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Evaluation of Interventions to Improve the Quality of Antenatal and Labor and Delivery Services in Kogi and Ebonyi States

Summary findings from direct observations of care

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In Nigeria, maternal and newborn mortality remain unacceptably high. In 2015, the Government of Nigeria (GoN) and U.S. Agency for International Development (USAID) asked its flagship global Maternal and Child Survival Program (MCSP) to work in Ebonyi and Kogi States to improve the quality of family planning (FP) services, including postpartum family planning (PPFP), and maternal and newborn health (MNH) services, including antenatal care (ANC), delivery care, and postpartum care. To determine the effect of MCSP-supported interventions, MCSP conducted baseline and endline cross-sectional quality of care (QoC) health facility assessments in a sample of supported health facilities across the two states in June 2016 and September 2018, respectively. This brief describes findings and recommendations from direct observation of antenatal and delivery care services.¹

Background

MCSP worked in partnership with the federal and state-level Ministries of Health in Nigeria to implement high-impact interventions for better care on the day of birth and helped to expand contraceptive access for postpartum women and increase voluntary FP uptake in Ebonyi and Kogi States. The choice of these two states was informed by the presence of other USAID investments as well as relatively poor health indicators. Program interventions were intended to accelerate progress toward the GoN's commitment to reduce maternal and newborn mortality as part of the Sustainable Development Goals. Interventions were rolled out in two phases.

Study Questions

- What is the quality of antenatal care services following the implementation of MCSP-supported interventions?
- What is the quality of labor and delivery care services following the implementation of MCSP-supported interventions?

¹ A report summarizing changes in health facility service availability and readiness for MNH services can be found here: <https://www.mcsprogram.org/resource/evaluation-of-interventions-to-improve-reproductive-maternal-and-newborn-health-service-availability-and-readiness-in-kogi-and-ebonyi-states/>

At the state and local government authority (LGA, or district) levels in Kogi and Ebonyi States from 2014 to 2018, MCSP worked closely with state and local government health managers, facility teams, implementing partners, and members of professional associations to strengthen integrated MNH and PFP counseling and services, including the development and implementation of a quality improvement (QI) operational plan in both states. Clinical training and gender sensitive/values clarification training (using the World Health Organization's [WHO's] Health Workers for Change curriculum) was conducted with health workers, and supportive supervision was provided on an ongoing basis. Starting with 120 supported health facilities in 2015, 45 of which were initially targeted for additional QI interventions in Phase One of program implementation, MCSP supported 321 facilities by the end of program implementation in September 2018, 91 of which received additional QI interventions.

QoC standards for MNH were launched by WHO while this program was underway and Nigeria joined the QoC Network. The relevance of this work to the implementation of the MNH QI work under the MCSP/Nigeria program is described in another brief.²

Methodology

Cross-sectional baseline and follow-up health facility surveys were conducted in two states of Nigeria—Ebonyi and Kogi—before and after the implementation of MCSP-supported interventions. The assessment included 40 of the 45 MCSP-supported facilities that received QI interventions as part of Phase One of the program.³ Structured observation checklists were used to observe client-provider interactions during ANC consultations and during labor and delivery (L&D) care services.

The target sample size for ANC observations (400, or 200 per state) was calculated assuming health workers and clients are clustered within facilities, with a median design effect of 1.5 to allow +12% precision in QoC indicator estimates. The actual precision of results depends on the indicator, number of facilities visited (40), and number of cases observed. The assumed prevalence for the indicators of interest was 50% to generate the largest sample size. Given the smaller caseloads of deliveries compared with ANC consultations at the target facilities, the plan was to observe all deliveries that took place on the days of the study team's visit.

Data collectors, who were clinicians currently practicing in the two study states, were trained over a 1-week period. The training included: practice using the data collection tools in the classroom during objective structured clinical exams with anatomic models; practice at health facilities; and orientation in how to obtain informed consent. Teams of two or three data collectors visited the selected facilities over 4–6 weeks to collect data for each round.

