households in the top three wealth quintiles as having the financial capacity to obtain contraceptive products from a private sector source. Financial capacity differs from willingness-to-pay. While financial capacity implies that women in these upper wealth quintiles are more likely to have the means to access private sector contraceptive products, it does not suggest that they are willing to do so. Nonetheless, Assumption 1 allowed us to home in on a subset of the population with an increased likelihood of becoming private sector clients.

Assumption 2: If Ghana had a private sector utilization rate similar to some of its peer countries, some women who are currently obtaining their product from the public sector would instead be obtaining it from the private sector.

To determine the proportion of contraceptive clients likely to seek products from the private sector, we conducted a literature search of available evidence in any intervention to convert public sector users to private sector users through PubMed and Google Scholar. Due to the scarcity of evidence, we

analyzed private sector utilization rates among Ghana's peer countries. Following discussions with technical staff from FHM Engage working in Ghana and TFHO, we identified Nigeria and Côte d'Ivoire as aspirational benchmarks for Ghana, given their comparable contexts and their more enabling market environments that have resulted in greater private sector utilization for contraceptive products.

The current private sector utilization, across all wealth quintiles, in Ghana is 39.9%. Based on analyses of the 2018 Nigeria DHS and 2021 Côte d'Ivoire DHS,[28,29] private sector utilization among women in the top three wealth quintiles using the seven contraceptive methods of interest was 43.4% and 50.0%, respectively. If Ghana was to achieve a comparable private sector utilization rate for the seven contraceptive methods of interest as those of Nigeria and Côte d'Ivoire respectively, 5.8% and 16.7% of current public sector Ghana clients in the top three wealth quintiles would shift to the private sector.

Assumption 3: The implementation of a well-designed community engagement and health systems strengthening intervention would convince a proportion of women with an unmet need to adopt a modern method.

Discussions with FHM Engage staff working in Ghana and TFHO identified community engagement and health systems strengthening interventions as potentially relevant to Ghana's context. We searched the existing literature to identify examples of community engagement and health systems strengthening interventions that have been applied in Africa to increase women's use of modern contraceptive methods. We identified five intervention studies that were conducted in Africa that focused on a combination of relevant components, including community-based distribution FP service, human-centered design-based approach to increase adolescent uptake, integrated supportive supervision on availability of resources, community mobilization and sensitization of health workers in the Tupange Urban Family Planning Program in Kenya.[30–34] The five studies found the interventions increased mCPR by between 1.1% to 6.8% over the life of the project. Evidence from the intervention studies shows higher intervention effect for lower-income women with unmet need. To account for this greater propensity for lower income women with unmet need, we used a higher intervention effect (1.7% of the overall intervention effect).[30] We applied this increased intervention effect to women who have unmet need for contraception.

Assumption 4: The implementation of a well-designed community engagement and digital intervention would convince a proportion of traditional method users to adopt a modern method.

The five intervention studies described in Assumption 3 also apply to women who currently use a traditional method of contraception. We applied the intervention mCPR increase of between 1.1% and 6.8% to women currently using a traditional method of contraception.

APPLYING ASSUMPTIONS TO THE SPECIFIC GROUPS

Table 5 illustrates how we applied the assumptions to each group in order to produce estimates for the number of women who could be expected to become new private contraceptive clients for the seven methods of interest.

TABLE 5: APPLICATION OF ASSUMPTIONS IN CALCULATING THE NUMBER OF CONVERTIBLE PRIVATE SECTOR CLIENTS

Conversion Group	How We Applied Our Assumptions

Group 2: Current Public sector users	All public sector users × % in top 3 wealth quintiles (assumption 1) × %Δ in private sector utilization (assumption 2) = New private sector clients from public sector
Group 3: Current unmet need	All women with an unmet need × % converted through interpersonal communication intervention (assumption 3) × % in top 3 wealth quintiles (assumption 1) × %Δ in private sector utilization (assumption 2) = New private sector clients previously with an unmet need
Group 4: Current traditional method users	All women currently using a traditional method × % converted through interpersonal communication intervention (assumption 4) × % in top 3 wealth quintiles (assumption 1) × %Δ in private sector utilization (assumption 2) = New private sector clients previously using a traditional method

Estimating the number of potential new client by type of contraceptive method using three scenarios

Along with estimating the potential number of new private sector clients, we expanded our number of possible private sector scenarios by considering three different private sector contraceptive method mixes.

Method mix scenario 1: Maintaining Ghana's current private sector method mix.
Method mix scenario 2: Expansion of DMPA-SC. To identify the effect that DMPA-SC expansion might have on Ghana's private sector method mix, we applied proportional changes seen in Uganda's method mix between 2016 and 2022 to Ghana's current private sector method mix.
Method mix scenario 3: Policy Scenario from Health Market Analyzer. The barriers to allowing the private sector to play a greater role in LARC provision are removed, and implant has increased in popularity.

Method mix scenario 1: current private sector method mix

We assumed that the current private sector method mix remains the same under an enabling environment. The scenario included seven methods - DMPA-IM, SMPA-SC, OCPs, male condoms, implant, IUD, and ECP. The methodology for ECP estimation was different from the other short-term methods. Unlike other modern contraceptive methods, ECP is used to help women prevent pregnancy after sexual intercourse, often in instances of contraceptive non-use, contraceptive failure, incorrect use, or forced sex. For ECP users, volume, and value estimation, we expanded the unmet need definition to include unmarried women who have been sexually active for the last 12 months. We used the average ECP use in the last 12 months instead of CYP.

Method mix scenario 2: expansion of DMPA-SC

Currently, 7.4% out of 11% of current injectable users use DMPA-SC/Sayana Press in Ghana[35]. Both DMPA-IM and DMPA-SC are allowed to be distributed by health clinics and trained pharmacies/chemists. Self-injection was recently approved in the country, allowing for the opportunity for its expansion. This scenario excludes ECP from the contraceptive method mix because it is not typically used as a regular method of contraception. ECP but rather to prevent pregnancy after sexual

intercourse. And, we do not have data to indicate/estimate how ECP use would change in Ghana if DMPA-SC access was expanded.

To estimate potential changes to Ghana's current private sector method mix, we examined changes to the method mix in other countries where DMPA-SC has been introduced and scaled up. Uganda is a good example of a country that recently experienced major changes in its policies related to injectable distribution and enabling self-injection. In 2016, DMPA-SC was added to Uganda's National Essential Medicine List,[36] and in 2017 Uganda changed its policies to allow licensed and accredited drug shops to stock and administer injectable contraceptives (including DMPA-SC) in 20 districts.[37] Finally, to further facilitate access to injectable contraceptive methods, self-injection was approved by the Government in 2019.

We compared the national method mix from Uganda between 2016 and 2022 using survey data from Performance Monitoring for Action (Table 6),[38] and applied the percent change of the corresponding method to Ghana's current private sector method mix.

TABLE 6: PERCENT CHANGE IN METHOD MIX IN UGANDA BETWEEN 2016 AND 2022

Method	Percent change
DMPA-IM	60% decrease
DMPA-SC	12.50 percentage points increase in 2022
OCPs	7% decrease
Male condoms	30% decrease
Implants	72% increase
IUD	3% increase

Method Mix Scenario 3: Policy scenario from health market analyzer

In Ghana, LARCs are delivered predominantly through the public sector, with 94 percent of implant users and 93 percent of IUD users obtaining their method from a public source. This method mix scenario was drawn from USAID's Health Market Analyzer[5] and reflects changes to the private sector method mix. It illustrates the potential changes in method mix if barriers are removed to allow the private sector to play a greater role in LARC provision, as simultaneously, implants increase in popularity. This scenario does not include ECP in the private sector method mix.

To estimate the impact on Ghana's private sector, we begin by assuming that implants increase in popularity and increase their share of overall method mix from 20.5 percent to a maximum of 40 percent. To accommodate this greater adoption in implants, we assumed all other LARCs remain unchanged and short-term methods decrease in popularity. Finally, we assume that the share of implants and IUDs provided through the private sector increase by 20 percentage points each. Table 7 details the results of these changes in the private sector method-mix under this policy scenario.

TABLE 7: PRIVATE SECTOR METHOD-MIX UNDER POLICY SCENARIO

Method	From	To
DMPA-IM	2%	1%

DMPA-SC	5%	3%
OCPs	30%	23%
Male condoms	25%	20%
Implants	4%	26%
IUD	0.3%	1%

Estimating volume and value by type of contraceptive method

For three short-term methods (injectables, OCPs, and male condoms), we multiplied each method by its respective Couple-Years of Protection (CYP)[39] to determine, on average, the number of product units of each method that could be expected to be sold annually to provide each woman with a year's worth of protection from pregnancy. For ECP, we used the average ECP use in the last 12 months, which is explained below. For the LARCs (Implants and IUD), we assumed the annual unit sales to be the same as the number of users utilizing the private sector for that method. We also calculated the private sector market value for each of the seven contraceptive products by multiplying the annual units sold for each method by its average retail price. The pricing information is from survey data supplied by TFHO's (Table 8). It is worth noting that these prices are subsidized and do not reflect facility visit fees for insertion and removal of reversible contraceptive methods. Also, the value estimation does not consider the length of implant and IUD use. These analyses resulted in an estimate for the number of current and potential private sector clients of each method, annual unit sales of each method, and annual revenue for each method.

TABLE 8: PRODUCT PRICING APPLIED FOR VALUE ESTIMATION

Product	Unit of Measure	GHS per unit *	GHS per year	Median USD per unit	USD per year
Injectables (DMPA-IM)	1 vial	GHS 10.0 – 20.0	GHS 35.00	$0.54	$2.16
Injectables (DMPA-SC)	1 vial	GHS 12.0 – 169.0	GHS 19.2	$0.3	$1.2
OCPs	1-month course	GHS 0.3 – 567.0	GHS 38.88	$0.16	$2.43
Male condoms**	Single use	GHS 2.0 - 30.8	GHS 576.00	$0.3	$36
ECP***	1 dose	GHS 2.0– 85.0	GHS 80.64	$0.72	$5.04
Implants****	1 implant	GHS 10.0 – 20.0		$0.75	
Intrauterine device****	1 IUD	GHS 12.0 – 169.0		$0.72	

Source: Pricing information from TFHO's survey data

* Ghana cedis (GHS) retail price was converted to USD (conversion rate was 1 USD to 16 GHS date: July 30, 2024).

** Male condom retail price was provided per condom (instead of per pack).

*** USD per year was estimated differently for ECP, because ECP may not be used as the primary method of contraception. The average number of months (out of the last 12 months) of ECP use was applied instead.

**** Commodity price does not reflect facility visit fees for insertion and removal of reversible contraceptive methods; the value estimation does not consider the length of implant and IUD use.

Sensitivity analysis of estimated volume

We compared our estimated current private sector volume with Contraceptive Social Marketing (CSM)[2] statistics published by DKT International.

