Bladder Care and Management of Prolonged/Obstructed Labor

A 2017 GLOBAL SURVEY OF INTRAPARTUM AND POSTPARTUM CLINICAL PRACTICES

USAID FROM THE AMERICAN PEOPLE

Fistula Care *Plus*

EngenderHealth for a better life

Fistula Care *Plus* (FC+)
c/o EngenderHealth
1875 Connecticut Ave NW
Washington, DC 20009
Telephone: 1-202-902-2000
Fax: 1-202-783-0281
Email: fistulacare@engenderhealth.org
www.fistulacare.org

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List of Acronyms

BEmONC	Basic Emergency Obstetric And Newborn Care
CEmONC	Comprehensive Emergency Obstetric and Newborn Care
ECSA-HC	East, Central, Southern African Health Community
EmONC	Emergency Obstetric and Newborn Care
FC+	Fistula Care *Plus* Project
FIGO	International Federation of Gynecology and Obstetrics
ICM	International Confederation of Midwives
L&D	labor and delivery
LMICs	low- and middle-income countries
MCHIP	Maternal and Child Health Integrated Program
ob-gyn	obstetrician-gynecologist
P/OL	prolonged/obstructed labor
SBA	skilled birth attendant
UC	urinary catheterization
UTI	urinary tract infection
WHO	World Health Organization

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Executive Summary

Bladder care is an important part of intrapartum care. Clinical guidelines recommend that patients void every two to four hours throughout labor and that providers use urinary catheterization (UC) for two weeks on patients who experience prolonged/obstructed labor (P/OL) to prevent obstetric fistula (East, Central, Southern African Health Community (ECSA-HC) and Fistula Care/EngenderHealth, 2012) (Lewis & DeBernis, 2006). Despite these recommendations, there is little data available about the current knowledge and practices of skilled birth attendants (SBAs) regarding intrapartum and postpartum bladder care and the use of UC to manage P/OL. To help build the evidence base for UC in relation to fistula prevention and treatment, the Fistula Care *Plus* (FC+) project conducted a key informant survey of SBAs to better understand how maternity providers in low- and middle-income countries (LMICs) provide intrapartum and postpartum bladder care and manage P/OL.

FC+ based the survey design on existing labor and delivery (L&D) clinical guidelines and nursing/midwifery training curricula and administered it in French and English using SurveyMonkey Inc. (a free, online platform), between May and October in 2017. The project employed a purposive/snowball sampling approach. SBAs who had attended a live birth within the past three years and who practice in a LMIC were eligible to participate. FC+ used Stata v12 to analyze survey data and generate descriptive summaries of key informant characteristics, knowledge, and practices. FC+ conducted chi-square tests of independence to identify significant disparities by region, facility type, and geography.

Respondents (n=222) were primarily midwives (61%) and obstetricians-gynecologists (ob-gyns)(15%) operating in Africa (56%) and South-East Asia[1] (39%). A majority of respondents reported employing many of the recommended practices related to intrapartum and postpartum bladder care and P/OL management. Specifically, most respondents reported using a partograph to monitor labor (99%), monitoring voiding frequency for postpartum patients (95%), and utilizing UC after P/OL (94%). While there was some variation in how respondents defined P/OL, most had a strong understanding of the criteria used to identify P/OL and its' potential outcomes. Despite this, the survey revealed a lack of facility protocols for SBAs on providing intrapartum and postpartum bladder care and management of P/OL, as well as a notable difference in in-service training, utilization of clinical practices, and availability of supplies between regions, facility types, and geographies.

The findings revealed a strong foundation for improving and standardizing intrapartum and postpartum bladder care and P/OL management. While variations in practices exposed where SBA training can be strengthened to promote widespread adoption of quality and effective intrapartum and postpartum practices, SBA reports indicated that UC after P/OL is feasible and acceptable, meaning that its systematic practice can be scaled up to prevent obstetric fistula and other sequelae of P/OL in low-resource settings. However, SBAs (particularly midwives) need additional support, including facility protocols, in-service training, and consistent availability of supplies (especially in Africa and in public facilities), in accordance with the updated 2018 World Health Organization (WHO) document: *WHO recommendations: Intrapartum care for a positive birth experience* (WHO, 2018).

[1] The term "South-East Asia" refers to the World Health Organization's region comprising Bangladesh, Bhutan, Democratic People's Republic of Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand, and Timor-Leste (http://www.searo.who.int/countries/en/).

Background

Bladder care is an important part of intrapartum care. Clinical curricula and guidelines recommend that patients void every two to four hours throughout labor, as a full bladder may obstruct the descent of the fetus (ECSA-HC and Fistula Care/EngenderHealth, 2012) (Lewis & De Bernis, 2006). Guidelines also recommend urinary catheterization (UC) for approximately two weeks coupled with a high-fluid-intake regime after vaginal or cesarean delivery for women who experience prolonged/obstructed labor (P/OL) to prevent obstetric fistula formation ECSA-HC and Fistula Care/EngenderHealth, 2012) (Lewis & De Bernis, 2006). Additionally, many clinicians utilize UC to non-surgically manage "fresh" fistulas (i.e., cases diagnosed within four weeks of injury) (Fistula Care, 2013) following P/OL (Waaldijk, 2004).

Obstructed labor is a major cause of maternal mortality and morbidity, complicating 3–6% of deliveries and contributing to 2.8% of global maternal mortality, up to 6.4% in Southeastern Asia (Dolea & AbouZahr, 2003) (Say, et al., 2014).

Obstructed labor is described as "the most disabling of all maternal conditions," with long-term sequelae including **obstetric fistula**, other forms of incontinence, and nerve injuries (Dolea & AbouZahr, 2003). Obstetric fistula is an abnormal hole or opening between the vagina, rectum, and/or bladder that leads to incontinence. Fistulas mainly occur in countries in Sub-Saharan Africa or South-East Asia (Tunçalp, et al., 2015).

Obstetric fistula **is preventable** if women experiencing P/OL are identified and managed early with appropriate **bladder care** and other interventions (WHO, 2008). The effective management of obstructed labor would result in the prevention of 59,150 obstetric fistulas and 16,800 maternal deaths (Alkire, et al., 2012).

Despite recommendations for using UC to prevent of obstetric fistula after P/OL, there is no rigorous empirical evidence demonstrating its effectiveness. Similarly, while non-surgical treatment with UC is expanding in use and there is extensive programmatic data supporting it's usage, there is limited research documenting its efficacy (Waaldijk, 1994). Exacerbating this lack of evidence is ambiguity related to the basic definition of P/OL, with a wide variety of definitions in curricula and research literature. Such variation hinders attempts to standardize guidelines and, in practice, may delay recognition and management of P/OL.

There is little data about the current knowledge and practices of skilled birth attendants (SBAs) regarding intrapartum and postpartum bladder care and UC, both as part of routine labor and delivery (L&D) care and specifically in managing P/OL. To help build the evidence base for UC in relation to fistula prevention/treatment,[2] the Fistula Care *Plus* (FC+) project conducted a key informant survey of SBAs to better understand the range of intrapartum and postpartum clinical practices currently employed in low- and middle-income countries (LMIC).

[2] The Fistula Care *Plus* (FC+) project hosted a research consultation on July 17, 2015 to discuss the relevance, parameters, and feasibility of a study to evaluate the effects of UC in preventing obstetric fistula and/or related outcomes in immediate postpartum women after P/OL. Meeting participants included FC+ staff, clinical and research experts, members of the FC+ International Research Advisory Group, and USAID representatives. The participants agreed that in order to investigate fistula incidence as an outcome of interest, the study would need a sample size of at least tens of thousands of women with P/OL to inform the study adequately. Given this challenge, participants agreed that a first step toward building the evidence-base on UC after P/OL would be to survey maternity service providers in countries where fistula is a problem to learn about current intrapartum and postpartum practices related to P/OL. Further information about this consultation is available at: https://fistulacare.org/wp-fcp/wp-content/uploads/2018/03/FC_CathConsultation_2015Report_Posting.pdf

Objective

The objective of this clinical practice survey is to better understand how SBAs in LMICs provide intrapartum and postpartum bladder care and manage P/OL.

Methods

Survey Design

FC+ deigned the key informant survey using existing L&D clinical guidelines and nursing and midwifery training curricula, as well as reports of common practices and/or beliefs among SBAs and input from fistula specialists. LMIC SBAs and global maternal health experts reviewed and pretested the survey, which FC+ refined based on their input.

Survey Structure

The final survey (see Annex B) consisted of two modules that collected information on the clinical and facility profile of the respondents and five modules covering the following topics:

1. Clinical practices related to intrapartum bladder care
2. Clinical practices related to postpartum bladder care
3. Identification and management of P/OL: intrapartum/postpartum care
4. Clinical practices related to antibiotic use
5. Supplies for intrapartum and postpartum bladder care

Eligibility Criteria

The survey targeted maternity service providers in countries where fistula is a concern as key informants on the subject of intrapartum and postpartum clinical practices. SBAs who had attended a live birth within the past three years and who practice in a LMIC were eligible to participate in the survey. The survey team defined SBA as "an accredited health professional—such as a midwife, doctor, or nurse—who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth, and the immediate postnatal period, and in the identification, management, and referral of complications in women and newborns" (WHO, ICM and FIGO, 2004). The survey team used 2017 World Bank LMIC classifications. At the beginning of the survey, FC+ employed a series of screening questions to determine whether respondents met the criteria for inclusion.

Survey Administration and Sampling

FC+ administered the survey in French and English using SurveyMonkey, Inc. (a free online platform) from May to October 2017. The survey did not record respondents' names. In addition, FC+ staff administered hard copies of the survey to approximately 50 key informant respondents in Bangladesh to address the challenge of limited internet access. Staff then entered hard copy responses into the online platform.

FC+ employed a purposive/snowball sampling approach to recruit key informant respondents. FC+ sent a link to the survey through emails to international and national obstetrician-gynecologist (ob-gyn) and midwifery associations. Additionally, FC+ sent an email with the survey link to representatives from relevant nongovernmental organizations as well as bilateral and multilateral organizations. The emails asked eligible recipients to complete the survey and to forward the survey link to other SBAs in LMICs. FC+ sent periodic reminder emails during the data collection period to encourage a greater number of responses. Additionally, FC+ staff conducted outreach to SBAs at

partner facilities and disseminated flyers advertising the survey in English and French at professional meetings and events.

Data Analysis

FC+ analyzed survey data to generate descriptive summaries of respondents' characteristics, knowledge, and practices. The report indicates frequencies and percentages in parentheses and in tables and figures. FC+ conducted chi-square tests of independence to evaluate key survey variables for significant differences by region, facility type, and geography. Annex A includes cross tabulations of these key variables by region, facility type, and geography and corresponding chi-square statistics, using a significance level of 95%. FC+ categorized textual data from open-ended survey questions using inductive codes and summarized data by theme. FC+ analyzed data using Stata v12 and Microsoft Excel. The SBA respondent served as the unit of analysis. While the report includes information on the facilities where respondents attend deliveries, it is important to note that sample sizes and percentages reflect individual respondents. Due to the anonymous nature of the survey, FC+ was unable to determine whether respondents were clustered among the same facilities and adjust analyses accordingly.

Ethical Considerations

As the survey elicited only key informant data from maternity service providers, it was not classified as human subjects' research and did not require ethical review by an institutional review board.

Findings

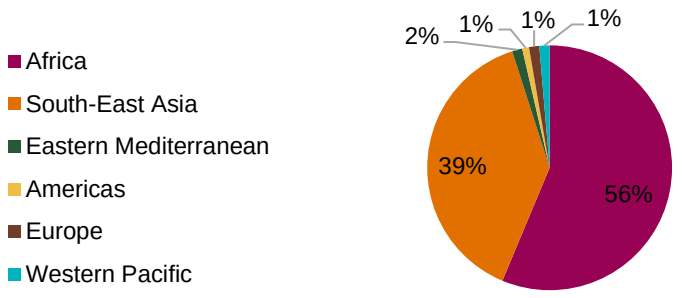
Respondents

A total of 299 individuals initiated the online survey and answered the first question. Of these, 45 did not meet the eligibility criteria. An additional 32 respondents were excluded from the analysis because they did not complete the first module on clinician profile. The final analytic sample included 222 respondents. However, there was survey attrition and only 131 respondents completed the entire survey. Therefore, the description of responses below includes a reference to the sample size for each question.

Respondent Characteristics

Figure 1 illustrates the distribution of regions where the respondents attend live births. Respondents reported which countries they practiced in and FC+ categorized these data into regions using World Health Organization (WHO) classifications. The majority of the survey respondents reported practicing in Africa (56%) and South-East Asia[3] (39%). Within Africa, countries representing 5% or more of the

Figure 1. Distribution of regions where respondents practice, n=222



[3] The term "South-East Asia" refers to the World Health Organization's region comprising Bangladesh, Bhutan, Democratic People's Republic of Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand, and Timor-Leste (http://www.searo.who.int/countries/en/).

respondents included Rwanda (16%), Niger (13%), Democratic Republic of Congo (12%), Zambia (12%), Uganda (10%), Malawi (7%), and Nigeria (6%). Within South-East Asia, the majority of the respondents reported practicing in Bangladesh (84%) and Nepal (11%). For the complete distribution of countries where the respondents practiced, see Table 15 in Annex A.

Table 1 provides the clinical profile of the respondents. The majority of the respondents were midwives or nurse-midwives (61%), followed by ob-gyns (15%). Nearly all respondents (93%) had attended births for at least 2 years and nearly half (45%) for at least 10 years.

