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Postpartum Family Planning Integration with Maternal, Newborn, and Child Health Services: A Cross-Sectional Analysis of Client Flow Patterns in India and Kenya

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ABSTRACT

Objectives: Maternal, newborn, and child health (MNCH) services represent opportunities to integrate postpartum family planning (PPFP). Objectives were to determine levels of MNCH-family planning (FP) integration and associations between integration, client characteristics, and service delivery factors in facilities that received programmatic PPFP support.

Design and setting: Cross-sectional client flow assessment conducted May–July 2014, over 5 days at 10 purposively selected public sector facilities in India (four hospitals) and Kenya (two hospitals, four health centers).

Participants: 2,158 client visits tracked (1,294 India; 864 Kenya). Women aged 18 or older accessing services while pregnant and/or with a child under 2 years.

Interventions: PPFP/postpartum intrauterine device—Bihar, India (2012–2013); Jharkhand, India (2010–2014); Embu, Kenya (2008–2012). Maternal, infant, and young child nutrition/FP integration—Bondo, Kenya (2011–2013).

Primary outcome measures: Proportion of visits where clients received integrated MNCH-FP services; client characteristics as predictors of MNCH-FP integration; MNCH-FP integration as predictor of number of providers seen, length of time spent at facility.

Results: Levels of MNCH-FP integration varied widely across facilities (5.3% to 63.0%), as did proportion of clients receiving MNCH-FP integrated services by service area. Clients traveling 30–59 minutes were half as likely to receive integrated services versus those traveling under 30 minutes (odds ratio [OR] 0.5, 95% confidence interval [CI] 0.4–0.7, p<.001). Clients receiving MNCH-FP services (versus MNCH services only) saw 1.3 times more providers (95% CI 1.2–1.5, p<0.001) and spent an average of 10.5 minutes longer at the facility (95% CI −0.1–21.9, not statistically significant).

Conclusions: Findings suggest importance of focused programmatic support for integration by MNCH service area. FP integration was highest in areas receiving specific support. Integration does not impose an undue burden on clients in terms of time spent at the facility. Clients living furthest from facilities are least likely to receive integrated services.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This cross-sectional study gleaned detailed information on client flow patterns, documenting the various combinations of care received by individuals during each visit to public health facilities in Kenya and India.
- This study addresses a gap in documentation of PPFP programming and coverage measures for receipt of integrated services, which is often difficult to measure when looking at clinical records or health facility service statistics due to inadequate details on services provided or inability to link data on patients accessing multiple service areas.
- The great variety in the percentage of clients receiving integrated MNCH and FP services, both across facilities as well as between service areas within individual facilities, necessitated disaggregation of results to aid in interpretation, which may have been a limitation.
- Analysis of FP integration with antenatal care and child health services yielded stronger results than postnatal care, due to low overall numbers of clients accessing postnatal care.
- For pragmatic reasons, integration during labor and delivery services was not assessed.

INTRODUCTION

Increased contraceptive use has reduced maternal deaths by 40% over the past 20 years,[1] and if pregnancies are spaced over 2 years apart, infant deaths can be reduced by 10% and child deaths (ages 1–4 years) by 21%.[2] Around the time of childbirth, women may not seek family planning (FP) information or services, yet they often attend antenatal care (ANC) or other child-focused health services. These points of service span the maternal, newborn, and child health (MNCH) continuum of care and offer valuable, reliable opportunities for health care providers to reach women at risk of closely spaced pregnancies with FP counseling and services.[2-4] Despite evidence of increased FP uptake when FP is integrated with maternal and newborn health, childhood immunization, nutrition programs like breastfeeding counseling and support, and prevention of mother-to-child transmission of HIV (PMTCT) services,[5-8] opportunities for integrated service delivery are often missed.[9,10]

Postpartum family planning (PPFP) programs should take advantage of all services along the MNCH continuum of care, in facilities and communities, to provide women with FP information and services to improve birth spacing and address unmet need for contraception.[11-13] An FP research prioritization exercise in the *WHO Bulletin* ranked identifying the mechanisms of PPFP integration with other services as one of the top three research priority areas.[14]

Several papers have defined integration in different ways, usually along a continuum. Ahgren (2005) proposed the term “fully segregated” to mean use of more than one service at a health facility is accidental or client-driven, versus “fully integrated” in which resources of multiple units are pooled.[15] In intermediate integration models, services are either linked, e.g., with intra-facility referrals and good communication between providers, or organized in a network with coordinated client transitions and clinical information shared between units. While

Ahgren's conceptual model applies to a Swedish local health area, Church et al. (2015) developed definitions for a low-income country setting.[16] They use the terms "fully stand-alone" to describe separate service delivery, such as an HIV clinic not attached to another health facility; "fully integrated" defined as all services provided in a single room by a single provider; "partially integrated" meaning care provided by different providers in different rooms of a health center; and "partially stand-alone" to mean care from providers in different buildings in a larger compound. We use the terms "single provider" to refer to consolidated care provided by the same person at a facility and "multiple co-located providers" to refer to integrated service delivery via internal referrals between providers within the same facility, as opposed to a "network of providers" in which clients are referred externally to different sites.

Measurement of integrated health care delivery poses limitations and challenges, including determining what to measure as well as how to measure it in a cost-effective way.[17, 18, 19] Authors of a systematic review of integrated services ascribe the difficulty in definitively measuring the benefits of integrated services to the difficulty in understanding the specifics of the interventions tested.[17] A systematic review of studies in mostly developed settings found that measurement methods used were relatively resource intensive, such as patient and provider surveys, focus group discussions, hospital manager or policymaker questionnaires or qualitative interviews, reviews of patient data or medical records, and direct observation.[20] Few reviewed studies used direct observation,[20] presumably because of its resource-intensive nature, yet it is particularly useful when clinical records provide inadequate details about services rendered.[21] To overcome some shortcomings of these methods, Birdthistle et al. (2014) developed a simple client flow assessment tool to track whether clients received maternal and child health care that was integrated with HIV and reproductive health care.

To address the gap in documentation of PPFP programming and measurement of service integration and to strengthen the body of programmatic learning around integration of PPFP into MNCH and nutrition services, we conducted a descriptive evaluation of integrated PPFP implementation models in Kenya and India. This paper presents results of a study component that assessed the extent to which pregnant clients and women with a child less than 2 years of age accessing MNCH services at selected facilities in India and Kenya also received FP services. The assessment approach adapted the client flow tool described in Birdthistle (2014). In addition, we explored which client characteristics predicted receipt of integrated MNCH-FP services, and whether integration was associated with differences in service delivery.

METHODS

In Kenya, facilities were selected from Embu County and Bondo Sub-County, Siaya County. Embu was an early intervention site for postpartum intrauterine contraceptive device (PPIUD) work through a U.S. Agency for International Development (USAID)-supported project on PPFP integration with ANC, maternity settings, and community-level maternal and newborn health

promotion (2008–2012). In Bondo, a USAID-funded program demonstrated feasibility of integrating maternal, infant, and young child nutrition (MIYCN) and FP across ANC, postnatal care [PNC], and child health at facility and community levels (2011–2014).

In India, facilities were selected from Jharkhand and Bihar states. In Jharkhand, USAID programs supported repositioning and strengthening PPFP services, including PPIUD and FP integration with ANC and maternity services (2009–2014). In Bihar, the Bill & Melinda Gates Foundation funded an expansion of the PPIUD work with a stronger demand-generation and community component (2012–2013).

The study utilized a cross-sectional design to track the services a client received and determine if PPFP services (including FP counseling and/or provision of FP methods) were offered consistently as expected under the integrated implementation model. Results presented here are a component of a larger mixed-methods descriptive evaluation of PPFP integration that included client and provider surveys and semi-structured interviews with providers and key informants.

Study sites included hospitals and lower-level health centers, purposively selected based on duration, intensity, and level of programmatic support for PPFP integration, as well as pragmatic factors like accessibility (see **Table 1**).

Table 1: Study Sites, Interventions, and Tier of Service

Site	**Bondo, Kenya**	**Embu, Kenya**	**Bihar, India**	**Jharkhand, India**	**Total**
Integrated Interventions	MIYCN-FP: Integration with ANC, maternity, PNC, child health	PPFP/PPIUD: Integration with ANC, maternity	PPFP/PPIUD: Integration with ANC, maternity	PPFP/PPIUD: Integration with ANC, maternity	
Tier of Service					
Hospitals	1	1	2	2	6
Health centers/sub-centers/dispensary	2	2	0	0	4
Total Sites	3	3	2	2	10

Data was collected in 2014 during May-June in India and June-July in Kenya. The client flow tool was administered for five consecutive weekdays at each facility. Research assistants (RAs) recruited to collect data were oriented on the study and research ethics before field deployment. The study team also oriented facility service providers on how to complete the client flow form.

RAs were positioned to screen as many eligible female clients as possible seeking care in the target service delivery areas. Inclusion criteria included clients who were: 1) seeking services at targeted MNCH service delivery areas (ANC; PMTCT; PNC; MIYCN; and other child health

services such as well-child visits and immunization) in selected health facilities, and 2) women aged 18–49 years who were pregnant or had a child under 2 years. Clients seeking labor and delivery services were excluded for practical reasons. After screening to confirm eligibility and obtaining oral informed consent, the RA asked the client to carry a one-page integration client flow checklist throughout her visit at the facility. The RA documented client arrival time on the form, gave it to the client, and asked her to give it to any facility staff she interacted with. Clients were asked to return the form to the RA when leaving the facility, at which point the RA documented departure time.

Study data was cleaned, coded, and managed using Research Electronic Data Capture (REDCap). Cleaned data were exported to SPSS Statistics version 22 and Stata® version 13 for analysis.

The unit of analysis was client visit: each completed client integration flow form that tracked the number of providers the client accessed at the health facility that day (up to five) and the services and referrals received from each provider. Records for 16 visits of clients under 18 years of age were excluded from analysis per the research protocol. Consenting clients who met the eligibility criteria but returned blank forms were also excluded, as were two records that failed logic checks (i.e., had marks for both ANC and PNC services provided to the client during their visit). In total, 73 of the original 2,231 records were excluded from analysis (around 3%).

The primary outcome examined was receipt of integrated MNCH-FP services, i.e., the proportion of all client visits during which the client received:

- Any MNCH service: ANC, PNC for mother/baby, and/or child health (child immunization, child weighing/mid-upper-arm circumference, iron folate for child, vitamin A for child, and/or child health in general such as visits where the provider wrote in that they conducted a child exam, assessment, treatment for childhood illnesses, etc.), AND
- Any FP service: FP counseling, lactational amenorrhea method counseling, FP services (i.e., receipt of an FP method).

Integration of FP with other cross-cutting service areas was also examined, specifically integration with HIV or nutrition services. HIV services were defined as HIV counseling/testing, HIV care, PMTCT, sexually transmitted infection (STI) screening, and/or STI treatment. Nutrition services included MIYCN counseling, MIYCN support, iron folate for mother, iron folate for child, and/or vitamin A for child.

Results were disaggregated by health facility and by MNCH service area in which the client accessed services—ANC, PNC, and/or child health. Differences in the percentages of visits with MNCH-FP integration by facility and service area were anticipated based on the focus, duration,

and timing of PPFP programmatic support. In Bihar and Jharkhand, India, and in Embu, Kenya, where the program emphasized PPIUD, we expected to see higher levels of FP integration occurring during ANC visits versus PNC or child health. In Embu, we were interested to what degree integration was sustained after the end of the program in 2012. In Bondo, Kenya, the only study site where the program focused on MIYCN-FP integration, we expected to see a higher percentage of visits with child health and FP integration compared to other sites.

We also explored the integration model in each site, i.e., whether clients who received integrated MNCH-FP services did so from a single provider or visited multiple co-located providers (see **Figure 1**). ANC clients were considered as having seen multiple co-located providers if they received ANC services from one provider and FP services from another provider, or ANC services from one provider and ANC and FP services from another provider, etc. Our analysis focused only on MNCH and FP services and does not include other services the client may have accessed during their visit like laboratory tests or pharmacy visits.

Client characteristics as predictors of receipt of integrated MNCH-FP services were also explored. A multiple logistic regression model was used to estimate the association between overall MNCH-FP integration (ANC, PNC, and/or child health visit along with FP visit) and client characteristics: country, type of client (adult alone vs. adult with child), mother's age, length of time spent traveling to facility, length of time spent at facility, and number of providers seen. The logistic regression model was adjusted for the correlation between clients within the same facility.

Poisson regression model was used to access the association between total number of providers seen and receipt of integrated MNCH-FP services, adjusting for other patient characteristics like country, type of client (adult alone vs. adult with child), mother's age, and length of time spent traveling to facility. Regression analysis was used to determine the association between the client's length of time spent at the facility as the outcome and receipt of integrated MNCH-FP services as the main exposure. Bootstrapping was used to deal with non-normality of the data. In both of these models, correlation among clients within the same facility was accounted for.

The study was reviewed and approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board, the Indian Institute of Health Management Research, and the Kenya Medical Research Institute.

RESULTS

Client characteristics

There were 2,158 visits tracked: 1,294 in India and 864 in Kenya (see **Table 2A, Table 2B**). Over three-quarters of client visits in Kenya involved an adult with a child (78.8%), while in

India about half of visits consisted of an adult with a child (47.8%), versus an adult visiting alone. The average age of women tracked ranged from 23.1 (standard deviation [SD]=3.0) years in Jharkhand Hospital 2 to 27.9 (SD=6.2) years in Embu Health Center 1.

Average length of time the client spent traveling to the facility varied in India, from 30 minutes in Jharkhand Hospital 1, to almost 1 hour in Bihar Hospital 1, while average travel time was similar across the sites in Kenya, ranging from 35 minutes in Bondo Health Center 2 to 46 minutes in Embu Hospital. Average time clients spent at the facility fluctuated widely by facility in India. Clients in Bihar Hospital 2 spent on average 46 minutes at the facility while clients in Bihar Hospital 1 and both Jharkhand sites were at the facility for longer than an hour on average (70 to 106 minutes). In Kenya, clients at all sites spent over an hour on average at the facility, from 80 minutes in Bondo Hospital to over 2 hours (137 minutes) in Embu Health Center 1.

Table 2A: Descriptive characteristics of clients, visits tracked, and number of providers clients saw by facility in India

	Bihar Hospital #1		Bihar Hospital #2		Jharkhand Hospital #1		Jharkhand Hospital #2	
	n / Mean	% / SD (range)	n / Mean	% / SD	n / Mean	% / SD	n / Mean	% / SD
Number of client visits*	**435**	**22.0%**	**317**	**16.0%**	**290**	**14.6%**	**252**	**12.7%**
Adult (alone)	247	56.8%	178	56.2%	146	50.3%	105	41.7%
Child/Adult w/child	188	43.2%	139	43.8%	144	49.7%	147	58.3%
Woman's age (years)	**23.89**	**3.38 (18, 38)**	**23.47**	**2.04 (19, 30)**	**24.83**	**4.00 (18, 43)**	**23.11**	**3.04 (18, 42)**
Child's age (months)	**9.83**	**7.22 (.17, 22)**	**4.52**	**3.01 (.1, 15)**	**6.22**	**5.18 (.1, 24)**	**7.53**	**6.46 (1, 23)**
<6 months	69	36.7%	103	74.1%	84	58.3%	76	51.7%
6-11 months	19	10.1%	28	20.1%	33	22.9%	38	25.9%
12-23 months	100	53.2%	8	5.8%	24	16.7%	33	22.4%
24 months or more	0	0.0%	0	0.0%	3	2.1%	0	0.0%
Time spent traveling from home/residence to facility	**58.09**	**31.26 (10, 240)**	**31.78**	**17.73 (10, 90)**	**29.67**	**17.67 (2, 90)**	**39.27**	**28.20 (5, 190)**
<15 mins	11	2.5%	57	18.0%	49	16.9%	26	10.3%
15-29 mins	25	5.7%	63	19.9%	96	33.1%	46	18.3%
30-59 mins	136	31.3%	133	42.0%	95	32.8%	119	47.2%
60-89 mins	186	42.8%	63	19.9%	49	16.9%	41	16.3%
90-119 mins	33	7.6%	1	0.3%	1	0.3%	11	4.4%
2 hours or more	44	10.1%	0	0.0%	0	0.0%	9	3.6%
Time spent at facility	**90.97**	**44.16 (15, 250)**	**46.41**	**28.64 (12, 180)**	**70.85**	**44.97 (10, 252)**	**106.77**	**48.30 (6, 240)**
<15 mins	0	0.0%	2	0.6%	2	0.7%	4	1.6%
15-29 mins	19	4.4%	82	25.9%	36	12.4%	7	2.8%
30-59 mins	92	21.1%	164	51.7%	115	39.7%	24	9.5%
60-89 mins	126	29.0%	41	12.9%	61	21.0%	60	23.8%
90-119 mins	78	17.9%	15	4.7%	33	11.4%	50	19.8%
2 hours or more	120	27.6%	13	4.1%	43	14.8%	107	42.5%
# of providers/stops	**2.44**	**1.13 (1, 5)**	**2.01**	**.94 (1, 4)**	**2.49**	**1.03 (1, 5)**	**2.17**	**1.12 (1, 4)**
1	99	22.8%	131	41.3%	50	17.2%	96	38.1%
2	154	35.4%	59	18.6%	106	36.6%	62	24.6%
3	85	19.5%	121	38.2%	83	28.6%	50	19.8%
4	84	19.3%	6	1.9%	43	14.8%	44	17.5%
5	13	3.0%	0	0.0%	8	2.8%	0	0.0%

*Percentage reflects proportion of the number of visits that the site (health facility) contributed to the total of the 2,158 visits (India=1,294; Kenya=864).

Table 2B: Descriptive characteristics of clients, visits tracked, and number of providers clients saw by facility in Kenya

	Bondo Hospital		Bondo Health Center #1		Bondo Health Center #2		Embu Hospital		Embu Health Center #1		Embu Health Center #2	
	n / Mean	% / SD	n / Mean	% / SD	n / Mean	% / SD	n / Mean	% / SD	n / Mean	% / SD	n / Mean	% / SD
Number of client visits*	**228**	**11.5%**	**66**	**3.3%**	**86**	**4.3%**	**342**	**17.3%**	**111**	**5.6%**	**31**	**1.6%**
Adult (alone)	72	31.6%	8	12.1%	12	14.0%	69	20.2%	15	13.5%	7	22.6%
Child/Adult w/child	156	68.4%	58	87.9%	74	86.0%	273	79.8%	96	86.5%	24	77.4%
Woman's age (years)	**24.33**	**4.46 (18, 39)**	**24.47**	**5.60 (18, 38)**	**25.97**	**5.25 (18, 40)**	**27.15**	**5.42 (18, 47)**	**27.87**	**6.20 (18, 41)**	**27.23**	**6.09 (18, 43)**
Child's age (months)	**5.56**	**4.99 (0, 24)**	**7.88**	**5.50 (1, 25)**	**6.18**	**5.13 (1, 19)**	**7.9**	**6.51 (1, 31)**	**10.54**	**6.79 (1, 23)**	**10.35**	**7.47 (1, 27)**
<6 months	91	58.3%	23	39.7%	38	51.4%	128	46.9%	27	28.1%	7	29.2%
6-11 months	45	28.8%	24	41.4%	23	31.1%	68	24.9%	30	31.3%	9	37.5%
12-23 months	18	11.5%	9	15.5%	13	17.6%	71	26.0%	39	40.6%	7	29.2%
24 months or more	2	1.3%	2	3.4%	0	0.0%	6	2.2%	0	0.0%	1	4.2%
Time spent traveling from home/residence to facility	**44.26**	**29.41 (2, 150)**	**56.55**	**39.72 (4, 150)**	**35.37**	**26.60 (5, 120)**	**46.45**	**38.73 (2, 240)**	**43.33**	**27.81 (5, 150)**	**30.65**	**18.06 (5, 60)**
<15 mins	15	6.8%	7	10.8%	15	17.4%	36	10.8%	6	5.7%	5	16.1%
15-29 mins	30	13.5%	9	13.8%	19	22.1%	51	15.3%	13	12.3%	8	25.8%
30-59 mins	100	45.0%	18	27.7%	34	39.5%	129	38.7%	54	50.9%	12	38.7%
60-89 mins	53	23.9%	14	21.5%	12	14.0%	76	22.8%	23	21.7%	6	19.4%
90-119 mins	8	3.6%	6	9.2%	3	3.5%	7	2.1%	4	3.8%	0	0.0%
2 hours or more	16	7.2%	11	16.9%	3	3.5%	34	10.2%	6	5.7%	0	0.0%
Time spent at facility	**79.91**	**55.77 (6, 273)**	**128.17**	**62.17 (18, 326)**	**117.24**	**66.50 (14, 292)**	**113.13**	**70.73 (1, 372)**	**136.57**	**82.71 (7, 326)**	**114.43**	**79.26 (23, 340)**
<15 mins	8	3.6%	0	0.0%	2	2.4%	25	7.4%	4	3.7%	0	0.0%
15-29 mins	36	16.1%	2	3.0%	3	3.6%	18	5.3%	7	6.5%	3	10.7%
30-59 mins	57	25.6%	8	12.1%	16	19.0%	33	9.8%	12	11.2%	4	14.3%
60-89 mins	42	18.8%	9	13.6%	15	17.9%	54	16.0%	9	8.4%	7	25.0%
90-119 mins	31	13.9%	10	15.2%	6	7.1%	62	18.4%	23	21.5%	2	7.1%
2 hours or more	49	22.0%	37	56.1%	42	50.0%	145	43.0%	52	48.6%	12	42.9%
# of providers / stops	**1.31**	**0.60 (1, 5)**	**1.76**	**.88 (1, 4)**	**1.34**	**.64 (1, 4)**	**1.57**	**.82 (1, 5)**	**1.13**	**.33 (1, 2)**	**1.26**	**.51 (1, 3)**
1	171	75.0%	32	48.5%	64	74.4%	194	56.7%	97	87.4%	24	77.4%
2	46	20.2%	21	31.8%	16	18.6%	119	34.8%	14	12.6%	6	19.4%
3	10	4.4%	10	15.2%	5	5.8%	19	5.6%	0	0.0%	1	3.2%
4	0	0.0%	3	4.5%	1	1.2%	2	0.6%	0	0.0%	0	0.0%
5	1	0.4%	0	0.0%	0	0.0%	8	2.3%	0	0.0%	0	0.0%

*Percentage reflects proportion of the number of visits that the site (health facility) contributed to the total of the 2,158 visits (India=1,294; Kenya=864).