Results

Subnational estimation of indicators

This section includes the estimations for all WRA. Estimations for young women (ages 15 to 24), as well as tables of estimated numbers at the subnational level that populate each map, are included in the Annex. Metrics for Management has also developed a user-friendly web application, the Contraceptive Market Size Visualizer, to dynamically explore these data in detail. The interactive visualizer can be accessed here (https://m4mgmt.org/contraceptive-market-size-visualizer/).

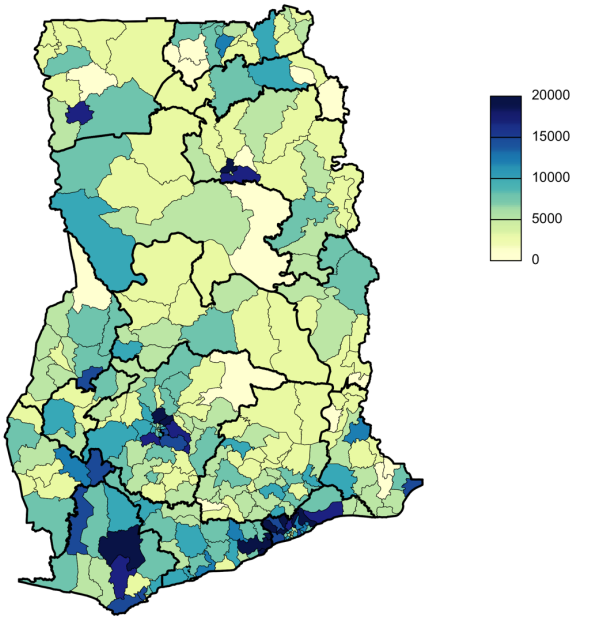
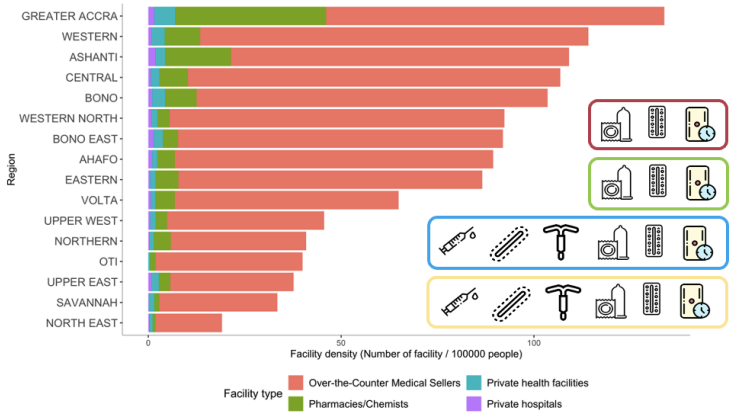


Figure 1 illustrates the number of women using a modern contraceptive method at the district level. Higher numbers are represented by dark blue, while lower numbers are shown in light yellow. The estimates are shown in absolute numbers. The map shows an uneven distribution of modern contraceptive users across the country, which is partially explained by population density. The highest number of WRA using a modern method are within districts in the Greater Accra region, Ashanti region and Central region.

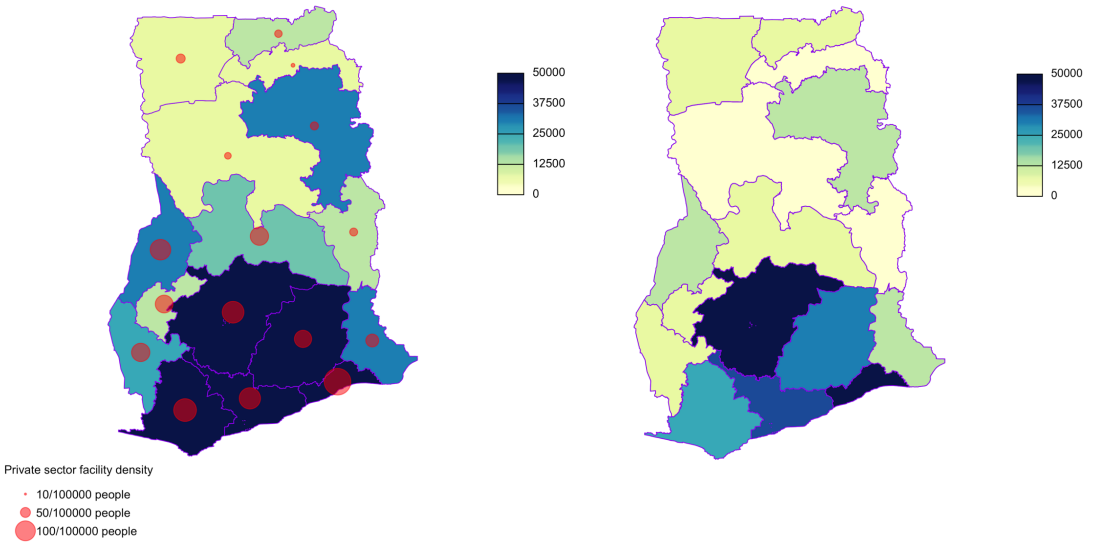
FIGURE 1: NUMBER OF WRA USING A MODERN CONTRACEPTIVE METHOD BY DISTRICT

Figure 2 illustrates the private facility density by type of facility in each region. OTCMS and pharmacies are the predominant types of private sector providers. Besides knowing the overall density of private facilities, it is also important to consider the types of contraceptive methods that can be sold by each facility type. Pharmacies can sell



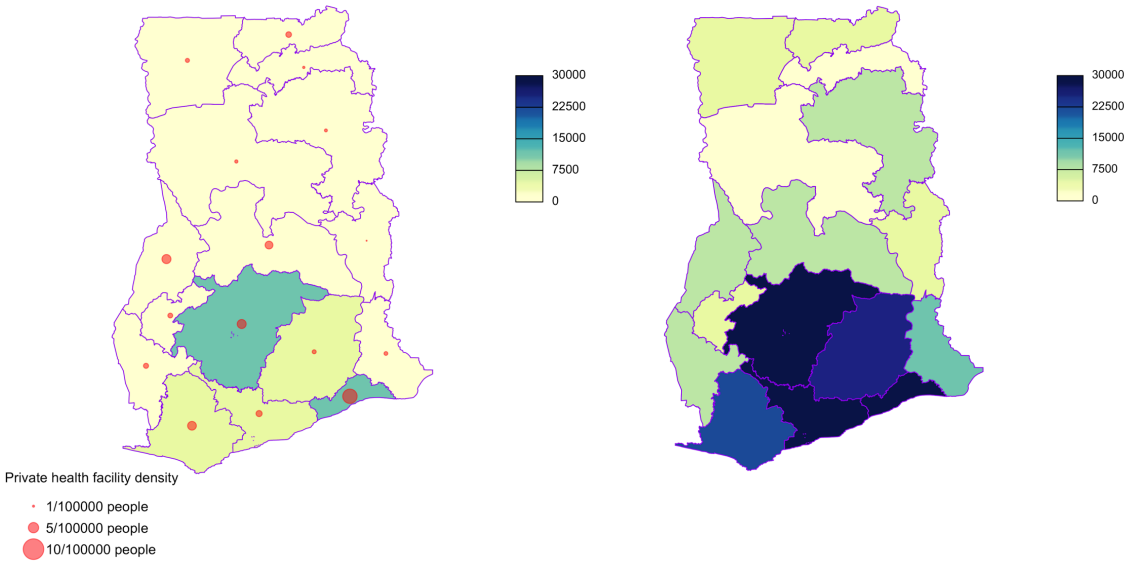
injectables, OCPs, EC, and male condoms and OTCMS can sell the latter three methods.

FIGURE 2: PRIVATE FACILITY COMPOSITION AND DENSITY BY REGION



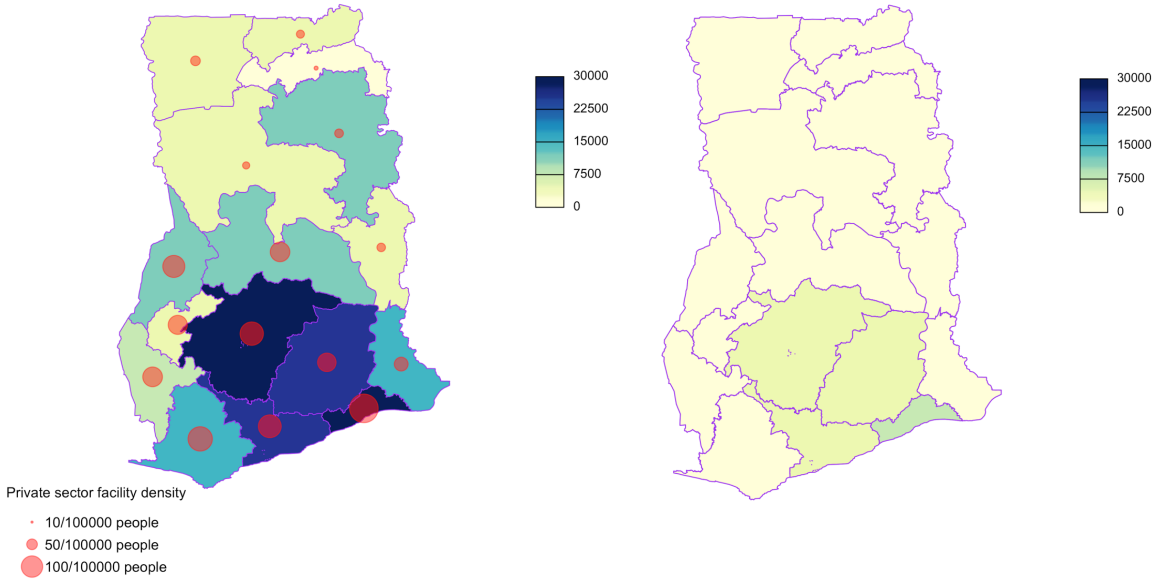
FIGURES 3: NUMBER OF WRA USING SHORT-TERM CONTRACEPTIVE METHODS A) USING A PRIVATE SECTOR SOURCE OVERLAID WITH DENSITY OF PRIVATE HEALTH FACILITIES AND PHARMACIES/CHEMISTS (LEFT), B) WRA WITH FINANCIAL CAPACITY OBTAINING FROM A PUBLIC SOURCE (RIGHT)

Figures 3a and 3b show the sector where women obtained their short-term contraceptive products. The red circles in Figure 3a illustrate the density of all private facilities within that region. Figure 3b shows the number of women who have the financial capacity to buy their short-term contraceptive products from a private sector source yet bought them in the public sector. Most regions have more short-term method users using private sources than those with financial capacity who use the public sector. While Greater Accra and Ashanti regions have the highest number of short-term method users who obtained from the private sector, a sizable number of users with financial capacity (278,000 users) still obtained their method from the public sector in those regions.