Table 1. Clinical profile of respondents

	n	%
Health professional cadre, n=222		
Ob-gyn	34	15%
General surgeon	0	0%
Doctor (other than ob-gyn or general surgeon)	19	9%
Medical or clinical officer (no specialist training after internship)	7	3%
Assistant medical/clinical officer	1	0%
Midwife/nurse-midwife	136	61%
Nurse	18	8%
Other	7	3%
Number of years attending births, n=222		
Less than 2 years	16	7%
2–5 years	57	26%
6–9 years	49	22%
10+ years	100	45%
Number of years of preservice clinical training, n=222		
Up to 1 year	38	17%
2–3 years	111	50%
4–5 years	38	17%
6+ years	35	16%

Respondents reported on pre- and in-service training, with 83% having had at least two years of preservice training and 33% at least four years. Figure 2 illustrates the percentage of respondents who received in-service training on various topics related to bladder care and management of P/OL. Nearly all of the respondents received in-service training on the partograph (94%), basic emergency obstetric and newborn care (BEmONC, 82%), and management of P/OL (76%); less than two-thirds of the respondents received in-service training on puerperal sepsis, comprehensive emergency obstetric and newborn care (CEmONC), intra/postpartum bladder care, and postpartum UC. In-service training varied by region. Respondents from Africa were signficantly more likely than those from South-East Asia to receive in-service training on management of P/OL (86% Africa, 62% South-East Asia), prevention and management of puerperal sepsis (75% Africa, 52% South-East Asia), and CEmONC (70% Africa, 56% South-East Asia). There was also some variation by facility type and geography. Respondents from public facilities (71%) were signficantly more likely than those from nonpublic facilities (57%) to receive training on prevention and management of puerperal sepsis and respondents from urban facilities (68%) were significantly more likely than nonurban facilities (55%) to receive training on CEmONC. For the cross-tabulation of in-service

clinical training by region, facility type, and geography and chi-square test results, see Table 16 in Annex A.

Figure 2. Percentage of respondents who received in-service clinical training by topic, n=222

Facility Characteristics

Table 2 provides the characteristics of the facilities where the respondents worked. The majority of respondents worked at facilities located in urban areas (61%). Nearly half of the respondents—that is, 46%—reported working at referral, regional/provincial, academic, or national hospitals; followed by 19% who reported working at subdistrict or district hospitals and 17% who reported working at a health centers. Over half of the respondents worked at public health facilities (57%), with the remainder (43%) working at nonpublic facilities (75% private, 14% religious/faith-based, and 11% other). Approximately half of the respondents reported that their facility is or has previously received support from FC+ or its predecessor, the Fistula Care project.

Over half of the respondents who worked at a referral, regional/provincial, academic, or national hospital, reported that their facility is public (55%); two-thirds of respondents who worked at a subdistrict or district hospital reported that their facility is public (67%); and the majority of respondents working at health centers reported that their facility is public (82%). For the cross-tabulation of facility type by management, see Annex A.

Table 2. Characteristics of respondents' affiliated facility

	n	%
Facility type, n=222		
Dispensary or general clinic	1	0%
Health center	38	17%
Maternal and child health or reproductive health house/clinic	29	13%
Subdistrict or district hospital	43	19%
Referral, regional/provincial, academic, or national hospital	102	46%
Other	9	4%
Facility management, n=222		
Public	127	57%
Nonpublic	95	43%
Private	71	75%
Religious/faith-based	13	14%
Other	11	11%
Facility location, n=222		
Urban	136	61%
Nonurban	86	39%
Facility ever supported by FC/FC+, n=192		
Yes	96	50%
No	70	36%
Don't know	26	14%

Figure 3 illustrates the percentage of respondents who reported that their facility regularly (i.e., within past three months) offered the seven BEmONC signal functions and nine CEmONC signal functions (WHO, UNFPA, UNICEF, and AMDD, 2009). FC+ classified facilities as "BEmONC" or "CEmONC" facilities based on the services that the respondents reported their facility recently provided. In line with other recent literature, FC+ also classified facilities as "BEmONC-1" and "CEmONC-1" if they had recently provided the signal functions, with the exception of assisted vaginal deliveries (WHO, UNFPA, UNICEF, and AMDD, 2009). Approximately two-thirds of the respondents (66%) reported working at a CEmONC (57%) or CEmONC-1 (9%) facility. Approximately 10% of the respondents reported working at a BEmONC (9%) or BEmONC-1 (1%) facility.[4] Most respondents reported that their facility had the capacity to perform operative delivery (82%). Over two-thirds of the respondents reported that they are able to provide vacuum-extractor (ventouse) delivery and over one-third reported that they are able to provide cesarean section (35%). Additionally, 28% of respondents reported being able to use forceps for live births, while only 16% reported being able to use forceps for destructive delivery of stillbirths. Table 3 provides a descriptive summary of the clinical capacity of respondents' facilities to provide emergency obstetric and newborn care (EmONC).

Figure 3. Routine facility provision of emergency obstetric and newborn care (EmONC) services, n=192

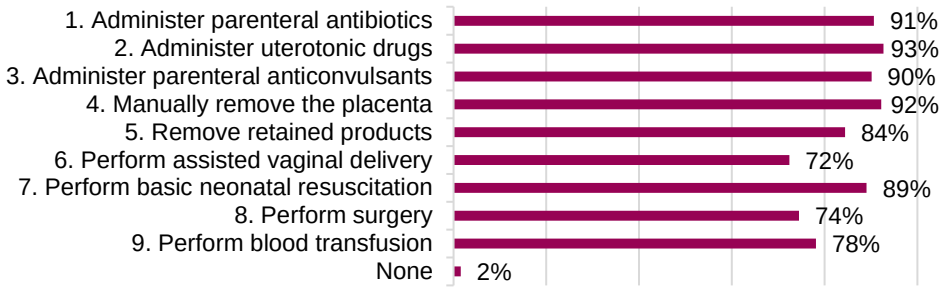


Table 3. Clinical capacity of respondents' affiliated facility to provide EmONC

	n	%
Facility classification, n=192		
Yes, BEmONC-1 (all BEmONC functions except assisted vaginal delivery)	2	1%
Yes, BEmONC (all BEmONC functions)	18	9%
Yes, CEmONC-1 (all CEmONC functions except assisted vaginal delivery)	18	9%
Yes, CEmONC	110	57%
Neither	44	23%
Facility capacity to perform operative delivery, n=192		
Yes	158	82%
No	32	17%
Don't know	2	1%
Types of deliveries respondent is able to provide, n=191		
Forceps for live births	54	28%
Forceps for destructive delivery of stillbirths	30	16%
Vacuum-extractor (ventouse)	132	69%
Cesarean section	66	35%

Table 4 provides the percentage of respondents who reported that their facility has clinical protocols on intrapartum and postpartum bladder care and management of P/OL. Fewer than half of the respondents reported that their facility has a protocol on intrapartum bladder care (38%), on postpartum UC (36%), or on UC during postpartum care after P/OL (41%). Slightly over half of the

[4] BEmONC and CEmONC classifications are reported based on respondents' answers to each of the nine signal functions. The survey asked respondents to classify their facility based on the BEmONC/CEmONC signal function criteria. Approximately 80 of 192 respondents had misclassified their facility when staff compared to how they answered for each of the nine signal functions.

respondents reported that their facility has a protocol on prevention, identification, and treatment of obstetric fistula after P/OL (56%). Clinical protocols varied by region and facility type. Respondents from South-East Asia and nonpublic facilities were significantly more likely than those from Africa and public facilities to report having a protocol on all four topics: intrapartum bladder care (49% South-East Asia, 28% Africa; 53% nonpublic, 27% public); postpartum UC (43% South-East Asia, 29% Africa; 46% nonpublic, 27% public); UC during postpartum care after P/OL (46% South-East Asia, 33% Africa; 44% nonpublic, 37% public); and prevention, identification, and treatment of fistula after P/OL (71% in South-East Asia, 41% Africa; 70% nonpublic, 41% public). For more details, see Table 17 in Annex A.

Table 4. Percentage of respondents reporting facility protocols

	%		
Protocol topic	**Yes**	**No**	**Don't know**
Intrapartum bladder care, n=177	38%	53%	8%
Postpartum UC, n=164	36%	54%	10%
UC during postpartum care after P/OL, n=133	41%	44%	16%
Prevention, identification, & treatment of fistula after P/OL, n=133	56%	39%	5%

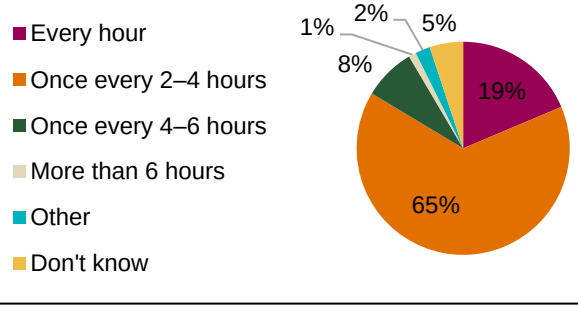
Clinical Practices related to Intrapartum Bladder Care

Almost all respondents (99%) reported using the partograph to monitor labor (87% always, 12% sometimes). Respondents' usage of the partograph to monitor labor varied significantly by region, and facility type, and geography. More respondents from Africa and nonurban facilities than from South-East Asia and urban facilities reported always using the partograph to monitor labor (93% Africa, 80% South-East Asia; 96% nonurban, 81% in urban). For more details, see Table 18 in Annex A. Those who reported not using the partograph cited the "nature of pain," "descent of presenting part," and the fetal nonstress test as ways to monitor the progress of labor.

Of those who reported using the partograph to monitor labor (n=182), all reported using this tool to identify and manage P/OL (82% always, 18% sometimes). Nearly all respondents (96%) reported that they had received guidance or training on use of the partograph for diagnosis and management of P/OL. FC+ did not find a significant relationship between use of the partograph to identify and manage P/OL or receipt of guidance or training on use of the partograph for diagnosis and management of P/OL by region, facility type, or geography.

Respondents described what they consider a healthy frequency for urinary voiding during labor (see Figure 4). Through a literature review on UC after P/OL, FC+ found that the recommended voiding frequency during labor ranges from every two to every six hours (Fistula Care *Plus*, 2015). Nearly three-quarters of the respondents (73%) reported that they consider a healthy frequency for voiding during labor within that two- to six-hour range. These responses did not differ significantly by region, facility type, or geography (see Table 19 in Annex A). Respondents who chose "other" as the healthy amount clarified that a

Figure 4. Frequency respondent considers healthy for urinating during pregnancy, n=177



healthy voiding frequency depends on whether the patient is receiving intravenous fluids and varies by patient.

The survey examined the uptake of intrapartum bladder care practices, specifying recommendations from existing guidelines or curricula on intrapartum bladder care and asking how often respondents or their teams perform each practice (CSA-HC and Fistula Care/EngenderHealth, 2012) (Nigeria Federal Ministry of Health, 2016) (Canterbury District Health Board, 2017) (Velinor, 2010) (WHO, RHR, 2000, reprint 2007). Table 5 provides the percentage of respondents who reported always, sometimes, and never performing the specified practice. A majority (79–98%) of respondents reported either always or sometimes performing each of the recommended stated practices. The most commonly reported practices were: (1) encourage the laboring woman to void at regular intervals of 2–4 hours (82% always, 16% sometimes); (2) if laboring woman has difficulty passing urine after four hours, consider an in/out urethral catheter (73% always,25% sometimes); and (3) if necessary, catheterize (using the Foley catheter) before assisted delivery or cesarean section and document and monitor urinary output (74% always, 19% sometimes). The percentage of respondents who reported utilizing the various intrapartum bladder care practices varied by region, facility type, and geography; however, the significant differences were not consistent. For more details, see Table 20 in Annex A.

Table 5. Clinical practices related to intrapartum bladder care, n=177

Practice	% Yes		Never
Document frequency of voiding on the partograph (Nigeria Federal Ministry of Health, 2016)	88%	*(53% always, 34% sometimes)*	12%
Monitor maternal urine output every two hours, correctly recording color and amount on partograph (ECSA-HC and Fistula Care/EngenderHealth, 2012)	90%	*(49% always, 41% sometimes)*	10%
Test urine for presence of glucose, acetone, and protein and record results on partograph (ECSA-HC and Fistula Care/EngenderHealth, 2012)	84%	*(38% always, 46% sometimes)*	14%
Encourage the laboring woman to void at regular intervals (i.e., every two to four hours) (Nigeria Federal Ministry of Health, 2016)	98%	*(82% always, 16% sometimes)*	2%
If laboring woman has difficulty passing urine after four hours, consider an in/out urethral catheter (Canterbury District Health Board, 2017)	98%	*(73% always, 25% sometimes)*	2%
Catheterize the laboring woman if the partograph action line is crossed(Nigeria Federal Ministry of Health, 2016)	88%	*(55% always, 33% sometimes)*	12%
Avoid UC in labor, if possible, to prevent risk of urinary tract infection (UTI) and urethral trauma (Velinor, 2010)	85%	*(45% always, 40% sometimes)*	15%
If UC in labor is used, practice intermittent catheterization to reduce the risk of UTI (Velinor, 2010)	79%	*(37% always, 41% sometimes)*	21%
If necessary, catheterize (Foley catheter) before assisted delivery or cesarean section and document and monitor urinary output (WHO, RHR, 2000, reprint 2007)	93%	*(74% always, 19% sometimes)*	7%

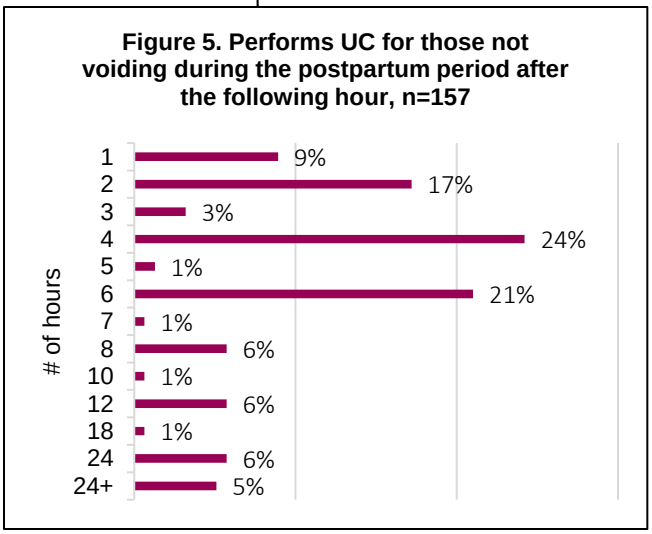
In addition to reporting on the recommended practices, the survey asked respondents to describe other intrapartum practices that they or their teams utilize. Reported practices to encourage voiding during labor included: running the water tap near laboring patient (n=3), using a warm compress (n=1), giving fluids to the laboring patient (n=1), and encouraging the patient to void prior to each vaginal exam (n=1). Other reported intrapartum practices included using *toilette vulvaire* to encourage emptying of the rectum (n=3) and using catheters during the intrapartum period to prevent ascending infections (n=2). One respondent stated, "Some doctors and midwives always catheterize the bladder before delivery, irrespective if the woman voided regularly and the possibility of having a filled bladder is very low," and another noted that when women come in with a fully dilated cervix, they are routinely catheterized with a plain rubber catheter.