Integration by facility and service area

Figures 2 and **3** display the proportion of visits where clients received integrated MNCH-FP services, by facility (**Figure 2**) and by MNCH service area within each facility (**Figure 3**). MNCH-FP integration varied widely by facility (see **Online Table S1, Online Table S2** for data tables corresponding to the figures). In India, receipt of MNCH-FP integrated services ranged from 16.3% of MNCH client visits in Bihar Hospital 2 to 63% in Jharkhand Hospital 1. In Kenya, only 5.5% of MNCH visits in Embu Hospital reflected MNCH-FP integration, compared to 14.8% in the Bondo Hospital and 57.1% in Bondo Health Center 2.

In India, analysis by service area showed higher levels of FP integration with ANC services versus PNC or child health. In Bihar, 28.1–35.2% of clients receiving ANC services also received FP services. By contrast, only 0–15.7% of clients receiving PNC and 2.2–10.9% of clients receiving child health services also received FP services. In Jharkhand, 71.1–73.2% of clients accessing ANC also receiving FP; but, PNC-FP integration was also relatively high at 60% of clients accessing PNC. In Jharkhand, child health-FP integration was quite different between the two hospitals, with 55.7% of clients accessing child health services in Jharkhand Hospital 1 but only 6.2% in Jharkhand Hospital 2.

In Kenya, Bondo health centers recorded much higher integration across all MNCH service areas than Bondo Hospital. Across ANC, PNC, and child health services in each of the Bondo health centers, 40% to 85% of clients in each service area also received FP services. By contrast, at Bondo Hospital about one-third (34.5%) of clients accessing ANC, one-fifth (20.5%) of clients accessing child health, and only 1.8% of clients accessing PNC also received FP services. Embu sites showed greater FP integration with ANC (14.3–28.6% of ANC clients) than in other service areas such as child health (3.1–10.5% of child health clients).

Integration models

Table 3 outlines the percentage of clients receiving integrated MNCH-FP services from a single provider versus multiple co-located providers, demonstrating a stark difference by site and service area. Bihar Hospital 2 showed that nearly all (97.9%) clients who received both ANC and FP received both services from a single provider, compared to only a quarter (24.6%) at Bihar Hospital 1. In Jharkhand Hospital 1, 38.9% of ANC clients who received FP counseling did so from the same ANC provider, whereas in Jharkhand Hospital 2 virtually none (1.4%) received both services from a single provider.

In Bondo Hospital in Kenya, ANC-FP integration was too rare to draw inferences, but in child health and PNC, about half (48%, 50%, respectively) of FP integration was provided by a single provider. In Bondo health centers, single provider integration was even more prevalent; one health center recorded 77.6% of child health-FP clients, 90.5% of PNC-FP clients, and 92.3% of

ANC-FP clients received these services from just one provider. In health centers and the hospital in Embu, the majority of FP integration (70% or more depending on site and service area) was carried out by a single provider.

Table 3: Total integrated MNCH-FP visits and visits in which those services were received from a single provider, by service area and facility

	Bihar Hospital #1		Bihar Hospital #2		Jharkhand Hospital #1		Jharkhand Hospital #2		Bondo Hospital		Bondo Health Centers		Embu Hospital		Embu Health Centers		TOTAL	
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
Total ANC-FP visits	69		48		90		69		1		13		10		4		304	
ANC and FP services both received from a single provider	**17**	**(24.6%)**	**47**	**(97.9%)**	**35**	**(38.9%)**	**1**	**(1.4%)**	**1**	*****	**12**	**(92.3%)**	**8**	**(80.0%)**	**4**	*****	**125**	**(41.1%)**
Total PNC-FP visits	8		0		21		9		10		21		0		1		70	
PNC and FP services both received from a single provider	**0**	**(0.0%)**	**0**	*****	**13**	**(61.9%)**	**0**	**(0.0%)**	**5**	**(50.0%)**	**19**	**(90.5%)**	**0**	*****	**1**	*****	**38**	**(54.3%)**
Total child health-FP visits	18		3		59		8		25		58		7		5		183	
Child health and FP services both received from a single provider	**2**	**(11.1%)**	**1**	*****	**26**	**(44.1%)**	**1**	**(12.5%)**	**12**	**(48.0%)**	**45**	**(77.6%)**	**5**	**(71.4%)**	**4**	**(80.0%)**	**96**	**(52.5%)**

* Insufficient number of visits (<5) to calculate a meaningful percentage

Client characteristics as predictors of receipt of integrated services

The first logistic regression model (**Table 4**) examining client characteristics as predictors of MNCH-FP integration estimates that the odds of integration are roughly half for clients traveling between 30–59 minutes than for those traveling less than 30 minutes after adjusting for country, whether the client attended with a child, client's age, length of time spent at facility, and numbers of providers seen (OR .520, 95% CI 0.408–0.662, p<0.001). Similarly, the odds of integration are 0.4 times less for clients traveling more than an hour compared to clients traveling less than 30 minutes to the facility (95% CI 0.281–0.592, p<0.001). The odds of integration are 2.369 higher for each additional provider seen at the facility after controlling for country, attendance with a child, client's age, length of time spent at facility, and length of time spent traveling to facility (95% CI 1.509–3.717, p<0.001). Length of time spent at the facility is not significantly associated with receipt of MNCH-FP integrated services.

Table 4: Multiple logistic regression model of client characteristics as predictors of MNCH-FP integration

Client Characteristics	Odds Ratio	[95% CI]
Country		
Kenya vs. India (reference)	0.948	[0.211, 4.252]
Type of client		
Child/Adult with child vs. Adult alone (reference)	0.858	[0.438, 1.678]
Mother's age (years): for every 1 year increment	0.985	[0.931, 1.043]
Length of time spent traveling to facility (minutes):		
30-59 minutes vs. <30 minutes (reference)	0.520***	[0.408, 0.662]
60 or more vs. < 30 minutes (reference)	0.408***	[0.281, 0.592]
Length of time spent at facility (minutes):		
15-29 minutes vs. <15 minutes (reference)	1.633	[0.808, 3.301]
30-59 minutes vs. <15 minutes (reference)	1.684	[0.743, 3.817]
60-89 minutes vs. <15 minutes (reference)	1.315	[0.542, 3.191]
90-119 minutes vs. <15 minutes (reference)	1.304	[0.466, 3.647]
2 hours or more vs. <15 minutes (reference)	1.971	[0.746, 5.206]
Number of providers seen (1 to 5): for each additional provider	2.369***	[1.509, 3.717]
N=2118		

Exponentiated coefficients; 95% confidence intervals in brackets
* p<0.05, ** p<0.01, *** p<0.001

Integration as predictor of client experiences

A Poisson regression model was used to estimate the association between MNCH-FP integration and number of providers seen (**Table 5**), adjusting for other patient characteristics (country, whether or not the client attended with a child, client's age, and length of time spent traveling to the facility). The model estimates that the incidence rate for number of providers seen increases by a factor of 1.342 (34%, p<.001) for patients with MNCH-FP integration versus patients with MNCH only. Kenya compared to India, while holding the other variables constant, is expected to have an incidence rate for number of providers seen 0.743 times that of India (a 25.7% decrease). Clients coming alone had a 33% excess incidence rate (risk ratio .665, 95% CI 0.576–0.769, p<.001) of seeing multiple co-located providers compared to clients coming with a child. The incidence rate for clients traveling an hour or more to the facility increases slightly 1.093 times (9.3%, p-value <0.001) versus those traveling less than 30 minutes. Client's age was not a statistically significant predictor of number of providers seen.

Table 5: Poisson regression model of MNCH-FP integration as predictor of number of providers seen

Variables	Risk Ratio	[95% CI]
MNCH-FP integration vs. MNCH services only (reference)	1.342***	[1.223, 1.472]
Country		
Kenya vs. India (reference)	0.743***	[0.635, 0.869]
Type of client		
Child/Adult with child vs. Adult alone (reference)	0.665***	[0.576, 0.769]
Mother's age (years): for every 1 year increment	1.002	[0.995, 1.010]
Length of time spent traveling to facility (minutes):		
30-59 minutes vs. <30 minutes (reference)	1.034	[0.996, 1.074]
60 or more vs. <30 minutes (reference)	1.093***	[1.039, 1.151]
N=2137		

Exponentiated coefficients; 95% confidence intervals in brackets
*** p<0.001

A multivariate regression model was used to estimate the association between MNCH-FP integration and time spent at the facility (**Table 6**), adjusting for other patient characteristics (country, whether or not a client attended with a child, client's age, and length of time spent traveling to the facility). The model estimates that time spent at the facility increased by 10.5 minutes for patients with MNCH-FP integration versus patients accessing MNCH services without FP services, but the association was not statistically significant (95% CI −0.952–21.92). Clients traveling 30–59 minutes to the facility spent 10.2 minutes longer at the visit than those

who traveled less than 30 minutes (95% CI 1.916–18.52, p<0.05). Similarly, clients who traveled over an hour to get to the facility spent 16.6 more minutes at the visit than those clients who traveled less than 30 minutes (95% CI 4.754–28.54, p<.01). Whether or not a client attended with a child, or the client's age were not statistically significant predictors of length of visit.

Table 6: Regression model of MNCH-FP integration as predictor of length of time spent at facility

Variables	Coefficient	[95% CI]
MNCH-FP integration vs. MNCH services only	10.48	[-0.952, 21.920]
Country		
Kenya vs. India (reference)	31.91*	[0.529, 63.290]
Type of client		
Child/Adult with child vs. Adult alone (reference)	-3.281	[-9.800, 3.239]
Mother's age (years): for every 1 year increment	0.325	[-0.586, 1.235]
Length of time spent traveling to facility (minutes):		
30-59 minutes vs. <30 minutes (reference)	10.22*	[1.916, 18.520]
60 or more vs. <30 minutes (reference)	16.65**	[4.754, 28.540]
N=2118		

95% confidence intervals in brackets
* p<0.05, ** p<0.01

DISCUSSION

Findings suggest the importance of providing targeted programmatic support for integration along each point on the continuum of care. Study findings show that FP integration remained most prominent in the MNCH service area(s) that originally received support for such integration and, depending on the site and programmatic focus, was not in evidence within non-targeted facility service areas at the same levels. Higher levels of FP integration were seen in ANC in sites where PPIUD interventions emphasized PPFP counseling during ANC (India; Embu, Kenya), while higher levels of FP integration with PNC and child health were found in the MIYCN-FP intervention sites (Bondo, Kenya). In addition, sites with the largest lag between the program intervention period and the client flow assessment (Embu) recorded the lowest levels of MNCH-FP integration, suggesting the need for programs to explore means of institutionalizing and sustaining interventions after program support has ended.

Clients who accessed integrated MNCH-FP services (compared to those who accessed MNCH services alone) tended to see a larger number of providers. Nonetheless, the amount of time they spent at the facility did not significantly increase, suggesting that integration may not impose an undue time burden on clients.

Strengths of the study included analysis of a large sample size of clients in each country and use of the client flow method, which provided detailed information on combination of services received by clients. Compared to other measures of service delivery like quality of care/observation surveys and readiness assessments, this approach reflects a simpler, less labor-intensive way to document integration of care received by individuals throughout a visit to the health facility. While client exit surveys could provide similar information, having the provider fill out the checklist themselves may reduce clients' recall or social acceptability bias and provide more accurate data.

One challenge was devising a tool with a limited checklist of items for data collection on a single page. Our interest in capturing multiple aspects of PPFP integration along the MNCH continuum meant that we needed to look at many dimensions of integration. Similar to challenges encountered by the Integra Initiative, without knowing client history it was not possible to tell from the form which services clients actually needed or should have been receiving[9]. For future assessments, it would be useful to distinguish between ANC 1 and later ANC visits since ANC 1 is less likely to include FP counseling than later visits. Because of the diversity of settings in our study, our client flow tool had categories of child health and nutrition services that may have been difficult for providers to interpret. For example, the form contained checkboxes for "iron/folate-mother" and "iron/folate-child," but children typically receive only iron supplements if needed and not folate; it also lacked a checkbox for treatment of a sick child. In a single setting, the client flow tool could be modified to have clearer, more context-specific child health service categories.

Also similar to the limitations discussed by the Integra Initiative, a "snapshot" of a five-day period at a health facility may not represent a "typical" client flow at any particular facility, if indeed a typical pattern exists[9]. In Kenya, a polio campaign took place at the same time as study data collection, which resulted in frequent change of staff attending to clients and may have impacted client flow. Different providers were present or pulled away for the campaign; despite daily orientation by the study teams, remaining providers in some cases told clients they were too busy to fill out the form and left sections blank. Data collection must strike a balance between collecting sufficient information and the practicality of gathering the data.

Overall, the extent to which integration occurs can be seen as a result of how services are organized as well as the health system context and how well services inherently fit together. While not captured by facility-level data, integration may be bolstered when interventions take place within supportive political and policy environments. At the facility level, sites focused on primary health care may be more conducive to integration than higher-level facilities where clients may be seeking more complex or specialized care.

On the service delivery side, managers aiming to integrate services should focus on those that have similar target groups, match well in terms of recommended timing of service provision, and do not create an undue burden on health workers when combined with other services. Human resource constraints can affect delivery of integrated services, such as when providers from the service delivery areas being integrated are not available in the same facility at the same time.[22]

From the client perspective, attention should be given to the needs of clients living furthest from facilities, as our data shows they are least likely to receive integrated services. Whether this is due to provider perceptions that these clients do not have sufficient time to receive integrated services, or client concern about time limitations at the facility, warrants further exploration. The client flow tool may hold promise as a component of baseline and endline assessments or studies for integration-focused programs or as another tool for health facility assessments to examine consistency of integration.

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AUTHORS' CONTRIBUTIONS
Devon Mackenzie: Managed adaptation of the client flow tool, assisted with training of data collectors in Kenya, led the cleaning and analysis of client flow data, and drafted the manuscript.
Anne Pfitzer: Principal investigator on the study and led study design and training of research teams, provided input on analysis and interpretation, and assisted in drafting the manuscript.
Christina Maly: Assisted with study design and training of data collectors in India, provided input on data interpretation, and assisted in drafting the manuscript.
Charles Waka: Managed setup and data entry, cleaning, and coding of data through the Research Electronic Data Capture (REDCap) system, assisted in drafting the manuscript.
Gajendra Singh: Contributed to data cleaning, provided input on and conducted data analysis.
Abanti Sanyal: Conducted regression analyses of data.

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COMPETING INTERESTS STATEMENT
All authors have completed the ICMJE uniform disclosure form at www.icmje.org/coi_disclosure.pdf and declare: no support from any organization for the submitted work; no financial relationships with any organizations that might have an interest in the submitted work in the previous 3 years; no other relationships or activities that could appear to have influenced the submitted work.

DATA SHARING STATEMENT
The anonymized dataset and statistical code will be made available from the corresponding author at Dryad repository.

Appendices/Supplementary Files:

1. **STROBE Checklist**
2. **Online Table S1: Total and proportion of visits where client received integrated MNCH and FP services, by facility**
3. **Online Table S2: Proportion of integrated MNCH-FP visits by MNCH service area and facility**

Figure Titles:

Figure 1: Types of Service Integration at the Facility Level

Figure 1. Percentage of client visits with integrated MNCH and FP services received (out of MNCH visits)

Figure 2. Percentage of integrated MNCH and FP visits by MNCH service area and facility

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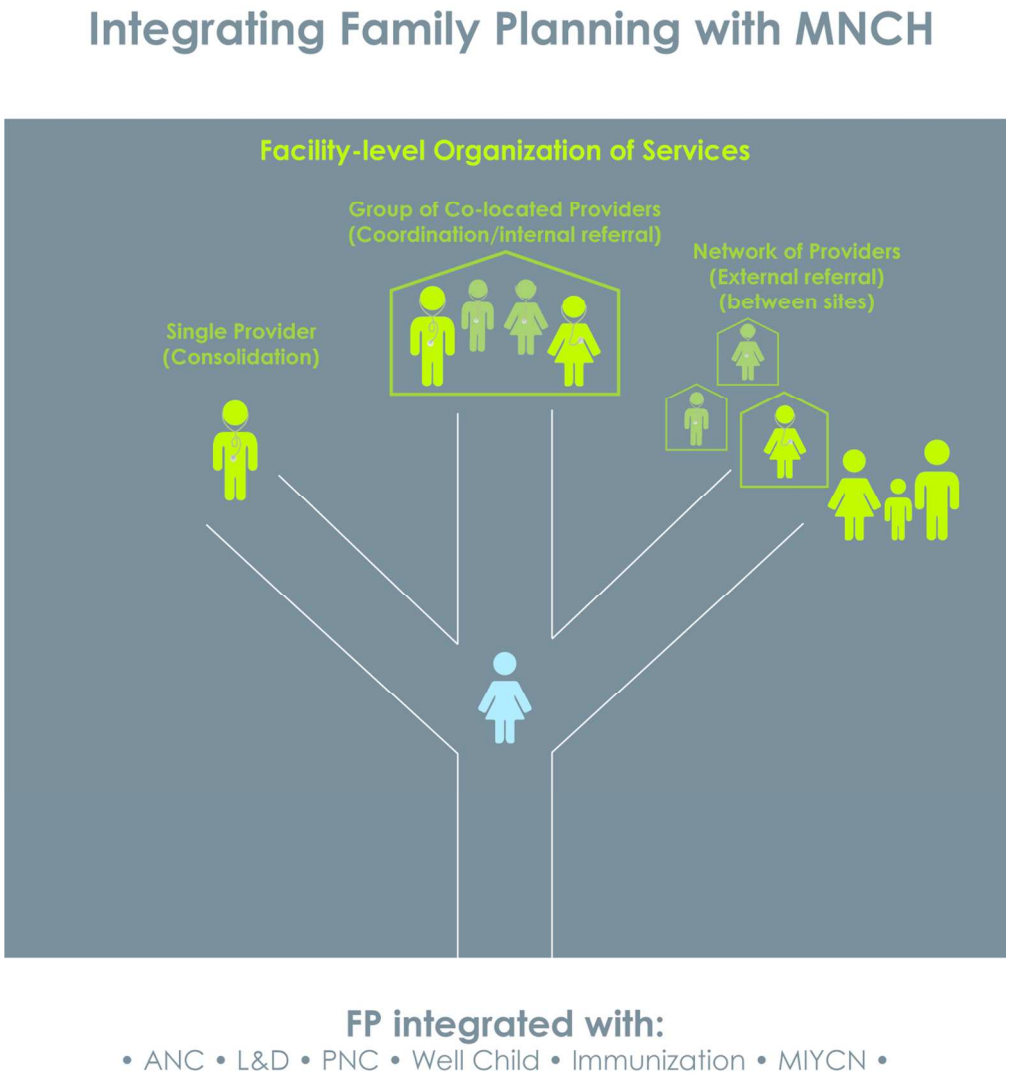
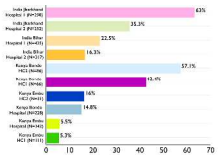