Data collectors entered data directly on Android-enabled tablet PCs using custom-created data entry programs developed with CommCare software package. Generalized linear models were used to compare outcomes by time point—baseline vs. endline. Poisson distribution was used for binary outcomes and multinomial distribution for categorical outcomes, with time point as the primary predictor and provider-correlated robust variance estimates. Means across multiple items are calculated by summing the values and dividing by the number of items. Poisson distribution was used to test the difference in means by time point. Reported p-values are from the Wald test for time point variable from the corresponding regression model.

The study received ethical approval from the Johns Hopkins Bloomberg School of Public Health institutional review board and the Nigeria Human Research Ethics Committee. Verbal informed consent was obtained from health workers and clients and written permission to visit the facility was obtained from the facility in-charge.

² <https://www.mcsprogram.org/resource/nigeria-mnch-program-technical-brief-improving-quality-of-maternal-newborn-and-postpartum-family-planning-care/>

³ In a subset of primary health centers and hospitals supported by MCSP, the project supported the co-design and implementation of a two-phased, multi-faceted QI intervention to improve quality of integrated childbirth and postnatal care services for women and newborns, beginning in 45 facilities in Phase One and scaling up to 46 more facilities in Phase Two, which began in the program's second year, for a total of 91 QI facilities supported.

Key Findings and Conclusions

The final sample size of ANC and L&D observations is included in Table 1 below.

Table 1: Final sample of client-provider interactions (number)

| Data collection tool | Ebonyi State | | Kogi State | | Total | |
|----------------------|--------------|---------|------------|---------|----------|---------|
| | Baseline | Endline | Baseline | Endline | Baseline | Endline |
| ANC observations | 202 | 200 | 233 | 197 | 435 | 397 |
| L&D observations | 19 | | 28 | | 47 | |

At endline, more primary health centers were included than at baseline, since more were included in the final set of Phase One program intervention facilities, which received support from the beginning of the program. The distribution of the different categories of health care providers observed for ANC was also different between baseline and endline across states and overall ($p=0.001$), with the proportion of community health extension workers higher at endline while the proportion of doctors was lower.

Quality of Antenatal Care

History of pregnancy complications and current danger signs: The proportion of ANC consultations where health providers asked about any complications experienced during previous pregnancies was significantly higher during endline compared with baseline in both states and in total ($p=0.000$). The mean composite score for number of different complications with previous pregnancies discussed with clients was significantly higher at endline compared with baseline ($p=0.000$). The proportion of ANC consultations where each individual complication was discussed increased significantly by state and overall except for “prior neonatal death” and postpartum depression (which increased significantly only in Ebonyi, from, 0% to 10.4%). Regarding discussion of danger signs/complications pertaining to the current pregnancy, the proportion of ANC consultations where providers asked about any danger signs/complications, the mean composite score (sum total of the number of different danger signs/complications discussed), as well as proportion of ANC consultations where providers discussed each relevant complication, were all significantly higher at endline compared with baseline in each of the individual states and also at total ($p<0.05$). (See Table 2).