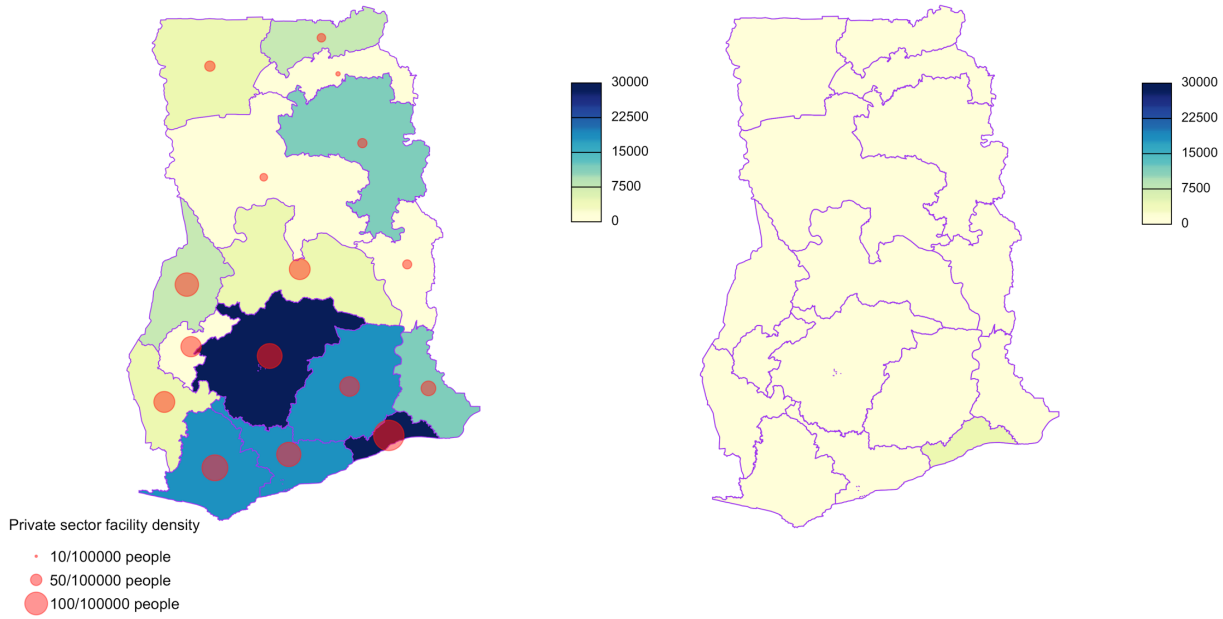
FIGURES 4: NUMBER OF WRA USING INJECTABLE CONTRACEPTIVES A) FROM A PRIVATE SOURCE OVERLAID WITH DENSITY OF PRIVATE HEALTH FACILITIES (LEFT), B) WRA WITH FINANCIAL CAPACITY BUYING FROM A PUBLIC SOURCE (RIGHT)

Figures 4a and 4b follow the same design while focusing on the number of women using injectable contraceptives. As injectable contraceptives can be distributed at private health facilities, pharmacies, and chemists, the red circles in Figure 4a includes the density of all private facilities. A comparison of the two maps shows that most women with financial capacity currently use the public sector to access injectables. Greater Accra, Ashanti, Central, Eastern and Western regions have more injectable users with financial capacity currently using the public sector than the total private sector injectable clients. About 230,000 women with the financial ability to pay obtained from public source.



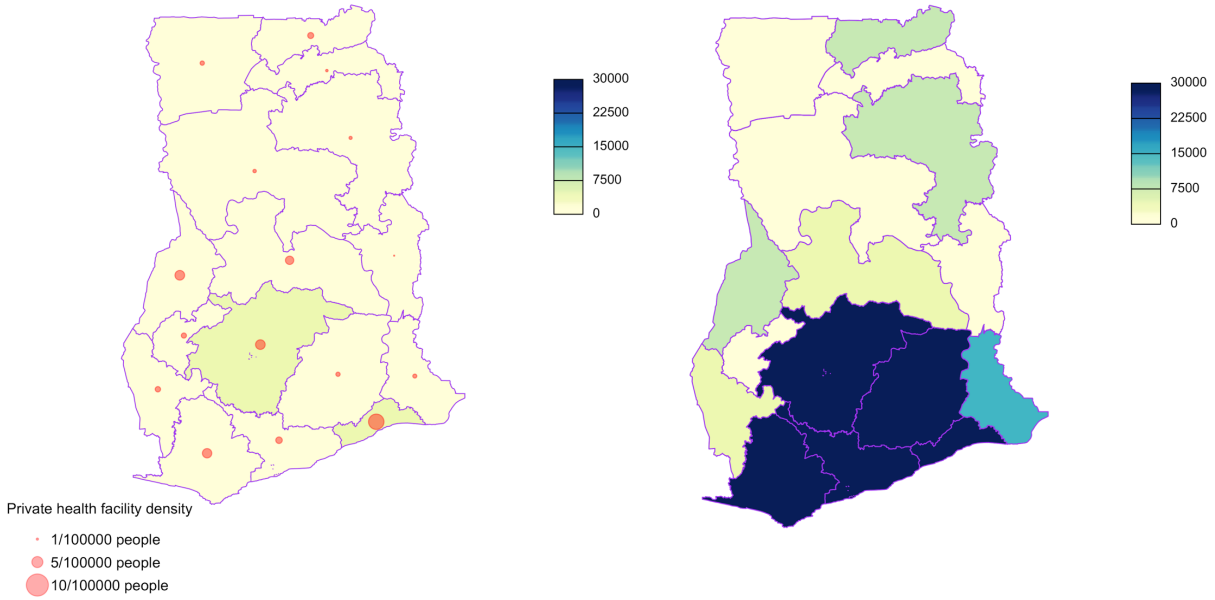
FIGURES 5: NUMBER OF WRA USING ORAL CONTRACEPTIVE PILLS A) FROM A PRIVATE SOURCE WITH DENSITY OF PRIVATE HEALTH FACILITIES AND PHARMACIES/OTCMS (LEFT), B) WRA WITH FINANCIAL CAPACITY OBTAINING FROM A PUBLIC SOURCE (RIGHT)

Figures 5a and 5b focus on the number of women using OCPs. In most regions, most oral contraceptive pills are obtained from the private sector. About 34,000 women with financial capacity obtained them from the public sector.



FIGURES 6: NUMBER OF WRA USING MALE CONDOMS A) FROM A PRIVATE SOURCE OVERLAID WITH DENSITY OF PRIVATE HEALTH FACILITIES AND PHARMACIES/OTCMS (LEFT), B) WRA WITH FINANCIAL CAPACITY OBTAINING FROM A PUBLIC SOURCE (RIGHT)

Figures 6a and 6b illustrate the estimated number of women using male condoms by sector. Note that the private facility density in Figure 6a includes private health facilities, pharmacies and OTCMS. A high proportion of male condom users (92%) obtained their products from the private sector. In Greater Accra and Ashanti regions, a small number of users with the financial capacity to pay are obtaining condoms from the public sector.



FIGURES 7: NUMBER OF WRA USING IMPLANTS A) FROM A PRIVATE SOURCE OVERLAID WITH DENSITY OF PRIVATE HEALTH FACILITIES (LEFT), B) WRA WITH FINANCIAL CAPACITY OBTAINING IMPLANTS FROM A PUBLIC SOURCE (RIGHT)

Figures 7a and 7b illustrate the estimated number of implant users by sector. Only a small number of implant insertions occur in the private sector. About 255,000 implant users with financial capacity currently obtain them from the public sector. Greater Accra, Ashanti, Western, Eastern, and Central have a high number of implant users with the financial ability to pay are using the public sector.

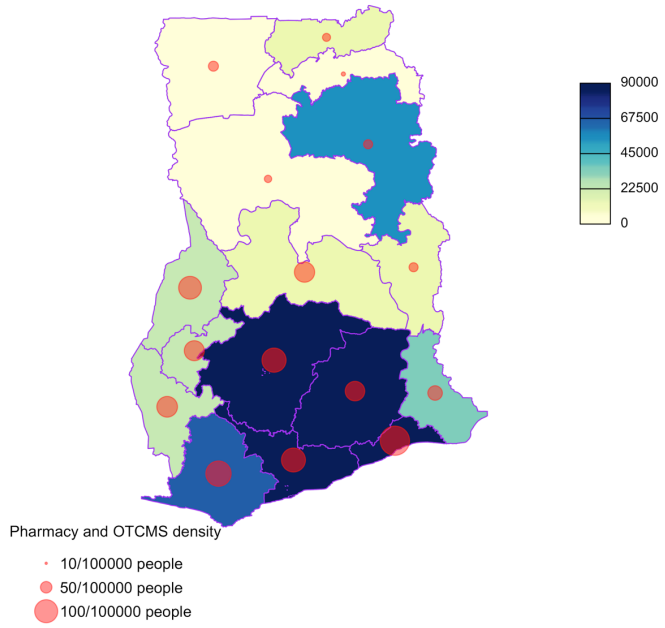


Figure 8 illustrates the estimated number of ECP users in the private sector. Over 881,000 women used ECP in the last 12 months. Ashanti, Greater Accra, Eastern, Central, and Western regions have high numbers of ECP users.