Clinical Practices related to Postpartum Bladder Care

Nearly all respondents reported that they always (73%) or sometimes (24%) ask postpartum patients if they have any problems with bowel or bladder functions (n=175). Two-thirds of respondents reported that they always monitor voiding frequency for postpartum patients during the first 24 hours after delivery (66%), and nearly one-third reported doing so sometimes (29%) (n=175). Of those who monitor voiding frequency during the first 24 hours, nearly all reported that they provide UC to patients who are not able to pass urine successfully (73% always, 24% sometimes) (n=165). There were some significant variations in these practices by region and facility type, with more respondents from South-East Asia and nonpublic facilities than from Africa and public facilities reporting that they always ask postpartum patients if they have had any bladder or bowel problems (90% South-East Asia, 57% Africa; 77% nonpublic, 55% public) and that they monitor voiding frequency for postpartum patients during the first 24 hours after delivery (91% South-East Asia, 58% Africa; 75% nonpublic, 59% public). For more details, see Table 21 in Annex A.

Of those who perform UC, the survey asked respondents after which hour of not voiding do they or their teams insert a catheter. Figure 5 illustrates the distribution of respondents' answers to this question. Most respondents stated that they insert a catheter after four hours (24%), six hours (21%), or two hours (17%). There was variation by region and facility type with a median of four hours among respondents from Africa and public facilities and six hours among those from South-East Asia and nonpublic facilities.

Figure 5. Performs UC for those not voiding during the postpartum period after the following hour, n=157



In addition to time without voiding, the survey asked respondents who reported utilizing postpartum UC about other practices to assess bladder function and the need for UC (see Table 6). The majority of respondents reported utilizing the four specified practices, with assessing vital signs and checking if bladder is palpable as the most widely practiced.

Table 6. Practices to assess bladder function and if UC is needed, n=157

Practice	% Yes		Never
Check if bladder palpable	100%	*(81% always, 19% sometimes)*	0%
Ask about discomfort before, during, or after voiding	99%	*(78% always, 21% sometimes)*	1%
Ask about bleeding after voiding	97%	*(69% always, 28% sometimes)*	3%
Assess vital signs	98%	*(88% always, 10% sometimes)*	2%

Respondents also reported other practices that they or their teams typically employ to assess bladder function and the need for UC. These included urine retention checks (n=2), urine color assessments (n=1), routine urine examination and serum creatinine tests (n=1), and urinary incontinence checks

(n=3), lumbar or lower abdomen pain checks, (n=2), restlessness checks, (n=1), or a review for a history of P/OL (n=1).

The survey also examined respondents' clinical postpartum bladder care practices following operative delivery, specifically adherence to existing WHO guidelines, as summarized in Table 7 (WHO, RHR, 2000, reprint 2007). Over two-thirds of the respondents (71%) reported always employing the recommended timing of post-operative UC for simple cases and those exhibiting a bladder injury. However, only one-third of the respondents (35%) reported always providing nitrofurantoin 100 mg if the woman is not on antibiotics. Reported uptake of these practices varied notably by facility geography and somewhat by facility type and region. For example, significantly more respondents from urban than nonurban facilities reported always retaining an indwelling catheter for a minimum of eight hours (79% urban, 63% nonurban), removing the catheter after eight hours if urine is clear (76% urban, 64% nonurban), leaving the catheter in place for a minimum of seven days if bladder is injured (78% urban, 61% nonurban), and giving nitrofurantoin until the catheter is removed if the patient is not receiving antibiotics (43% urban, 22% nonurban). Additionally, signficantly more respondents from nonpublic than public facilities reported always removing the catheter after eight hours if urine is clear (76% nonpublic, 67% public) and signficantly more respondents from South-East Asia than Africa reported always giving nitrofurantoin until the catheter is removed if the patient is not receiving antibiotics (47% South-East Asia, 25% Africa). For more details, see Table 22 in Annex A.

Table 7. Clinical practices related to post-operative postpartum bladder care, n=164

Practice	Yes		Never
Retain an indwelling catheter for a minimum of 8 hours post-operatively.	88%	*(73%16% always,sometimes)*	12%
For operative delivery: if urine is clear, remove catheter 8 hours after surgery or after first postoperative night; if urine is not clear, leave catheter in place until urine is clear; ensure that urine is clear before removing catheter.	86%	*(71%15% always,sometimes)*	14%
If the bladder was injured (e.g., uterine rupture or during cesarean section): leave the catheter in place for a minimum of seven days and until urine is clear.	87%	*(71%16% always;sometimes)*	13%
If the woman is not currently receiving antibiotics, give nitrofurantoin 100 mg by mouth once daily until the catheter is removed, for prophylaxis against cystitis.	65%	*(35%30% always,sometimes)*	35%

In addition to the recommended practices, respondents also described two other post-operative postpartum bladder care practices that they or their teams typically utilize: pelvic floor physical therapy (n=1) and urine routine examination and serum creatinine testing (n=1). Four respondents explained that their facilities do not use nitrofurantoin and others noted that they or their teams provide the following post-operative antibiotics to postpartum women: ampicilin (n=5), metronidazole (n=3), cephalosporin (n=2), gentamicin (n=2), ceftriaxone (n=1), and septrin (n=1).

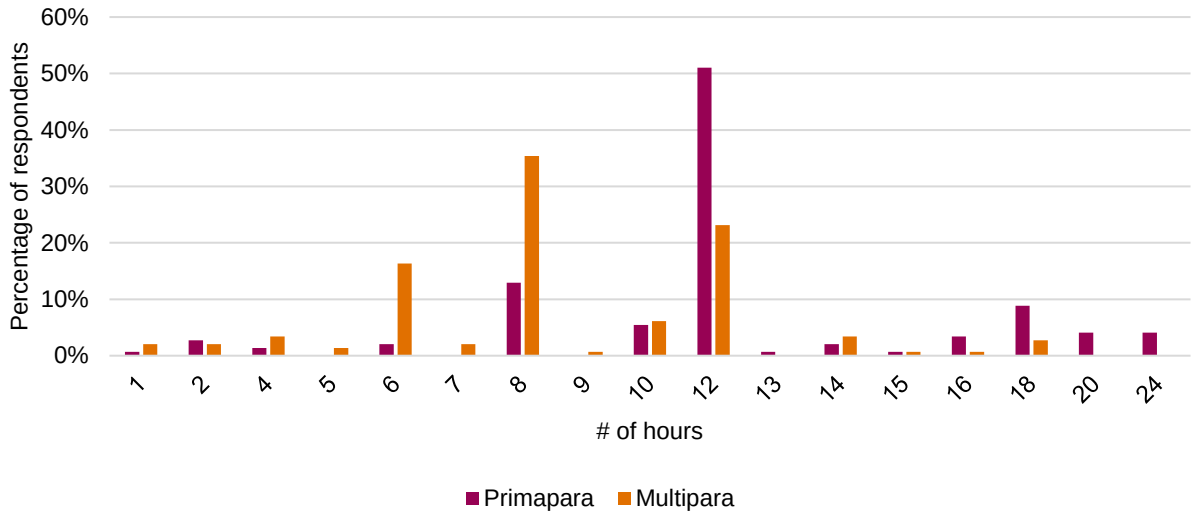
Identification and Management of P/OL: Intrapartum and Postpartum Care

The survey examined how respondents identify and manage P/OL during the intrapartum and postpartum periods. While there was not a clear consensus on the definition of P/OL at the time of the survey (Fistula Care *Plus*, 2015), prolonged labor (dilation ≥4cm) was generally accepted as active labor lasting longer than 12 hours (WHO, 2008) (ECSA-HC and Fistula Care/EngenderHealth, 2012).5 Figure 6 illustrates the duration of active labor that respondents consider P/OL for

[5] The 2018 WHO publication, *WHO Recommendation: Intrapartum care for a positive birth experience*, offers additional clarification on the identification of P/OL, but was published after the survey had been completed.

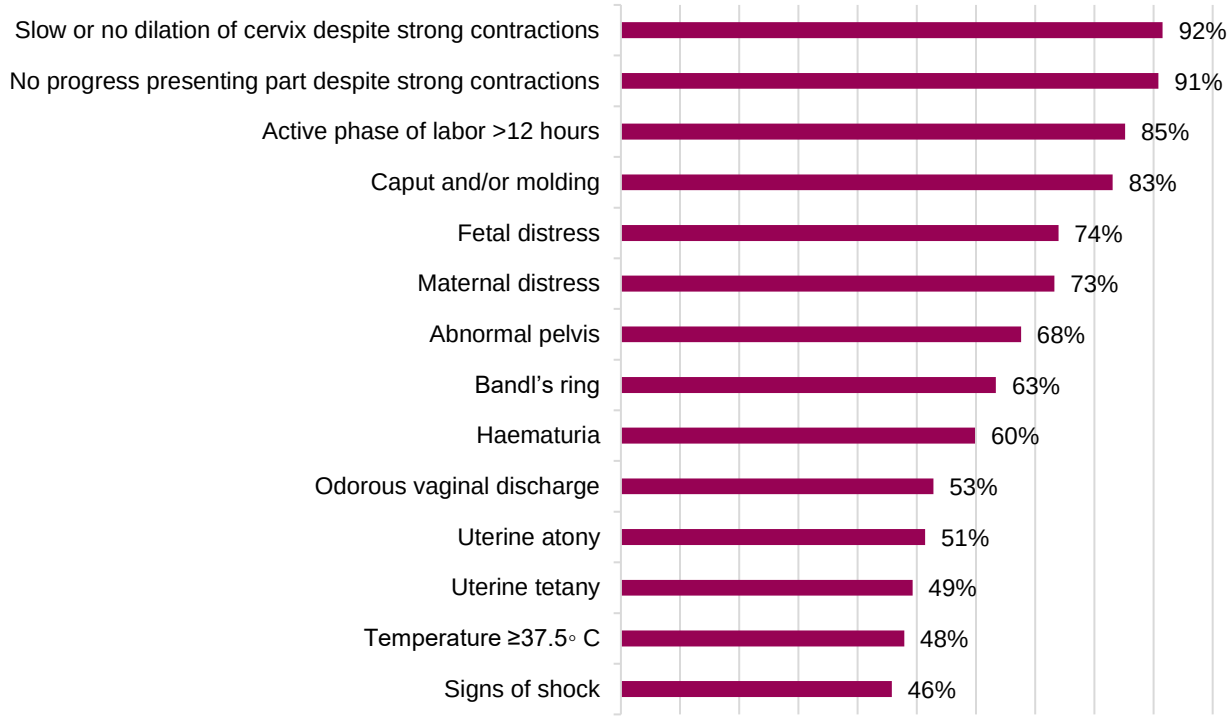
primapara and multipara patients. The majority of respondents defined P/OL as being active labor lasting longer than 12 hours (51%), 8 hours (13%), or 18 hours (9%) for primapara women with a median of 12 hours; and longer than 8 hours (35%), 12 hours (23%), or 6 hours (16%) for multipara women with a median of 8 hours. The median number of hours were identical across region, facility type, and geography; Figures 6a–f in Annex A illustrates differences in distributions of responses.