Table 2: History of pregnancy complications and current danger signs

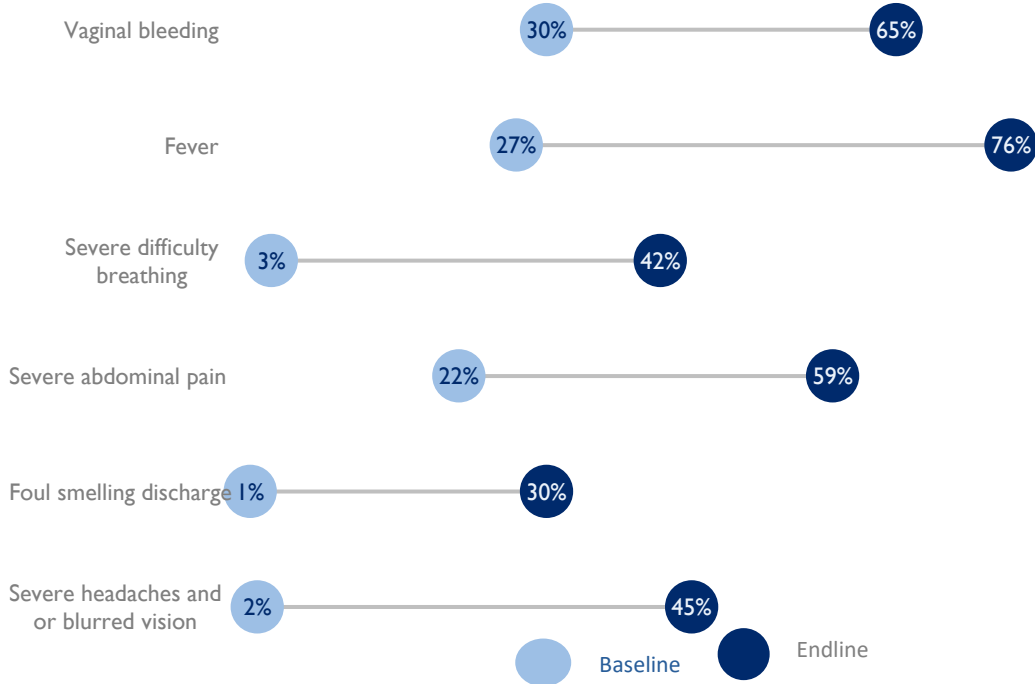
| Item | Ebonyi State | | | Kogi State | | | Total | | |
|--|----------------|----------------|---------|----------------|----------------|---------|----------------|----------------|---------|
| | Baseline | Endline | P-value | Baseline | Endline | P-value | Baseline | Endline | P-value |
| Asked about any complications* with previous pregnancies (percentage) | 11.4 | 58.5 | 0.000 | 14.2 | 49.0 | 0.000 | 12.9 | 56.5 | 0.000 |
| Mean composite score for number of complications with previous pregnancies discussed with clients (number) | 0.38 (1.29) | 4.55 (4.65) | 0.000 | 0.57 (1.57) | 3.73 (4.43) | 0.000 | 0.48 (1.45) | 4.14 (4.55) | 0.000 |
| Discussed any danger signs regarding current pregnancy with client (percentage) | 63.9 | 83.5 | 0.018 | 61.8 | 83.0 | 0.023 | 62.8 | 83.3 | 0.001 |

| Item | Ebonyi State | | | Kogi State | | | Total | | |
|--|----------------|----------------|---------|----------------|----------------|---------|----------------|----------------|---------|
| | Baseline | Endline | P-value | Baseline | Endline | P-value | Baseline | Endline | P-value |
| Mean number of danger signs regarding current pregnancy discussed with client (number) | 1.07 (1.17) | 3.58 (2.17) | 0.000 | 1.11 (1.16) | 2.96 (1.99) | 0.000 | 1.09 (1.16) | 3.27 (2.10) | 0.000 |

*Complications included: heavy bleeding during/after delivery, anemia, high blood pressure, fever or infection, convulsions, multiple pregnancies, prolonged labor, cesarean delivery, assisted delivery prior abortions/miscarriages, prior stillbirth, prior neonatal death, postpartum depression