FIGURE 8: NUMBER OF WRA USING ECP

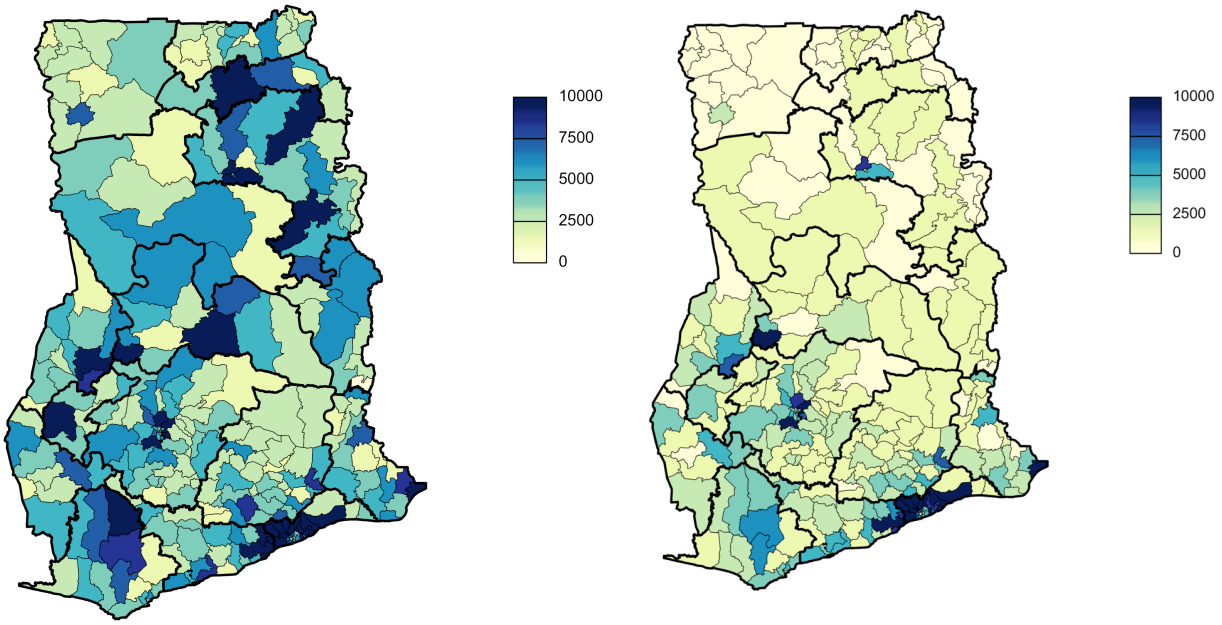
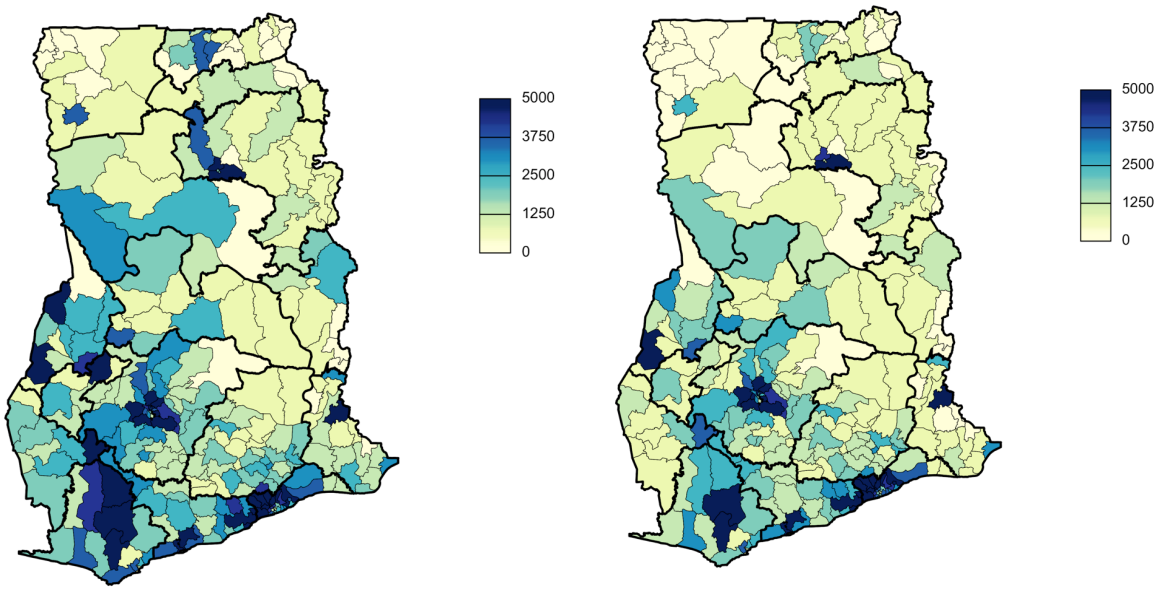


FIGURE 9: NUMBER OF WRA A) WITH AN UNMET NEED FOR CONTRACEPTION (LEFT), B) WITH AN UNMET NEED FOR CONTRACEPTION AND WITH FINANCIAL CAPACITY (RIGHT)

Figures 9a and 9b illustrate the estimated number of women with an unmet need for contraception and those with financial capacity at the district level. While women across the country have unmet need for contraception, those with financial capacity to potentially utilize the private sector should they adopt a method are concentrated in the districts within Greater Accra.



FIGURES 10: NUMBER OF WRA A) USING A TRADITIONAL CONTRACEPTIVE METHOD (LEFT), B) WRA WITH FINANCIAL CAPACITY USING A TRADITIONAL CONTRACEPTIVE METHOD (RIGHT)

Figures 10a and 10b illustrate the estimated number of women using a traditional contraceptive method and those with financial capacity at the district level. A high number of traditional method users with the financial ability to pay (532,000) are concentrated in urban areas.

National estimations of volume and value by types of contraceptive product

Current Market Value

Estimates of the current private sector market size for the seven priority contraceptive methods that could be estimated from Ghana DHS data are shown in Table 9. The estimated current retail value of the Ghana private market for injectable contraceptives, OCPs, male condoms, implants and IUDs – excluding ECP – is $7,956,000 USD.

TABLE 9: ESTIMATED CURRENT GHANA PRIVATE SECTOR CONTRACEPTIVE MARKET VOLUME AND VALUE OF SEVEN PRIORITY PRODUCTS.

Contraceptive Product	Estimated number of current private sector clients	Estimated annual private sector product volume	Estimated annual private sector product value
Injectable (DMPA-IM)	13,000	51,000	$27,000
Injectable (DMPA-SC)	43,000	174,000	$52,000
Oral contraceptive pills	239,000	3,587,000	$581,000
Male condoms	202,000	24,236,000	$7,271,000
Implants	31,000	31,000	$23,000
IUD	3,000	3,000	$2,000
Total			**$7,956,000**
ECP	946,000	6,625,000	$4,770,000

Method Mix Scenario 1: Current Private Sector Method Mix

Potential Market Value Increase under Current Method Mix Scenario

Using the current private sector method mix in Ghana, Table 10 shows that if Ghana increased its private sector utilization rate to be similar to Nigeria (43.4% private sector utilization, low) or Côte d'Ivoire (50.0% private sector utilization, high), the estimated private market for contraceptives (excluding ECP) would be between $431,000 to $1,643,500 larger. This increase results from more public sector contraceptive users switching to private sector sources and from a portion of current non-

users of modern contraceptives with financial capacity, including those with an unmet need and those using a traditional method, choosing to adopt modern contraceptives from private sources.

TABLE 10: ESTIMATED POTENTIAL INCREASE IN GHANA'S PRIVATE SECTOR CONTRACEPTIVE MARKET VOLUME AND VALUE UNDER CURRENT PRIVATE SECTOR METHOD MIX SCENARIO.

Contraceptive Product	Estimated potential increase in number of private sector clients		Estimated potential private sector product volume increase*		Estimated potential private sector product value increase*	
	Low	High	Low	High	Low	High
Injectable (DMPA-IM)	1,000	3,000	3,000	11,000	$2,000	$6,000
Injectables (DMPA-SC)	2,000	9,000	9,000	36,000	$3,000	$11,000
Oral contraceptive pills	13,000	49,000	194,000	738,000	$31,000	$120,000
Male condoms	11,000	42,000	1,312,000	5,002,000	$394,000	$1,501,000
Implants	2,000	6,000	2,000	6,000	$1,000	$5,000
IUD	0	500	0	500	$0	$500
Total					**$431,000**	**$1,643,500**
ECP	14,00	89,000	98,000	621,000	$70,000	$447,000

*The estimated potential product volume and value increase with the conversion of new private sector clients to achieve at least one CYP following the assumptions described in the earlier section, except for ECP.

Estimated Total Market Value under Current Method Mix Scenario

Ghana's total private sector market value for the six contraceptive methods of interest was calculated by adding the current market values (see Table 9) and estimated potential new revenues (see Table 10) from a more enabling environment and appropriate interventions, using the current private sector method mix. Table 11 shows the estimated market value under these circumstances (excluding ECP), which suggests a potential increase of between 5% to 17% over the current market value. The estimated total potential value could be between 8.4M and 9.6M, with revenue increases primarily driven by male condoms and OCP.

TABLE 11: ESTIMATED TOTAL PRIVATE SECTOR MARKET VALUE UNDER THE CURRENT PRIVATE SECTOR METHOD MIX SCENARIO

Contraceptive Product	Estimated annual private sector product value	Estimated potential private sector product value increase*		Estimated total value*	
		Low	High	Low	High
Injectable (DMPA-IM)	$27,000	$2,000	$6,000	$29,000	$33,000
Injectable (DMPA-SC)	$52,000	$3,000	$11,000	$55,000	$63,000

Oral contraceptive pills	$581,000	$31,000	$120,000	$612,000	$701,000
Male condoms	$7,271,000	$394,000	$1,501,000	$7,664,000	$8,771,000
Implants	$23,000	$1,000	$5,000	$24,000	$28,000
IUD	$2,000	$0	$500	$2,000	$2,500
Total				**$8,386,000**	**$9,598,500**
ECP	$4,770,000	$70,000	$447,000	$4,840,000	$5,217,000

*The estimated potential private sector value increase with the conversion of new private sector clients to achieve at least one CYP following the assumptions described in the earlier section, except for ECP.

Method Mix Scenario 2: Expansion of DMPA-SC

Potential Market Value Increase in Ghana's Private Sector Method Mix under the Expansion of DMPA-SC Scenario

In this scenario, we estimated the effects of DMPA-SC expansion by applying the proportional changes seen in Uganda's method mix between 2016 and 2022 to Ghana's current private sector method mix, as described in the earlier section. Table 12 presents the estimated potential increase in Ghana's private sector if DMPA-SC is expanded and a private sector utilization rate similar to Nigeria (low) or Côte d'Ivoire (high) is realized. The estimated private market for contraceptives could expand by between $317,000 and $1,209,000 USD.

TABLE 12: ESTIMATED POTENTIAL INCREASE IN GHANA'S PRIVATE SECTOR CONTRACEPTIVE MARKET VOLUME AND VALUE UNDER THE EXPANSION OF DMPA-SC SCENARIO.

Contraceptive Product	Estimated potential increase in number of private sector clients		Estimated potential private sector product volume increase*		Estimated potential private sector product value increase*	
	Low	High	Low	High	Low	High
Injectables (DMPA-IM)	<1,000	1,000	1,000	4,000	<$1,000	$2,000
Injectables (DMPA-SC)	8,000	30,000	31,000	119,000	$9,000	$36,000
Oral contraceptive pills	12,000	46,000	179,000	683,000	$29,000	$111,000
Male condoms	42,000	29,000	917,000	3,496,000	$275,000	$1,049,000
Implants	3,000	11,000	3,000	11,000	$2,000	$8,000
IUD	1,000	5,000	1,000	5,000	$1,000	$3,000
Total					**$317,000**	**$1,209,000**

*The estimated potential private sector value increase with the conversion of new private sector clients to achieve at least one CYP following the assumptions described in the earlier section

Note that no estimation was conducted for ECP under the alternative private sector method mix due to the uncertainty of its effect on 12-month ECP use.