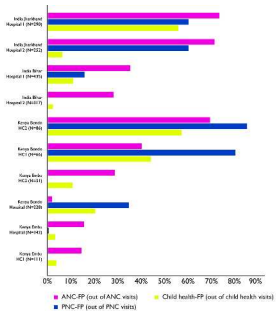
Types of Service Integration at the Facility Level

117x126mm (300 x 300 DPI)



Percentage of client visits with integrated MNCH and FP services received (out of MNCH visits)

635x94mm (300 x 300 DPI)



Percentage of integrated MNCH and FP visits by MNCH service area and facility

635x193mm (300 x 300 DPI)

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3-4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5-6
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5-6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-7
Bias	9	Describe any efforts to address potential sources of bias	17
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6-7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	N/A
		(*c*) Explain how missing data were addressed	6
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	N/A
		(*e*) Describe any sensitivity analyses	N/A
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8
		(b) Indicate number of participants with missing data for each variable of interest	Not presented
Outcome data	15*	Report numbers of outcome events or summary measures	8-16
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Adjusted estimates (95% CI) presented 14, 15, 16
		(*b*) Report category boundaries when continuous variables were categorized	9, 10, 13
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	16
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	17
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	17-18
Generalisability	21	Discuss the generalisability (external validity) of the study results	Not presented
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	19

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Online Table S1: Total and proportion of visits where client received integrated MNCH and FP services, by facility

Facility	**Bihar Hospital #1**		**Bihar Hospital #2**		**Jharkhand Hospital #1**		**Jharkhand Hospital #2**		**Bondo Hospital**		**Bondo Health Center #1**		**Bondo Health Center #2**		**Embu Hospital**		**Embu Health Center #1**		**Embu Health Center #2**		**TOTAL**	
Number of visits	**n=435**		**n=317**		**n=290**		**n=252**		**n=228**		**n=66**		**n=86**		**n=342**		**n=111**		**n=31**		**N=2158**	
Services	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**N**	**(%)**
Integration of MNCH (ANC, PNC, and/or child health) and FP during client visit	**89**	**(20.5%)**	**51**	**(16.1%)**	**153**	**(52.8%)**	**83**	**(32.9%)**	**27**	**(11.8%)**	**25**	**(37.9%)**	**44**	**(51.2%)**	**16**	**(4.7%)**	**5**	**(4.5%)**	**4**	**(12.9%)**	**497**	**(23.0%)**
ANC and FP received during visit (out of all visits)	69	(15.9%)	48	(15.1%)	90	(31.0%)	69	(27.4%)	1	(0.4%)	4	(6.1%)	9	(10.5%)	10	(2.9%)	2	(1.8%)	2	(6.5%)	304	(14.1%)
PNC and FP received during visit (out of all visits)	8	(1.8%)	0	(0.0%)	21	(7.2%)	9	(3.6%)	10	(4.4%)	4	(6.1%)	17	(19.8%)	0	(0.0%)	1	(0.9%)	0	(0.0%)	70	(3.2%)
Child health and FP received during visit (out of all visits)	18	(4.1%)	3	(0.9%)	59	(20.3%)	8	(3.2%)	25	(11.0%)	22	(33.3%)	36	(41.9%)	7	(2.0%)	3	(2.7%)	2	(6.5%)	183	(8.5%)
Integration of FP and cross-cutting service areas																						
HIV and FP received during visit (out of all visits)	55	(12.6%)	0	(0.0%)	64	(22.1%)	1	(0.4%)	2	(0.9%)	2	(3.0%)	10	(11.6%)	2	(0.6%)	5	(4.5%)	1	(3.2%)	142	(6.6%)
Nutrition and FP received during visit (out of all visits)	4	(0.9%)	3	(0.9%)	73	(25.2%)	2	(0.8%)	21	(9.2%)	22	(33.3%)	46	(53.5%)	14	(4.1%)	4	(3.6%)	2	(6.5%)	191	(8.9%)

Notes:

MNCH includes: ANC, PNC (PNC-mother and/or PNC-baby) and/or child health (child immunization, child weighing/MUAC, iron folate-child, vitamin A-child, and/or child health)

FP includes: FP counseling, LAM counseling, and/or FP services

HIV includes: HIV counseling/testing, HIV care, PMTCT, STI screening, and/or STI treatment

Nutrition includes: MIYCN counseling, MIYCN support, iron folate-mother, iron folate-child, and/or vitamin A-child

Totals for integration of MNCH and FP do not equal the sum of ANC-FP, PNC-FP, and child health-FP visits due to some overlap between these categories

Online Table S2: Proportion of integrated MNCH-FP visits by MNCH service area and facility

	Bihar Hospital #1		Bihar Hospital #2		Jharkhand Hospital #1		Jharkhand Hospital #2		Bondo Hospital		Bondo Health Center #1		Bondo Health Center #2		Embu Hospital		Embu Health Center #1		Embu Health Center #2		TOTAL	
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
MNCH visits	396		313		243		235		182		59		77		290		95		25		1915	
MNCH and FP services received	**89**	**(22.5%)**	**51**	**(16.3%)**	**153**	**(63.0%)**	**83**	**(35.3%)**	**27**	**(14.8%)**	**25**	**(42.4%)**	**44**	**(57.1%)**	**16**	**(5.5%)**	**5**	**(5.3%)**	**4**	**(16.0%)**	**497**	**(26.0%)**
ANC visits	196		171		123		97		57		10		13		65		14		7		753	
ANC and FP received	**69**	**(35.2%)**	**48**	**(28.1%)**	**90**	**(73.2%)**	**69**	**(71.1%)**	**1**	**(1.8%)**	**4**	**(40.0%)**	**9**	**(69.2%)**	**10**	**(15.4%)**	**2**	**(14.3%)**	**2**	**(28.6%)**	**304**	**(40.4%)**
PNC visits	51		5		35		15		29		5		20		19		1		0		180	
PNC and FP received	**8**	**(10.9%)**	**0**	**(0.0%)**	**21**	**(60.0%)**	**9**	**(60.0%)**	**10**	**(34.5%)**	**4**	**(80.0%)**	**17**	**(85.0%)**	**0**	**(0.0%)**	**1**	**(n/a)**	**0**	**(n/a)**	**70**	**(38.9%)**
Child health visits	165		137		106		130		124		50		63		224		83		19		1101	
Child health and FP received	**18**	**(4.1%)**	**3**	**(2.2%)**	**59**	**(55.7%)**	**8**	**(6.2%)**	**25**	**(20.2%)**	**22**	**(44.0%)**	**36**	**(57.1%)**	**7**	**(3.1%)**	**3**	**(3.6%)**	**2**	**(10.5%)**	**183**	**(16.6%)**

Notes:
MNCH includes: ANC, PNC (PNC-mother and/or PNC-baby) and/or child health (child immunization, child weighing/MUAC, iron folate-child, vitamin A-child, and/or child health)
FP includes: FP counseling, LAM counseling, and/or FP services

Totals for integration of MNCH and FP do not equal the sum of ANC-FP, PNC-FP, and child health-FP visits due to some overlap between these categories

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Postpartum Family Planning Integration with Maternal, Newborn, and Child Health Services: A Cross-Sectional Analysis of Client Flow Patterns in India and Kenya

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ABSTRACT

Objectives: Maternal, newborn, and child health (MNCH) services represent opportunities to integrate postpartum family planning (PPFP). Objectives were to determine levels of MNCH-family planning (FP) integration and associations between integration, client characteristics, and service delivery factors in facilities that received programmatic PPFP support.

Design and setting: Cross-sectional client flow assessment conducted May–July 2014, over 5 days at 10 purposively selected public sector facilities in India (four hospitals) and Kenya (two hospitals, four health centers).

Participants: 2,158 client visits tracked (1,294 India; 864 Kenya). Women aged 18 or older accessing services while pregnant and/or with a child under 2 years.

Interventions: PPFP/postpartum intrauterine device—Bihar, India (2012–2013); Jharkhand, India (2010–2014); Embu, Kenya (2008–2012). Maternal, infant, and young child nutrition/FP integration—Bondo, Kenya (2011–2013).

Primary outcome measures: Proportion of visits where clients received integrated MNCH-FP services, client characteristics as predictors of MNCH-FP integration, and MNCH-FP integration as predictor of length of time spent at facility.

Results: Levels of MNCH-FP integration varied widely across facilities (5.3% to 63.0%), as did proportion of clients receiving MNCH-FP integrated services by service area. Clients traveling 30–59 minutes were half as likely to receive integrated services versus those traveling under 30 minutes (odds ratio [OR] 0.5, 95% confidence interval [CI] 0.4–0.7, p<.001). Clients receiving MNCH-FP services (versus MNCH services only) spent an average of 10.5 minutes longer at the facility (95% CI −0.1–21.9, not statistically significant).

Conclusions: Findings suggest importance of focused programmatic support for integration by MNCH service area. FP integration was highest in areas receiving specific support. Integration does not seem to impose an undue burden on clients in terms of time spent at the facility. Clients living furthest from facilities are least likely to receive integrated services.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This cross-sectional study gleaned detailed information on client flow patterns, documenting the various combinations of care received by individuals during each visit to public health facilities in Kenya and India.
- This study addresses a gap in documentation of PPFP programming and coverage measures for receipt of integrated services, which is often difficult to measure when looking at clinical records or health facility service statistics due to inadequate details on services provided or inability to link data on patients accessing multiple service areas.
- The great variety in the percentage of clients receiving integrated MNCH and FP services, both across facilities as well as between service areas within individual facilities, necessitated disaggregation of results to aid in interpretation, which may have been a limitation.
- Analysis of FP integration with antenatal care and child health services yielded stronger results than postnatal care, due to low overall numbers of clients accessing postnatal care.
- For pragmatic reasons, integration during labor and delivery services was not assessed.

INTRODUCTION

Increased contraceptive use has reduced maternal deaths by 40% over the past 20 years.[1] If pregnancies are spaced over 2 years apart, infant deaths can be reduced by 10% and child deaths (ages 1–4 years) by 21%.[2] Around the time of childbirth, women may not seek family planning (FP) information or services, yet they often attend antenatal care (ANC) or child health services. These contact points span the maternal, newborn, and child health (MNCH) continuum of care and offer valuable, reliable opportunities for health care providers to reach women at risk of closely spaced pregnancies with FP counseling and services.[2-4]

Despite evidence of increased FP uptake when FP is integrated with maternal and newborn health, childhood immunization, nutrition programs, and prevention of mother-to-child transmission of HIV (PMTCT) services,[5-8] opportunities for integrated service delivery are often missed.[9,10] Postpartum family planning (PPFP) programs should take advantage of all services along the MNCH continuum of care, in facilities and communities, to provide women with FP information and services to improve birth spacing and address unmet need for contraception.[11-13] An FP research prioritization exercise in the *WHO Bulletin* ranked identifying the mechanisms of PPFP integration with other services as one of the top three priority areas.[14]

Papers have defined integration in different ways, usually along a continuum. Ahgren et al.[15] proposed the term “fully segregated” to mean use of more than one service at a health facility is accidental or client-driven, versus “fully integrated” in which multiple units pool resources. While Ahgren’s conceptual model was tested in Sweden, Church et al.[16] developed definitions for a low-income country setting. They use the terms “fully stand-alone” to describe separate service delivery (e.g. an HIV clinic distinct from another facility); “fully integrated” defined as

all services provided in a single room by a single provider; "partially integrated" meaning care provided by different providers in different rooms of a facility; and "partially stand-alone" to mean care from providers in different buildings in a larger compound.[16] We use the terms "single provider" to refer to consolidated care provided by the same person at a facility and "multiple co-located providers" to refer to integrated service delivery via internal referrals between providers within the same facility, as opposed to a "network of providers" where clients are referred externally to different sites.

Measurement of integrated health care delivery poses challenges, including determining what to measure and how to measure it in a cost-effective way.[17, 18, 19] Authors of a systematic review of integrated services ascribe the difficulty in measurement to the variety in services integrated and approaches used.[17] Another systematic review of studies in mostly developed settings found that measurement methods used were relatively resource intensive, such as patient and provider surveys, focus group discussions, hospital manager or policymaker questionnaires or qualitative interviews, reviews of patient data or medical records, and direct observation.[20] Few reviewed studies used direct observation,[20] presumably because of its resource-intensive nature, yet it is particularly useful when clinical records provide inadequate details about services rendered.[21] To overcome some shortcomings of these methods, the Integra Initiative research project developed a simple client flow assessment tool to track whether clients received maternal and child health (MCH) care integrated with HIV and reproductive health care.[9]

To address the gap in documentation of PPFP programming and measurement of service integration and to strengthen the body of learning around integration of PPFP into MNCH and nutrition services, we conducted a descriptive evaluation of integrated PPFP implementation models in Kenya and India. This paper presents results of a study component that assessed the extent to which pregnant clients and women with a child under 2 years of age accessing MNCH services at selected facilities in India and Kenya also received FP services. The assessment approach adapted the client flow tool from the Integra Initiative.[9] In addition, we explored which client characteristics predicted receipt of integrated MNCH-FP services, and whether integration was associated with differences in length of client visit to the health facility.

METHODS

In Kenya, facilities were selected from Embu County and Bondo Sub-County, Siaya County. Embu was an early intervention site for postpartum intrauterine contraceptive device (PPIUD) work through a U.S. Agency for International Development (USAID)-supported project on PPFP integration with ANC, maternity settings, postnatal care (PNC), and community-level maternal and newborn health promotion (2006–2010). In Bondo, a USAID-funded program demonstrated feasibility of integrating maternal, infant, and young child nutrition (MIYCN) and FP across ANC, PNC, and child health at facility and community levels (2011–2014).

In India, facilities were selected from Jharkhand and Bihar states. In Jharkhand, USAID programs supported strengthening PPFP services, including PPIUD and FP integration with ANC and maternity services (2009–2014). In Bihar, the Bill & Melinda Gates Foundation funded an expansion of the PPFP/PPIUD work with a stronger demand-generation and community component (2012–2013).

The study utilized a cross-sectional design to track the services a client received and determine if PPFP services (including FP counseling and/or provision of FP methods) were offered consistently as expected under the implementation model. Results presented here are a component of a larger mixed-methods descriptive evaluation of PPFP integration that included client and provider surveys and semi-structured interviews with providers and key informants. Study sites included hospitals and health centers, purposively selected based on duration, intensity, and level of programmatic support for PPFP integration, as well as pragmatic factors like accessibility (see **Table 1**). A separate paper on the characteristics of successful integrated FP and MCH services provides additional background on study locations and sites [22] and a related article on the FP and MIYCN integration work in Bondo shares learning from that demonstration program.[23]

Table 1: Study Sites, Interventions, and Tier of Service

Site	**Bondo, Kenya**	**Embu, Kenya**	**Bihar, India**	**Jharkhand, India**	**Total**
Integrated Interventions	MIYCN-FP: Integration with ANC, maternity, PNC, child health	PPFP/PPIUD: Integration with ANC, maternity, PNC	PPFP/PPIUD: Integration with ANC, maternity	PPFP/PPIUD: Integration with ANC, maternity	
Tier of Service					
Hospitals	1 sub-county hospital	1 county hospital	2 district hospitals	2 district hospitals	6
Health Centers	2	2	0	0	4
Total Sites	3	3	2	2	10

Data was collected in 2014 during May-June in India and June-July in Kenya. A one-page client flow tool was administered by research assistants (RAs) for five consecutive weekdays at each facility. The study team oriented facility service providers on how to complete the client flow form. RAs were positioned to screen as many eligible female clients as possible seeking care in the target service delivery areas. Inclusion criteria included clients who were: 1) seeking services at targeted MNCH service delivery areas (ANC, PMTCT, PNC, MIYCN, and other child health services such as well-child visits and immunization) in selected health facilities, and 2) women aged 18–49 years who were pregnant or had a child under 2 years. Clients seeking labor and delivery services were excluded for practical reasons. After screening to confirm eligibility and obtaining oral informed consent, the RA asked the client to carry the client flow checklist

throughout her visit at the facility. The RA documented client arrival time on the form, gave it to the client, and asked her to give it to any facility staff she interacted with. Clients were asked to return the form to the RA when leaving the facility, at which point the RA documented departure time.

Study data was cleaned, coded, and managed using Research Electronic Data Capture (REDCap). Cleaned data were exported to SPSS Statistics version 22 and Stata® version 13 for analysis.

The unit of analysis was client visit: each completed client form that tracked the number of providers the client accessed at the health facility that day (up to five) and the services and referrals received from each provider. Records for 16 visits of clients under 18 years of age were excluded from analysis per the research protocol. Consenting clients who met the eligibility criteria but returned blank forms were also excluded, as were two records that failed logic checks (i.e., had marks for both ANC and PNC services provided to the client during their visit). In total, 73 of the original 2,231 records were excluded from analysis (around 3%).

The primary outcome examined was receipt of integrated MNCH-FP services, i.e., the proportion of all client visits during which the client received:

- Any MNCH service, defined as: ANC, PNC (postnatal check for mother and/or postnatal check for baby), and/or child health (child immunization, child weighing/mid-upper-arm circumference, iron folate for child, vitamin A for child, and/or child health in general e.g., visits where the provider wrote in the "other" category that they conducted a child exam, treatment for childhood illness, etc.), AND
- Any FP service: FP counseling, lactational amenorrhea method counseling, FP services (i.e. receipt of an FP method).

See **Supplementary File – Integration Client Flow Form** for a sample form used for data collection.

We disaggregated results by health facility and by MNCH service area in which the client accessed services—ANC, PNC, and/or child health. Differences in the percentages of visits with MNCH-FP integration by facility and service area were anticipated based on the focus, duration, and timing of PPFP programmatic support. In Bihar and Jharkhand, India, where the program emphasized PPIUD, we expected to see higher levels of FP integration occurring during ANC visits versus PNC or child health. In Embu, we were interested to what degree integration was sustained after the end of the intensive program phase in 2010. In Bondo, Kenya, the only study site where the program focused on MIYCN-FP integration, we expected to see a higher percentage of visits with child health and FP integration compared to other sites.

We also explored the integration model in each site, i.e., whether clients who received integrated MNCH-FP services did so from a single provider or visited multiple co-located providers (see **Figure 1**). ANC clients were considered as having seen multiple co-located providers if they received ANC services from one provider and FP services from another provider, or ANC services from one provider and ANC and FP services from another provider, etc. at the facility. Our analysis focused only on MNCH and FP services and does not include other services the client may have accessed during their visit like laboratory tests or pharmacy visits.

Client characteristics as predictors of receipt of integrated MNCH-FP services were also explored. A multiple logistic regression model was used to estimate the association between overall MNCH-FP integration (ANC, PNC, and/or child health visit along with FP visit) and client characteristics: country, type of client (adult alone vs. adult with child), mother's age, length of time spent traveling to facility, length of time spent at facility, and number of providers seen. The logistic regression model was adjusted for the correlation between clients within the same facility. Regression analysis was used to determine the association between the client's length of time spent at the facility as the outcome and receipt of integrated MNCH-FP services as the main exposure. Bootstrapping was used to deal with non-normality of the data. Correlation among clients within the same facility was accounted for.

The study was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board, the Indian Institute of Health Management Research and the Kenya Medical Research Institute.

RESULTS

Client characteristics

There were 2,158 visits tracked: 1,294 in India and 864 in Kenya (see **Table 2A, Table 2B**). Over three-quarters of client visits in Kenya involved an adult with a child (78.8%), while in India about half of visits consisted of an adult with a child (47.8%), versus an adult visiting alone. The average age of women tracked ranged from 23.1 (standard deviation [SD]=3.0) years in Jharkhand Hospital 2 to 27.9 (SD=6.2) years in Embu Health Center 1.

Average length of time the client spent traveling to the facility varied in India, from 30 minutes in Jharkhand Hospital 1, to almost an hour in Bihar Hospital 1, while average travel time was similar across the sites in Kenya, ranging from 35 minutes in Bondo Health Center 2 to 46 minutes in Embu Hospital. Average time clients spent at the facility fluctuated widely by facility in India. Clients in Bihar Hospital 2 spent on average 46 minutes at the facility, while clients in Bihar Hospital 1 and both Jharkhand sites were at the facility for longer than an hour on average (70 to 106 minutes). In Kenya, clients at all sites spent over an hour on average at the facility, from 80 minutes in Bondo Hospital to over 2 hours (137 minutes) in Embu Health Center 1.