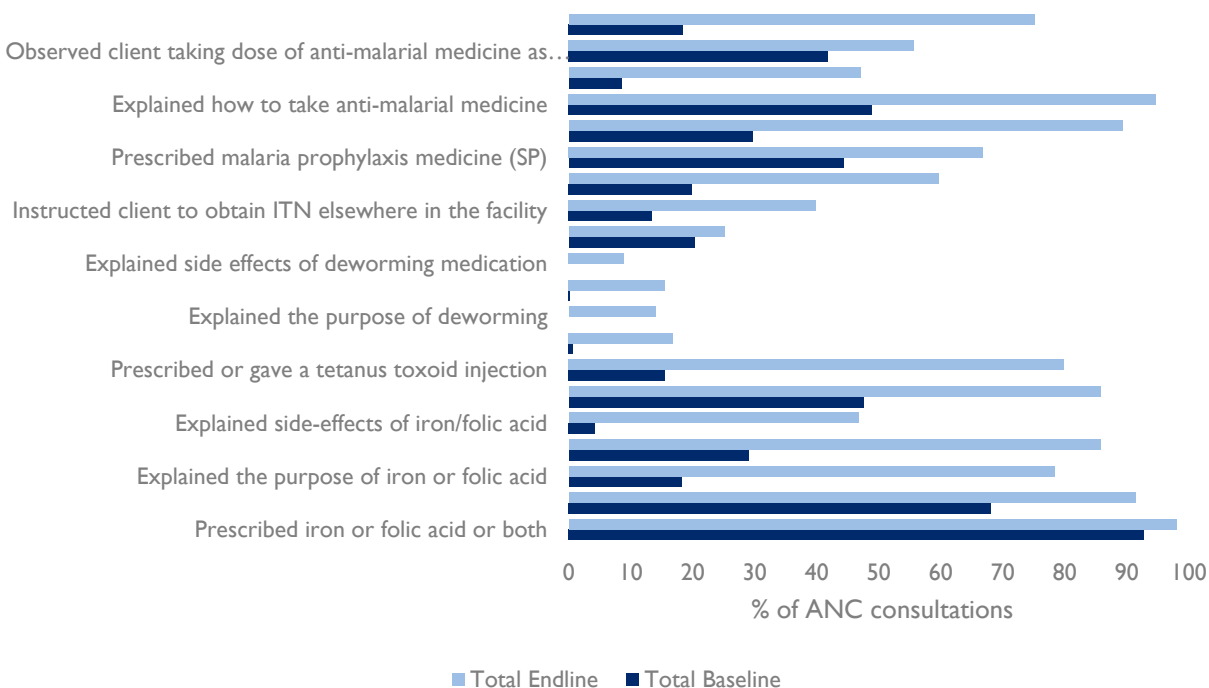
Figure 1 below shows individual items pertaining to danger signs in the current pregnancy. Discussion of all signs (except “foul smelling discharge”) increased significantly overall and by state, with discussion of vaginal bleeding and fever at higher levels than other signs.

Figure 1: Percentage of ANC consultations where specific danger signs pertaining to the current pregnancy were discussed



Preventive treatments and counseling messages: The mean number of preventive treatments and counseling messages given to ANC clients was significantly higher at endline compared with baseline in each state and in total ($p < 0.001$). The proportion of ANC consultations where providers gave each of different types of treatments and counseling, such as insecticide treated bed nets (ITNs), was consistently significantly higher at endline compared with baseline by state and overall with one exception: “observed client taking dose of antimalarial medicine as part of consultation” (see Figure 2 below). While many dramatic improvements were seen, provision of deworming medication and associated counseling still remained below 50% as did explaining the side effects of iron folate. Healthy timing and spacing of pregnancy and PFP counseling messages are not included here, but in a separate table.