Estimated Potential Total Market Value for the DMPA-SC Expansion Scenario

Ghana's total potential private sector market value for the six contraceptive methods of interest was calculated by adding the current market values (See Table 9) to the potential new revenues (see Table 12) from a more enabling environment and appropriate interventions, using the DMPA-SC expansion scenario. Table 13 shows the estimated alternative market value if DMPA-SC is expanded in Ghana. The total potential value under the expansion of the DMPA-SC scenario may be between 8.3M and 9.2M USD. The slight reduction in total potential value compared to the current method mix scenario (scenario 1, Table 11) is attributed to the decrease in use of male condoms and OCPs. Note that the total value does not include ECP.

TABLE 13: ESTIMATED ALTERNATIVE TOTAL PRIVATE SECTOR MARKET VALUE UNDER THE EXPANSION OF DMPA-SC SCENARIO.

Contraceptive Product	Estimated annual private sector product value	Estimated potential private sector product value increase*		Estimated total value*	
		Low	High	Low	High
Injectables (DMPA-IM)	$27,000	<$1,000	$2,000	$28,000	$29,000
Injectables (DMPA-SC)	$52,000	$9,000	$36,000	$62,000	$88,000
Oral contraceptive pills	$581,000	$29,000	$111,000	$610,000	$692,000
Male condoms	$7,271,000	$275,000	$1,049,000	$7,546,000	$8,320,000
Implants	$23,000	$2,000	$8,000	$25,000	$31,000
IUD	$2,000	$1,000	$3,000	$3,000	$5,000
Total				**$8,274,000**	**$9,166,000**

Note that no estimation was conducted for ECP under the alternative private sector method mix due to the uncertainty of its effect on 12-month ECP use.

Method Mix Scenario 3: Policy Scenario from Health Market Analyzer

Potential Market Value Increase from the Health Market Analyzer if the Private Sector Plays a Greater Role in LARC Provision

The policy scenario from the Health Market Analyzer illustrates the potential changes if barriers were removed to allow the private sector to play a greater role in LARC provision as implants increase in popularity. We estimated the effects of increased use of implants in the private sector as described in an earlier section. Table 14 shows the estimated potential increase if LARC gains popularity in the private sector and a private sector utilization rate similar to Nigeria (low) or Côte d'Ivoire (high) is realized.

The potential private sector market value increase for contraceptives could grow between $348,000 and $1,326,000 USD.

TABLE 14: ESTIMATED POTENTIAL INCREASE IN GHANA'S PRIVATE SECTOR CONTRACEPTIVE MARKET VOLUME AND VALUE. UNDER THE POLICY SCENARIO FROM HEALTH MARKET ANALYZER

Contraceptive Product	Estimated potential increase in number of private sector clients		Estimated potential private sector product volume increase*		Estimated potential private sector product value increase*	
	Low	High	Low	High	Low	High
Injectables (DMPA-IM)	<500	1,000	1,000	4,000	<$1,000	$2,000
Injectables (DMPA-SC)	1,000	4,000	5,000	17,000	$1,000	$5,000
Oral contraceptive pills	10,000	38,000	151,000	576,000	$24,000	$93,000
Male condoms	9,000	33,000	1,041,000	3,970,000	$312,000	$1,191,000
Implants	11,000	43,000	11,000	43,000	$8,000	$32,000
IUD	1,000	2,000	1,000	2,000	$500	$2,000
Total					**$348,000**	**$1,326,000**

*The estimated potential private sector value increase with the conversion of new private sector clients to achieve at least one CYP following the assumptions described in the earlier section

Note: No estimation was conducted for ECP under this policy scenario due to the uncertainty of its effect on 12-month ECP use.

Estimated Potential Total Market Value under the Health Market Analyzer Policy Scenario

Ghana's total private sector market value for the six contraceptive methods of interest was calculated by adding the current market values (see Table 9) to the potential new revenues (See Table 14) from a more enabling environment and appropriate interventions under the policy scenario from health market analyzer. Table 15 shows the estimated total market value under these circumstances. The estimated total potential value can be between 8.3M and 9.3M USD. Compared to the current method mix scenario (scenario 1, Table 11), the slight reduction can be attributed to the decrease in short-term methods sales being complemented by an increase in implant sales.

TABLE 15: ESTIMATED ALTERNATIVE TOTAL PRIVATE SECTOR MARKET VALUE UNDER THE POLICY SCENARIO FROM THE HEALTH MARKET ANALYZER

Contraceptive Product	Estimated annual private sector product value	Estimated potential private sector product value increase*		Estimated total value*	
		Low	High	Low	High
Injectables (DMPA-IM)	$27,000	<$1,000	$2,000	$28,000	$29,000

Injectables (DMPA-SC)	$52,000	$1,000	$5,000	$54,000	$57,000
Oral contraceptive pills	$581,000	$24,000	$93,000	$606,000	$674,000
Male condoms	$7,271,000	$312,000	$1,191,000	$7,583,000	$8,462,000
Implants	$23,000	$8,000	$32,000	$32,000	$55,000
IUD	$2,000	$500	$2,000	$2,000	$4,000
Total				**$8,304,000**	**$9,282,000**

*The estimated potential private sector value increase with the conversion of new private sector clients to achieve at least one CYP following the assumptions described in the earlier section
Note: No estimation was conducted for ECP under this policy scenario due to the uncertainty of its effect on 12-month ECP use.

Discussion

Utility of the approach

The results of this work were disseminated with key market actors in Ghana on October 8th and 9th, 2024 to identify how they can use the market sizing estimates. Participants in the dissemination event included government representatives, donors, social marketers, manufacturers, and commercial and implementing partners.

Market actors identified three main uses of these estimates. (1) They can be used to facilitate conversations to identify important barriers, including revisions to existing policies. This helps to understand the different enabling and constraining market forces affecting the uptake of contraceptive products in Ghana. (2) They illustrate how the demand for data can inform strategic planning and management. Stakeholders discussed their intended utilization of the data, including for funding and resource allocation. This also shows the data's ability to serve the information needs of diverse market actors. (3) Finally, these analyses highlight the need for close collaboration among stakeholders. Participants at the event indicated the need for government engagement with market actors to work on a common vision of the FP market to help optimize the delivery of contraception across public and private channels.

Replicability

The potential replicability of this novel method for estimating the geographic distribution, size, and value of the private market for key contraceptive products in Ghana is promising. Except for the pricing information, all of the data utilized in these analyses are freely accessible, and we employed the free software environment for statistical computing and graphics, R, to produce the small area estimations. Furthermore, the methods section of this report provides a detailed account of how we combined the various data sources and did the analyses.

However, two key limiting factors deserve consideration before attempting to reproduce these analyses. First, the price data for all the contraceptive products has to be included in the analyses to ensure an accurate estimation of the private market value. Discrepancies in pricing, such as wholesale versus retail

prices and subsidized prices, can significantly alter the market's estimated value. Second, the subnational estimations require proficiency in the R programming language and an understanding of Bayesian small area estimation techniques. Addressing each of these considerations requires making specific assumptions about the nature of the data based on the literature and having a thorough understanding of family planning markets and behaviors. These assumptions should be clearly discussed and understood by both the research team and the intended audience.

Sensitivity analysis

Sensitivity analysis shows the comparison of our estimated current private sector volume with contraceptive social marketing (CSM) statistics volume in 2022 published by DKT International for injectables, OCP, male condoms and ECP. Table 16 (Annex 1) indicates that the volume of injectables and OCP in the market sizing are lower than the CSM statistics, and higher for male condoms and ECP.

The volume of injectables is the most different between the two sets of data and the underestimation is likely related to poor sales data records. Currently in Ghana, pharmacists can sell injectables but cannot inject them, leading clients to buy injectables from pharmacies (private sector) and then take them to a public facility for injection.

It is important to note that the market sizing analyses presented in this report represents a different but complementary approach to tracking FP products obtained through social marketing entities. Our estimates are derived from nationally representative survey estimates of private sector use, and, except for the case of injectables, align with trends in the CSM data.

Other potential use of the approach

The methodology can be adopted and applied to meet various stakeholders' diverse purposes and information needs. Given the availability of DHS and census data in multiple countries, small area estimation can be applied to additional FP indicators tailored for other audiences and in other countries. These might include local policymakers who must plan, monitor, and evaluate local-level activities, and/or implementing organizations who need to be able to identify underserved geographical areas to improve programming and advocacy. FP indicators may also be combined with socio-demographic data to better estimate the size of underserved populations sub-nationally. In addition to FP, the methodology can also be applied to understand other aspects of child, adolescent, and maternal health commonly measured in national household surveys, including malaria, malnutrition, immunization, teenage pregnancies, stillbirths, and antenatal care.[40–42]

Although the methodology relies on household surveys and population data, other routine data sources such as stock, retail audit, or service data may also be incorporated to increase precision.[3] Furthermore, as national surveys are periodic, consistent routine data from both the private and public sectors can provide an early indication of trends in product and service use.

For all of its varying uses, these analytic outputs require local contextualization to ensure appropriate customization for the specific purpose and audience. For instance, the rationale for estimating the number of contraceptive users with financial capacity obtained currently using the public sector was designed to approximate the potential capability to pay for contraceptive products in the private sector. Application of the methodological approach in other settings will require discussions with local

stakeholders to determine if the indicators and associated assumptions are applicable and whether additional contextualization is needed.

Limitation

Our approach has several limitations. First, estimates of some modern contraceptive methods that have a low proportion of use (e.g., implants and IUD in the private sector) may lack precision, especially for young women (see results in Annexes 2 and 3). Second, the pricing information is for subsidized products, which may affect private sector pricing. Additionally, implants and IUD prices do not reflect facility visit fees for insertion and removal of reversible contraceptive methods.

Third, the underpinning assumptions might not hold if there is a policy change. For example, the accepted definition of unmet need may not reflect the contraceptive needs of these women. Fourth, not all the identified intervention studies may be applicable to the private sector in Ghana. This could potentially affect the assumed mCPR increase, especially for women with unmet needs and traditional method users. Fifth, as the sample of DHS survey was designed to include general population, estimates on use, volume and value did not include FP use from key population groups such as migrants, refugees, female sex workers, and people living in urban slums.

Conclusion and next steps

Private sector actors in the contraceptive product market in Ghana have a critical need for accurate and comprehensive market intelligence data. This information is essential not only for understanding the size and geographic distribution of their existing clientele but also for identifying potential new clients. However, the challenge lies in the often sparse or poor-quality nature of the market data. By harnessing the power of robust market intelligence, they can optimize their product targeting strategies and resource allocation, ultimately enabling them to better serve the diverse needs of their clients. FHM Engage has the important task of facilitating this process, thereby promoting increased contraceptive utilization in Ghana.

Our novel approach to producing market sizing information for the private sector contraceptive market in Ghana utilizes Bayesian small area estimation methods in combination with nationally representative data. This innovative methodology enables us to generate subnational estimates, offering insights at either the district or regional level, for a range of key contraceptive utilization indicators. By combining these subnational rates with population metrics, we enabled a deeper understanding of the geographical distribution of contraceptive users in Ghana. Additionally, our approach provides national-level estimates of both client and product volumes, using different scenarios, shedding light on the value of the private sector market for key contraceptive products.