Table 2A: Descriptive characteristics of clients, visits tracked, and number of providers clients saw by facility in India

	Bihar Hospital #1		Bihar Hospital #2		Jharkhand Hospital #1		Jharkhand Hospital #2	
	n / Mean	% / SD (range)	n / Mean	% / SD	n / Mean	% / SD	n / Mean	% / SD
Number of client visits*	435	22.0%	317	16.0%	290	14.6%	252	12.7%
Adult (alone)	247	56.8%	178	56.2%	146	50.3%	105	41.7%
Child/Adult w/child	188	43.2%	139	43.8%	144	49.7%	147	58.3%
Woman's age (years)	23.89	3.38 (18, 38)	23.47	2.04 (19, 30)	24.83	4.00 (18, 43)	23.11	3.04 (18, 42)
Child's age (months)	9.83	7.22 (.17, 22)	4.52	3.01 (.1, 15)	6.22	5.18 (.1, 24)	7.53	6.46 (1, 23)
Time spent traveling from home/residence to facility	58.09	31.26 (10, 240)	31.78	17.73 (10, 90)	29.67	17.67 (2, 90)	39.27	28.20 (5, 190)
Time spent at facility	90.97	44.16 (15, 250)	46.41	28.64 (12, 180)	70.85	44.97 (10, 252)	106.77	48.30 (6, 240)
# of providers/stops	2.44	1.13 (1, 5)	2.01	.94 (1, 4)	2.49	1.03 (1, 5)	2.17	1.12 (1, 4)

*Percentage reflects proportion of the number of visits that the site (health facility) contributed to the total of the 2,158 visits (India=1,294; Kenya=864).

Table 2B: Descriptive characteristics of clients, visits tracked, and number of providers clients saw by facility in Kenya

	Bondo Hospital		Bondo Health Center #1		Bondo Health Center #2		Embu Hospital		Embu Health Center #1		Embu Health Center #2	
	n / Mean	% / SD	n / Mean	% / SD	n / Mean	% / SD	n / Mean	% / SD	n / Mean	% / SD	n / Mean	% / SD
Number of client visits*	228	11.5%	66	3.3%	86	4.3%	342	17.3%	111	5.6%	31	1.6%
Adult (alone)	72	31.6%	8	12.1%	12	14.0%	69	20.2%	15	13.5%	7	22.6%
Child/Adult w/child	156	68.4%	58	87.9%	74	86.0%	273	79.8%	96	86.5%	24	77.4%
Woman's age (years)	24.33	4.46 (18, 39)	24.47	5.60 (18, 38)	25.97	5.25 (18, 40)	27.15	5.42 (18, 47)	27.87	6.20 (18, 41)	27.23	6.09 (18, 43)
Child's age (months)	5.56	4.99 (0, 24)	7.88	5.50 (1, 25)	6.18	5.13 (1, 19)	7.9	6.51 (1, 31)	10.54	6.79 (1, 23)	10.35	7.47 (1, 27)
Time spent traveling from home/residence to facility	44.26	29.41 (2, 150)	56.55	39.72 (4, 150)	35.37	26.60 (5, 120)	46.45	38.73 (2, 240)	43.33	27.81 (5, 150)	30.65	18.06 (5, 60)
Time spent at facility	79.91	55.77 (6, 273)	128.17	62.17 (18, 326)	117.24	66.50 (14, 292)	113.13	70.73 (1, 372)	136.57	82.71 (7, 326)	114.43	79.26 (23, 340)
# of providers / stops	1.31	0.60 (1, 5)	1.76	.88 (1, 4)	1.34	.64 (1, 4)	1.57	.82 (1, 5)	1.13	.33 (1, 2)	1.26	.51 (1, 3)

*Percentage reflects proportion of the number of visits that the site (health facility) contributed to the total of the 2,158 visits (India=1,294; Kenya=864).

Integration by facility and service area

Figures 2 and **3** display the proportion of visits where clients received integrated MNCH-FP services, by facility (**Figure 2**) and by MNCH service area within each facility (**Figure 3**). MNCH-FP integration varied widely by facility (see **Online Table S1** for total and proportion of all visits where clients received integrated MNCH and FP services by facility, and **Online Table S2** for proportion of MNCH visits where clients received integrated MNCH-FP services by service area). In India, receipt of MNCH-FP integrated services ranged from 16.3% of MNCH client visits in Bihar Hospital 2 to 63% in Jharkhand Hospital 1. In Kenya, only 5.5% of MNCH visits in Embu Hospital reflected MNCH-FP integration, compared to 14.8% in the Bondo Hospital and 57.1% in Bondo Health Center 2.

In India, analysis by service area showed higher levels of FP integration with ANC services versus PNC or child health. In Bihar, 28.1–35.2% of clients receiving ANC services also received FP services. By contrast, only 0–10.9% of clients receiving PNC and 2.2–4.1% of clients receiving child health services also received FP services. In Jharkhand, 71.1–73.2% of clients accessing ANC also receiving FP; but, PNC-FP integration was also relatively high at 60% of clients accessing PNC. In Jharkhand, child health-FP integration was quite different between the two hospitals, with 55.7% of clients accessing child health services in Jharkhand Hospital 1 but only 6.2% in Jharkhand Hospital 2.

In Kenya, Bondo health centers recorded higher integration across all MNCH service areas than Bondo Hospital. Across ANC, PNC, and child health services in each of the Bondo health centers, 40% to 85% of clients in each service area also received FP services. By contrast, at Bondo Hospital only 1.8% of clients accessing ANC, about one-third (34.5%) of clients accessing PNC, and one-fifth (20.2%) of clients accessing child health also received FP services. Embu sites showed greater FP integration with ANC (14.3–28.6% of ANC clients) than in other service areas such as child health (3.1–10.5% of child health clients).

Integration models

Table 3 outlines the percentage of clients receiving integrated MNCH-FP services from a single provider versus multiple co-located providers, demonstrating a stark difference by site and service area. Bihar Hospital 2 showed that nearly all (97.9%) clients who received both ANC and FP received both services from a single provider, compared to only a quarter (24.6%) at Bihar Hospital 1. In Jharkhand Hospital 1, 38.9% of ANC clients who received FP counseling did so from the same ANC provider, whereas in Jharkhand Hospital 2 virtually none (1.4%) received both services from a single provider.

In Bondo Hospital in Kenya, ANC-FP integration was too rare to draw inferences, but in PNC and child health, about half (50%, 48%, respectively) of FP integration was provided by a single provider. In Bondo health centers, single provider integration was even more prevalent; Bondo

Health Center 2 recorded 100% of ANC-FP clients, 94.1% of PNC-FP clients, and 91.7% of child health-FP clients received these services from just one provider. In the hospital in Embu, the majority of FP integration (80% in ANC and 71.4% in child health) was carried out by a single provider. Embu health centers had too few clients receiving integrated services to evaluate.

Table 3: Total integrated MNCH-FP visits and visits in which those services were received from a single provider, by service area and facility

	Bihar Hospital #1		Bihar Hospital #2		Jharkhand Hospital #1		Jharkhand Hospital #2		Bondo Hospital		Bondo Health Center #1		Bondo Health Center #2		Embu Hospital		Embu Health Center #1		Embu Health Center #2	
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
Total ANC-FP visits	69		48		90		69		1		4		9		10		2		2	
ANC and FP services both received from a single provider	**17**	**(24.6%)**	**47**	**(97.9%)**	**35**	**(38.9%)**	**1**	**(1.4%)**	**1**	*	**3**	*	**9**	**(100%)**	**8**	**(80.0%)**	**2**	*	**2**	*
Total PNC-FP visits	8		0		21		9		10		4		17		0		1		0	
PNC and FP services both received from a single provider	**0**	**(0.0%)**	**0**	*	**13**	**(61.9%)**	**0**	**(0.0%)**	**5**	**(50.0%)**	**3**	*	**16**	**(94.1%)**	**0**	*	**1**	*	**0**	*
Total child health-FP visits	18		3		59		8		25		22		36		7		3		2	
Child health and FP services both received from a single provider	**2**	**(11.1%)**	**1**	*	**26**	**(44.1%)**	**1**	**(12.5%)**	**12**	**(48.0%)**	**12**	**(54.5%)**	**33**	**(91.7%)**	**5**	**(71.4%)**	**3**	*	**1**	*

* Insufficient number of visits (<5) to calculate a meaningful percentage

Client characteristics as predictors of receipt of integrated services

A logistic regression model (**Table 4**) examining client characteristics as predictors of MNCH-FP integration estimates that the odds of integration are roughly half for clients traveling between 30–59 minutes than for those traveling less than 30 minutes after adjusting for country, whether the client attended with a child, client's age, length of time spent at facility, and numbers of providers seen (OR .520, 95% CI 0.408–0.662, p<0.001). Similarly, the odds of integration for clients traveling more than an hour are 0.4 times the odds of integration for clients traveling less than 30 minutes to the facility (95% CI 0.281–0.592, p<0.001). The odds of integration are 2.369 higher for each additional provider seen at the facility after controlling for country, attendance with a child, client's age, length of time spent at facility, and length of time spent traveling to facility (95% CI 1.509–3.717, p<0.001). Length of time spent at the facility is not significantly associated with receipt of MNCH-FP integrated services.

Table 4: Multiple logistic regression model of client characteristics as predictors of MNCH-FP integration

Client Characteristics	Odds Ratio	[95% CI]
Country		
Kenya vs. India (reference)	0.948	[0.211, 4.252]
Type of client		
Child/Adult with child vs. Adult alone (reference)	0.858	[0.438, 1.678]
Mother's age (years): for every 1 year increment	0.985	[0.931, 1.043]
Length of time spent traveling to facility (minutes):		
30-59 minutes vs. <30 minutes (reference)	0.520***	[0.408, 0.662]
60 or more vs. < 30 minutes (reference)	0.408***	[0.281, 0.592]
Length of time spent at facility (minutes):		
15-29 minutes vs. <15 minutes (reference)	1.633	[0.808, 3.301]
30-59 minutes vs. <15 minutes (reference)	1.684	[0.743, 3.817]
60-89 minutes vs. <15 minutes (reference)	1.315	[0.542, 3.191]
90-119 minutes vs. <15 minutes (reference)	1.304	[0.466, 3.647]
2 hours or more vs. <15 minutes (reference)	1.971	[0.746, 5.206]
Number of providers seen at facility (1 to 5): for each additional provider	2.369***	[1.509, 3.717]
N=2118		

Exponentiated coefficients; 95% confidence intervals in brackets
* p<0.05, ** p<0.01, *** p<0.001

Integration as predictor of client experiences

A multivariate regression model was used to estimate the association between MNCH-FP integration and time spent at the facility (**Table 5**), adjusting for other patient characteristics (country, whether or not a client attended with a child, client's age, and length of time spent traveling to the facility). The model estimates that time spent at the facility increased by 10.5 minutes for patients with MNCH-FP integration versus patients accessing MNCH services without FP services, but the association was not statistically significant (95% CI −0.952–21.92). Clients traveling 30–59 minutes to the facility spent 10.2 minutes longer at the visit than those who traveled less than 30 minutes (95% CI 1.916–18.52, p<0.05). Similarly, clients who traveled over an hour to get to the facility spent 16.6 more minutes at the visit than those clients who traveled less than 30 minutes (95% CI 4.754–28.54, p<.01). Whether or not a client attended with a child, or the client's age were not statistically significant predictors of length of visit.

Table 5: Regression model of MNCH-FP integration as predictor of length of time spent at facility

Variables	Coefficient	[95% CI]
MNCH-FP integration vs. MNCH services only	10.48	[-0.952, 21.920]
Country		
Kenya vs. India (reference)	31.91*	[0.529, 63.290]
Type of client		
Child/Adult with child vs. Adult alone (reference)	-3.281	[-9.800, 3.239]
Mother's age (years): for every 1 year increment	0.325	[-0.586, 1.235]
Length of time spent traveling to facility (minutes):		
30-59 minutes vs. <30 minutes (reference)	10.22*	[1.916, 18.520]
60 or more vs. <30 minutes (reference)	16.65**	[4.754, 28.540]
N=2118		

95% confidence intervals in brackets
* p<0.05, ** p<0.01

DISCUSSION

Findings suggest the importance of targeted programmatic support for integration along each point on the continuum of care. Results show that FP integration tended to be most prominent in the MNCH service area(s) that received support for integration and for the most part was not in evidence within non-targeted facility service areas at the same levels. In Bondo, Kenya, where the MIYCN-FP intervention model emphasized integration across ANC, PNC, and child health, high levels of FP integration were found across all three service delivery platforms (with the exception of Bondo Hospital, where integration lagged particularly in ANC). In sites where PPIUD interventions emphasized PPFP counseling during ANC (Bihar and Jharkhand, India; Embu, Kenya), levels of FP integration were higher in ANC than PNC or child health. In Embu,

where PNC-FP integration also took place, PNC visits at health centers were too infrequent to analyze and the few PNC visits at the hospital showed no FP integration, possibly due to attrition in service integration over time. Sites with the largest lag between the program intervention period and the client flow assessment (Embu) recorded the lowest levels of MNCH-FP integration, suggesting the need for better means of institutionalizing and sustaining interventions. This is consistent with prior research by the Integra Initiative noting declines over time in facility integration scores.[24]

Strengths of the study included the large sample size and use of the client flow method providing detailed information on combination of services clients received. Compared to other measures of service delivery like quality of care/observation surveys and readiness assessments, this approach reflects a simpler, less labor-intensive way to document individuals' receipt of integrated care. While client exit surveys could provide similar information, having the provider fill out the checklist may provide more accurate data by avoiding client recall or social acceptability bias.

One challenge was devising a one-page tool with a limited checklist of items that nonetheless captured multiple dimensions of MNCH and FP service integration across different settings. For future assessments, it would be useful to distinguish between ANC 1 and later ANC visits, since ANC 1 is less likely to include FP counseling. In addition, our client flow tool had categories of child health and nutrition services that may have been difficult for providers to interpret. For example, the form contained "iron/folate-child," but children typically receive only iron supplements if needed and not folate; it also lacked a checkbox for treatment of sick children. The tool could be modified to have clearer child health service categories.

Similar to limitations discussed by the Integra Initiative, a "snapshot" of a five-day period at a facility may not represent a "typical" client flow, if a typical pattern exists.[9] In Kenya, a polio campaign took place concurrently with data collection, resulting in staff disruption. Despite daily orientation by the study teams to mitigate changes in staff assignments, providers sometimes told clients they were too busy to complete the form and left sections blank. Data collection must strike a balance between collecting sufficient information and practicality of gathering data.

Overall, the extent to which integration occurs can be a result of how services are organized, the health system context, and how well services inherently fit together. A review of interventions to improve PPFP in low- and middle-income countries found evidence that integration of FP with other platforms like immunization and PMTCT may increase PPFP knowledge and uptake.[6] However, there remains need for larger studies in low-resource settings on effective means of consistent and systematic PPFP implementation.[18] Human resource constraints can affect delivery of integrated services, such as when providers from the service delivery areas being integrated are not available in the same facility at the same time.[25] Evidence suggests the importance of repeated contact points; one review concluded that single, short FP counseling

sessions during ANC are insufficient to increase uptake of PPFP, but FP integration across ANC and PNC can sizably increase uptake in the first year postpartum.[5] Our study adds a more detailed snapshot of the combinations of services provided to pregnant and postpartum women and degree of service integration at the client level among facilities engaged in different models of PPFP interventions. Findings reinforce the importance of integrating FP counseling and services throughout the continuum of care and the continued need to increase PNC coverage in general.

From the client perspective, clients who accessed integrated MNCH-FP services spent an average of only ten minutes longer at the health facility than those who accessed MNCH services alone. This contrasts with findings from the FP-HIV integration field that quantified a significant increase in waiting times of clients in integrated facilities versus comparison sites.[26] Within a facility, MNCH-FP integration may not impose a greater time burden on clients. Additional research could explore underlying factors, such as whether this reflects achievement of efficiency in integrated service delivery; an unintended consequence with implications for quality of care in which multiple services are provided, but in a cursory fashion; or other factors altogether. Findings suggest that attention should be given to the needs of clients living furthest away from a facility, as they seem least likely to receive integrated services. A multi-country study of child health and access to health facilities in low- and middle-income countries found that lengthy travel distances are associated with decreased utilization of health services and poorer health outcomes.[27] Our data indicates that differences in receipt of care may persist even after arrival at a facility. Whether this is due to provider perceptions that these clients do not have sufficient time to access integrated services or clients exhibiting concern about time limitations at the facility warrants further exploration.

CONCLUSION

This study offers further support for the utility of a client flow tool to assess whether integrated services are being accessed as intended in service delivery settings. At many facilities, FP integration was highest in service delivery areas receiving specific programmatic support and lower in areas that did not receive attention, highlighting the importance of focused programmatic support specific to distinct service delivery areas. Our results suggest there is also a need to address how to better sustain integration once an intervention has ended. Findings provide cautious optimism that integration does not lead to greater waiting times for clients accessing integrated MNCH-FP services in these settings. Results point to the vulnerability of clients living furthest away who were least likely to access integrated services, reinforcing calls for emphasis on last-mile interventions. The client flow tool may hold promise as a component of baseline and endline assessments, studies for integration-focused programs, or as another tool for health facility assessments to examine consistency of service integration and characteristics of clients receiving integrated services.

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AUTHORS' CONTRIBUTIONS
Devon Mackenzie: Managed adaptation of the client flow tool, assisted with training of data collectors in Kenya, led the cleaning and analysis of client flow data, and drafted the manuscript.
Anne Pfitzer: Principal investigator on the study and led study design and training of research teams, provided input on analysis and interpretation, and assisted in drafting the manuscript.
Christina Maly: Assisted with study design and training of data collectors in India, provided input on data interpretation, and assisted in drafting the manuscript.
Charles Waka: Managed setup and data entry, cleaning, and coding of data through the Research Electronic Data Capture (REDCap) system, assisted in drafting the manuscript.
Gajendra Singh: Contributed to data cleaning, provided input on and conducted data analysis.
Abanti Sanyal: Conducted regression analyses of data.

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COMPETING INTERESTS STATEMENT
All authors have completed the ICMJE uniform disclosure form at www.icmje.org/coi_disclosure.pdf and declare: no support from any organization for the submitted work; no financial relationships with any organizations that might have an interest in the submitted work in the previous 3 years; no other relationships or activities that could appear to have influenced the submitted work.

REPORTING STATEMENT

The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement completed for this article is included as a supplementary file (see **supplementary file – STROBE Checklist**).

DATA SHARING STATEMENT

The anonymized dataset and codebook will be made available from the corresponding author at Dryad repository.