Figure 2: Preventive treatments and counseling provided during ANC consultations



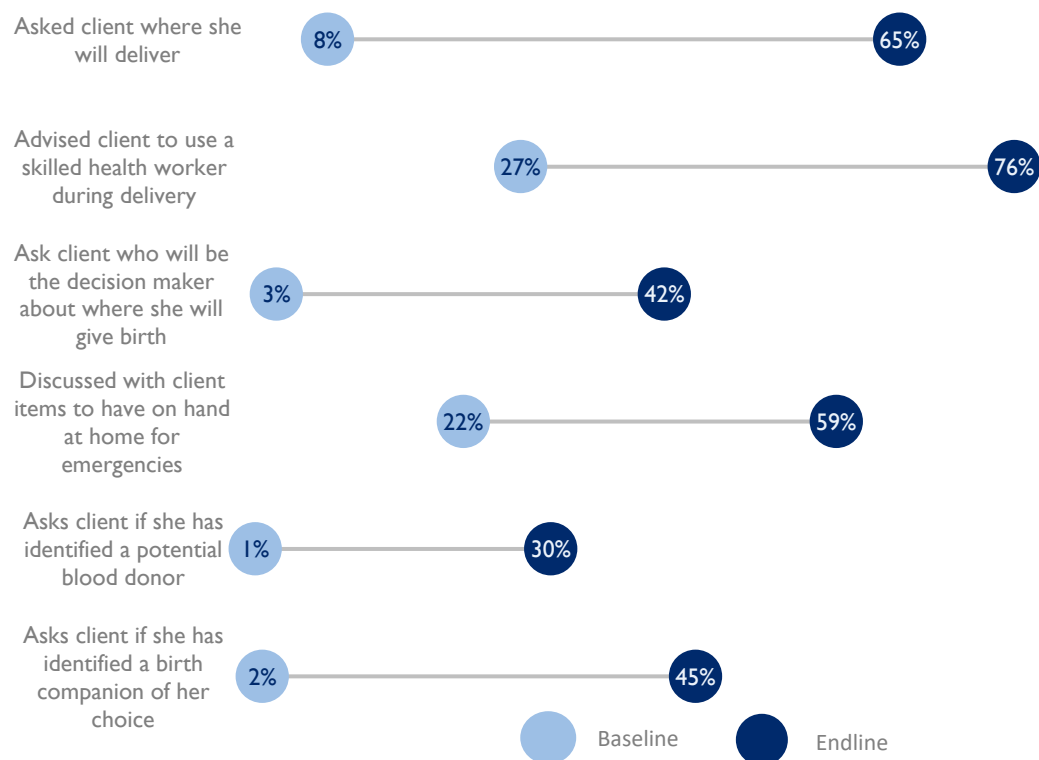
Pregnancy progress and birth preparedness and complication readiness counseling: The percentage of ANC consultations where health care providers informed clients about progress of the pregnancy was significantly higher at endline compared with baseline in Ebonyi, Kogi, and overall ($p < 0.001$). The mean number of birth preparedness items discussed was also significantly higher at endline than at baseline for each state and at endline ($p < .001$). The proportion of ANC consultations where health care providers discussed at least one birth preparedness item was significantly higher at endline compared with baseline in both states (Kogi- $p < .001$, Ebonyi $p < .01$) and overall ($p < .001$). (See Table 3).

Table 3: Communication about birth progress and birth preparedness and complication readiness, baseline to endline (percentage)

| Item | Ebonyi State | | | Kogi State | | | Total | | |
|---|------------------|-------------|---------|------------------|-------------|---------|------------------|-------------|---------|
| | Baseline (n=202) | Endline | p-value | Baseline (n=233) | Endline | p-value | Baseline (N=435) | Endline | p-value |
| Provider informed client about progress of the pregnancy | 42.8 | 82.3 | 0.000 | 47.4 | 83.8 | 0.0000 | 45.3 | 83.1 | 0.000 |
| Mean number of birth preparedness items discussed with client | 0.58 (1.00) | 3.26 (2.30) | 0.000 | 0.65 (1.05) | 3.02 (1.94) | 0.000 | 0.62 (1.02) | 3.14 (2.13) | 0.000 |
| Client was counseled on at least one birth preparedness item | 34.2 | 78.5 | 0.000 | 34.8 | 83.5 | 0.009 | 34.5 | 81 | 0.000 |

Changes in individual birth preparedness and complication readiness items are presented in Figure 3 below. All changes were significant overall and by state at $p < .001$ except, “Discussed with client items to have on hand at home for emergencies,” which was significant at $p < .05$ in Kogi and $p < .01$ in Ebonyi. Asking the client about identifying a blood donor improved but remained low at endline.