Figure 6. Respondents' definition of P/OL, by hours of active labor, n=147



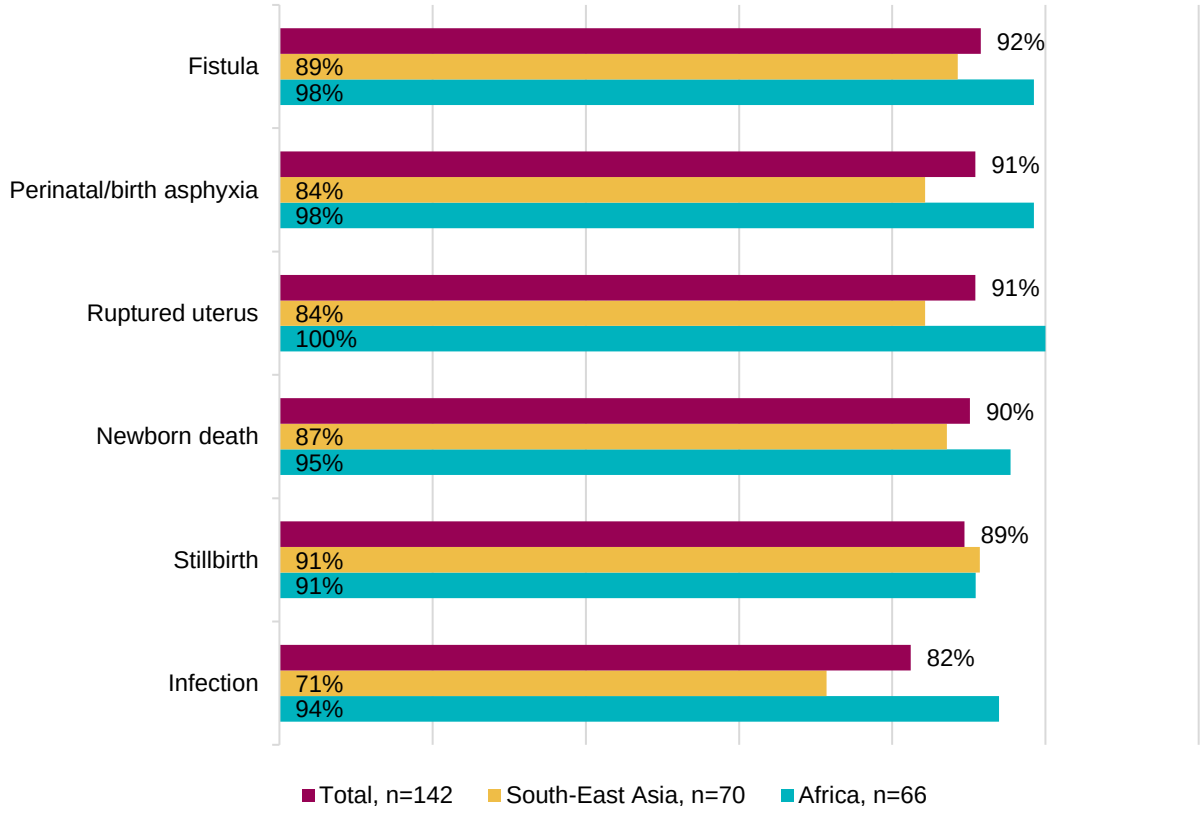
The survey also examined other signs and symptoms respondents use to identify P/OL, based on a list drawn from the Maternal and Child Health Integrated Program (MCHIP) Quality of Care Survey (USAID, MCHIP, 2013). As shown in Figure 7, the most commonly cited criteria include slow or no dilation of cervix despite strong contractions (92%), no progress presenting part despite strong contractions (91%), active phase of labor >12 hours (85%), and caput and/or molding (83%). Less than half of the respondents cite uterine tetany (49%), temperature ≥37.5◦ C (48%), and signs of shock (systolic bp <100 mmHg, pulse >100/min) (46%) as criteria for P/OL. In addition to the stated criteria, respondents cited the following additional criteria they use to identify P/OL: dry vagina (n=4), retention of urine (n=2), and meconium-stained liquor (n=2). One respondent from Bangladesh reported that identifying P/OL "depends on [the] whole picture! We are diagnosing failure to progress to prevent P/OL. Obstructed labor may happen without prolonged labor also! And it is diagnosed in patients coming from outside with messed up labour."

Figure 7. Criteria used to identify P/OL, n=142



The survey also included a list of labor outcomes and asked respondents to select which ones may be sequelae of P/OL, as illustrated in Figure 8. The majority of respondents (89–92%) identified almost all of the specified outcomes as potential consequences of P/OL: fistula, perinatal/birth asphyxia, ruptured uterus, newborn death, and stillbirth. Slightly fewer respondents (82%) selected infection as a potential outcome. Respondents from Africa were significantly more likely than respondents from South-East Asia to cite fistula (98% Africa, 89% East-South Asia), perinatal/birth asphyxia (98% Africa, 84% South-East Asia), ruptured uterus (100% Africa, 84% South-East Asia), and infection (94% Africa, 71% South-East Asia), as potential outcomes of P/OL. For chi-square test results, see Table 23 in Annex A. Respondents mentioned the following when probed for additional outcomes of P/OL: maternal death (n=6), postpartum hemorrhage (n=6), foot drop (n=2), meconium-stained liquor (n=2), retention of urine (n=2), chorioamnionitis (n=1), infertility (n=1), neonatal sepsis (n=1), and puerperal sepsis (n=1).

Figure 8. Percentage of respondents who cite potential outcomes of P/OL



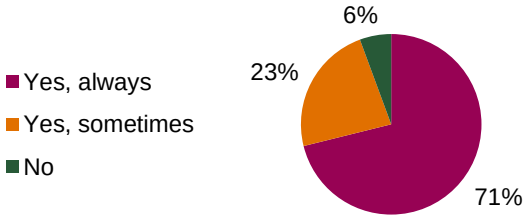
The survey assessed how SBAs manage obstructed labor, listing practices from established criteria for auditing the clinical quality of obstetric care (Graham, et al., 2000) (Bailey, et al., 2002). As shown in Table 8, the majority of the respondents (89–99%) reported either always or sometimes utilizing the recommended practices for managing P/OL. At least three-quarters of the respondents reported that they always do the following for P/OL: drain the urinary bladder (80%), type and cross-match blood (80%), maintain an observation chart (urine output, pulse, blood pressure, temperature) with measurements every 15–30 minutes (76%), and achieve intravenous access and hydration (75%). Notable percentages of the respondents reported never doing the following: deliver the fetus within two hours of diagnosis of obstructed labor (11%), give broad-spectrum antibiotics (8%), and route the delivery based on degree of obstruction (8%). Respondents also described three other practices they use in managing obstructed labor: check fetal heartbeat every 15 minutes (n=1), provide oxytocin (n=1), and resuscitate (n=1).

Table 8. Typical management of obstructed labor, n=142

	%		
Practice	**Yes**		**Never**
Route of delivery is based on degree of obstruction (Bailey, et al., 2002)	92%	(68% always, 24% sometimes)	8%
Route of delivery is based on whether fetus is alive or dead (Bailey, et al., 2002)	95%	(64% always, 31% sometimes)	5%
Urinary bladder is drained (Graham, et al., 2000)	99%	(80% always, 19% sometimes	1%
Delivery of the fetus occurs within 2 hours of diagnosis of obstructed labor (Graham, et al., 2000)	89%	(58% always, 31% sometimes)	11%
An observation chart is maintained (urine output, pulse, blood pressure, temperature), with measurements every 15-30 minutes (Graham, et al., 2000)	96%	(76% always, 20% sometimes)	4%
Intravenous access and hydration are achieved (Graham, et al., 2000)	99%	(75% always, 24% sometimes)	1%
Broad-spectrum antibiotics are given (Graham, et al., 2000)	92%	(73% always, 19% sometimes)	8%
Typing and cross-matching of blood is carried out (Graham, et al., 2000)	94%	(80% always, 13% sometimes)	6%

Respondents' management of obstructed labor varied notably by region and facility type and somewhat by facility geography. Respondents from South-East Asia were significantly more likely than those from Africa to report always draining the bladder (91% South-East Asia, 71% Africa), achieving intravenous access and hydration (89% South-East Asia, 62% Africa), and typing and cross-matching blood (87% South-East Asia, 76% Africa). Additionally, respondents from nonpublic facilities were significantly more likely than those from public facilities to report always observing that the route of delivery is based on degree of obstruction (78% nonpublic, 58% public) and that delivery of fetus occurs within two hours of diagnosis of obstructed labor (67% nonpublic, 48% public). However, respondents from public and urban facilities were significantly more likely than respondents from nonpublic and nonurban facilities, respectively, to report always giving broad-spectrum antibiotics (80% public, 67% nonpublic; 82% urban, 60% nonurban). For more details, see Table 24 in Annex A.

Figure 9. Percentage of respondents who provide UC to patients who experience P/OL, n=142

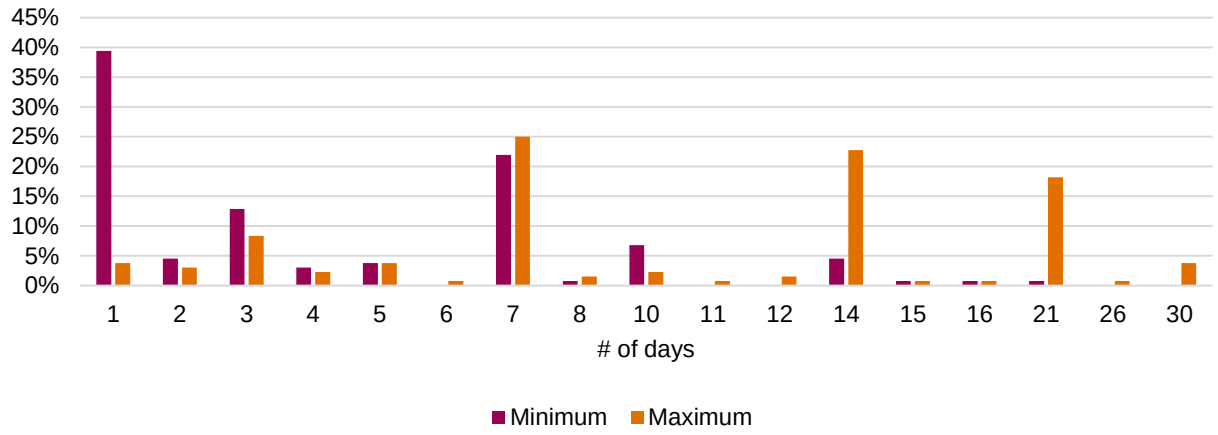


As shown in Figure 9, the vast majority of respondents (94%) reported utilizing UC for patients who experience P/OL. Of those, 71% reported always and 23% sometimes utilizing UC. Reported utilization of UC varied by region, with respondents from South-East Asia (79%) significantly more likely to report always utilizing UC for patients who experience P/OL than those from Africa (68%). For more details, see Table 25 in Annex A. Additionally, the survey asked respondents to describe potential clinical benefits of providing postpartum UC to women after P/OL. Respondents mentioned preventing obstetric fistula (n=54), preventing bladder trauma or injury (n=14), preventing postpartum hemorrhage (n=8), letting the bladder rest (n=8), avoiding urine retention (n=6), and preventing infections (n=5) and urinary tract infections (UTIs) (n=3) as potential benefits to women.

Respondents described how they typically manage UC care after P/OL. Figure 10 illustrates the minimum and maximum number of days respondents reported catheterizing P/OL patients. A

considerable proportion reported 1 day (39%), followed by 7 days (22%) and 3 days (13%) with a median of 3 days for the minimum duration and either 7 days (25%), 14 days (23%) or 3 days (8%) with a median of 10 days for the maximum duration. Respondents who utilize UC following P/OL listed the following considerations when determining the appropriate duration of time: urine output and color (n=26), degree of obstruction (n=15), presence and type of bladder injury (n=12), duration of P/OL (n=7), mode of delivery (n=6), presence of infection (n=5), labor outcomes (n=4), and route of delivery (n=2).

Figure 10. Minimum and maximum # of days respondents reported catheterizing patients after prolonged/obstructed labor, n=132



Reported duration of UC for P/OL patients varied by region and facility type, with respondents from South-East Asia and nonpublic facilities reporting longer durations of UC for P/OL patients than respondents from Africa and public facilities. For South-East Asia respondents, the median number of days for UC following P/OL was a minimum 7 and maximum of 14, compared with a minimum of 1 and maximum of 7 for respondents from Africa. While the median was a minimum of 3 days for respondents from both nonpublic and public facilities, the median was a maximum of 14 days for respondents from nonpublic facilities, as compared with 7 days for respondents from public facilities. There were no notable differences in medians for respondents from urban and nonurban facilities. Figures 10a–f in Annex A illustrate the minimum and maximum number of days respondents reported catheterizing P/OL patients by region, facility type, and geography.

For those who utilize UC following P/OL, the survey examined adherence to recommendations from the Nigeria Ministry of Health, the first national guidance on provision of UC for prevention and management of obstetric fistula (Nigeria Federal Ministry of Health, 2016). As Table 9 illustrates, the vast majority of respondents reported that they always counsel patients at discharge, (88%) and always retain the catheter and refer the patient if there is a suspicion of fistula (78%). There was no variation in these responses by region, facility type, or geography (see Table 26 in Annex A). The least-adopted practice was performing pelvic examination prior to catheter removal, with 17% reporting never utilizing the practice. In addition to the stated practices, respondents also explained that they utilize pelvic floor and physiotherapy exercises (n=2) and counsel patients about physical labor, sexual activity, and hygiene practices (n=3).

Table 9. Typical provision of postpartum UC for patients who experience P/OL, n=126

Practice	% Yes		Never
While catheter is in situ, monitor for every 4 hours for the following 24 hours postnatal and then daily for 14 days, checking for cloudy or purulent urine, hematuria, and urine output	97%	(66% always, 31% sometimes)	3%
Perform pelvic examination prior to catheter removal	83%	(47% always, 36% sometimes)	17%
Retain catheter if there is clinical suspicion of fistula and refer client to facility with fistula expertise prior to catheter removal	95%	(78% always, 17% sometimes)	5%
Prior to discharge, counsel client to return immediately to the facility in the event of urine leakage/incontinence	99%	(88% always, 11% sometimes)	1%

The survey also examined respondents' opinions and beliefs about postpartum UC for patients who experience P/OL, using statements derived from existing guidelines and curricula (see Table 10) (ECSA-HC and Fistula Care/EngenderHealth, 2012) (Lewis & De Bernis, 2006) (Nigeria Federal Ministry of Health, 2016) (WHO, 2008) (Hancock, 2009). The statement that solicited the most disagreement (14%) and uncertainty (17%) was about the recommended postpartum UC regime of catheterization for 14 days with a high-fluid-intake regime. The statement that solicited the most uncertainty (29%) was about the potential of early catheterization after P/OL to heal small fistulas (<2cm). There was no variation in responses by region, facility type, or geography (see Table 27 in Annex A).