Appendices/Supplementary Files:

1. STROBE Checklist
2. Online Table S1: Total and proportion of visits where client received integrated MNCH and FP services, by facility
3. Online Table S2: Proportion of integrated MNCH-FP visits by MNCH service area and facility
4. Integration Client Flow Form

Figure Titles:

Figure 1: Types of Service Integration at the Facility Level

Figure 2. Percentage of client visits with integrated MNCH and FP services received (out of MNCH visits)

Figure 3. Percentage of integrated MNCH and FP visits by MNCH service area and facility

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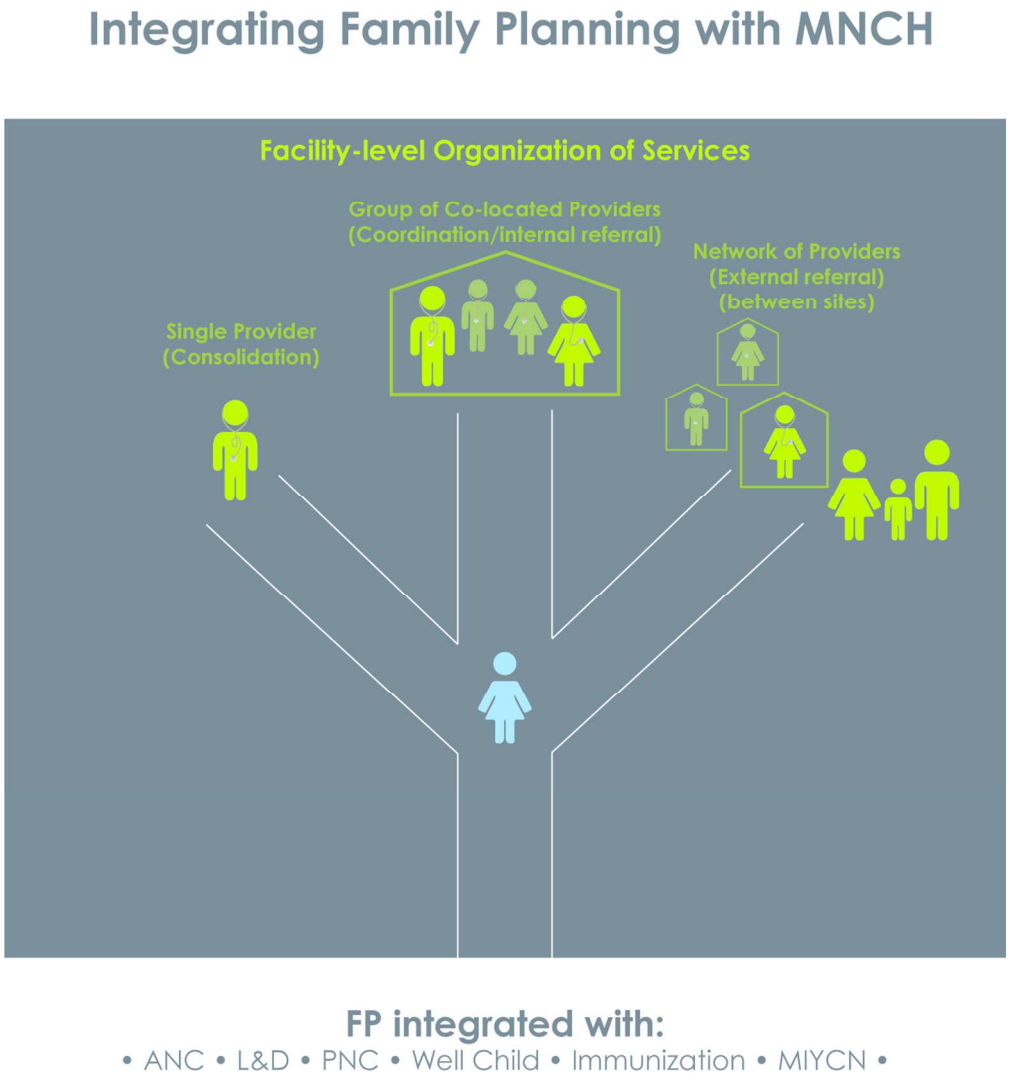
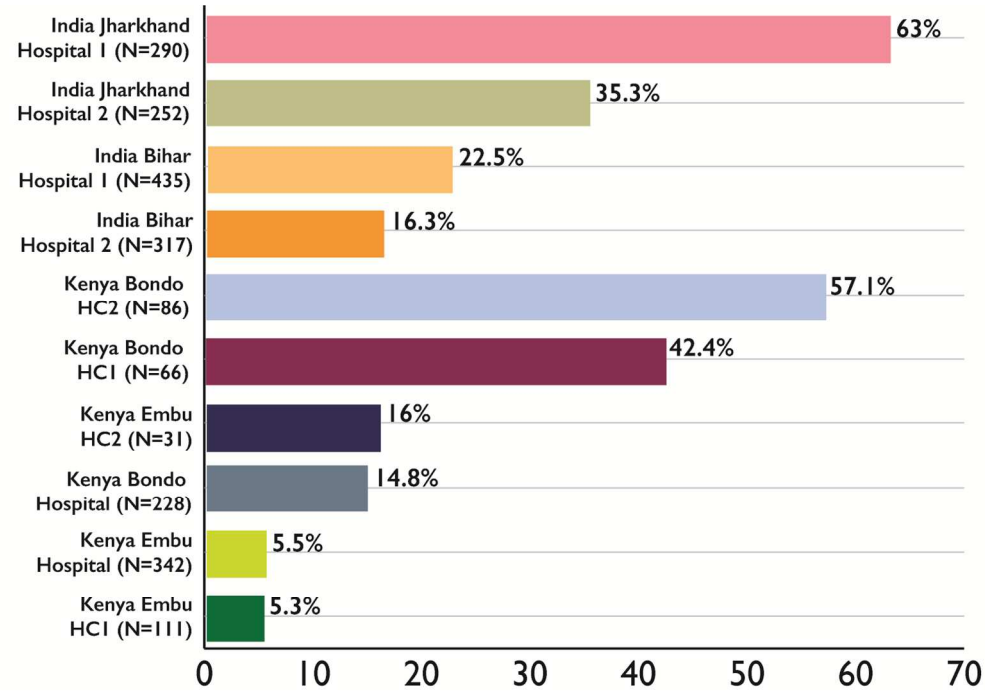


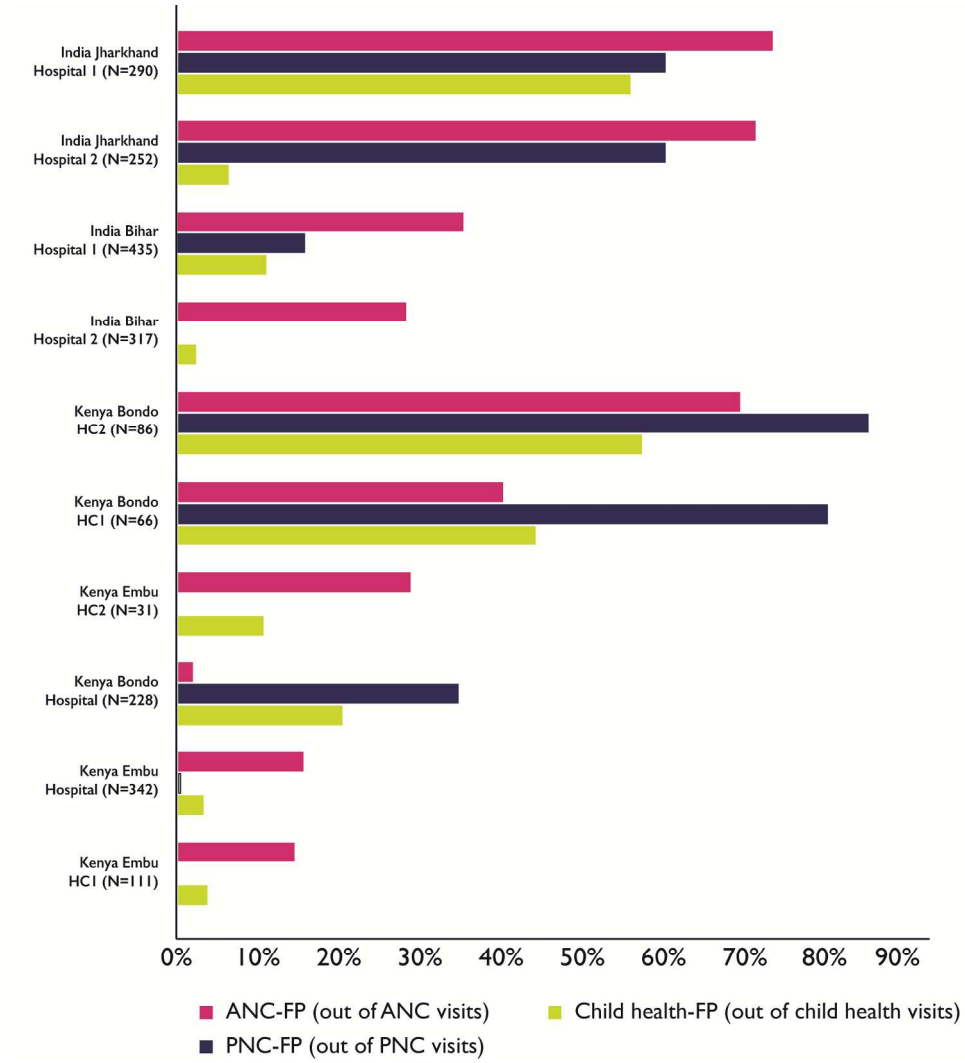
Types of Service Integration at the Facility Level

117x126mm (300 x 300 DPI)



Percentage of client visits with integrated MNCH and FP services received (out of MNCH visits)

137x94mm (300 x 300 DPI)



Percentage of integrated MNCH and FP visits by MNCH service area and facility

183x193mm (300 x 300 DPI)

INTEGRATION CLIENT FLOW FORM – Tool 5b

Client #: ☐☐/☐☐☐

Facility Code: _____ **Date (DD-MM-YY):** ___ – ___ – ___

Client Arrival Time: ___:___ **Client Type:** ☐ Adult (alone) ☐ Child/Adult w/child (child's age:____months)

Mother's Age: _____ **Time spent traveling from home/residence to facility:** ___ hours ___ minutes

Client End Time: ____:___

Instructions to client: Please take this form to each nurse, doctor, or other service provider that you see during your visit at this facility today. Please hand the form back to one of the interviewers before you leave the facility.

Instructions to providers: When client gives you this form, please find first **un-checked** section for provider and tick box (1st provider, 2nd provider, etc.). Provider services as you would normally do. At the end of the session, tick the appropriate box for consultation time (short, normal, or extended), located next to 'Provider seen.' For section A, tick any of the services that you provided to the client. Section B asks about *internal* referrals: if you refer the client to services inside the **same** health facility, tick the appropriate box(es). If you do not refer the client to other services, leave this question blank. Section C asks about *external* referrals: indicate if you refer the client to a provider or a health facility elsewhere.

1. Purpose of visit (tick ALL that apply):
[To be filled by Study Team who will ask client]

☐ Antenatal care (ANC)
☐ Postnatal care (PNC)
☐ Sick child visit
☐ Immunization or well child visit
☐ Family planning counseling / provision
☐ Nutrition assessment, counseling, or treatment
☐ STI/HIV counseling, testing, or care
☐ Laboratory
☐ Pharmacy
☐ Other (specify): _____

☐ 1st Provider seen

Consultation time: ☐ Short ☐ Normal ☐ Extended

1A. What service(s) did you provide? (tick ALL that apply)

☐ Antenatal care
☐ Postnatal check–mother
☐ Postnatal check–baby
☐ Child immunization
☐ FP counseling
☐ LAM counseling
☐ FP provision
☐ HIV counseling/testing
☐ HIV care (pre ART or ART)
☐ PMTCT
☐ STI screening
☐ STI treatment
☐ TB care/treatment
☐ Child weighing/MUAC
☐ Maternal, Infant Young Child Nutrition counseling
☐ Maternal, Infant Young Child Nutrition support
☐ Iron folate–mother
☐ Iron folate–child
☐ Vitamin A–child
☐ Dispensing drugs
☐ Laboratory test
☐ Other (specify): _____

1B. What services did you refer the client to at your facility?
(tick ALL that apply)

☐ Antenatal care
☐ Postnatal check–mother
☐ Postnatal check–baby
☐ Child immunization
☐ FP counseling
☐ FP provision
☐ HIV counseling/testing
☐ HIV care (pre ART or ART)
☐ PMTCT
☐ STI screening
☐ STI treatment
☐ TB care/treatment
☐ Maternal, Infant Young Child Nutrition counseling
☐ Maternal, Infant Young Child Nutrition support
☐ Iron folate–mother
☐ Iron folate–child
☐ Child weighing/MUAC
☐ Vitamin A–child
☐ Pharmacy (drugs/FP pills)
☐ Laboratory test
☐ Other:_____

1C. Did you refer the client to another facility? ☐Y ☐N

☐ 2nd Provider seen

Consultation time: ☐ Short ☐ Normal ☐ Extended

2A. What service(s) did you provide? (tick ALL that apply)

☐ Antenatal care
☐ Postnatal check–mother
☐ Postnatal check–baby
☐ Child immunization
☐ FP counseling
☐ LAM counseling
☐ FP provision
☐ HIV counseling/testing
☐ HIV care (pre ART or ART)
☐ PMTCT
☐ STI screening
☐ STI treatment
☐ TB care/treatment
☐ Child weighing/MUAC
☐ Maternal, Infant Young Child Nutrition counseling
☐ Maternal, Infant Young Child Nutrition support
☐ Iron folate–mother
☐ Iron folate–child
☐ Vitamin A–child
☐ Dispensing drugs
☐ Laboratory test
☐ Other (specify): _____

2B. What services did you refer the client to at your facility?
(tick ALL that apply)

☐ Antenatal care
☐ Postnatal check–mother
☐ Postnatal check–baby
☐ Child immunization
☐ FP counseling
☐ FP provision
☐ HIV counseling/testing
☐ HIV care (pre ART or ART)
☐ PMTCT
☐ STI screening
☐ STI treatment
☐ TB care/treatment
☐ Maternal, Infant Young Child Nutrition counseling
☐ Maternal, Infant Young Child Nutrition support
☐ Iron folate–mother
☐ Iron folate–child
☐ Child weighing/MUAC
☐ Vitamin A–child
☐ Pharmacy (drugs/FP pills)
☐ Laboratory test
☐ Other:_____

2C. Did you refer the client to another facility? ☐Y ☐N

☐ 3rd Provider seen — Consultation time: ☐ Short ☐ Normal ☐ Extended

3A. What service(s) did you provide? (tick ALL that apply)

- ☐ Antenatal care
- ☐ Postnatal check–mother
- ☐ Postnatal check–baby
- ☐ Child immunization
- ☐ FP counseling
- ☐ LAM counseling
- ☐ FP provision
- ☐ HIV counseling/testing
- ☐ HIV care (pre ART or ART)
- ☐ PMTCT
- ☐ STI screening
- ☐ STI treatment
- ☐ TB care/treatment
- ☐ Child weighing/MUAC
- ☐ Maternal, Infant Young Child Nutrition counseling
- ☐ Maternal, Infant Young Child Nutrition support
- ☐ Iron folate–mother
- ☐ Iron folate–child
- ☐ Vitamin A–child
- ☐ Dispensing drugs
- ☐ Laboratory test
- ☐ Other (specify): _____

3B. What services did you refer the client to at your facility?

(tick ALL that apply)

- ☐ Antenatal care
- ☐ Postnatal check–mother
- ☐ Postnatal check–baby
- ☐ Child immunization
- ☐ FP counseling
- ☐ FP provision
- ☐ HIV counseling/testing
- ☐ HIV care (pre ART or ART)
- ☐ PMTCT
- ☐ STI screening
- ☐ STI treatment
- ☐ TB care/treatment
- ☐ Maternal, Infant Young Child Nutrition counseling
- ☐ Maternal, Infant Young Child Nutrition support
- ☐ Iron folate–mother
- ☐ Iron folate–child
- ☐ Child weighing/MUAC
- ☐ Vitamin A–child
- ☐ Pharmacy (drugs/FP pills)
- ☐ Laboratory test
- ☐ Other: _____

3C. Did you refer the client to another facility? ☐ Y ☐ N

☐ 4th Provider seen — Consultation time: ☐ Short ☐ Normal ☐ Extended

4A. What service(s) did you provide? (tick ALL that apply)

- ☐ Antenatal care
- ☐ Postnatal check–mother
- ☐ Postnatal check–baby
- ☐ Child immunization
- ☐ FP counseling
- ☐ LAM counseling
- ☐ FP provision
- ☐ HIV counseling/testing
- ☐ HIV care (pre ART or ART)
- ☐ PMTCT
- ☐ STI screening
- ☐ STI treatment
- ☐ TB care/treatment
- ☐ Child weighing/MUAC
- ☐ Maternal, Infant Young Child Nutrition counseling
- ☐ Maternal, Infant Young Child Nutrition support
- ☐ Iron folate–mother
- ☐ Iron folate–child
- ☐ Vitamin A–child
- ☐ Dispensing drugs
- ☐ Laboratory test
- ☐ Other (specify): _____

4B. What services did you refer client to at your facility?

(tick ALL that apply)

- ☐ Antenatal care
- ☐ Postnatal check–mother
- ☐ Postnatal check–baby
- ☐ Child immunization
- ☐ FP counseling
- ☐ FP provision
- ☐ HIV counseling/testing
- ☐ HIV care (pre ART or ART)
- ☐ PMTCT
- ☐ STI screening
- ☐ STI treatment
- ☐ TB care/treatment
- ☐ Maternal, Infant Young Child Nutrition counseling
- ☐ Maternal, Infant Young Child Nutrition support
- ☐ Iron folate–mother
- ☐ Iron folate–child
- ☐ Child weighing/MUAC
- ☐ Vitamin A–child
- ☐ Pharmacy (drugs/FP pills)
- ☐ Laboratory test
- ☐ Other: _____

4C. Did you refer the client to another facility? ☐ Y ☐ N

☐ 5th Provider seen — Consultation time: ☐ Short ☐ Normal ☐ Extended

5A. What service(s) did you provide? (tick ALL that apply)

- ☐ Antenatal care
- ☐ Postnatal check–mother
- ☐ Postnatal check–baby
- ☐ Child immunization
- ☐ FP counseling
- ☐ LAM counseling
- ☐ FP provision
- ☐ HIV counseling/testing
- ☐ HIV care (pre ART or ART)
- ☐ PMTCT
- ☐ STI screening
- ☐ STI treatment
- ☐ TB care/treatment
- ☐ Child weighing/MUAC
- ☐ Maternal, Infant/Young Child Nutrition counseling
- ☐ Maternal, Infant Young Child Nutrition support
- ☐ Iron folate–mother
- ☐ Iron folate–child
- ☐ Vitamin A–child
- ☐ Dispensing drugs
- ☐ Laboratory test
- ☐ Other (specify): _____

5B. What services did you refer client to at your facility?

(tick ALL that apply)

- ☐ Antenatal care
- ☐ Postnatal check–mother
- ☐ Postnatal check–baby
- ☐ Child immunization
- ☐ FP counseling
- ☐ FP provision
- ☐ HIV counseling/testing
- ☐ HIV care (pre ART or ART)
- ☐ PMTCT
- ☐ STI screening
- ☐ STI treatment
- ☐ TB care/treatment
- ☐ Maternal, Infant/Young Child Nutrition counseling
- ☐ Maternal, Infant Young Child Nutrition support
- ☐ Iron folate–mother
- ☐ Iron folate–child
- ☐ Child weighing/MUAC
- ☐ Vitamin A–child
- ☐ Pharmacy (drugs/FP pills)
- ☐ Laboratory test
- ☐ Other: _____

5C. Did you refer the client to another facility? ☐ Y ☐ N

Thank you!