Figure 3: Changes in counseling about birth preparedness and complication readiness during ANC, baseline vs. endline



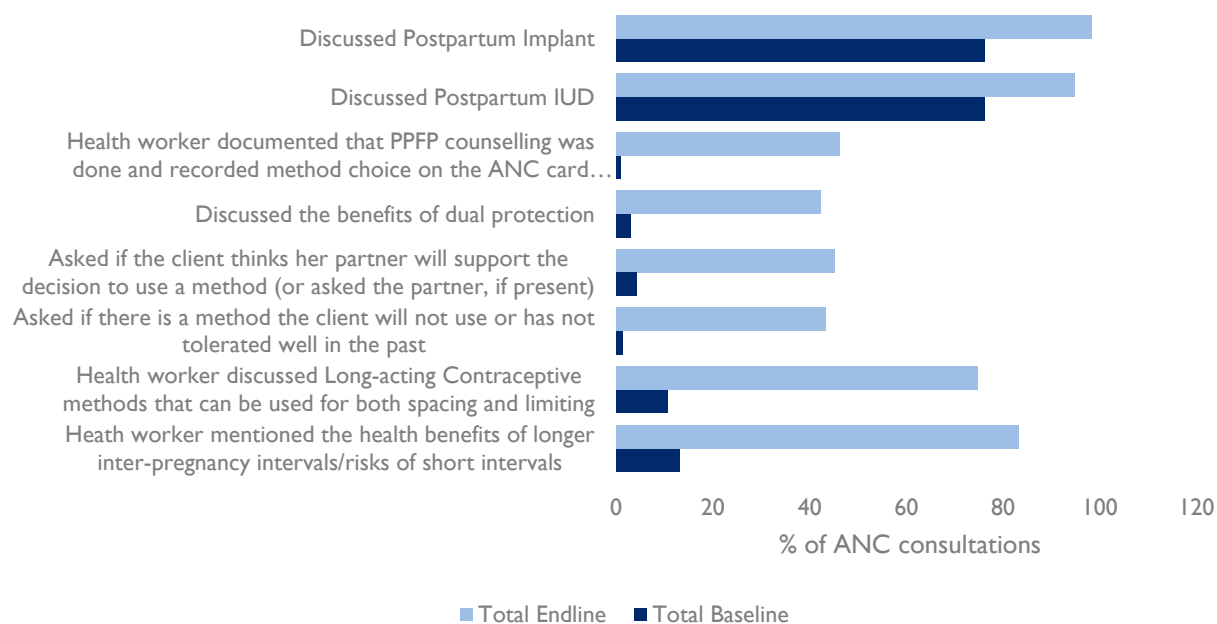
PPFP counseling: The proportion of providers who discussed PPFP at all was significantly higher at endline compared with baseline by state and overall ($p=0.000$). The mean number of PPFP items discussed with clients, out of a total of eight items assessed, was also significantly higher in each state as well overall ($p<.001$). (See Table 4).

Table 4: Discussion of PPFP during ANC consultations, baseline vs. endline

| Item | Ebonyi State | | | Kogi State | | | Total | | |
|--|------------------|-------------|---------|------------------|-------------|---------|------------------|-------------|---------|
| | Baseline (n=202) | Endline | p-value | Baseline (n=233) | Endline | p-value | Baseline (N=435) | Endline | p-value |
| Health worker discussed PPFP (percentage) | 12.4 | 82.9 | 0.000 | 22.4 | 93.0 | 0.000 | 17.7 | 88.0 | 0.000 |
| Mean number of PPFP items discussed with clients (8 items total) | 0.36 (1.01) | 3.92 (2.48) | 0.000 | 0.64 (1.34) | 4.47 (1.92) | 0.000 | 0.51 (1.21) | 4.20 (2.23) | 0.000 |

The proportion of ANC consultations where health workers discussed specific PPFP-related items is presented in Figure 4 below. All changes are significant at a minimum of $p<0.05$ by state and overall.

Figure 4: Changes in counseling on PFFP, baseline vs. endline



Quality of L&D Care

Statistical analysis comparing the quality of L&D care at baseline versus endline was not conducted as the small sample of observations at baseline did not provide adequate power to establish point estimates and measure change over time. However, when comparing the frequency of performance of some key interventions/practices that were supported by MCSP at baseline versus endline, it is important to note that several demonstrated better performance at endline, such as: use of a partograph to monitor labor; provision of oxytocin immediately after birth to prevent postpartum hemorrhage; and elements of essential newborn care, including immediate drying of the newborn, clamping the cord after pulsations stop, applying chlorhexidine to the cord, and breastfeeding within the first hour after birth (data not shown). In addition, findings suggest some improvements in respectful maternity care over time as providers at endline more frequently greeted clients respectfully, asked them if they had any questions, and encouraged them to have a companion of choice present during labor and birth. Moreover, at endline, women more frequently had a companion present during labor or birth (56%) compared with women observed giving birth at baseline (10%).