Table 10. Respondents believe following about postpartum UC for patients who experience P/OL, n=126

Belief	Agree	Disagree	Don't know/ Not sure
Women should be catheterized when the duration of labor exceeds or is reported to exceed 18 hours (i.e., P/OL) (ECSA-HC and Fistula Care/EngenderHealth, 2012) (Lewis & De Bernis, 2006) (Nigeria Federal Ministry of Health, 2016) (WHO, 2008)	87%	6%	7%
Women who have survived P/OL should be treated by routine urethral catheterization for a period of 14 days, with a high-fluid-intake regime immediately after delivery or as soon as they present at the facility (Lewis & De Bernis, 2006) (Nigeria Federal Ministry of Health, 2016)	69%	14%	17%
Early catheterization treatment after P/OL following vaginal delivery or cesarean section may heal fistulas <2 cm with bladder drainage (Hancock, 2009)	69%	2%	29%
UC during or immediately after P/OL can be performed at BEmONC and CEmONC facilities by trained health providers who have midwifery competencies and skills/authorization to insert and manage urinary catheters (Nigeria Federal Ministry of Health, 2016)	90%	2%	7%
Women who have experienced P/OL and are being treated with catheters can be managed as either inpatient or outpatient with the catheter in situ, depending on the trained healthcare provider's assessment (Lewis & De Bernis, 2006) (Nigeria Federal Ministry of Health, 2016)	82%	5%	13%

The analysis demonstrates that utilization of UC after P/OL is widespread among respondents with 71% reporting always and 23% reporting sometimes doing so. Table 11 provides a summary of the potential challenges, risks, and barriers related to intrapartum and postpartum UC following P/OL reported by respondents. Respondents most frequently cited infection, trauma/injury, catheter difficulty, patient discomfort, and limited resources as challenges for both vaginal birth and cesarean sections before and after delivery.

Table 11. Cited challenges, risks, and barriers related to intrapartum or postpartum UC for a patient experiencing P/OL

	Before delivery	After delivery
Vaginal birth	• Infections (urinary, UTI, hematuria, sepsis) (n=29) • Trauma/Injury (urethral, bladder, fetal head, fistula) (n=15) • Catheter difficulty (insertion, blockage, balloon obstruction, advanced descent of fetus) (n=14) • Patient discomfort (abdominal pain, bleeding) (n=14) • Fetal head blocking catheter insertion (n=6) • Limited resources (supplies, knowledge) (n=5) • Compressed urethra (n=4)	• Infection (ascending, UTI, sepsis, urinary, urethral, hematuria) (n=49) • Trauma/Injury (fistula, urethral, atonic bladder) (n=10) • Patient discomfort (pain, bleeding, burning sensation) (n=9) • Limited resources (knowledge, , monitoring/management of catheter, hospital stay) (n=8) • Catheter difficulty (blockage) (n=7) • Incontinence/urine retention (n=7) • Patient refusal (n=2)
Cesarean section	• Infection (urinary, UTI, hematuria, sepsis) (n=24) • Trauma/Injury (fistula, bladder, urethral) (n=16) • Patient discomfort (abdominal pain, bleeding, burning sensation, during insertion) (n=7) • Catheter difficulty (insertion/passing, low fetal head) (n=6) • Limited resources (supplies, knowledge) (n=4) • Patient refusal (n=3)	• Infection (ascending, UTI, sepsis) (n=35) • Patient discomfort (abdominal/wound pain, emotional) (n=9) • Catheter difficulty (blockage, continued care, insertion) (n=7) • Trauma/Injury (bladder, urethral, fistula) (n=7) • Limited resources (knowledge, monitoring/management of catheter, lack of protocol, hospital stay) (n=8) • Incontinence/urine retention (n=6)

Clinical Practices related to Antibiotic Use

As sepsis is an important potential consequence of P/OL, the survey asked respondents about their practices related to antibiotic use across different stages of pregnancy and delivery care. Table 12 provides the percentage of respondents who utilize various antibiotic practices across the pregnancy and delivery stages. Antibiotics were most frequently utilized (>90%) following preterm pre-labor rupture of membranes (82% always, 12% sometimes), for clinical signs of chorioamnionitis (81% always, 11% sometimes), with documented antenatal infection (76% always, 17% sometimes), and for prevention of puerperal infection (66% always, 27% sometimes). Antibiotic practices used least frequently following uncomplicated vaginal births (22% always, 32% sometimes) and following cord clamp at the time of cesarean section (34% always, 22% sometimes). Over a quarter of respondents reported that women who require antibiotics must either be always (10%) or sometimes (18%) transferred to another facility.

Table 12. Respondents' use of antibiotics during L&D, n=145

	%		
Administer antibiotics to women:	**Yes**		**Never**
For the prevention of puerperal infection	93%	*(66% always, 27% sometimes)*	7%
With documented antenatal infection	92%	*(76% always, 17% sometimes)*	8%
With group B streptococcus colonization	86%	*(66% always, 20% sometimes)*	14%
With preterm labor	85%	*(52% always, 33% sometimes)*	15%
With preterm pre-labor rupture of membranes	94%	*(82% always, 12% sometimes)*	6%
Who show clinical signs of chorioamnionitis	92%	*(81% always, 11% sometimes)*	8%
Prior to cesarean section	83%	*(62% always, 21% sometimes)*	17%
Following cord clamp at the time of cesarean section	57%	*(34% always, 22% sometimes)*	43%
Following uncomplicated vaginal birth	54%	*(22% always, 32% sometimes)*	46%
Following complicated vaginal birth	88%	*(63% always, 25% sometimes)*	12%
Following cesarean section	88%	*(67% always, 21% sometimes)*	12%
To take for some period following departure from health facility	79%	*(36% always, 43% sometimes)*	21%
Who arrive at facility postpartum with a complication	92%	*(63% always, 29% sometimes)*	8%

Reported antibiotic L&D practices varied notably by facility geography and somewhat by facility type and region. Significantly more respondents from urban than nonurban facilities reported always administering antibiotics to women: with documented antenatal infection (85% urban, 63% nonurban); with group B streptococcus colonization (76% urban, 50% nonurban); who show clinical signs of chorioamnionitis (86% urban, 76% nonurban); following cord clamp at the time of cesarean section (45% urban, 18% nonurban); following uncomplicated vaginal birth (30% urban, 12% nonurban); following complicated vaginal birth (73% urban, 50% nonurban); following cesarean section (80% urban, 50% nonurban); and to take for some period following departure from health facility (59% urban, 32% non-urban). Conversely, significantly more respondents from nonurban than urban facilities reported administering antibiotics to women prior to cesarean section (68% nonurban, 58% urban) and that women requiring antibiotics must be transferred to another facility (17% nonurban, 5% urban). Additionally, respondents from public facilities were significantly more likely than those from nonpublic facilities to report always administering antibiotics to women: with documented antenatal infection (85% public, 67% nonpublic); who show clinical signs of chorioamnionitis (83% public, 79% nonpublic); following cord clamp at the time of cesarean section (38% public, 30% nonpublic); and following cesarean section (80% public, 55% nonpublic). Lastly, respondents from Africa were significantly more likely than those from South-East Asia to report always administering antibiotics to women with preterm pre-labor rupture of membranes (86% Africa, 82% South-East Asia) and who show clinical signs of chorioamnionitis (86% Africa, 80% South-East Asia). However, signficantly more respondents from South-East Asia than Africa reported always administering antibiotics to women following complicated vaginal birth (66% South-East Asia, 60% Africa). For more details, see Table 28 in Annex A.

Supplies for Intrapartum and Postpartum Bladder Care

Lastly, the survey inquired about access to supplies for UC during intrapartum or postpartum periods. As illustrated in Figure 11, nearly two-thirds (63%) reported that supplies are always available. Furthermore, significantly more respondents from South-East Asia than Africa and from nonpublic than public facilities reported that bladder care supplies are always or generally available (78% South-East Asia, 42% Africa; 93% nonpublic, 29% public). For more details, see Table 29 in Annex A.

Figure 11. Typical availability of supplies for intrapartum and postpartum bladder care by respondent, n=131

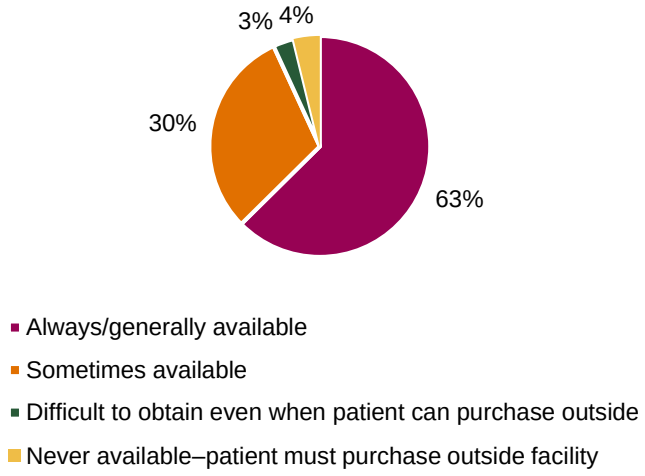


Table 13 provides the percentage of respondents who reported the availability of specific supplies. The majority of respondents reported that they always have access to new, unused sterile catheters (86%) and attachable collection bags (77%); however, approximately one-tenth of respondents reported that they never have access to sterile lubricant for catheter insertion (12%) or urine collection containers (8%). Reported availability of specific supplies varied notably by facility type and somewhat by region, with significantly more respondents from nonpublic than public facilities reporting always having access to new, unused sterile catheters (94% nonpublic, 77% public); sterile lubricant for catheter insertion (76% nonpublic, 60% public); and attachable collection bags (85% nonpublic, 68% public). Additionally, significantly more respondents from South-East Asia (78%) than from Africa (53%) reported always having access to sterile lubricant for catheter insertion. For more details, see Table 30 in Annex A.

Table 13. Respondents' report access to supplies for UC during intrapartum or postpartum care, n=131

Supply	Always	Sometimes	Never
Unused sterile new catheters	86%	12%	2%
Sterile lubricant for catheter insertion	69%	19%	12%
Attachable collection bags	77%	21%	2%
Urine collection containers	66%	26%	8%

When prompted to provide intrapartum bladder care practices that were not listed in Table 5, one respondent revealed that if the patient is unable to pass urine and there is no Foley catheter, they can "cut any tube (e.g., feeding tube) and use it to empty the bladder, [however] this usually causes trauma to the urethra."

Discussion

The 2017 survey on intrapartum and postpartum practices demonstrated that the majority of respondents reported practicing many of the recommended best practices related to intrapartum and postpartum bladder and management of P/OL. The vast majority reported using the partograph to monitor labor (99%), monitoring voiding frequency for postpartum patients during the first 24 hours after delivery (95%), and utilizing UC for patients who experience P/OL (94%). Despite this, the survey revealed a lack of facility protocols in place for SBAs for providing intrapartum and postpartum bladder care and management of P/OL, as well as notable disparities in in-service training, utilization of clinical practices, and availability of supplies between regions, facility types, and geographies. It is reasonable that respondents from lower-resources settings, such as Africa and nonurban facilities, were more likely to use the partograph to monitor labor. However, while respondents from Africa and public facilities received more in-service training, it was respondents from South East Asia and nonpublic facilities, who utilized more of the recommended clinical practices and had greater access to facility protocols and supplies.

Limitations

A key limitation of the survey is that it was primarily administered online. Online surveys typically engage respondents who have greater access to internet connectivity. Therefore, the survey targeting SBAs in LMICs yielded a skewed sample of SBAs working in urban areas and at higher-level health facilities. The majority of respondents reported either working at referral, regional/provincial, academic, or national hospitals (46%) or subdistrict or district hospitals (19%) located in urban areas (61%). Additionally, two-thirds of the respondents (66%) reported working at either CEmONC or CEmONC-1 facilities. Another indication that the sample skewed toward higher-level facilities is that half of the respondents reported that their facilities is or was supported by FC+ or its predecessor, the Fistula Care Project. Given the sample's tilt toward higher-level facilities in urban areas, the analysis is not representative of the entire LMIC maternity context and is specifically limited in its understanding of practices employed at lower-level facilities in nonurban areas.

A limitation related to the anonymous nature of the survey is the inability to account for multiple respondents from the same facilities. This could have two effects: first, because FC+ could not account for such clustering in the statistical analysis, it is possible that inferences regarding the significance of differences between regions, facilities, or geography were incorrect. Additionally, if many respondents were from the same few facilities, the characteristics of those facilities (e.g., availability of clinical protocols) could weight the survey results, further reducing the generalizability of the findings.

Another limitation of the survey was a likely bias among respondents to report conducting recommended best practices. FC+ designed the survey deliberately to only include recommended practices around intrapartum and postpartum bladder care and management of P/OL, as to not unintentionally encourage SBAs to exercise harmful practices. SBAs respondents were likely able to deduce this from the survey's content. Thus, it is likely that many of the respondents over-reported utilizing these best practices (e.g., partograph use to monitor labor).

While the analysis looked at variations in key variables by region, facility type, and geography, it would have also been useful to look at these variables disaggregated by health professional cadre; however, given the overwhelmingly large number of midwife and nurse-midwife respondents and small number of other respondents, such as ob-gyns, this analysis would not have been meaningful. A future survey with a larger sample may yield more representative findings that could be disaggregated by additional categories, such as health professional cadre.