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3-4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4-5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-7
Bias	9	Describe any efforts to address potential sources of bias	14
Study size	10	Explain how the study size was arrived at	5-6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6-7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	N/A
		(*c*) Explain how missing data were addressed	6
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	N/A
		(*e*) Describe any sensitivity analyses	N/A
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	6-7
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8
		(b) Indicate number of participants with missing data for each variable of interest	Not presented
Outcome data	15*	Report numbers of outcome events or summary measures	9-13
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Adjusted estimates (95% CI) presented 12, 13
		(*b*) Report category boundaries when continuous variables were categorized	N/A
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	13-14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	14
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	14-15
Generalisability	21	Discuss the generalisability (external validity) of the study results	Not presented
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	16

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Online Table S1: Total and proportion of visits where client received integrated MNCH and FP services, by facility

Facility	**Bihar Hospital #1**		**Bihar Hospital #2**		**Jharkhand Hospital #1**		**Jharkhand Hospital #2**		**Bondo Hospital**		**Bondo Health Center #1**		**Bondo Health Center #2**		**Embu Hospital**		**Embu Health Center #1**		**Embu Health Center #2**	
Number of visits	**n=435**		**n=317**		**n=290**		**n=252**		**n=228**		**n=66**		**n=86**		**n=342**		**n=111**		**n=31**	
Services	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
Integration of MNCH (ANC, PNC, and/or child health) and FP during client visit	**89**	**(20.5%)**	**51**	**(16.1%)**	**153**	**(52.8%)**	**83**	**(32.9%)**	**27**	**(11.8%)**	**25**	**(37.9%)**	**44**	**(51.2%)**	**16**	**(4.7%)**	**5**	**(4.5%)**	**4**	**(12.9%)**
ANC and FP received during visit (out of all visits)	69	(15.9%)	48	(15.1%)	90	(31.0%)	69	(27.4%)	1	(0.4%)	4	(6.1%)	9	(10.5%)	10	(2.9%)	2	(1.8%)	2	(6.5%)
PNC and FP received during visit (out of all visits)	8	(1.8%)	0	(0.0%)	21	(7.2%)	9	(3.6%)	10	(4.4%)	4	(6.1%)	17	(19.8%)	0	(0.0%)	1	(0.9%)	0	(0.0%)
Child health and FP received during visit (out of all visits)	18	(4.1%)	3	(0.9%)	59	(20.3%)	8	(3.2%)	25	(11.0%)	22	(33.3%)	36	(41.9%)	7	(2.0%)	3	(2.7%)	2	(6.5%)
Integration of FP and cross-cutting service areas																				
HIV and FP received during visit (out of all visits)	55	(12.6%)	0	(0.0%)	64	(22.1%)	1	(0.4%)	2	(0.9%)	2	(3.0%)	10	(11.6%)	2	(0.6%)	5	(4.5%)	1	(3.2%)
Nutrition and FP received during visit (out of all visits)	4	(0.9%)	3	(0.9%)	73	(25.2%)	2	(0.8%)	21	(9.2%)	22	(33.3%)	46	(53.5%)	14	(4.1%)	4	(3.6%)	2	(6.5%)

Notes:
MNCH includes: ANC, PNC (PNC-mother and/or PNC-baby) and/or child health (child immunization, child weighing/MUAC, iron folate-child, vitamin A-child, and/or child health)
FP includes: FP counseling, LAM counseling, and/or FP services
HIV includes: HIV counseling/testing, HIV care, PMTCT, STI screening, and/or STI treatment
Nutrition includes: MIYCN counseling, MIYCN support, iron folate-mother, iron folate-child, and/or vitamin A-child

Totals for integration of MNCH and FP do not equal the sum of ANC-FP, PNC-FP, and child health-FP visits due to some overlap between these categories

Online Table S2: Proportion of integrated MNCH-FP visits by MNCH service area and facility

	Bihar Hospital #1		Bihar Hospital #2		Jharkhand Hospital #1		Jharkhand Hospital #2		Bondo Hospital		Bondo Health Center #1		Bondo Health Center #2		Embu Hospital		Embu Health Center #1		Embu Health Center #2	
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
MNCH visits	396		313		243		235		182		59		77		290		95		25	
MNCH and FP services received	**89**	**(22.5%)**	**51**	**(16.3%)**	**153**	**(63.0%)**	**83**	**(35.3%)**	**27**	**(14.8%)**	**25**	**(42.4%)**	**44**	**(57.1%)**	**16**	**(5.5%)**	**5**	**(5.3%)**	**4**	**(16.0%)**
ANC visits	196		171		123		97		57		10		13		65		14		7	
ANC and FP received	**69**	**(35.2%)**	**48**	**(28.1%)**	**90**	**(73.2%)**	**69**	**(71.1%)**	**1**	**(1.8%)**	**4**	**(40.0%)**	**9**	**(69.2%)**	**10**	**(15.4%)**	**2**	**(14.3%)**	**2**	**(28.6%)**
PNC visits	51		5		35		15		29		5		20		19		1		0	
PNC and FP received	**8**	**(10.9%)**	**0**	**(0.0%)**	**21**	**(60.0%)**	**9**	**(60.0%)**	**10**	**(34.5%)**	**4**	**(80.0%)**	**17**	**(85.0%)**	**0**	**(0.0%)**	**1**	**(n/a)**	**0**	**(n/a)**
Child health visits	165		137		106		130		124		50		63		224		83		19	
Child health and FP received	**18**	**(4.1%)**	**3**	**(2.2%)**	**59**	**(55.7%)**	**8**	**(6.2%)**	**25**	**(20.2%)**	**22**	**(44.0%)**	**36**	**(57.1%)**	**7**	**(3.1%)**	**3**	**(3.6%)**	**2**	**(10.5%)**

Notes:

MNCH includes: ANC, PNC (PNC-mother and/or PNC-baby) and/or child health (child immunization, child weighing/MUAC, iron folate-child, vitamin A-child, and/or child health)

FP includes: FP counseling, LAM counseling, and/or FP services

Totals for integration of MNCH and FP do not equal the sum of ANC-FP, PNC-FP, and child health-FP visits due to some overlap between these categories

Non-MNCH visits excluded from the denominator in this table consist of any visits in which the client did not receive any ANC, PNC, or child health services as defined above during their visit, but accessed other services such as HIV, nutrition, or laboratory tests (HIV counseling/testing; HIV care; PMTCT; STI screening; STI treatment; TB care/treatment; maternal, infant and young child nutrition counseling; maternal, infant, and young child nutrition support; iron folate-mother; dispensing drugs, laboratory test).

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ABSTRACT

Objectives: Maternal, newborn, and child health (MNCH) services represent opportunities to integrate postpartum family planning (PPFP). Objectives were to determine levels of MNCH-family planning (FP) integration and associations between integration, client characteristics, and service delivery factors in facilities that received programmatic PPFP support.

Design and setting: Cross-sectional client flow assessment conducted May–July 2014, over 5 days at 10 purposively selected public sector facilities in India (four hospitals) and Kenya (two hospitals, four health centers).

Participants: 2,158 client visits tracked (1,294 India; 864 Kenya). Women aged 18 or older accessing services while pregnant and/or with a child under 2 years.

Interventions: PPFP/postpartum intrauterine device—Bihar, India (2012–2013); Jharkhand, India (2010–2014); Embu, Kenya (2008–2012). Maternal, infant, and young child nutrition/FP integration—Bondo, Kenya (2011–2013).

Primary outcome measures: Proportion of visits where clients received integrated MNCH-FP services, client characteristics as predictors of MNCH-FP integration, and MNCH-FP integration as predictor of length of time spent at facility.

Results: Levels of MNCH-FP integration varied widely across facilities (5.3% to 63.0%), as did proportion of clients receiving MNCH-FP integrated services by service area. Clients traveling 30–59 minutes were half as likely to receive integrated services versus those traveling under 30 minutes (odds ratio [OR] 0.5, 95% confidence interval [CI] 0.4–0.7, p<.001). Clients receiving MNCH-FP services (versus MNCH services only) spent an average of 10.5 minutes longer at the facility (95% CI −0.1–21.9, not statistically significant).

Conclusions: Findings suggest importance of focused programmatic support for integration by MNCH service area. FP integration was highest in areas receiving specific support. Integration does not seem to impose an undue burden on clients in terms of time spent at the facility. Clients living furthest from facilities are least likely to receive integrated services.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This cross-sectional study gleaned detailed information on client flow patterns, documenting the various combinations of care received by individuals during each visit to public health facilities in Kenya and India.
- This study addresses a gap in documentation of PPFP programming and coverage measures for receipt of integrated services, which is often difficult to measure when looking at clinical records or health facility service statistics due to inadequate details on services provided or inability to link data on patients accessing multiple service areas.
- The great variety in the percentage of clients receiving integrated MNCH and FP services, both across facilities as well as between service areas within individual facilities, necessitated disaggregation of results to aid in interpretation, which may have been a limitation.
- Analysis of FP integration with antenatal care and child health services yielded stronger results than postnatal care, due to low overall numbers of clients accessing postnatal care.
- For pragmatic reasons, integration during labor and delivery services was not assessed.

INTRODUCTION

Increased contraceptive use has reduced maternal deaths by 40% over the past 20 years.[1] If pregnancies are spaced over 2 years apart, infant deaths can be reduced by 10% and child deaths (ages 1–4 years) by 21%.[2] Around the time of childbirth, women may not seek family planning (FP) information or services, yet they often attend antenatal care (ANC), postnatal care (PNC), or child health services. These contact points span the maternal, newborn, and child health (MNCH) continuum of care and offer valuable, reliable opportunities for health care providers to reach women at risk of closely spaced pregnancies with FP counseling and services.[2-4]

Despite evidence of increased FP uptake when FP is integrated with maternal and newborn health, childhood immunization, nutrition programs, and prevention of mother-to-child transmission of HIV (PMTCT) services,[5-8] opportunities for integrated service delivery are often missed.[9,10] Postpartum family planning (PPFP) programs should take advantage of all services along the MNCH continuum of care, in facilities and communities, to provide women with FP information and services to improve birth spacing and address unmet need for contraception.[11-13] An FP research prioritization exercise in the *WHO Bulletin* ranked identifying the mechanisms of PPFP integration with other services as one of the top three priority areas.[14]

Papers have defined integration in different ways, usually along a continuum. Ahgren et al.[15] proposed the term “fully segregated” to mean use of more than one service at a health facility is accidental or client-driven, versus “fully integrated” in which multiple units pool resources. While Ahgren’s conceptual model was tested in Sweden, Church et al.[16] developed definitions for a low-income country setting. They use the terms “fully stand-alone” to describe separate service delivery (e.g. an HIV clinic distinct from another facility); “fully integrated” defined as

all services provided in a single room by a single provider; "partially integrated" meaning care provided by different providers in different rooms of a facility; and "partially stand-alone" to mean care from providers in different buildings in a larger compound.[16] We use the terms "single provider" to refer to consolidated care provided by the same person at a facility and "multiple co-located providers" to refer to integrated service delivery via internal referrals between providers within the same facility, as opposed to a "network of providers" where clients are referred externally to different sites.

Measurement of integrated health care delivery poses challenges, including determining what to measure and how to measure it in a cost-effective way.[17, 18, 19] Authors of a systematic review of integrated services ascribe the difficulty in measurement to the variety in services integrated and approaches used.[17] Another systematic review of studies in mostly developed settings found that measurement methods used were relatively resource intensive, such as patient and provider surveys, focus group discussions, hospital manager or policymaker questionnaires or qualitative interviews, reviews of patient data or medical records, and direct observation.[20] Few reviewed studies used direct observation,[20] presumably because of its resource-intensive nature, yet it is particularly useful when clinical records provide inadequate details about services rendered.[21] To overcome some shortcomings of these methods, the Integra Initiative research project developed a simple client flow assessment tool to track whether clients received maternal and child health (MCH) care integrated with HIV and reproductive health care.[9]

To address the gap in documentation of PPFP programming and measurement of service integration and to strengthen the body of learning around integration of PPFP into MNCH and nutrition services, we conducted a descriptive evaluation of integrated PPFP implementation models in Kenya and India. This paper presents results of a study component that assessed the extent to which pregnant clients and women with a child under 2 years of age accessing MNCH services at selected facilities in India and Kenya also received FP services. The assessment approach adapted the client flow tool from the Integra Initiative.[9] In addition, we explored which client characteristics predicted receipt of integrated MNCH-FP services, and whether integration was associated with differences in length of client visit to the health facility.

METHODS

In Kenya, facilities were selected from Embu County and Bondo Sub-County, Siaya County. Embu was an early intervention site for introduction of a comprehensive postnatal care package (2006-2008) and postpartum intrauterine contraceptive device (PPIUD) work (2007-2010) through U.S. Agency for International Development (USAID)-supported projects encompassing PPFP integration with ANC, maternity settings, postnatal care, and community-level maternal and newborn health promotion. In Bondo, a USAID-funded program demonstrated feasibility of integrating maternal, infant, and young child nutrition (MIYCN) and FP across ANC, PNC, and child health at facility and community levels (2011–2014).

In India, facilities were selected from Jharkhand and Bihar states. In Jharkhand, USAID programs supported strengthening PPFP services, including PPIUD and FP integration with ANC and maternity services (2009–2014). In Bihar, the Bill & Melinda Gates Foundation funded an expansion of the PPFP/PPIUD work with a stronger demand-generation and community component (2012–2013).

The study utilized a cross-sectional design to track the services a client received and determine if PPFP services (including FP counseling and/or provision of FP methods) were offered consistently as expected under the implementation model. Results presented here are a component of a larger mixed-methods descriptive evaluation of PPFP integration that included client and provider surveys and semi-structured interviews with providers and key informants. Study sites included hospitals and health centers, purposively selected based on duration, intensity, and level of programmatic support for PPFP integration, as well as pragmatic factors like accessibility (see **Table 1**). A separate paper on the characteristics of successful integrated FP and MCH services provides additional background on study locations and sites,[22] and related articles on the FP and MIYCN integration work in Bondo [23] and the postnatal care package in Embu [24] share learning from those demonstration programs.

Table 1: Study Sites, Interventions, and Tier of Service

Site	**Bondo, Kenya**	**Embu, Kenya**	**Bihar, India**	**Jharkhand, India**	**Total**
Integrated Interventions	MIYCN-FP: Integration with ANC, maternity, PNC, child health	PPFP/PPIUD: Integration with ANC, maternity, PNC	PPFP/PPIUD: Integration with ANC, maternity	PPFP/PPIUD: Integration with ANC, maternity	
Tier of Service					
Hospitals	1 sub-county hospital	1 county hospital	2 district hospitals	2 district hospitals	6
Health Centers	2	2	0	0	4
Total Sites	3	3	2	2	10

Data was collected in 2014 during May-June in India and June-July in Kenya. A one-page client flow tool was administered by research assistants (RAs) for five consecutive weekdays at each facility. The study team oriented facility service providers on how to complete the client flow form. RAs were positioned to screen as many eligible female clients as possible seeking care in the target service delivery areas. Inclusion criteria included clients who were: 1) seeking services at targeted MNCH service delivery areas (ANC, PMTCT, PNC, MIYCN, and other child health services such as well-child visits and immunization) in selected health facilities, and 2) women aged 18–49 years who were pregnant or had a child under 2 years. Clients seeking labor and delivery services were excluded for practical reasons. After screening to confirm eligibility and

obtaining oral informed consent, the RA asked the client to carry the client flow checklist throughout her visit at the facility. The RA documented client arrival time on the form, gave it to the client, and asked her to give it to any facility staff she interacted with. Clients were asked to return the form to the RA when leaving the facility, at which point the RA documented departure time.

Study data was cleaned, coded, and managed using Research Electronic Data Capture (REDCap). Cleaned data were exported to SPSS Statistics version 22 and Stata® version 13 for analysis.

The unit of analysis was client visit: each completed client form that tracked the number of providers the client accessed at the health facility that day (up to five) and the services and referrals received from each provider. Records for 16 visits of clients under 18 years of age were excluded from analysis per the research protocol. Consenting clients who met the eligibility criteria but returned blank forms were also excluded, as were two records that failed logic checks (i.e., had marks for both ANC and PNC services provided to the client during their visit). In total, 73 of the original 2,231 records were excluded from analysis (around 3%).

The primary outcome examined was receipt of integrated MNCH-FP services, i.e., the proportion of all client visits during which the client received:

- Any MNCH service, defined as: ANC, PNC (postnatal check for mother and/or postnatal check for baby), and/or child health (child immunization, child weighing/mid-upper-arm circumference, iron folate for child, vitamin A for child, and/or child health in general e.g., visits where the provider wrote in the "other" category that they conducted a child exam, treatment for childhood illness, etc.), AND
- Any FP service: FP counseling, lactational amenorrhea method counseling, FP services (i.e. receipt of an FP method).

See **Supplementary File – Integration Client Flow Form** for a sample form used for data collection.

We disaggregated results by health facility and by MNCH service area in which the client accessed services—ANC, PNC, and/or child health. Differences in the percentages of visits with MNCH-FP integration by facility and service area were anticipated based on the focus, duration, and timing of PPFP programmatic support. In Bihar and Jharkhand, India, where the program emphasized PPIUD, we expected to see higher levels of FP integration occurring during ANC visits versus PNC or child health. In Embu, we were interested to what degree integration was sustained after the end of the intensive program phase in 2010. In Bondo, Kenya, the only study site where the program focused on MIYCN-FP integration, we expected to see a higher percentage of visits with child health and FP integration compared to other sites.

We also explored the integration model in each site, i.e., whether clients who received integrated MNCH-FP services did so from a single provider or visited multiple co-located providers (see **Figure 1**). ANC clients were considered as having seen multiple co-located providers if they received ANC services from one provider and FP services from another provider, or ANC services from one provider and ANC and FP services from another provider, etc. at the facility. Our analysis focused only on MNCH and FP services and does not include other services the client may have accessed during their visit like laboratory tests or pharmacy visits.

Client characteristics as predictors of receipt of integrated MNCH-FP services were also explored. A multiple logistic regression model was used to estimate the association between overall MNCH-FP integration (ANC, PNC, and/or child health visit along with FP visit) and client characteristics: country, type of client (adult alone vs. adult with child), mother's age, length of time spent traveling to facility, length of time spent at facility, and number of providers seen. The logistic regression model was adjusted for the correlation between clients within the same facility. Regression analysis was used to determine the association between the client's length of time spent at the facility as the outcome and receipt of integrated MNCH-FP services as the main exposure. Bootstrapping was used to deal with non-normality of the data. Correlation among clients within the same facility was accounted for.

The study was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board, the Indian Institute of Health Management Research, and the Kenya Medical Research Institute. The manuscript was prepared following the STROBE statement (see **Supplementary File – STROBE Checklist**).

RESULTS

Client characteristics

There were 2,158 visits tracked: 1,294 in India and 864 in Kenya (see **Table 2A, Table 2B**). Over three-quarters of client visits in Kenya involved an adult with a child (78.8%), while in India about half of visits consisted of an adult with a child (47.8%), versus an adult visiting alone. The average age of women tracked ranged from 23.1 (standard deviation [SD]=3.0) years in Jharkhand Hospital 2 to 27.9 (SD=6.2) years in Embu Health Center 1.

In both India and Kenya, the average length of time the client spent traveling to the facility ranged from about half an hour to an hour. Average time clients spent at the facility fluctuated widely by facility in India. Clients in Bihar Hospital 2 spent on average 46 minutes at the facility, while clients in Bihar Hospital 1 and both Jharkhand sites were at the facility for longer than an hour on average (70 to 106 minutes). In Kenya, clients at all sites spent over an hour on

average at the facility, from 80 minutes in Bondo Hospital to over 2 hours (137 minutes) in Embu Health Center 1.

Table 2A: Descriptive characteristics of clients, visits tracked, and number of providers clients saw by facility in India

	Bihar Hospital #1		Bihar Hospital #2		Jharkhand Hospital #1		Jharkhand Hospital #2	
	n / Mean	% / SD (range)	n / Mean	% / SD	n / Mean	% / SD	n / Mean	% / SD
Number of client visits*	435	22.0%	317	16.0%	290	14.6%	252	12.7%
Adult (alone)	247	56.8%	178	56.2%	146	50.3%	105	41.7%
Child/Adult w/child	188	43.2%	139	43.8%	144	49.7%	147	58.3%
Woman's age (years)	23.89	3.38 (18, 38)	23.47	2.04 (19, 30)	24.83	4.00 (18, 43)	23.11	3.04 (18, 42)
Child's age (months)	9.83	7.22 (.17, 22)	4.52	3.01 (.1, 15)	6.22	5.18 (.1, 24)	7.53	6.46 (1, 23)
Time spent traveling from home/residence to facility (minutes)	58.09	31.26 (10, 240)	31.78	17.73 (10, 90)	29.67	17.67 (2, 90)	39.27	28.20 (5, 190)
Time spent at facility (minutes)	90.97	44.16 (15, 250)	46.41	28.64 (12, 180)	70.85	44.97 (10, 252)	106.77	48.30 (6, 240)
# of providers/stops	2.44	1.13 (1, 5)	2.01	.94 (1, 4)	2.49	1.03 (1, 5)	2.17	1.12 (1, 4)

*Percentage reflects proportion of the number of visits that the site (health facility) contributed to the total of the 2,158 visits (India=1,294; Kenya=864).

Table 2B: Descriptive characteristics of clients, visits tracked, and number of providers clients saw by facility in Kenya

	Bondo Hospital		Bondo Health Center #1		Bondo Health Center #2		Embu Hospital		Embu Health Center #1		Embu Health Center #2	
	n / Mean	% / SD	n / Mean	% / SD	n / Mean	% / SD	n / Mean	% / SD	n / Mean	% / SD	n / Mean	% / SD
Number of client visits*	228	11.5%	66	3.3%	86	4.3%	342	17.3%	111	5.6%	31	1.6%
Adult (alone)	72	31.6%	8	12.1%	12	14.0%	69	20.2%	15	13.5%	7	22.6%
Child/Adult w/child	156	68.4%	58	87.9%	74	86.0%	273	79.8%	96	86.5%	24	77.4%
Woman's age (years)	24.33	4.46 (18, 39)	24.47	5.60 (18, 38)	25.97	5.25 (18, 40)	27.15	5.42 (18, 47)	27.87	6.20 (18, 41)	27.23	6.09 (18, 43)
Child's age (months)	5.56	4.99 (0, 24)	7.88	5.50 (1, 25)	6.18	5.13 (1, 19)	7.9	6.51 (1, 31)	10.54	6.79 (1, 23)	10.35	7.47 (1, 27)
Time spent traveling from home/residence to facility (minutes)	44.26	29.41 (2, 150)	56.55	39.72 (4, 150)	35.37	26.60 (5, 120)	46.45	38.73 (2, 240)	43.33	27.81 (5, 150)	30.65	18.06 (5, 60)
Time spent at facility (minutes)	79.91	55.77 (6, 273)	128.17	62.17 (18, 326)	117.24	66.50 (14, 292)	113.13	70.73 (1, 372)	136.57	82.71 (7, 326)	114.43	79.26 (23, 340)
# of providers / stops	1.31	0.60 (1, 5)	1.76	.88 (1, 4)	1.34	.64 (1, 4)	1.57	.82 (1, 5)	1.13	.33 (1, 2)	1.26	.51 (1, 3)

*Percentage reflects proportion of the number of visits that the site (health facility) contributed to the total of the 2,158 visits (India=1,294; Kenya=864).