The quality of L&D care at endline only, including performance of active management of the third stage of labor (AMTSL), was analyzed against a standard validated quality index of 20 items.⁴ Overall, QoC was relatively good, with mean scores of 14.7 in Ebonyi and 13.1 in Kogi. However, only 35% of deliveries observed had at least 80% of the index delivery tasks performed (see Table 5).

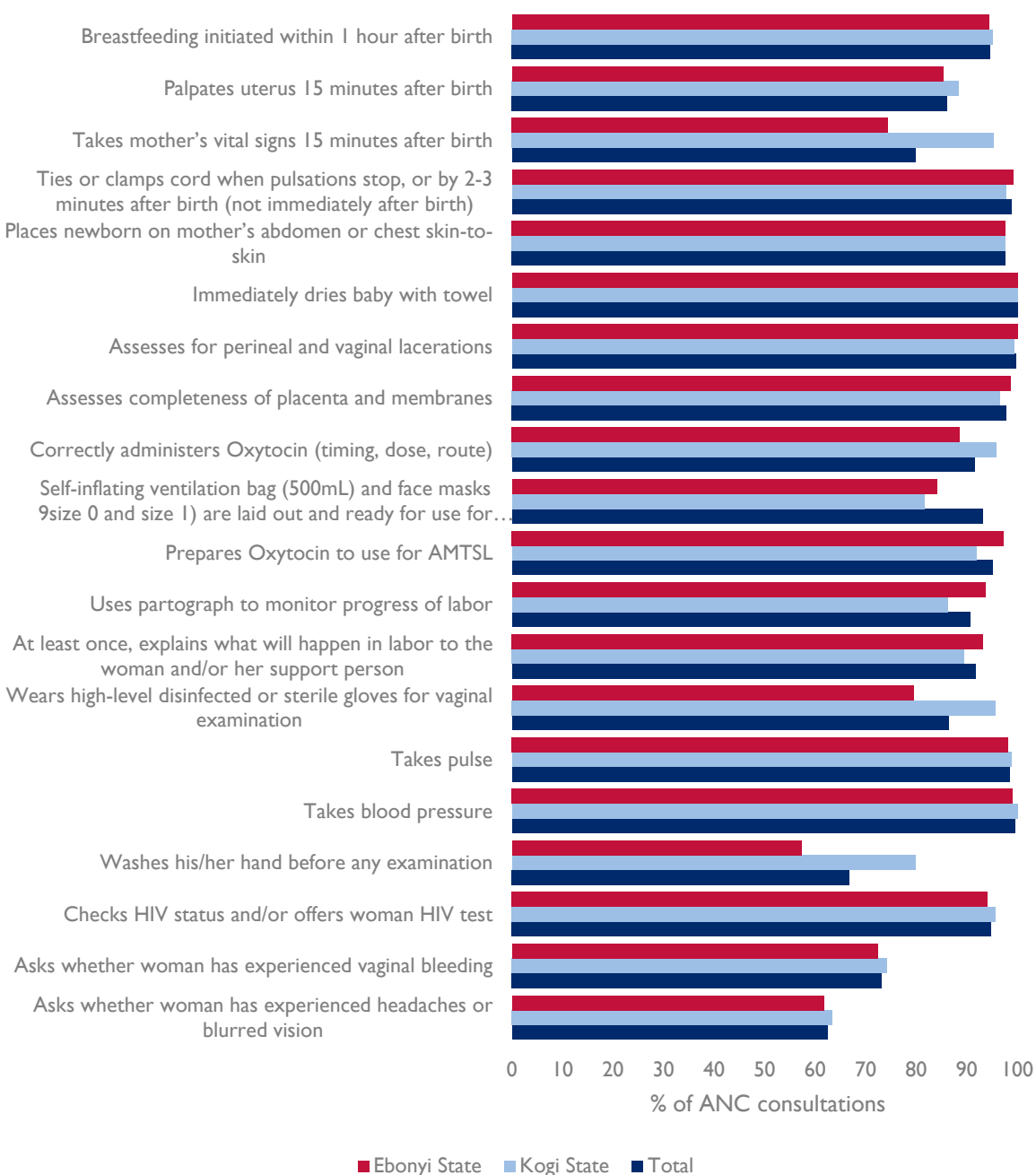
Table 5: Quality of delivery care services at endline