The static images of our small area estimation maps and market volume and value tables are featured in an accompanying PowerPoint presentation and in this report. Additionally, Metrics for Management has produced a user-friendly web application - the Contraceptive Market Size Visualizer - to dynamically visualize the data in detail. The interactive visualizer is found at (https://m4mgmt.org/contraceptive-market-size-visualizer/). This visualization tool can facilitate the discovery of new insights as users toggle

between and scroll across detailed, information-rich maps, as well as interactive graphs that would empower users to learn more about potential changes in the contraceptive market environment as they explore various market scenarios, making it easier to delve into the data and its implications.

In conclusion, this innovative approach has generated valuable market intelligence insights, shedding light on the private sector contraceptive market in Ghana. The success of this approach suggests its applicability in other FHM Engage partner countries and across global health domains with current health product utilization data, yet where comprehensive market data are limited, promising enhanced insights to drive positive change and optimize service delivery in diverse regions and health sectors worldwide.

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Annex 1. Sensitivity analysis

TABLE 16: COMPARISON OF ESTIMATED CURRENT GHANA PRIVATE SECTOR CONTRACEPTIVE MARKET VOLUME OF FOUR PRIORITY PRODUCTS WITH CONTRACEPTIVE SOCIAL MARKETING STATISTICS DATA.

Contraceptive Product	Estimated current private sector volume (FHM)	CSM annual product volume (DKT International 2022)
Injectables	225,000	998,440
Oral contraceptive pills	3,587,000	4,635,940
Male condoms	24,236,000	19,338,546
ECP	6,625,000	4,700,710

Annex 2. Subnational maps of indicators for young women aged 15 to 24

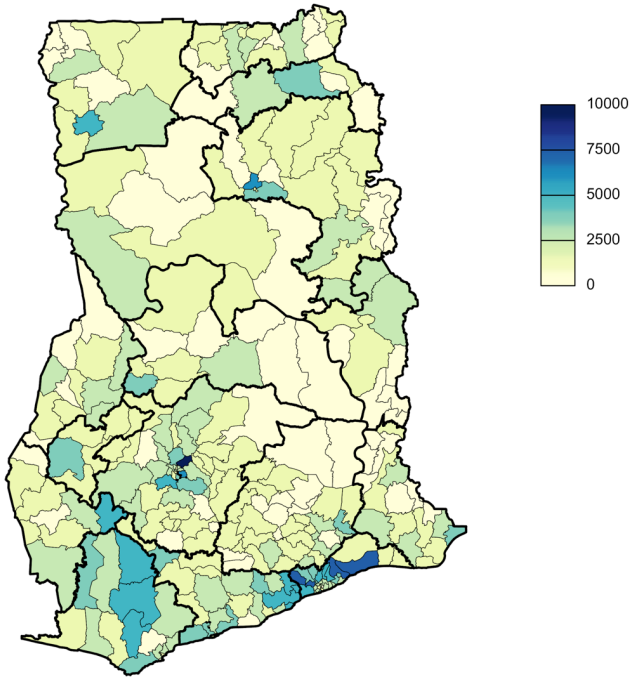
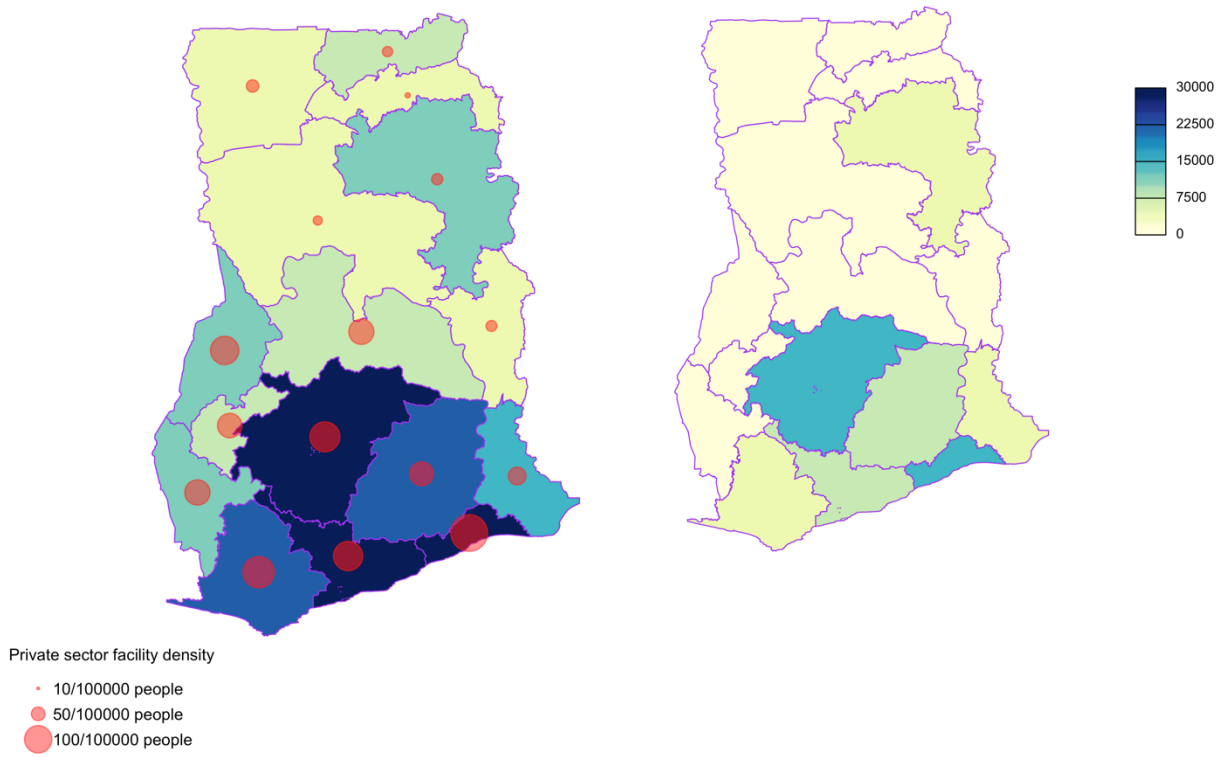
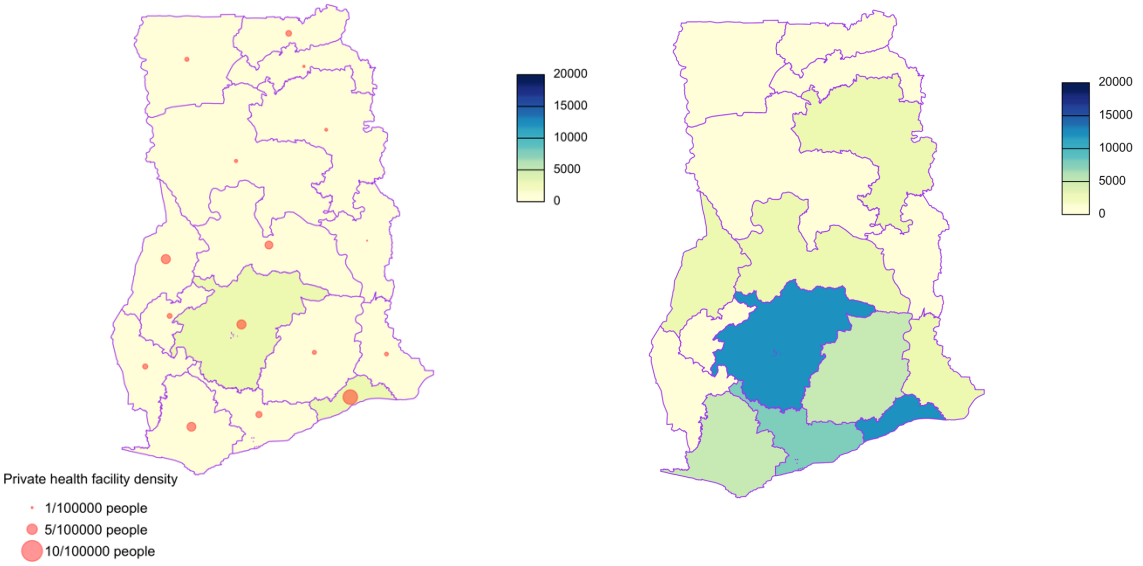


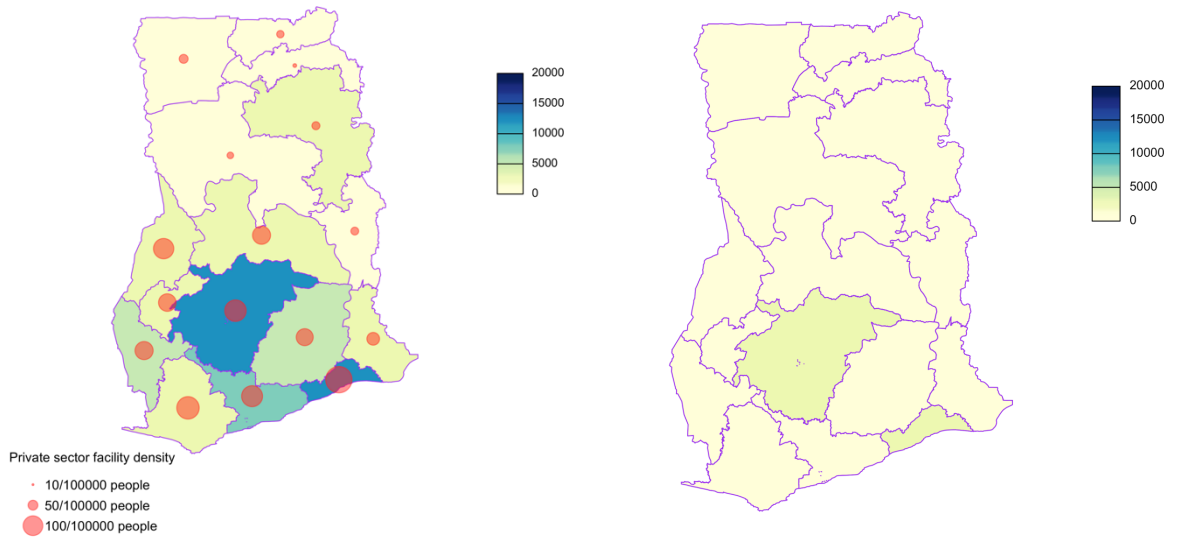
FIGURE 11: NUMBER OF YOUNG WOMEN USING A MODERN CONTRACEPTIVE METHOD BY DISTRICT.