Defining P/OL

Respondents generally had a strong understanding of the commonly accepted criteria at the time of the survey to identify P/OL and its potential outcomes. Three-quarters of the respondents cited the following as criteria to identify P/OL: slow or no dilation of cervix despite strong contractions, no progress presenting part despite strong contractions, active phase of labor greater than 12 hours, and caput and/or molding. Additionally, the majority of respondents identified almost all of the specified P/OL outcomes (fistula, perinatal/birth asphyxia, ruptured uterus, newborn death, and stillbirth) with respondents from Africa more likely than those from South-East Asia to identify ruptured uterus, perinatal/birth asphyxia, and fistula. Despite this, the survey results also demonstrate the need for more comprehensive training on P/OL, as less than half of the respondents cited uterine tetany, high temperature, and signs of shock as criteria for P/OL.

Furthermore, the analysis revealed a limited understanding of how to define P/OL among the survey respondents. While there was not a clear consensus on the definition of P/OL at the time of the survey (Fistula Care *Plus*, 2015), prolonged active labor (dilation ≥4cm) was generally accepted as labor lasting longer than 12 hours (WHO, 2008) ((ECSA-HC and Fistula Care/EngenderHealth, 2012). Only half of the respondents identified prolonged active labor as lasting longer than 12 hours for primapara women and longer than 8 or 12 hours for multipara women, with a greater percentage of respondents from South-East Asia than Africa and from nonpublic than public facilities citing 12 hours.

Identifying P/OL patients in LMIC settings is challenging because laboring women may present at facilities well into their labor. Thus, health providers receiving patients at the facility may not have been present for much of the labor, resulting in poor documentation of when active labor commenced. Given that SBAs in LMICs may perceive active labor lasting shorter than the actual duration, it is particularly important to provide comprehensive training to SBAs on the criteria to identify P/OL so that they can provide timely and effective care to women who experience P/OL.

The 2018 *WHO Recommendations: Intrapartum care for a positive birth experience* includes updated evidence-based definitions and guidance for the latent and active first stage of labor, the duration and progress of the first stage of labor, progress of the first stage of labor, and definition of the second stage of labor (WHO, 2018). The WHO is developing a new labor care tool that can update or replace the currently used partograph. While this guidance and tool were not available at the time of the survey, they will be important elements of SBA training in LMIC going forward.

Limited Availability of Protocols

The survey results demonstrated the limited availability of protocols in place for SBAs on intrapartum and postpartum bladder care and management of P/OL. Despite this, respondents reported practicing many of the recommend intrapartum and postpartum practices. For example, the majority of respondents (79–98%) reported that they either always or sometimes utilize all of the recommended intrapartum bladder care practices. However, only 38% of the respondents reported that their facility has a protocol on intrapartum bladder care. Additionally, while 97% of respondents reported that they either always or sometimes provide UC to postpartum patients who are not able to pass urine successfully, only 36% reported that their facility has a protocol for postpartum UC. Lastly, 94% of respondents reported always or sometimes utilizing UC for patients who experience P/OL; however, only 41% of respondents reported that their facility has a protocol on UC during postpartum care after P/OL. The lack of protocols is particularly pronounced in Africa and in nonpublic facilities.

Despite the high utilization of many best practices as understood in widely used guidance at the time of the survey, the analysis reveals particular areas where SBAs are less clear on the recommended approaches. For example, one-third of the respondents reported that they either disagree with or are not sure about how early catheterization treatment after P/OL can heal fistulas smaller than two cm and the postpartum P/OL regime of catheterization for 14 days with a high-fluid-intake regime immediately. While regional guidelines recommend UC for approximately two weeks for women who experience P/OL to prevent obstetric fistula formation (ECSA-HC and Fistula Care/EngenderHealth, 2012) (Lewis & De Bernis, 2006), survey respondents reported a broader range (i.e., one day to one month) for the appropriate number of days to catheterize after P/OL, with nearly half of the respondents reporting seven days or fewer as the maximum duration. The limited understanding on the recommended catheterization regime following P/OL was more pronounced among respondents from Africa and public facilities than those from South-East Asia and nonpublic facilities. The absence of protocols on intrapartum and postpartum bladder care and management of P/OL may explain some of the variation in postpartum UC practices for patients who experience P/OL among the survey respondents.

Variations in Training, Practices, and Supplies

The survey findings demonstrated notable disparities in in-service training, utilization of clinical postpartum practices, and availability of bladder care supplies by region, facility type, and geography. With regards to in-service training, respondents from Africa were more likely than those from South-East Asia to receive in-service training on CEmONC, management of P/OL, and prevention and management of puerperal sepsis. Similarly, respondents from public facilities were more likely than respondents from nonpublic facilities to receive in-service training on prevention and management of puerperal sepsis and respondents from urban facilities were more likely than those from nonurban facilities to receive in-service training on CEmONC. Additionally, respondents from lower-resources settings, such as Africa and nonurban facilities, were more likely to use the partograph to monitor labor. While respondents from Africa and public facilities appeared to complete more in-service training and use partographs more frequently, respondents from South-East Asia and nonpublic facilities were more likely to report having relevant protocols in place, greater availability of bladder care supplies, employing the WHO-recommended postpartum bladder care practices, and utilizing UC for patients experiencing P/OL. Lastly, respondents from urban facilities were more likely than respondents from nonurban facilities to report employing WHO-recommended postpartum bladder care practices.

Infection Prevention

The survey examined antibiotic use and efforts to reduce infection across different stages of pregnancy and delivery care, since sepsis is an important potential consequence of P/OL. Antibiotics were most frequently utilized (>90%) following preterm pre-labor rupture of membranes, for clinical signs of chorioamnionitis, with documented antenatal infection, and for prevention of puerperal infection. Antibiotic practices used least frequently (<60%) following uncomplicated vaginal births and cord clamp at the time of cesarean section. Overall, respondents from urban and public facilities reported higher usage of antibiotics across L&D. Additionally, respondents from nonurban facilities were significantly more likely than those from urban facilities to report that women requiring antibiotics must be transferred to another facility. Furthermore, infection prevention practices were stronger among respondents from urban and public facilities than nonpublic and nonurban facilities, with respondents from urban and public facilities significantly more likely to practice intermittent catheterization during the intrapartum period to reduce infection risk and to provide broad-spectrum antibiotics for the management of P/OL.

Implications

The survey findings revealed a strong foundation for improving and standardizing intrapartum and postpartum bladder care and management of P/OL. The analysis of variations in practices by region, facility type, and geography exposes areas where SBA training can be strengthened to support increased adoption of quality and effective intrapartum and postpartum practices. While respondents from Africa and public facilities received more in-service training, respondents from South East Asia and nonpublic facilities utilized more of the recommended clinical practices. Pre- and in-service training for SBAs—particularly midwives, nurses, and community health workers within Africa and at public facilities—needs to emphasize best practices for intrapartum and postpartum bladder care and management of P/OL, as well as competency-based training in catheter insertion and management.

SBA reports indicated that UC after P/OL is likely feasible and acceptable, meaning that its systematic practice could be scaled-up with the aim of preventing obstetric fistula and other lower urinary tract sequelae of P/OL in low-resource settings. However, SBAs—particularly midwives and especially providers within Africa and at public facilities—need facility protocols, quality in-service training, and consistently available supplies. Additionally, there is no rigorous research providing high-quality evidence demonstrating the effectiveness of this practice specifically to prevent fistula. Feasibility issues prevent the efficient implementation of a clinical trial to generate such evidence. Therefore, documentation of SBAs' experiences implementing catheterization after P/OL may help build an evidence base through aggregated clinical data and inform the standardization of post-POL catheterization protocols.

Commentary on the Survey Findings: A Midwifery Perspective

By Sheena Currie, Senior Maternal Health Advisor, Jhpiego

There is much to feel positive about in SBAs' reports of key clinical practices, as documented by this survey. For example, 73% report *always* asking postpartum patients about problems with bowel or bladder functions. This is quite high, as checking these functions after birth as part of routine postnatal care is a fairly new recommendation.

The survey findings help highlight the comprehensive role SBAs, particularly midwives, can play in supporting best practices in labor care. Such practices include ensuring the woman moves around, uses non-supine positions, has the support of a birth companion, is well hydrated, and has easy access to clean washrooms with water to encourage voiding. This role especially includes promoting respectful care by providing women with full explanations and information, for instance on the importance of voiding regularly and why providers would like to measure and test urine.

Ensuring that selected best practices are in use can be context-specific. Appropriate care is a balance, for instance between efforts to reduce unnecessary interventions and interventions that may avert morbidity. One practice recommendation is that all women diagnosed with P/OL should be catheterized prior to assisted vaginal delivery or cesarean section for a period of 14 days and put on a high-fluid-intake regime to prevent fistula formation. Consideration is needed on flexible ways to provide this, especially given that 14% of survey respondents disagree and 17% are not sure about this regime. For example, one of my colleagues in Rwanda noted, "This doesn't require the woman to be an inpatient if there are no other conditions that require her to stay in hospital. She can go home and come back for follow-up visits. She should also be provided information on when she can come before the given appointment, such as when she feels she is developing fever or if the urine is not flowing well through the catheter." Such flexibility and ability to adapt to meet women's wishes could improve the uptake of UC and improve the client-provider partnership in care.

The analysis examining variations in practices by region, facility type, and geography exposes areas where learning support for SBAs (as part of quality improvement) can promote more widespread adoption of effective intrapartum and postpartum practices. It is notable that, while respondents from Africa and public facilities received more in-service training, respondents from South-East Asia and nonpublic facilities utilized more of the recommended clinical practices. Preservice education and in-service training for SBAs—particularly midwives and nurses within Africa and at public facilities—needs to emphasize best practices for intrapartum and postpartum bladder care as well as management of P/OL, including competency-based training in catheter insertion and management. Notably, the existing International Confederation of Midwives' list of essential midwifery competencies includes checking for fistula. Further, the International Confederation of Midwives is currently updating these competencies and we expected prevention of fistula to be more prominent. It would be interesting to know how many countries include prevention of fistula in their preservice training for midwives. However, training by itself may not change behavior; there must be post-training follow up through mentorship and preferably as part of quality improvement processes.

SBA reports in this survey demonstrate the acceptability and feasibility of UC after P/OL. UC is not complicated and the decision to catheterize must be the midwife's, if she has clear criteria to guide her. This is especially critical in settings where medical doctors are not available. However, SBAs (particularly those operating within Africa and at public facilities) need facility protocols, quality in-service training (preferably on-the-job training), and access to a consistent availability of supplies. The presence of up-to-date, evidence-based protocols is important but not adequate by itself—all

staff must also be aware of these protocols and consider how facilities can monitor compliance, for example, through clinical audits as part of quality improvement efforts.

SBAs are practicing in a context of evolving guidance. The recently released 2018 WHO intrapartum care guidelines show a changing landscape for monitoring the progress of labor, especially regarding partograph use, and further updates are likely. The new guidance specifically redefined the active first stage of labor to be from 5cm until full cervical dilation and noted that there is no standard duration of the latent first stage labor and that it can vary widely from one woman to another (WHO, 2018). As the WHO and other agencies update guidance and protocols, systems to help SBAs consistently perform to standard will contribute to improved care.

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Annex A: Supplementary Tables and Figures

Table 14. Countries where respondents attend live births, n=222

Country	n	% within region
Africa	125	
Burkina Faso	3	2%
Cameroon	1	1%
Democratic Republic of Congo	15	12%
Ethiopia	2	2%
Ghana	2	2%
Guinea	1	1%
Kenya	2	2%
Lesotho	3	2%
Liberia	1	1%
Madagascar	1	1%
Malawi	9	7%
Mauritania	2	2%
Namibia	1	1%
Niger	16	13%
Nigeria	8	6%
Rwanda	20	16%
Senegal	1	1%
South Africa	3	2%
South Sudan	2	2%
Tanzania	1	1%
Uganda	12	10%
Zambia	15	12%
Zimbabwe	4	3%
South-East Asia	86	
Bangladesh	72	84%
Cambodia	3	3%
Indonesia	1	1%
Malaysia	1	1%
Nepal	9	10%
Eastern Mediterranean	3	
Somalia	3	100%
Americas	2	
Belize	1	50%
Haiti	1	50%
Europe	3	
Bulgaria	1	33%
Turkey	2	67%
Western Pacific	3	
Philippines	3	100%

Table 15. Respondents' facility level by type, n=222

	Public		Nonpublic	
	n	%	n	%
Dispensary or general clinic	1	100%	0	0%
Health center	31	82%	7	18%
Maternal and Child Health (MCH) or Reproductive Health (RH) house/clinic	6	21%	23	79%
Sub-district or district hospital	29	67%	14	33%
Referral, regional/provincial, academic, or national hospital	56	55%	46	45%
Other	4	44%	5	56%
Total	127		95	

Table 16. Percentage of respondents who received in-service clinical training by region, facility type, and geography and associated chi-square test

	Patrograph		Intra/post-partum bladder care		Postpartum UC		BEmONC		CEmONC		Management of P/OL		Prevention & management of puerperal sepsis		None of the above	
	n	X^2	%	X^2	%	X^2	%	X^2	%	X^2	%	X^2	%	X^2	%	X^2
Region		1.6		.01		.3		3.3		4.7*		17.3***		11.9**		.4
Africa, n=125	96%		62%		63%		86%		70%		86%		75%		4%	
South-East Asia, n=86	92%		62%		59%		77%		56%		62%		52%		0%	
Facility type		.1		.3		.0044		2.4		.0006		1.5		4.7*		2.4
Public, n=127	94%		60%		61%		86%		63%		79%		71%		0%	
Nonpublic, n=95	95%		63%		61%		78%		63%		72%		57%		0%	
Facility geography		1.4		.9		.04		.1		4.3*		.0007		.05		.05
Urban, n=136	93%		59%		60%		83%		68%		76%		65%		0%	
Nonurban, n=86	97%		65%		62%		81%		55%		76%		64%		0%	
Total, n=222	94%		61%		61%		61%		63%		76%		65%		3%	

Chi-square tests are with df=1. Significance is noted by *p<.05, **p<.01, and ***p<.001.