Integration by facility and service area

Figures 2 and **3** display the proportion of visits where clients received integrated MNCH-FP services, by facility (**Figure 2**) and by MNCH service area within each facility (**Figure 3**). MNCH-FP integration varied widely by facility (see **Online Table S1** for total and proportion of all visits where clients received integrated MNCH and FP services by facility, and **Online Table S2** for proportion of MNCH visits where clients received integrated MNCH-FP services by service area). In India, receipt of MNCH-FP integrated services ranged from 16.3% of MNCH client visits in Bihar Hospital 2 to 63% in Jharkhand Hospital 1. In Kenya, only 5.5% of MNCH visits in Embu Hospital reflected MNCH-FP integration, compared to 14.8% in the Bondo Hospital and 57.1% in Bondo Health Center 2.

In India, analysis by service area showed higher levels of FP integration with ANC services versus PNC or child health. In Bihar, 28.1–35.2% of clients receiving ANC services also received FP services. By contrast, only 0–10.9% of clients receiving PNC and 2.2–4.1% of clients receiving child health services also received FP services. In Jharkhand, 71.1–73.2% of clients accessing ANC also receiving FP; but, PNC-FP integration was also relatively high at 60% of clients accessing PNC. In Jharkhand, child health-FP integration was quite different between the two hospitals, with 55.7% of clients accessing child health services in Jharkhand Hospital 1 but only 6.2% in Jharkhand Hospital 2.

In Kenya, Bondo health centers recorded higher integration across all MNCH service areas than Bondo Hospital. Across ANC, PNC, and child health services in each of the Bondo health centers, 40% to 85% of clients in each service area also received FP services. By contrast, at Bondo Hospital only 1.8% of clients accessing ANC, about one-third (34.5%) of clients accessing PNC, and one-fifth (20.2%) of clients accessing child health also received FP services. Embu sites showed greater FP integration with ANC (14.3–28.6% of ANC clients) than in other service areas such as child health (3.1–10.5% of child health clients).

Integration models

Table 3 outlines the percentage of clients receiving integrated MNCH-FP services from a single provider versus multiple co-located providers, demonstrating a stark difference by site and service area. Bihar Hospital 2 showed that nearly all (97.9%) clients who received both ANC and FP received both services from a single provider, compared to only a quarter (24.6%) at Bihar Hospital 1. In Jharkhand Hospital 1, 38.9% of ANC clients who received FP counseling did so from the same ANC provider, whereas in Jharkhand Hospital 2 virtually none (1.4%) received both services from a single provider.

In Bondo Hospital in Kenya, ANC-FP integration was too rare to draw inferences, but in PNC and child health, about half (50%, 48%, respectively) of FP integration was provided by a single provider. In Bondo health centers, single provider integration was even more prevalent; Bondo

Health Center 2 recorded 100% of ANC-FP clients, 94.1% of PNC-FP clients, and 91.7% of child health-FP clients received these services from just one provider. In the hospital in Embu, the majority of FP integration (80% in ANC and 71.4% in child health) was carried out by a single provider. Embu health centers had too few clients receiving integrated services to evaluate.

Table 3: Total integrated MNCH-FP visits and visits in which those services were received from a single provider, by service area and facility

	Bihar Hospital #1		Bihar Hospital #2		Jharkhand Hospital #1		Jharkhand Hospital #2		Bondo Hospital		Bondo Health Center #1		Bondo Health Center #2		Embu Hospital		Embu Health Center #1		Embu Health Center #2	
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
Total ANC-FP visits	69		48		90		69		1		4		9		10		2		2	
ANC and FP services both received from a single provider	**17**	**(24.6%)**	**47**	**(97.9%)**	**35**	**(38.9%)**	**1**	**(1.4%)**	**1**	*	**3**	*	**9**	**(100%)**	**8**	**(80.0%)**	**2**	*	**2**	*
Total PNC-FP visits	8		0		21		9		10		4		17		0		1		0	
PNC and FP services both received from a single provider	**0**	**(0.0%)**	**0**	*	**13**	**(61.9%)**	**0**	**(0.0%)**	**5**	**(50.0%)**	**3**	*	**16**	**(94.1%)**	**0**	*	**1**	*	**0**	*
Total child health-FP visits	18		3		59		8		25		22		36		7		3		2	
Child health and FP services both received from a single provider	**2**	**(11.1%)**	**1**	*	**26**	**(44.1%)**	**1**	**(12.5%)**	**12**	**(48.0%)**	**12**	**(54.5%)**	**33**	**(91.7%)**	**5**	**(71.4%)**	**3**	*	**1**	*

* Insufficient number of visits (<5) to calculate a meaningful percentage

Client characteristics as predictors of receipt of integrated services

A logistic regression model (**Table 4**) examining client characteristics as predictors of MNCH-FP integration estimates that the odds of integration are roughly half for clients traveling between 30–59 minutes than for those traveling less than 30 minutes after adjusting for country, whether the client attended with a child, client's age, length of time spent at facility, and numbers of providers seen (OR .520, 95% CI 0.408–0.662, p<0.001). Similarly, the odds of integration for clients traveling more than an hour are 0.4 times the odds of integration for clients traveling less than 30 minutes to the facility (95% CI 0.281–0.592, p<0.001). The odds of integration are 2.369 times higher for each additional provider seen at the facility after controlling for country, attendance with a child, client's age, length of time spent at facility, and length of time spent traveling to facility (95% CI 1.509–3.717, p<0.001). Length of time spent at the facility is not significantly associated with receipt of MNCH-FP integrated services.

Table 4: Multiple logistic regression model of client characteristics as predictors of MNCH-FP integration

Client Characteristics	Odds Ratio	[95% CI]
Country		
Kenya vs. India (reference)	0.948	[0.211, 4.252]
Type of client		
Child/Adult with child vs. Adult alone (reference)	0.858	[0.438, 1.678]
Mother's age (years): for every 1 year increment	0.985	[0.931, 1.043]
Length of time spent traveling to facility (minutes):		
30-59 minutes vs. <30 minutes (reference)	0.520***	[0.408, 0.662]
60 or more vs. < 30 minutes (reference)	0.408***	[0.281, 0.592]
Length of time spent at facility (minutes):		
15-29 minutes vs. <15 minutes (reference)	1.633	[0.808, 3.301]
30-59 minutes vs. <15 minutes (reference)	1.684	[0.743, 3.817]
60-89 minutes vs. <15 minutes (reference)	1.315	[0.542, 3.191]
90-119 minutes vs. <15 minutes (reference)	1.304	[0.466, 3.647]
2 hours or more vs. <15 minutes (reference)	1.971	[0.746, 5.206]
Number of providers seen at facility (1 to 5): for each additional provider	2.369***	[1.509, 3.717]
N=2118		

Exponentiated coefficients; 95% confidence intervals in brackets
* p<0.05, ** p<0.01, *** p<0.001

Integration as predictor of client experiences

A multivariate regression model was used to estimate the association between MNCH-FP integration and time spent at the facility (**Table 5**), adjusting for other patient characteristics (country, whether or not a client attended with a child, client's age, and length of time spent traveling to the facility). The model estimates that time spent at the facility increased by 10.5 minutes for patients with MNCH-FP integration versus patients accessing MNCH services without FP services, but the association was not statistically significant (95% CI −0.952–21.92). Clients traveling 30–59 minutes to the facility spent 10.2 minutes longer at the visit than those who traveled less than 30 minutes (95% CI 1.916–18.52, p<0.05). Similarly, clients who traveled over an hour to get to the facility spent 16.6 more minutes at the visit than those clients who traveled less than 30 minutes (95% CI 4.754–28.54, p<.01). Whether or not a client attended with a child, or the client's age were not statistically significant predictors of length of visit.

Table 5: Regression model of MNCH-FP integration as predictor of length of time spent at facility

Variables	Coefficient	[95% CI]
MNCH-FP integration vs. MNCH services only	10.48	[-0.952, 21.920]
Country		
Kenya vs. India (reference)	31.91*	[0.529, 63.290]
Type of client		
Child/Adult with child vs. Adult alone (reference)	-3.281	[-9.800, 3.239]
Mother's age (years): for every 1 year increment	0.325	[-0.586, 1.235]
Length of time spent traveling to facility (minutes):		
30-59 minutes vs. <30 minutes (reference)	10.22*	[1.916, 18.520]
60 or more vs. <30 minutes (reference)	16.65**	[4.754, 28.540]
N=2118		

95% confidence intervals in brackets
* p<0.05, ** p<0.01

DISCUSSION

Findings suggest the importance of targeted programmatic support for integration along each point on the continuum of care. Results show that FP integration tended to be most prominent in the MNCH service area(s) that received support for integration and for the most part was not in evidence within non-targeted facility service areas at the same levels. In Bondo, Kenya, where the MIYCN-FP intervention model emphasized integration across ANC, PNC, and child health, high levels of FP integration were found across all three service delivery platforms (with the exception of Bondo Hospital, where integration lagged particularly in ANC). In sites where PPIUD interventions emphasized PPFP counseling during ANC (Bihar and Jharkhand, India; Embu, Kenya), levels of FP integration were higher in ANC than PNC or child health. In Embu,

where PNC-FP integration also took place, PNC visits at health centers were too infrequent to analyze and the few PNC visits at the hospital showed no FP integration, possibly due to attrition in service integration over time. Sites with the largest lag between the program intervention period and the client flow assessment (Embu) recorded the lowest levels of MNCH-FP integration, suggesting the need for better means of institutionalizing and sustaining interventions. This is consistent with prior research by the Integra Initiative noting declines over time in facility integration scores.[25]

Strengths of the study included the large sample size and use of the client flow method providing detailed information on combination of services clients received. Compared to other measures of service delivery like quality of care/observation surveys and readiness assessments, this approach reflects a simpler, less labor-intensive way to document individuals' receipt of integrated care. While client exit surveys could provide similar information, having the provider fill out the checklist may provide more accurate data by avoiding client recall or social acceptability bias.

One challenge was devising a one-page tool with a limited checklist of items that nonetheless captured multiple dimensions of MNCH and FP service integration across different settings. For future assessments, it would be useful to distinguish between ANC 1 and later ANC visits, since ANC 1 is less likely to include FP counseling. In addition, our client flow tool had categories of child health and nutrition services that may have been difficult for providers to interpret. For example, the form contained "iron/folate-child," but children typically receive only iron supplements if needed and not folate; it also lacked a checkbox for treatment of sick children. The tool could be modified to have clearer child health service categories.

Similar to limitations discussed by the Integra Initiative, a "snapshot" of a five-day period at a facility may not represent a "typical" client flow, if a typical pattern exists.[9] In Kenya, a polio campaign took place concurrently with data collection, resulting in staff disruption. Despite daily orientation by the study teams to mitigate changes in staff assignments, providers sometimes told clients they were too busy to complete the form and left sections blank. Data collection must strike a balance between collecting sufficient information and practicality of gathering data.

Overall, the extent to which integration occurs can be a result of how services are organized, the health system context, and how well services inherently fit together. A review of interventions to improve PPFP in low- and middle-income countries found evidence that integration of FP with other platforms like immunization and PMTCT may increase PPFP knowledge and uptake.[6] However, there remains need for larger studies in low-resource settings on effective means of consistent and systematic PPFP implementation.[18] Human resource constraints can affect delivery of integrated services, such as when providers from the service delivery areas being integrated are not available in the same facility at the same time.[26] Evidence suggests the importance of repeated contact points; one review concluded that single, short FP counseling

sessions during ANC are insufficient to increase uptake of PPFP, but FP integration across ANC and PNC can sizably increase uptake in the first year postpartum.[5] Our study adds a more detailed snapshot of the combinations of services provided to pregnant and postpartum women and degree of service integration at the client level among facilities engaged in different models of PPFP interventions. Findings reinforce the importance of integrating FP counseling and services throughout the continuum of care and the continued need to increase PNC coverage in general.

From the client perspective, clients who accessed integrated MNCH-FP services spent an average of only ten minutes longer at the health facility than those who accessed MNCH services alone. This contrasts with findings from the FP-HIV integration field that quantified a significant increase in waiting times of clients in integrated facilities versus comparison sites.[27] Within a facility, MNCH-FP integration may not impose a greater time burden on clients. Additional research could explore underlying factors, such as whether this reflects achievement of efficiency in integrated service delivery; an unintended consequence with implications for quality of care in which multiple services are provided, but in a cursory fashion; or other factors altogether. Findings suggest that attention should be given to the needs of clients living furthest away from a facility, as they seem least likely to receive integrated services. A multi-country study of child health and access to health facilities in low- and middle-income countries found that lengthy travel distances are associated with decreased utilization of health services and poorer health outcomes.[28] Our data indicates that differences in receipt of care may persist even after arrival at a facility. Whether this is due to provider perceptions that these clients do not have sufficient time to access integrated services or clients exhibiting concern about time limitations at the facility warrants further exploration.

CONCLUSION

This study offers further support for the utility of a client flow tool to assess whether integrated services are being accessed as intended in service delivery settings. At many facilities, FP integration was highest in service delivery areas receiving specific programmatic support and lower in areas that did not receive attention, highlighting the importance of focused programmatic support specific to distinct service delivery areas. Our results suggest there is also a need to address how to better sustain integration once an intervention has ended. Findings provide cautious optimism that integration does not lead to greater waiting times for clients accessing integrated MNCH-FP services in these settings. Results point to the vulnerability of clients living furthest away who were least likely to access integrated services, reinforcing calls for emphasis on last-mile interventions. The client flow tool may hold promise as a component of baseline and endline assessments, studies for integration-focused programs, or as another tool for health facility assessments to examine consistency of service integration and characteristics of clients receiving integrated services.

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AUTHORS' CONTRIBUTIONS
Devon Mackenzie: Managed adaptation of the client flow tool, assisted with training of data collectors in Kenya, led the cleaning and analysis of client flow data, and drafted the manuscript.
Anne Pfitzer: Principal investigator on the study and led study design and training of research teams, provided input on analysis and interpretation, and assisted in drafting the manuscript.
Christina Maly: Assisted with study design and training of data collectors in India, provided input on data interpretation, and assisted in drafting the manuscript.
Charles Waka: Managed setup and data entry, cleaning, and coding of data through the Research Electronic Data Capture (REDCap) system, assisted in drafting the manuscript.
Gajendra Singh: Contributed to data cleaning, provided input on and conducted data analysis.
Abanti Sanyal: Conducted regression analyses of data.

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All authors have completed the ICMJE uniform disclosure form at www.icmje.org/coi_disclosure.pdf and declare: no support from any organization for the submitted work; no financial relationships with any organizations that might have an interest in the submitted work in the previous 3 years; no other relationships or activities that could appear to have influenced the submitted work.

REPORTING STATEMENT

The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement completed for this article is included as a supplementary file (see **Supplementary File – STROBE Checklist**).

DATA SHARING STATEMENT

Extra data can be accessed via the Dryad data repository at http://datadryad.org/ with the doi: 10.5061/dryad.11313

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Appendices/Supplementary Files:

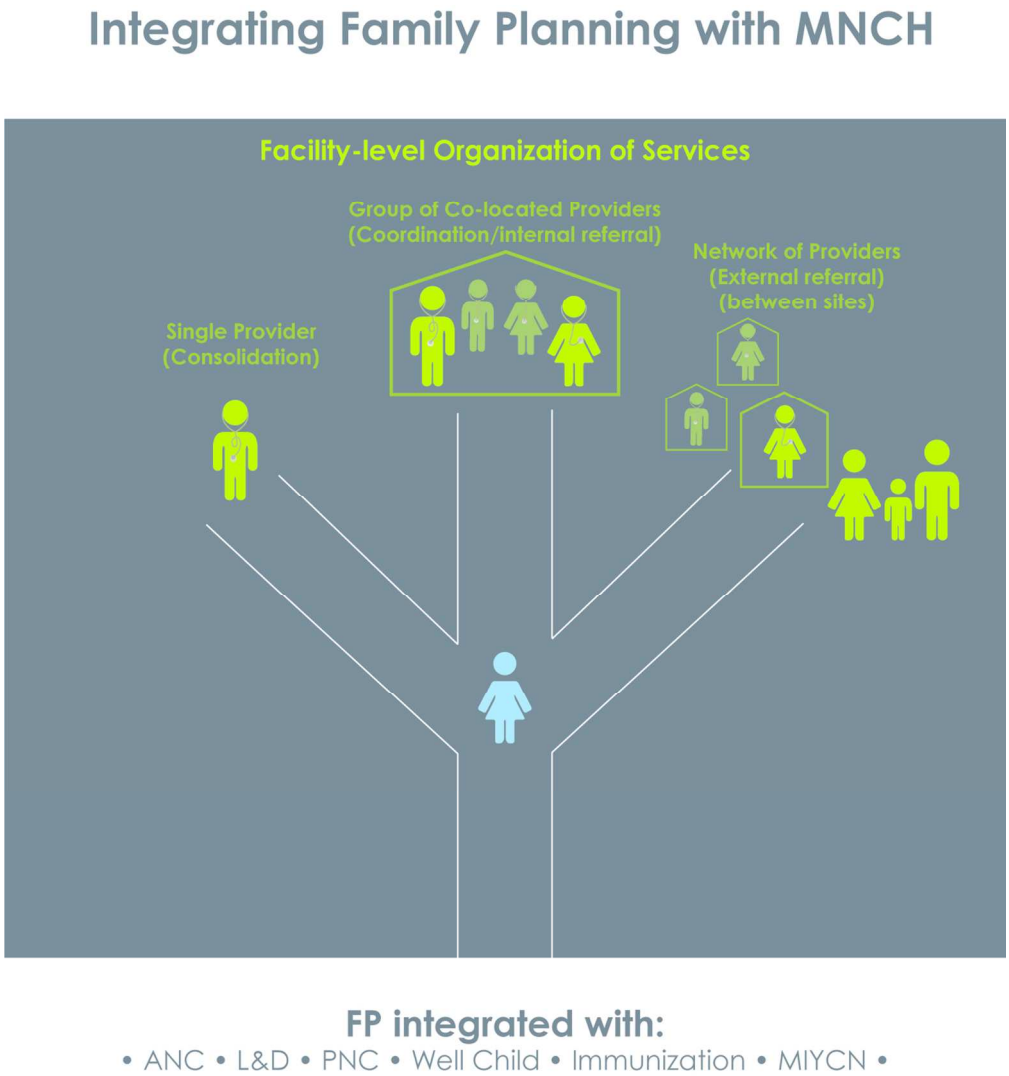
1. STROBE Checklist
2. Online Table S1: Total and proportion of visits where client received integrated MNCH and FP services, by facility
3. Online Table S2: Proportion of integrated MNCH-FP visits by MNCH service area and facility
4. Integration Client Flow Form

Figure Titles:

Figure 1: Types of Service Integration at the Facility Level

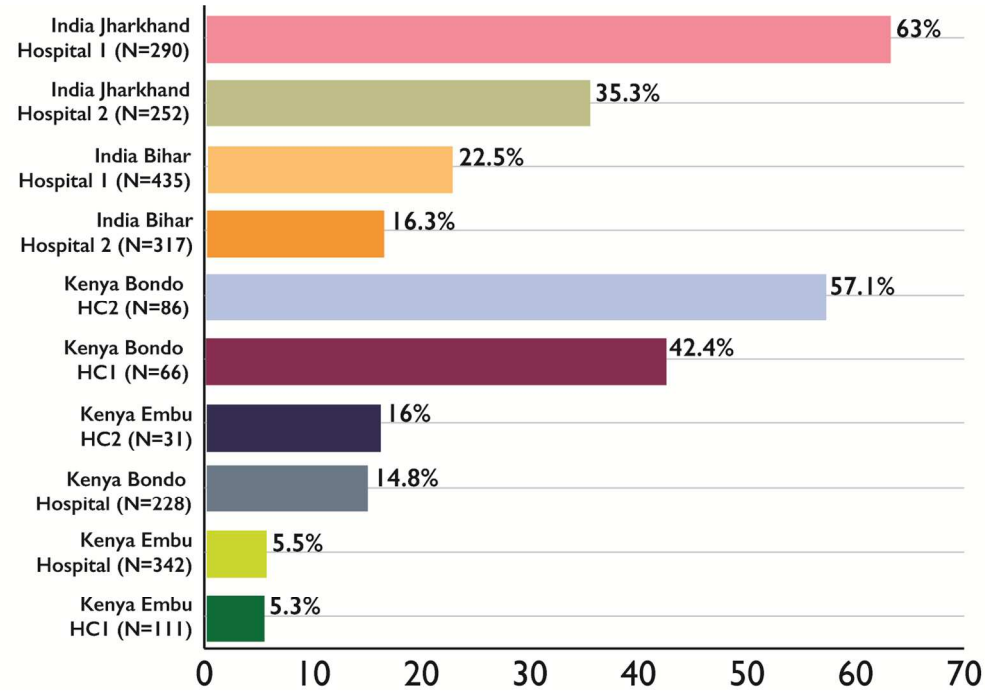
Figure 2. Percentage of client visits with integrated MNCH and FP services received (out of MNCH visits)