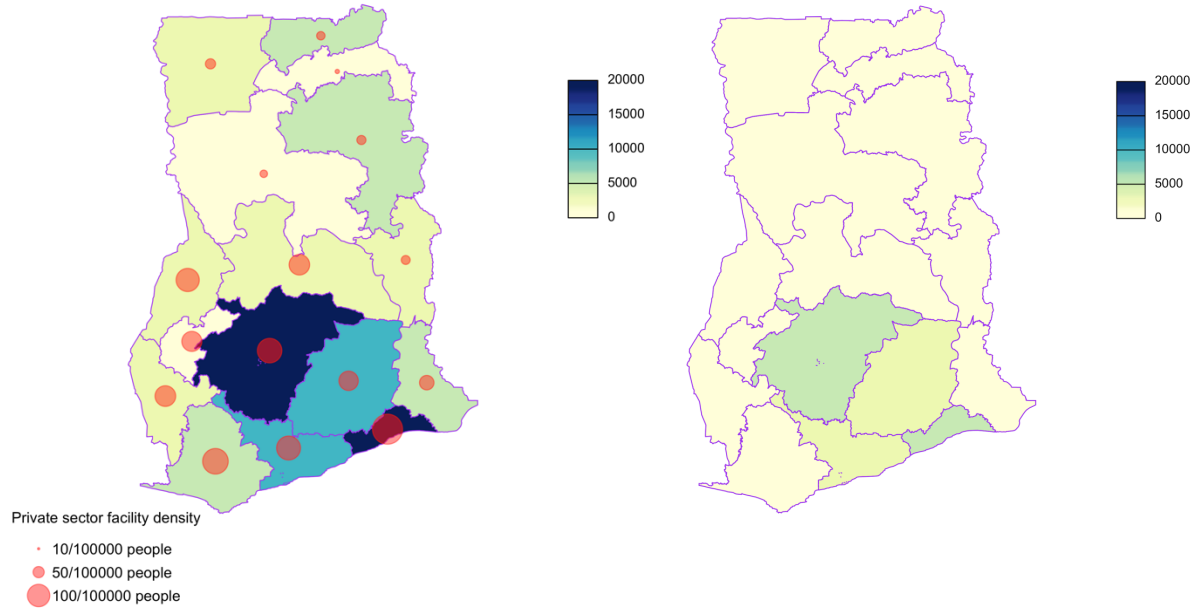
FIGURES 12: NUMBER OF YOUNG WOMEN USING SHORT-TERM CONTRACEPTIVE METHODS A) FROM A PRIVATE SECTOR SOURCE OVERLAYED WITH PRIVATE SECTOR FACILITY DENSITY (LEFT), B) YOUNG WOMEN WITH FINANCIAL CAPACITY USING A PUBLIC SECTOR SOURCE BY REGION (RIGHT).



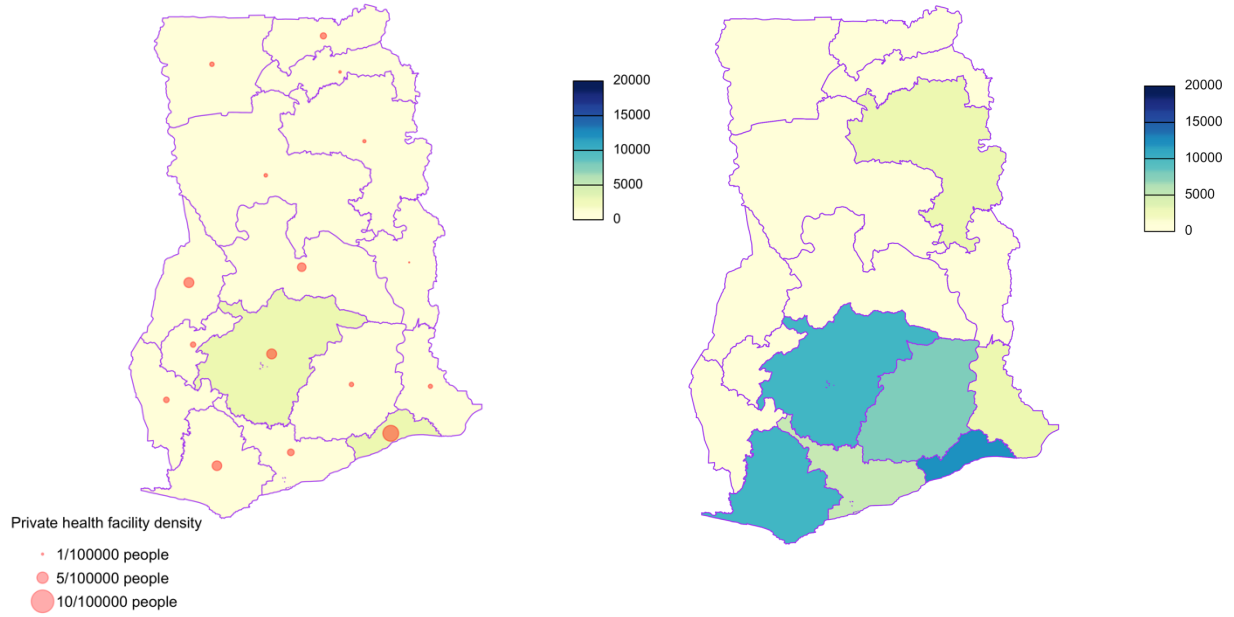
FIGURES 13: NUMBER OF YOUNG WOMEN USING INJECTABLE CONTRACEPTIVES A) FROM A PRIVATE SECTOR SOURCE OVERLAYED WITH PRIVATE HEALTH FACILITY DENSITY (LEFT), B) YOUNG WOMEN WITH FINANCIAL CAPACITY USING A PUBLIC SECTOR SOURCE BY REGION (RIGHT).



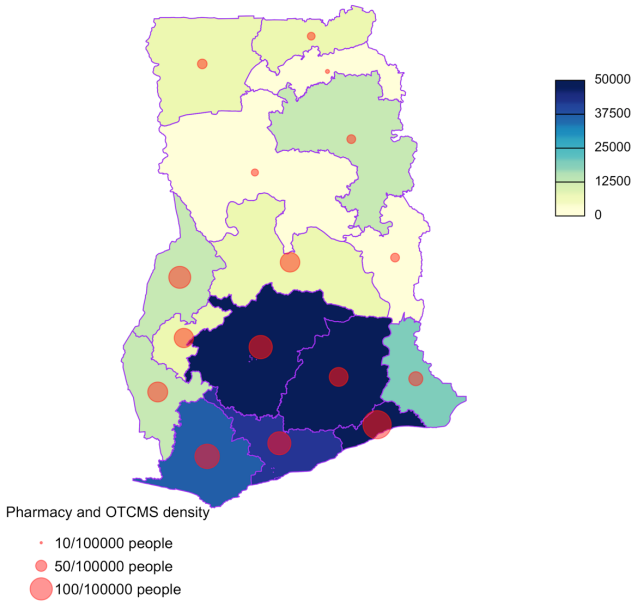
FIGURES 14: NUMBER OF YOUNG WOMEN USING ORAL CONTRACEPTIVE PILLS A) FROM A PRIVATE SECTOR SOURCE OVERLAYED WITH PRIVATE HEALTH FACILITY AND PHARMACY DENSITY (LEFT), B) FROM A PUBLIC SECTOR SOURCE WITH FINANCIAL CAPACITY BY REGION (RIGHT).



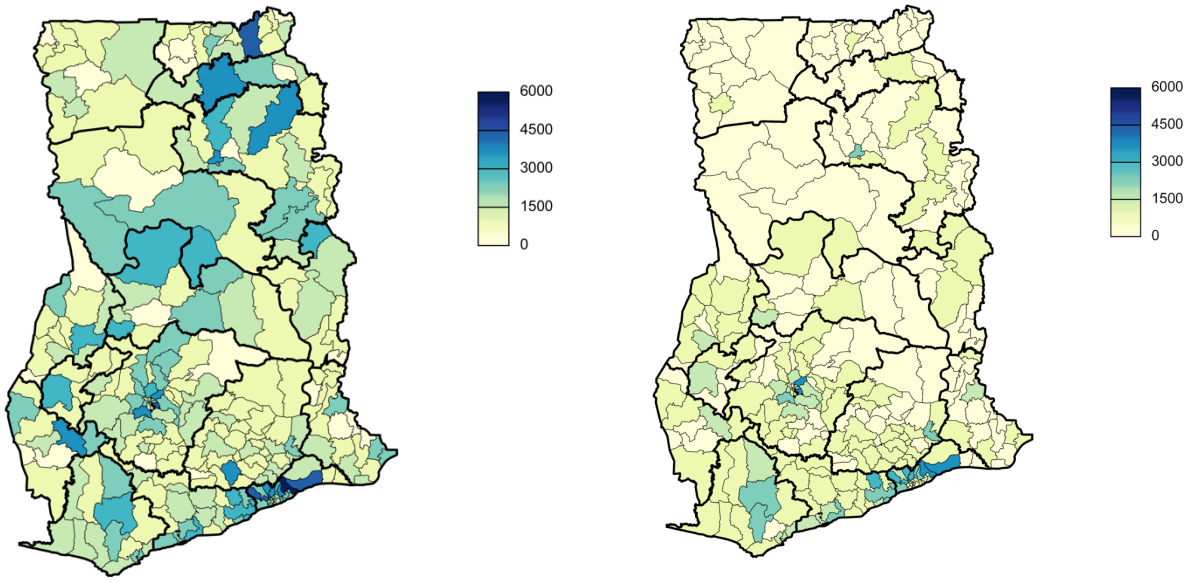
FIGURES 15: NUMBER OF YOUNG WOMEN USING MALE CONDOMS A) FROM A PRIVATE SECTOR SOURCE OVERLAYED WITH PRIVATE HEALTH FACILITY DENSITY (LEFT), B) FROM A PUBLIC SECTOR SOURCE WITH FINANCIAL CAPACITY BY REGION (RIGHT).