Table 17. Percentage of respondents who reported facility protocols by region, facility type, and geography and associated chi-square test

	Intrapartum bladder care, n=177				Postpartum UC, n=164				UC during postpartum care after P/OL, n=133				Prevention, identification, and treatment of obstetric fistula after P/OL, n=133			
	Yes	No	Don't know	X^2	Yes	No	Don't know	X^2	Yes	No	Don't know	X^2	Yes	No	Don't know	X^2
Region				29.3 ***				19.1 ***				27.0 ***				14.4 **
Africa	28%	71%	1%		29%	68%	2%		33%	66%	2%		41%	55%	3%	
South-East Asia	49%	33%	18%		43%	38%	19%		46%	25%	29%		71%	23%	6%	
Facility type				31.1 ***				21.3 ***				21.1 ***				11.2 **
Public	27%	71%	2%		27%	70%	3%		37%	60%	3%		41%	54%	5%	
Nonpublic	53%	31%	16%		46%	36%	18%		44%	29%	27%		70%	26%	4%	
Facility geography																
Urban	36%	56%	7%	1.4	33%	57%	10%	1.2	36%	49%	15%	2.0	55%	40%	5%	.3
Nonurban	42%	48%	10%		41%	48%	11%		47%	36%	17%		58%	38%	4%	
Total	38%	53%	9%		36%	54%	10%		41%	43%	16%		56%	39%	5%	

Chi-square tests are with df=2. Significance is noted by *p<.05, **p<.01, and ***p<.001. Sample sizes for region, facility type, and geography are different for each chi-square test and are not reported in this table.

Table 18. Percentage of respondents who reported using partograph by region, facility type, and geography and associated chi-square test

	Uses partograph to monitor labor, n=185				Uses partograph to identify and manage P/OL, n=182			
	Always	Sometimes	No	X^2	Always	Sometimes	No	X^2
Region				6.6*				1.9
Africa	93%	7%	0%		85%	15%	0%	
South-East Asia	80%	19%	1%		77%	23%	0%	
Facility type				2.0				2.4
Public	84%	15%	1%		78%	22%	0%	
Nonpublic	91%	8%	1%		87%	13%	0%	
Facility geography				8.2*				.7
Urban	81%	17%	2%		80%	20%	0%	
Nonurban	96%	4%	0%		85%	15%	0%	
Total	87%	12%	1%		82%	18%	0%	

Chi-square tests for monitoring labor are with df=2 and for identifying and managing P/OL are df=1. Significance is noted by *p<.05, **p<.01, and ***p<.001. Sample sizes for region, facility type, and geography are different for each chi-square test and are not reported in this table.

Table 19. Percentage of respondents who reported healthy frequencies for urinary voiding during labor by region, facility type, and geography and associated chi-square test

	Every hour	Every 2–4 hours	Every 4–6 hours	More than 6 hours	Other	Don't know	X^2
Region							*8.6*
Africa, n=90	24%	59%	6%	1%	3%	7%	
South-East Asia, n=78	10%	73%	10%	1%	1%	4%	
Facility type							*9.5*
Public, n=97	*23%*	*56%*	*9%*	*2%*	*3%*	*7%*	
Nonpublic, n=80	*14%*	*76%*	*6%*	*0%*	*1%*	*3%*	
Facility geography							*7.5*
Urban, n=108	*19%*	*62%*	*11%*	*2%*	*1%*	*6%*	
Nonurban, n=69	*19%*	*70%*	*3%*	*0%*	*4%*	*4%*	
Total, n=177	19%	65%	8%	1%	2%	5%	

Chi-square tests are with df=5. Significance is noted by *p<.05, **p<.01, and ***p<.001.

Table 20. Percentage of respondents who reported always doing the following clinical practices related to intrapartum bladder care by region, facility type, and geography and associated chi-square test

Practice	Region			Facility type			Facility geography			Total, n=177
	Africa, n=90	South-East Asia, n=78	X^2	Public, n=97	Nonpublic, n=80	X^2	Urban, n=108	Non-urban, n=69	X^2	
Document frequency of voiding on the partograph	*50%*	*54%*	.7	49%	58%	1.1	49%	59%	3.3	53%
Monitor maternal urine output every 2 hours, correctly recording coloramount on partograph	49%	*43%*	1.8	*53%*	45%	4.3	43%	58%	4.5	49%
Test urine for presence of glucose, acetone, and protein and record on partograph	30%	*46%*	4.7	35%	41%	10.3**	31%	49%	6.5*	38%
Encourage the laboring woman to void at regular intervals (i.e., every 2–4 hours)	*80%*	*85%*	2.0	79%	86%	2.7	81%	86%	.7	82%
If laboring women has difficulty passing urine after 4 hours, consider an in/out urethral catheter	*80%*	*67%*	3.9	74%	71%	.2	70%	77%	1.0	73%
Catheterize the laboring woman if the partograph “Aaction line is crossed	*59%*	*53%*	4.2	62%	48%	4.5	61%	46%	6.4*	55%
Avoid urethral catheterization in labor, if possible, to prevent risk of UTI and urethral trauma	*47%*	*42%*	.3	47%	43%	7.2*	48%	41%	1.9	45%
If urethral catheterization in labor is used, practice intermittent catheterization, as this reduces the risk of UTI	*37%*	*37%*	4.9	38%	36%	9.3*	43%	29%	7.9*	37%
If necessary, catheterize (Foley catheter) before assisted delivery or cesarean section and document and monitor urinary output	*77%*	*73%*	.8	72%	76%	6.1*	78%	68%	8.5*	74%

Percentage of respondents who reported sometimes or never to the statement are not included in the table. Chi-square tests in table are with df=2. Significance is noted by *p<.05, **p<.01, and ***p<.001.

Table 21. Percentage of respondents who reported clinical practices related to postpartum bladder care by region, facility type, and geography and associated chi-square test

	Asks postpartum patients if they have had any problems with bowel or bladder functions, n=175				Monitors voiding frequency for postpartum patients during first 24 hours after delivery, n=175				Performs UC for postpartum patients not able to pass urine successfully, n=165			
	Always	Sometimes	No	X^2	Always	Sometimes	No	X^2	Always	Sometimes	No	X^2
Region				22.4***				10.4**				1.0
Africa	57%	39%	5%		55%	38%	8%		73%	25%	2%	
South-East Asia	90%	9%	1%		77%	22%	1%		79%	20%	1%	
Facility type				25.1***				6.7*				1.4
Public	58%	37%	5%		59%	34%	7%		70%	26%	3%	
Nonpublic	91%	9%	0%		75%	24%	1%		77%	22%	1%	
Facility geography				1.1				.5				3.5
Urban	71%	25%	4%		66%	30%	4%		70%	26%	4%	
Nonurban	76%	22%	1%		66%	28%	6%		79%	21%	0%	
Total	73%	24%	3%		66%	29%	5%		73%	24%	3%	

Chi-square tests are with df=2. Significance is noted by *p<.05, **p<.01, and ***p<.001. Sample sizes for region, facility type, and geography are different for each chi-square test and are not reported in this table.

Table 22. Percentage of respondents who reported always doing the following clinical practices related to post-operative postpartum bladder care by region, facility type, and geography and associated chi-square test

Practice	Region			Facility type			Facility geography			Total, n=164
	Africa, n=82	South-East Asia, n=74	X^2	Public, n=86	Nonpublic, n=78	X^2	Urban, n=100	Non-urban, n=64	X^2	
Retain an indwelling catheter for a minimum of 8 hours postoperatively.	*73%*	*76%*	1.5	71%	74%	11.5**	79%	63%	11.1**	73%
For operative delivery: If urine is clear, remove catheter 8 hours after surgery or after first postoperative night. If urine is not clear, leave catheter in place until urine is clear. Ensure that urine is clear before removing catheter.	*70%*	*74%*	1.1	67%	76%	6.0*	76%	64%	10.8**	71%
If the bladder was injured (e.g., uterine rupture or during cesarean section), leave the catheter in place for a minimum of 7 days and until urine is clear.	72%	*72%*	.1	74%	68%	2.0	78%	61%	8.5*	71%
If the woman is not currently receiving antibiotics, give nitrofurantoin 100 mg by mouth once daily until the catheter is removed, for prophylaxis against cystitis.	*25%*	*47%*	8.0*	36%	33%	1.3	43%	22%	7.8*	35%

Percentage of respondents who reported sometimes or never to the statement are not included in the table. Chi-square tests in table are with df=2. Significance is noted by *p<.05, **p<.01, and ***p<.001.

Figure 6a. Responents's definition of P/OL for primapara women, by hours of active labor and by region

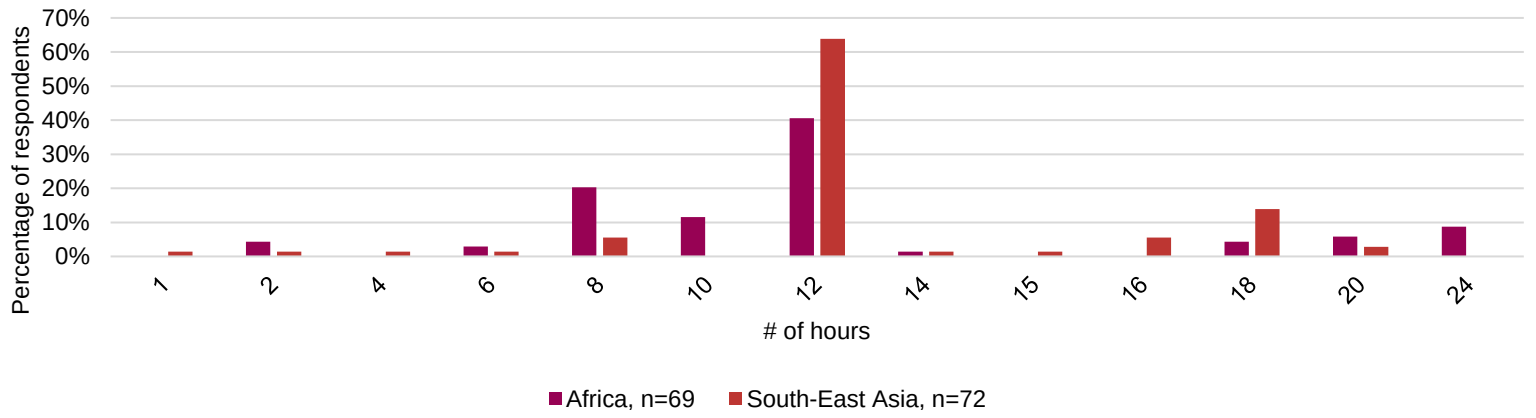


Figure 6b. Responents's definition of P/OL for multipara women, by hours of active labor and by region

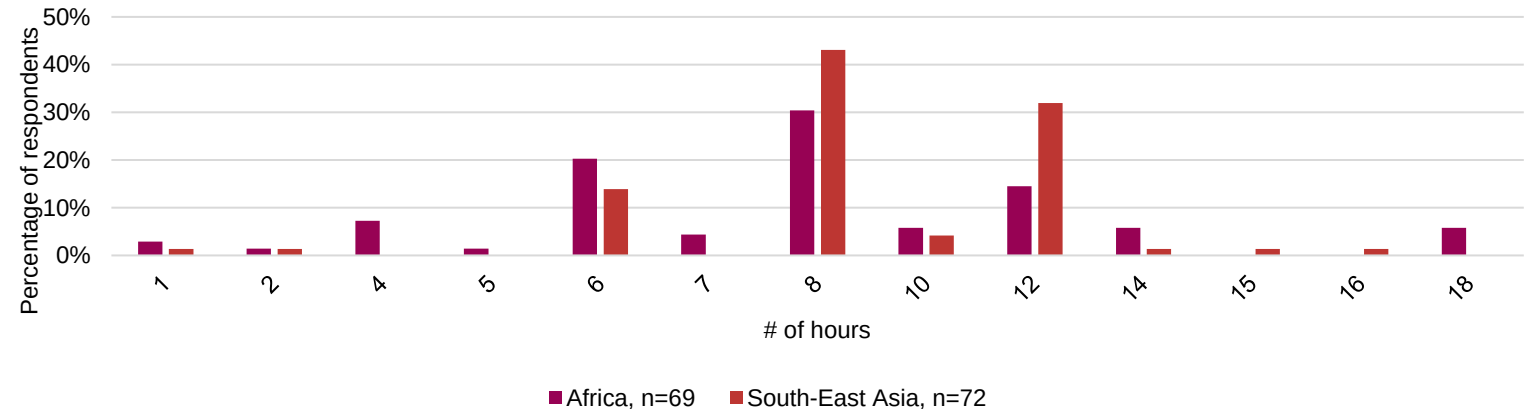


Figure 6c. Responents' definition of P/OL for primapara women, by hours of active labor and by facility type