| Item | Ebonyi | Kogi | All |
|--|-------------|-------------|-----------|
| Mean Delivery Score, L&D QoC Index of 20 items (Confidence interval) | 14.7 (3.52) | 13.1 (3.84) | 14 (3.74) |
| Good Delivery Practices: score of 80%, or 16 of 20 items performed correctly | 46.0 | 19.8 | 35.1 |

⁴ <https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-019-2281-z>

Performance of individual L&D tasks at endline are presented in Figure 5 below.

Figure 5: Performance of items in L&D quality index, by state and overall (endline only)



Program Implications

This study found significant improvements in the quality of ANC and L&D services in Ebonyi and Kogi States.⁵ Specifically:

- The proportion of ANC consultations where health providers asked about any complications experienced during previous pregnancies was significantly higher during endline compared with baseline

⁵ See this technical brief for more information about the interventions implemented at the study health facilities: <https://www.mcsp-program.org/resource/mcsp-nigeria-mnch-program-technical-brief/>

in both states and in total, and the mean composite score for number of different complications with previous pregnancies discussed with clients was significantly higher at endline compared with baseline.

- The mean number of preventive treatments and counseling messages (excluding PPF and healthy timing and spacing of pregnancy) given to ANC clients was significantly higher at endline compared with baseline in each state and in total. The proportion of ANC consultations where providers gave each of different types of treatments and counseling were consistently significantly higher at endline compared with baseline by state and overall with one exception: “observed client taking dose of antimalarial medicine as part of consultation.”
- The percentage of ANC consultations where health care providers informed clients about progress of the pregnancy was significantly higher at endline compared with baseline in Ebonyi, Kogi, and overall. The mean number of birth preparedness items discussed was also significantly higher at endline than at baseline for each state and at endline.
- The proportion of providers who discussed PPF at all was significantly higher at endline compared with baseline in by state and overall. The mean number of PPF items discussed with clients were also significantly higher in each state as well overall.
- The quality of L&D care against the standard quality index of 20 items was relatively good—with means scores of 14.7 in Ebonyi, 13.1 in Kogi, and 14.7 overall—but there is still room for improvement, especially with respect to aspects of infection prevention and screening for danger signs at admission.

There are several strengths and limitations to the study. Using direct observation to measure the quality of health service provided is the gold standard for measuring QoC. We were able to achieve the desired number of ANC consultations. However, due to a smaller-than-expected sample size of delivery observations at baseline because of health facility closures and lower-than-anticipated delivery caseloads, we were not able to measure changes over time. In addition, the presence of the study data collectors may have influenced how health workers behaved during the ANC consultations and deliveries observed. For researchers investigating similar topics, it may be useful to also include some qualitative research to understand provider’s perspectives pertaining to the program implementation strategies and changes in QoC.

The results here should be generalizable to the additional set of MCSP-supported facilities (51) included in Phase Two of the program rollout. If Ebonyi and Kogi States decide to scale up the full QI intervention package to other facilities beyond those supported by MCSP, we would also anticipate similar positive changes.

In conclusion, findings from this study suggest that the package of MNH and PPF capacity building and QI interventions implemented by Ministry of Health partners with MCSP support successfully improved the quality of ANC and L&D services and should be continued under the leadership of the state-level Ministries of Health in Ebonyi and Kogi States.

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