Figure 3. Percentage of integrated MNCH and FP visits by MNCH service area and facility



Types of Service Integration at the Facility Level

117x126mm (300 x 300 DPI)



Percentage of client visits with integrated MNCH and FP services received (out of MNCH visits)

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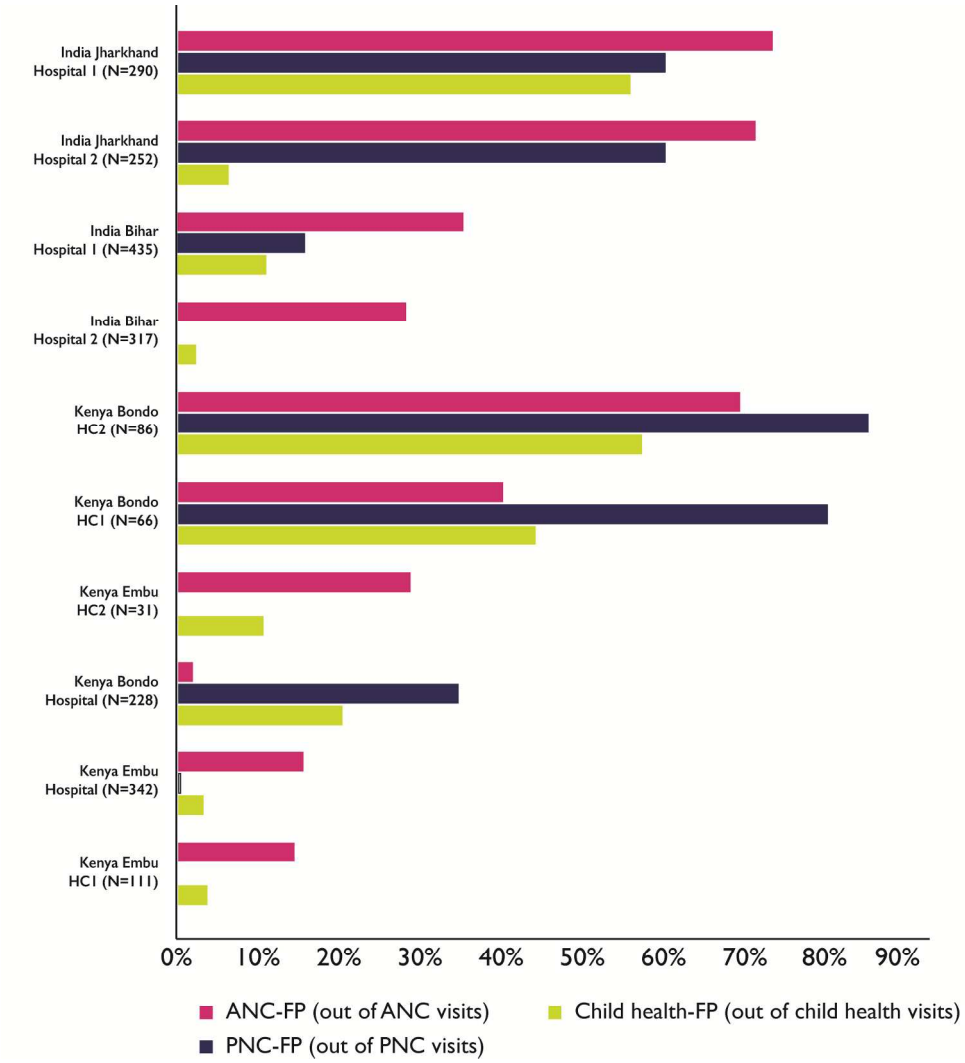

Percentage of integrated MNCH and FP visits by MNCH service area and facility

183x193mm (300 x 300 DPI)

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3-4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4-5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-7
Bias	9	Describe any efforts to address potential sources of bias	14
Study size	10	Explain how the study size was arrived at	5-6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6-7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	N/A
		(*c*) Explain how missing data were addressed	6
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	N/A
		(*e*) Describe any sensitivity analyses	N/A
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	6-7
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8
		(b) Indicate number of participants with missing data for each variable of interest	Not presented
Outcome data	15*	Report numbers of outcome events or summary measures	9-13
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Adjusted estimates (95% CI) presented 12, 13
		(*b*) Report category boundaries when continuous variables were categorized	N/A
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	13-14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	14
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	14-15
Generalisability	21	Discuss the generalisability (external validity) of the study results	Not presented
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	16

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Online Table S1: Total and proportion of visits where client received integrated MNCH and FP services, by facility

Facility	**Bihar Hospital #1**		**Bihar Hospital #2**		**Jharkhand Hospital #1**		**Jharkhand Hospital #2**		**Bondo Hospital**		**Bondo Health Center #1**		**Bondo Health Center #2**		**Embu Hospital**		**Embu Health Center #1**		**Embu Health Center #2**	
Number of visits	**n=435**		**n=317**		**n=290**		**n=252**		**n=228**		**n=66**		**n=86**		**n=342**		**n=111**		**n=31**	
Services	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
Integration of MNCH (ANC, PNC, and/or child health) and FP during client visit	**89**	**(20.5%)**	**51**	**(16.1%)**	**153**	**(52.8%)**	**83**	**(32.9%)**	**27**	**(11.8%)**	**25**	**(37.9%)**	**44**	**(51.2%)**	**16**	**(4.7%)**	**5**	**(4.5%)**	**4**	**(12.9%)**
ANC and FP received during visit (out of all visits)	69	(15.9%)	48	(15.1%)	90	(31.0%)	69	(27.4%)	1	(0.4%)	4	(6.1%)	9	(10.5%)	10	(2.9%)	2	(1.8%)	2	(6.5%)
PNC and FP received during visit (out of all visits)	8	(1.8%)	0	(0.0%)	21	(7.2%)	9	(3.6%)	10	(4.4%)	4	(6.1%)	17	(19.8%)	0	(0.0%)	1	(0.9%)	0	(0.0%)
Child health and FP received during visit (out of all visits)	18	(4.1%)	3	(0.9%)	59	(20.3%)	8	(3.2%)	25	(11.0%)	22	(33.3%)	36	(41.9%)	7	(2.0%)	3	(2.7%)	2	(6.5%)
Integration of FP and cross-cutting service areas																				
HIV and FP received during visit (out of all visits)	55	(12.6%)	0	(0.0%)	64	(22.1%)	1	(0.4%)	2	(0.9%)	2	(3.0%)	10	(11.6%)	2	(0.6%)	5	(4.5%)	1	(3.2%)
Nutrition and FP received during visit (out of all visits)	4	(0.9%)	3	(0.9%)	73	(25.2%)	2	(0.8%)	21	(9.2%)	22	(33.3%)	46	(53.5%)	14	(4.1%)	4	(3.6%)	2	(6.5%)

Notes:
MNCH includes: ANC, PNC (PNC-mother and/or PNC-baby) and/or child health (child immunization, child weighing/MUAC, iron folate-child, vitamin A-child, and/or child health)
FP includes: FP counseling, LAM counseling, and/or FP services
HIV includes: HIV counseling/testing, HIV care, PMTCT, STI screening, and/or STI treatment
Nutrition includes: MIYCN counseling, MIYCN support, iron folate-mother, iron folate-child, and/or vitamin A-child

Totals for integration of MNCH and FP do not equal the sum of ANC-FP, PNC-FP, and child health-FP visits due to some overlap between these categories

Online Table S2: Proportion of integrated MNCH-FP visits by MNCH service area and facility

	Bihar Hospital #1		Bihar Hospital #2		Jharkhand Hospital #1		Jharkhand Hospital #2		Bondo Hospital		Bondo Health Center #1		Bondo Health Center #2		Embu Hospital		Embu Health Center #1		Embu Health Center #2	
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
MNCH visits	396		313		243		235		182		59		77		290		95		25	
MNCH and FP services received	**89**	**(22.5%)**	**51**	**(16.3%)**	**153**	**(63.0%)**	**83**	**(35.3%)**	**27**	**(14.8%)**	**25**	**(42.4%)**	**44**	**(57.1%)**	**16**	**(5.5%)**	**5**	**(5.3%)**	**4**	**(16.0%)**
ANC visits	196		171		123		97		57		10		13		65		14		7	
ANC and FP received	**69**	**(35.2%)**	**48**	**(28.1%)**	**90**	**(73.2%)**	**69**	**(71.1%)**	**1**	**(1.8%)**	**4**	**(40.0%)**	**9**	**(69.2%)**	**10**	**(15.4%)**	**2**	**(14.3%)**	**2**	**(28.6%)**
PNC visits	51		5		35		15		29		5		20		19		1		0	
PNC and FP received	**8**	**(10.9%)**	**0**	**(0.0%)**	**21**	**(60.0%)**	**9**	**(60.0%)**	**10**	**(34.5%)**	**4**	**(80.0%)**	**17**	**(85.0%)**	**0**	**(0.0%)**	**1**	**(n/a)**	**0**	**(n/a)**
Child health visits	165		137		106		130		124		50		63		224		83		19	
Child health and FP received	**18**	**(4.1%)**	**3**	**(2.2%)**	**59**	**(55.7%)**	**8**	**(6.2%)**	**25**	**(20.2%)**	**22**	**(44.0%)**	**36**	**(57.1%)**	**7**	**(3.1%)**	**3**	**(3.6%)**	**2**	**(10.5%)**

Notes:

MNCH includes: ANC, PNC (PNC-mother and/or PNC-baby) and/or child health (child immunization, child weighing/MUAC, iron folate-child, vitamin A-child, and/or child health)
FP includes: FP counseling, LAM counseling, and/or FP services

Totals for integration of MNCH and FP do not equal the sum of ANC-FP, PNC-FP, and child health-FP visits due to some overlap between these categories

Non-MNCH visits excluded from the denominator in this table consist of any visits in which the client did not receive any ANC, PNC, or child health services as defined above during their visit, but accessed other services such as HIV, nutrition, or laboratory tests (HIV counseling/testing; HIV care; PMTCT; STI screening; STI treatment; TB care/treatment; maternal, infant and young child nutrition counseling; maternal, infant, and young child nutrition support; iron folate-mother; dispensing drugs, laboratory test).

INTEGRATION CLIENT FLOW FORM – Tool 5b

Client #: ☐☐/☐☐☐

Facility Code: _____ **Date (DD-MM-YY):** ___ – ___ – ___

Client Arrival Time: ___:___ **Client Type:** ☐ Adult (alone) ☐ Child/Adult w/child (child's age:____months)

Mother's Age: _____ **Time spent traveling from home/residence to facility:** ___ hours ___ minutes

Client End Time: ____:___

Instructions to client: Please take this form to each nurse, doctor, or other service provider that you see during your visit at this facility today. Please hand the form back to one of the interviewers before you leave the facility.

Instructions to providers: When client gives you this form, please find first **un-checked** section for provider and tick box (1st provider, 2nd provider, etc.). Provider services as you would normally do. At the end of the session, tick the appropriate box for consultation time (short, normal, or extended), located next to 'Provider seen.' For section A, tick any of the services that you provided to the client. Section B asks about *internal* referrals: if you refer the client to services inside the **same** health facility, tick the appropriate box(es). If you do not refer the client to other services, leave this question blank. Section C asks about *external* referrals: indicate if you refer the client to a provider or a health facility elsewhere.

1. Purpose of visit (tick ALL that apply):
[To be filled by Study Team who will ask client]

☐ Antenatal care (ANC)
☐ Postnatal care (PNC)
☐ Sick child visit
☐ Immunization or well child visit
☐ Family planning counseling / provision
☐ Nutrition assessment, counseling, or treatment
☐ STI/HIV counseling, testing, or care
☐ Laboratory
☐ Pharmacy
☐ Other (specify): _____

☐ 1st Provider seen

Consultation time: ☐ Short ☐ Normal ☐ Extended

1A. What service(s) did you provide? (tick ALL that apply)

☐ Antenatal care
☐ Postnatal check–mother
☐ Postnatal check–baby
☐ Child immunization
☐ FP counseling
☐ LAM counseling
☐ FP provision
☐ HIV counseling/testing
☐ HIV care (pre ART or ART)
☐ PMTCT
☐ STI screening
☐ STI treatment
☐ TB care/treatment
☐ Child weighing/MUAC
☐ Maternal, Infant Young Child Nutrition counseling
☐ Maternal, Infant Young Child Nutrition support
☐ Iron folate–mother
☐ Iron folate–child
☐ Vitamin A–child
☐ Dispensing drugs
☐ Laboratory test
☐ Other (specify): _____

1B. What services did you refer the client to at your facility?
(tick ALL that apply)

☐ Antenatal care
☐ Postnatal check–mother
☐ Postnatal check–baby
☐ Child immunization
☐ FP counseling
☐ FP provision
☐ HIV counseling/testing
☐ HIV care (pre ART or ART)
☐ PMTCT
☐ STI screening
☐ STI treatment
☐ TB care/treatment
☐ Maternal, Infant Young Child Nutrition counseling
☐ Maternal, Infant Young Child Nutrition support
☐ Iron folate–mother
☐ Iron folate–child
☐ Child weighing/MUAC
☐ Vitamin A–child
☐ Pharmacy (drugs/FP pills)
☐ Laboratory test
☐ Other:_____

1C. Did you refer the client to another facility? ☐Y ☐N

☐ 2nd Provider seen

Consultation time: ☐ Short ☐ Normal ☐ Extended

2A. What service(s) did you provide? (tick ALL that apply)

☐ Antenatal care
☐ Postnatal check–mother
☐ Postnatal check–baby
☐ Child immunization
☐ FP counseling
☐ LAM counseling
☐ FP provision
☐ HIV counseling/testing
☐ HIV care (pre ART or ART)
☐ PMTCT
☐ STI screening
☐ STI treatment
☐ TB care/treatment
☐ Child weighing/MUAC
☐ Maternal, Infant Young Child Nutrition counseling
☐ Maternal, Infant Young Child Nutrition support
☐ Iron folate–mother
☐ Iron folate–child
☐ Vitamin A–child
☐ Dispensing drugs
☐ Laboratory test
☐ Other (specify): _____

2B. What services did you refer the client to at your facility?
(tick ALL that apply)

☐ Antenatal care
☐ Postnatal check–mother
☐ Postnatal check–baby
☐ Child immunization
☐ FP counseling
☐ FP provision
☐ HIV counseling/testing
☐ HIV care (pre ART or ART)
☐ PMTCT
☐ STI screening
☐ STI treatment
☐ TB care/treatment
☐ Maternal, Infant Young Child Nutrition counseling
☐ Maternal, Infant Young Child Nutrition support
☐ Iron folate–mother
☐ Iron folate–child
☐ Child weighing/MUAC
☐ Vitamin A–child
☐ Pharmacy (drugs/FP pills)
☐ Laboratory test
☐ Other:_____

2C. Did you refer the client to another facility? ☐Y ☐N

☐ 3rd Provider seen — Consultation time: ☐ Short ☐ Normal ☐ Extended

3A. What service(s) did you provide? (tick ALL that apply)

- ☐ Antenatal care
- ☐ Postnatal check–mother
- ☐ Postnatal check–baby
- ☐ Child immunization
- ☐ FP counseling
- ☐ LAM counseling
- ☐ FP provision
- ☐ HIV counseling/testing
- ☐ HIV care (pre ART or ART)
- ☐ PMTCT
- ☐ STI screening
- ☐ STI treatment
- ☐ TB care/treatment
- ☐ Child weighing/MUAC
- ☐ Maternal, Infant Young Child Nutrition counseling
- ☐ Maternal, Infant Young Child Nutrition support
- ☐ Iron folate–mother
- ☐ Iron folate–child
- ☐ Vitamin A–child
- ☐ Dispensing drugs
- ☐ Laboratory test
- ☐ Other (specify): _____

3B. What services did you refer the client to at your facility?

(tick ALL that apply)

- ☐ Antenatal care
- ☐ Postnatal check–mother
- ☐ Postnatal check–baby
- ☐ Child immunization
- ☐ FP counseling
- ☐ FP provision
- ☐ HIV counseling/testing
- ☐ HIV care (pre ART or ART)
- ☐ PMTCT
- ☐ STI screening
- ☐ STI treatment
- ☐ TB care/treatment
- ☐ Maternal, Infant Young Child Nutrition counseling
- ☐ Maternal, Infant Young Child Nutrition support
- ☐ Iron folate–mother
- ☐ Iron folate–child
- ☐ Child weighing/MUAC
- ☐ Vitamin A–child
- ☐ Pharmacy (drugs/FP pills)
- ☐ Laboratory test
- ☐ Other: _____

3C. Did you refer the client to another facility? ☐ Y ☐ N

☐ 4th Provider seen — Consultation time: ☐ Short ☐ Normal ☐ Extended

4A. What service(s) did you provide? (tick ALL that apply)

- ☐ Antenatal care
- ☐ Postnatal check–mother
- ☐ Postnatal check–baby
- ☐ Child immunization
- ☐ FP counseling
- ☐ LAM counseling
- ☐ FP provision
- ☐ HIV counseling/testing
- ☐ HIV care (pre ART or ART)
- ☐ PMTCT
- ☐ STI screening
- ☐ STI treatment
- ☐ TB care/treatment
- ☐ Child weighing/MUAC
- ☐ Maternal, Infant Young Child Nutrition counseling
- ☐ Maternal, Infant Young Child Nutrition support
- ☐ Iron folate–mother
- ☐ Iron folate–child
- ☐ Vitamin A–child
- ☐ Dispensing drugs
- ☐ Laboratory test
- ☐ Other (specify): _____

4B. What services did you refer client to at your facility?

(tick ALL that apply)

- ☐ Antenatal care
- ☐ Postnatal check–mother
- ☐ Postnatal check–baby
- ☐ Child immunization
- ☐ FP counseling
- ☐ FP provision
- ☐ HIV counseling/testing
- ☐ HIV care (pre ART or ART)
- ☐ PMTCT
- ☐ STI screening
- ☐ STI treatment
- ☐ TB care/treatment
- ☐ Maternal, Infant Young Child Nutrition counseling
- ☐ Maternal, Infant Young Child Nutrition support
- ☐ Iron folate–mother
- ☐ Iron folate–child
- ☐ Child weighing/MUAC
- ☐ Vitamin A–child
- ☐ Pharmacy (drugs/FP pills)
- ☐ Laboratory test
- ☐ Other: _____

4C. Did you refer the client to another facility? ☐ Y ☐ N

☐ 5th Provider seen — Consultation time: ☐ Short ☐ Normal ☐ Extended

5A. What service(s) did you provide? (tick ALL that apply)

- ☐ Antenatal care
- ☐ Postnatal check–mother
- ☐ Postnatal check–baby
- ☐ Child immunization
- ☐ FP counseling
- ☐ LAM counseling
- ☐ FP provision
- ☐ HIV counseling/testing
- ☐ HIV care (pre ART or ART)
- ☐ PMTCT
- ☐ STI screening
- ☐ STI treatment
- ☐ TB care/treatment
- ☐ Child weighing/MUAC
- ☐ Maternal, Infant/Young Child Nutrition counseling
- ☐ Maternal, Infant Young Child Nutrition support
- ☐ Iron folate–mother
- ☐ Iron folate–child
- ☐ Vitamin A–child
- ☐ Dispensing drugs
- ☐ Laboratory test
- ☐ Other (specify): _____

5B. What services did you refer client to at your facility?

(tick ALL that apply)

- ☐ Antenatal care
- ☐ Postnatal check–mother
- ☐ Postnatal check–baby
- ☐ Child immunization
- ☐ FP counseling
- ☐ FP provision
- ☐ HIV counseling/testing
- ☐ HIV care (pre ART or ART)
- ☐ PMTCT
- ☐ STI screening
- ☐ STI treatment
- ☐ TB care/treatment
- ☐ Maternal, Infant/Young Child Nutrition counseling
- ☐ Maternal, Infant Young Child Nutrition support
- ☐ Iron folate–mother
- ☐ Iron folate–child
- ☐ Child weighing/MUAC
- ☐ Vitamin A–child
- ☐ Pharmacy (drugs/FP pills)
- ☐ Laboratory test
- ☐ Other: _____

5C. Did you refer the client to another facility? ☐ Y ☐ N

Thank you!