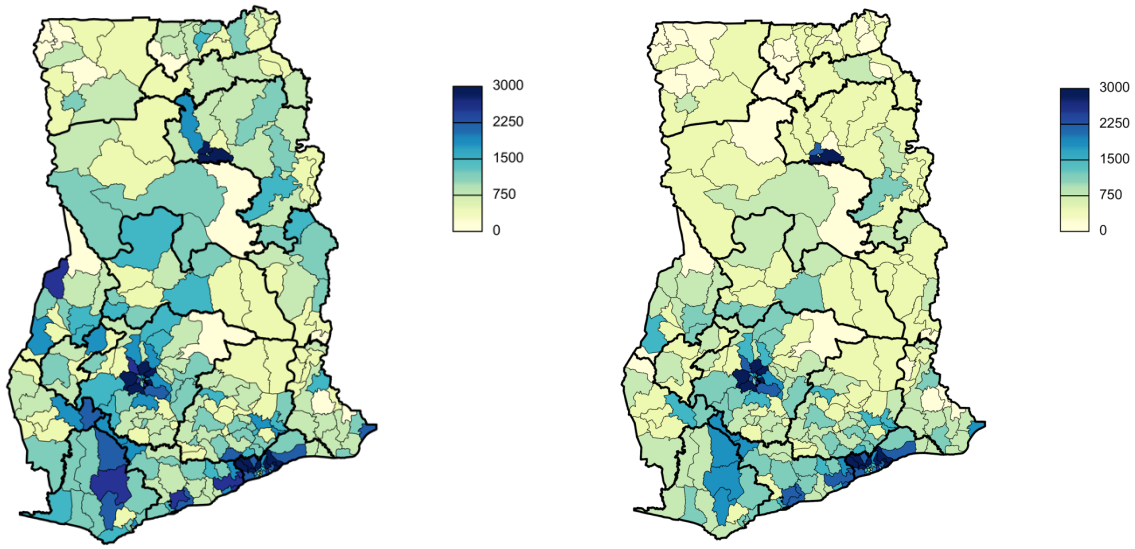
FIGURES 16: NUMBER OF YOUNG WOMEN USING IMPLANTS A) FROM A PRIVATE SECTOR SOURCE OVERLAYED WITH PRIVATE HEALTH FACILITY DENSITY (LEFT), B) FROM A PUBLIC SECTOR SOURCE WITH FINANCIAL CAPACITY BY REGION (RIGHT).



FIGURES 17: NUMBER OF YOUNG WOMEN USING ECP



FIGURES 18: NUMBER OF YOUNG WOMEN A) WITH AN UNMET NEED FOR CONTRACEPTION (LEFT), B) WITH AN UNMET NEED FOR CONTRACEPTION WITH FINANCIAL CAPACITY BY DISTRICT (RIGHT).



FIGURES 19: NUMBER OF YOUNG WOMEN A) USING A TRADITIONAL METHOD (LEFT), B) USING A TRADITIONAL METHOD WITH FINANCIAL CAPACITY BY DISTRICT.

Annex 3. Private market volume and value estimates for young women aged 15 to 24

TABLE 16: ESTIMATED CURRENT GHANA PRIVATE SECTOR CONTRACEPTIVE MARKET VOLUME AND VALUE AMONG YOUNG WOMEN.

Contraceptive Product	Estimated number of current private sector client	Estimated annual private sector product volume	Estimated annual private sector product value
Injectable (DMPA-IM)	5,000	19,000	$10,000
Injectable (DMPA-SC)	8,000	33,000	$10,000
Oral contraceptive pills	53,000	799,000	$129,000
Male condoms	111,000	13,263,000	$3,979,000
Implants	10,000	10,000	$7,000
IUD	<200	<200	<$200
Total			**$4,136,000**
ECP	434,000	3,037,00	$2,186,000

Method mix scenario 1: current private sector method mix scenario

TABLE 17: ESTIMATED POTENTIAL INCREASE IN GHANA PRIVATE SECTOR CONTRACEPTIVE MARKET VOLUME AND VALUE AMONG YOUNG WOMEN UNDER THE CURRENT METHOD MIX SCENARIO.

Contraceptive Product	Estimated potential increase in number of private sector clients		Estimated potential private sector product volume increase*		Estimated potential private sector product value increase*	
	Low	High	Low	High	Low	High
Injectable (DMPA-IM)	<200	1,000	<5000	2,000	<$500	$1,000
Injectable (DMPA-SC)	<500	1,000	1,000	4,000	<$500	$1,000
Oral contraceptive pills	2,000	6,000	25,000	97,000	$4,000	$16,000
Male condoms	4,000	13,000	424,000	1,610,000	$127,000	$483,000
Implants	<500	1,000	<500	1,000	<$500	$1,000

IUD	0	0	0	0	$0	$0
Total					**$131,000**	**$502,000**
ECP	5,000	29,000	32,000	203,000	$23,000	$146,000

*The estimated potential product volume and value increase with the conversion of all new private sector clients to achieve at least one CYP following the assumptions described in the earlier section.

TABLE 18: ESTIMATED TOTAL GHANA PRIVATE SECTOR CONTRACEPTIVE MARKET VOLUME AND VALUE AMONG YOUNG WOMEN UNDER THE CURRENT METHOD MIX SCENARIO.

Contraceptive Product	Estimated annual private sector product value	Estimated potential private sector product value increase*		Estimated total value*	
		Low	High	Low	High
Injectable (DMPA-IM)	$10,000	<$500	$1,000	$10,000	$11,000
Injectable (DMPA-SC)	$10,000	<$500	$1,000	$10,000	$11,000
Oral contraceptive pills	$129,000	$4,000	$16,000	$134,000	$145,000
Male condoms	$3,979,000	$127,000	$483,000	$4,106,000	$4,462,000
Implants	$7,000	<$500	$1,000	$7,000	$8,000
IUD	<$200	$0	$0	<$200	<$200
Total				**$4,267,000**	**$4,637,000**
ECP	$2,186,000	$23,000	$146,000	$2,069,000	$2,303,000

*The estimated potential private sector value increase with the conversion of all new private sector clients to achieve at least one CYP following the assumptions described in the earlier section.

Method mix scenario 2: expansion of DMPA-SC scenario

TABLE 19: ESTIMATED POTENTIAL INCREASE IN GHANA PRIVATE SECTOR CONTRACEPTIVE MARKET VOLUME AND VALUE AMONG YOUNG WOMEN UNDER THE EXPANSION OF DMPA-SC SCENARIO.

Contraceptive Product	Estimated potential increase in number of private sector clients		Estimated potential private sector product volume increase*		Estimated potential private sector product value increase*	
	Low	High	Low	High	Low	High
Injectables (DMPA-IM)	<100	<200	<500	1,000	<$200	$1,000
Injectables (DMPA-SC)	2,000	7,000	8,000	30,000	$2,000	$9,000

Oral contraceptive pills	3,000	11,000	45,000	170,000	$7,000	$28,000
Male condoms	2,000	7,000	229,000	871,000	$69,000	$261,000
Implants	<1,000	3,000	<1,000	3,000	$500	$2,000
IUD	<500	1,000	<500	1,000	<$500	$1,000
Total					**$79,000**	**$301,000**

*The estimated potential private sector value increase with the conversion of all new private sector clients to achieve at least one CYP following the assumptions described in the earlier section.
Note that no estimation was conducted for ECP under the alternative private sector method mix due to the uncertainty of its effect on 12-month ECP use.

TABLE 20: ESTIMATED ALTERNATIVE TOTAL PRIVATE SECTOR MARKET VALUE AMONG YOUNG WOMEN UNDER THE EXPANSION OF DMPA-SC SCENARIO.

Contraceptive Product	Estimated annual private sector product value	Estimated potential private sector product value increase*		Estimated total value*	
		Low	High	Low	High
Injectables (DMPA-IM)	$10,000	<$200	$1,000	$10,000	$11,000
Injectables (DMPA-SC)	$10,000	$2,000	$9,000	$12,000	$19,000
Oral contraceptive pills	$129,000	$7,000	$28,000	$137,000	$157,000
Male condoms	$3,979,000	$69,000	$261,000	$4,043,000	$4,240,000
Implants	$7,000	$500	$2,000	$8,000	$9,000
IUD	<$200	<$500	$1,000	<$500	<$1,000
Total				**$4,210,000**	**$4,436,000**

*The estimated potential private sector value increase with the conversion of all new private sector clients to achieve at least one CYP following the assumptions described in the earlier section.
Note that no estimation was conducted for ECP under the alternative private sector method mix due to the uncertainty of its effect on 12-month ECP use.

Method mix scenario 3: policy scenario from health market analyzer

TABLE 21: ESTIMATED POTENTIAL INCREASE IN GHANA PRIVATE SECTOR CONTRACEPTIVE MARKET VOLUME AND VALUE AMONG YOUNG WOMEN UNDER HEALTH MARKET ANALYZER POLICY SCENARIO.

Contraceptive Product	Estimated potential increase in number of private sector clients		Estimated potential private sector product volume increase*		Estimated potential private sector product value increase*	
	Low	High	Low	High	Low	High

Injectables (DMPA-IM)	<100	<500	<500	1,000	<$200	$1,000
Injectables (DMPA-SC)	<500	1,000	1,000	4,000	<$500	$1,000
Oral contraceptive pills	3,000	10,000	38,000	144,000	$6,000	$23,000
Male condoms	2,000	8,000	260,000	989,000	$78,000	$297,000
Implants	3,000	11,000	3,000	11,000	$2,000	$8,000
IUD	<200	<500	<200	<500	<$100	<$500
Total					**$87,000**	**$330,000**

*The estimated potential private sector value increase with the conversion of all new private sector clients to achieve at least one CYP following the assumptions described in the earlier section.
Note: No estimation was conducted for ECP under this policy scenario due to the uncertainty of its effect on 12-month ECP use.

TABLE 22: ESTIMATED ALTERNATIVE TOTAL PRIVATE SECTOR MARKET VALUE AMONG YOUNG WOMEN UNDER THE HEALTH MARKET ANALYZER POLICY SCENARIO.

Contraceptive Product	Estimated annual private sector product value	Estimated potential private sector product value increase*		Estimated total value*	
		Low	High	Low	High
Injectables (DMPA-IM)	$10,000	<$200	$1,000	$10,000	$11,000
Injectables (DMPA-SC)	$10,000	<$500	$1,000	$10,000	$11,000
Oral contraceptive pills	$129,000	$6,000	$23,000	$136,000	$153,000
Male condoms	$3,979,000	$78,000	$297,000	$4,057,000	$4,276,000
Implants	$7,000	$2,000	$8,000	$10,000	$16,000
IUD	<$200	<$100	<$500	<$200	<$500
Total				**$4,223,000**	**$4,468,000**

*The estimated potential private sector value increase with the conversion of all new private sector clients to achieve at least one CYP following the assumptions described in the earlier section.
Note: No estimation was conducted for ECP under this policy scenario due to the uncertainty of its effect on 12-month ECP use.

About FHM Engage

Frontier Health Markets (FHM) Engage is a five-year cooperative agreement (7200AA21CA00027) funded by the United States Agency for International Development. We work to improve the market environment for greater private sector participation in the delivery of health products and services and to improve equal access to and uptake of high-quality consumer driven health products, services, and information. Chemonics International implements FHM Engage in collaboration with Core Partners: Results for Development (co-technical lead), Pathfinder and Zenysis. FHM Engage Network Implementation Partners include ACCESS Health India, Africa Christian Health Association Platform, Africa Healthcare Federation, Amref Health Africa, Ariadne Labs, CERRHUD, Insight Health Advisors, Makerere University School of Public Health, Metrics for Management, Solina Group, Strategic Purchasing Africa Resource Center, Scope Impact, Stage Six, Strathmore University, Total Family Health Organization, and Ubora Institute.

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