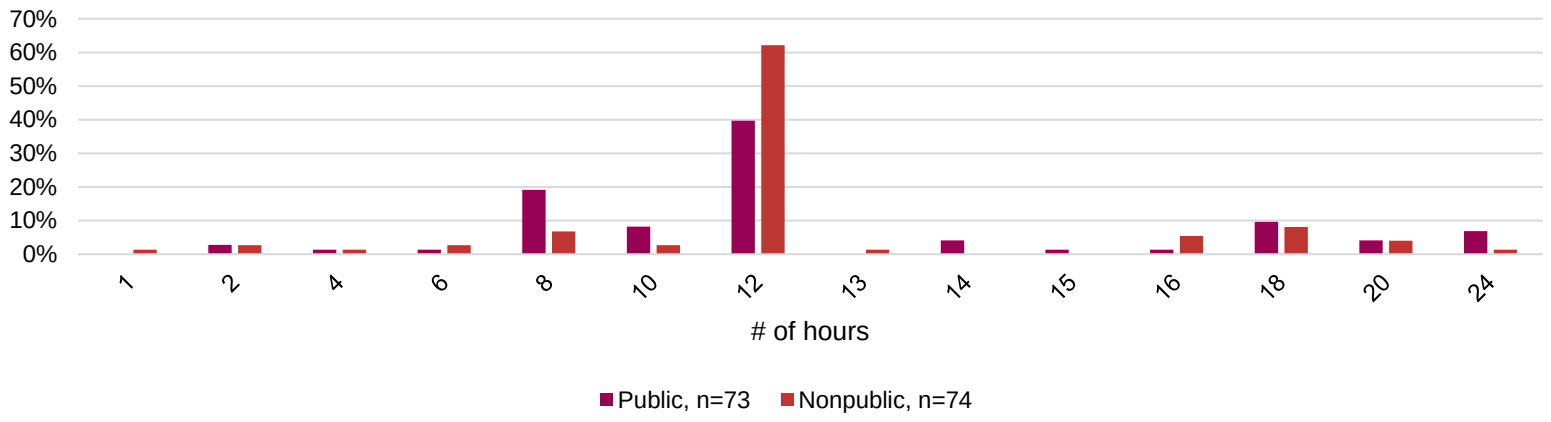


Figure 6d. Responents' definition of P/OL for multipara women, by hours of active labor and by facility type

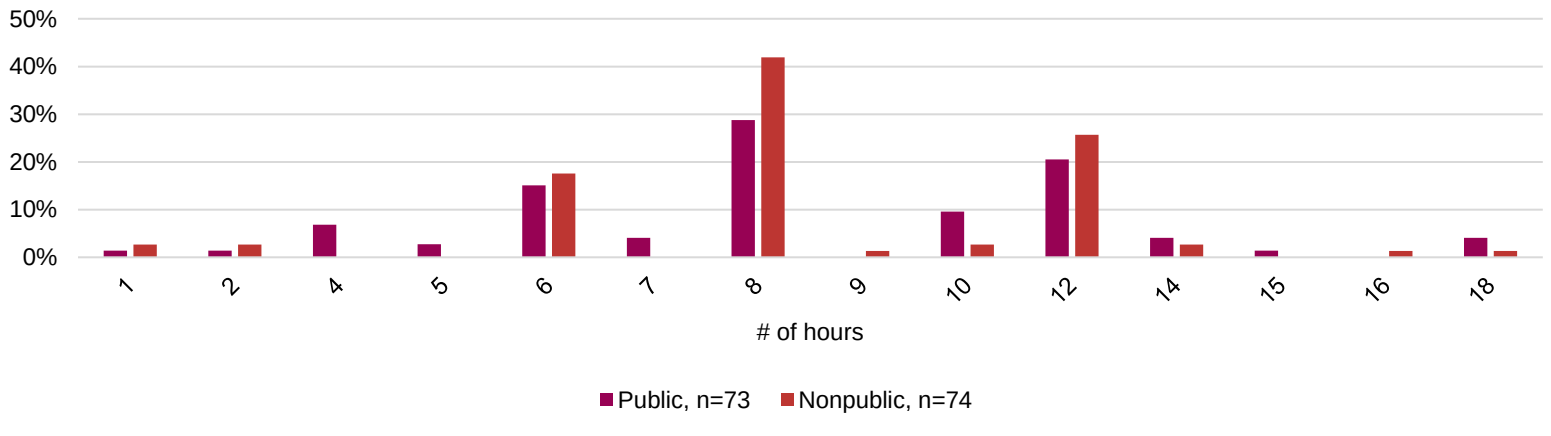


Figure 6e. Responents' definition of P/OL for primapara women, by hours of active labor and by facility geography

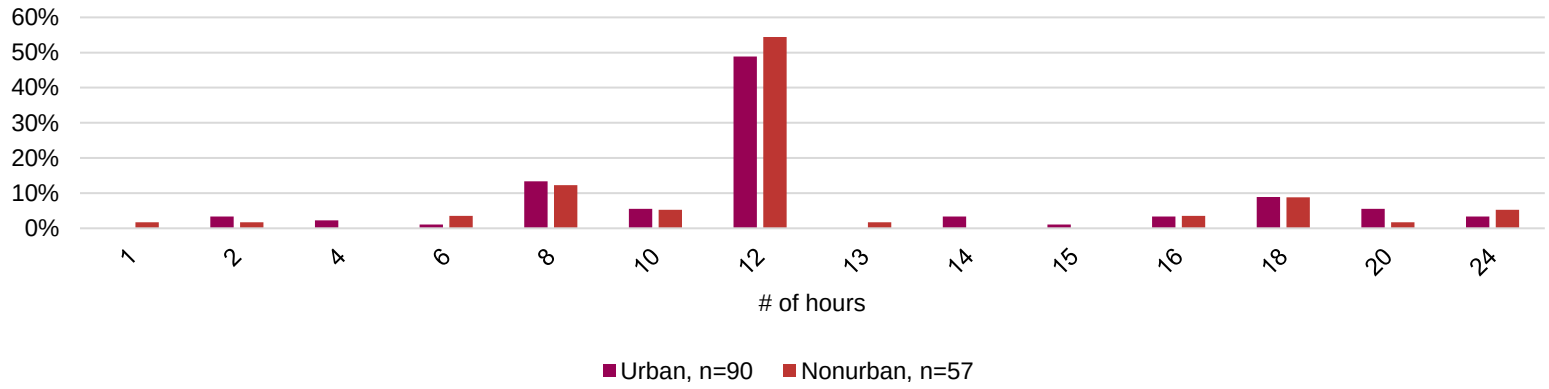


Figure 6f. Responents' definition of P/OL for multipara women, by hours of active labor and by facility grography

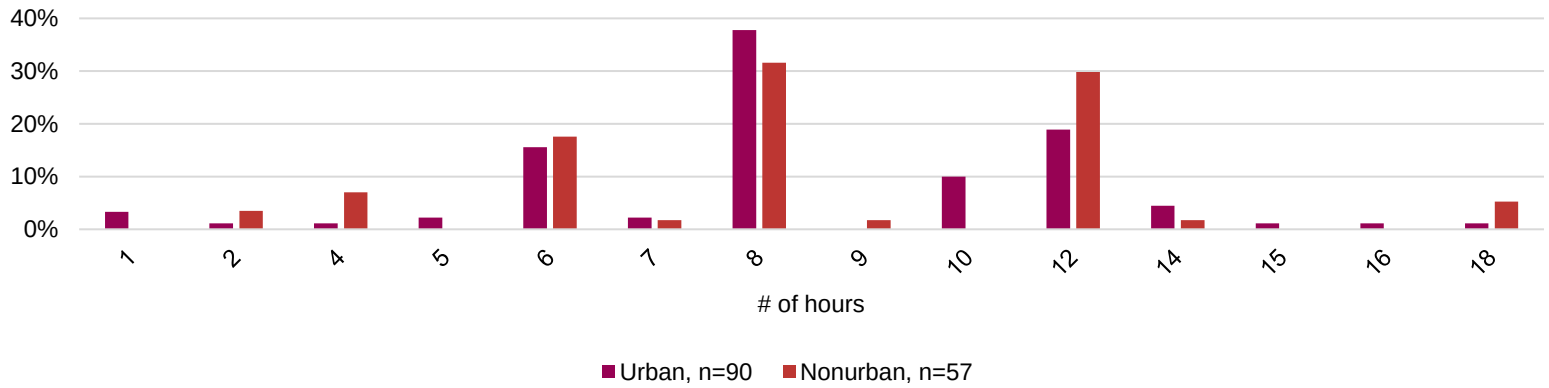


Table 23. Percentage of respondents who cited potential outcomes of P/OL by region and associated chi-square test

	Infection		Stillbirth		Newborn death		Ruptured uterus		Perinatal/birth asphyxia		Fistula	
	%	X^2	%	X^2	%	X^2	%	X^2	%	X^2	%	X^2
Region		11.8**		.01		2.9		11.3**		8.5**		5.4*
Africa, n=66	94%		91%		95%		100%		98%		98%	
South-East Asia, n=70	71%		91%		87%		84%		84%		89%	
Total, n=142	82%		89%		90%		91%		91%		92%	

Chi-square tests are with df=1. Significance is noted by *p<.05, **p<.01, and ***p<.001.

Table 24. Percentage of respondents who reported always utilizing the following practice to manage obstructed labor by region, facility type, and geography and associated chi-square test

Practice	Region			Facility type			Facility geography			Total, n=142
	Africa, n=66	South-East Asia, n=70	X^2	Public, n=69	Nonpublic, n=73	X^2	Urban, n=85	Non-urban, n=57	X^2	
Route of delivery is based on degree of obstruction	*68%*	*69%*	1.5	58%	78%	7.0*	68%	68%	.2	68%
Route of delivery is based on whether fetus is alive or dead	*58%*	*73%*	4.4	58%	70%	2.8	68%	58%	2.7	64%
Urinary bladder is drained	71%	*91%*	9.3**	75%	85%	3.6	82%	77%	1.5	80%
Delivery of the fetus occurs within two hours of diagnosis of obstructed labor	*53%*	*64%*	8.5*	48%	67%	12.6**	56%	60%	1.4	58%
An observation chart is maintained (urine output, pulse, blood pressure, temperature), with measurements every 15–30 minutes	*70%*	*83%*	3.6	72%	79%	4.0	75%	77%	.1	76%
Intravenous access and hydration are achieved	*62%*	*89%*	15.3***	72%	77%	2.7	71%	81%	2.2	75%
Broad-spectrum antibiotics are given	*80%*	*69%*	5.7	80%	67%	7.6*	82%	60%	11.9**	73%
Typing and cross-matching of blood is carried out	*76%*	*87%*	12.6**	80%	81%	4.1	82%	77%	6.0	80%

Percentage of respondents who reported sometimes or never to the statement are not included in the table. Chi-square tests in table are with df=2. Significance is noted by *p<.05, **p<.01, and ***p<.001.

Table 25. Percentage of respondents reporting UC to women who experience P/OL by region, facility type, and geography and associated chi-square test

	Always	Sometimes	No	X^2
Region				6.9*
Africa, n=66	68%	30%	2%	
South-East Asia, n=70	79%	14%	7%	
Facility type				.4
Public, n=69	72%	23%	4%	
Nonpublic, n=73	70%	23%	7%	
Facility geography				.5
Urban, n=85	73%	22%	5%	
Nonurban, n=57	68%	25%	7%	
Total, n=142	71%	23%	6%	

Chi-square tests are with df=2. Significance is noted by *p<.05, **p<.01, and ***p<.001.

Table 26. Percentage of respondents who reported always doing the following postpartum UC for patients who experience P/OL practices by region, facility type, and geography and associated chi-square test

Practice	Region			Facility type			Facility geography			Total, n=126
	Africa, n=57	South-East Asia, n=65	X^2	Public, n=61	Non-public, n=65	X^2	Urban, n=77	Non-urban, n=49	X^2	
While catheter is in situ, monitor for the following every four hours for 24 hours post-natally and then daily for 14 days: hematuria, cloudy or purulent urine, and urine output	56%	74%	5.1	70%	62%	1.6	65%	67%	.4	66%
Prior to catheter removal, perform pelvic examination	*44%*	*49%*	1.9	48%	46%	3.4	42%	55%	2.2	47%
Prior to catheter removal, retain catheter if there is clinical suspicion of fistula and refer to facility with fistula expertise	*77%*	*78%*	2.5	79%	77%	.6	71%	88%	5.1	78%
Prior to discharge, counsel patient to return immediately to the facility in case of urine leakage/incontinence	*84%*	*92%*	2.5	82%	94%	4.5	86%	92%	1.4	88%

Percentage of respondents who reported sometimes or never to the statement are not included in the table. Chi-square tests in table are with df=2. Significance is noted by *p<.05, **p<.01, and ***p<.001.

Figure 10a. Minimum # of days respondents reported catheterizing patients after prolonged/obstructed labor by region

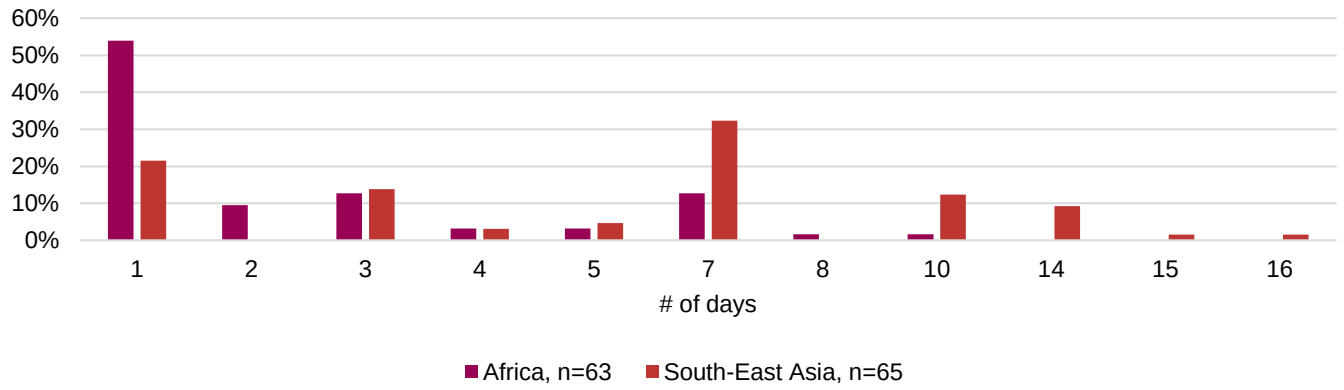
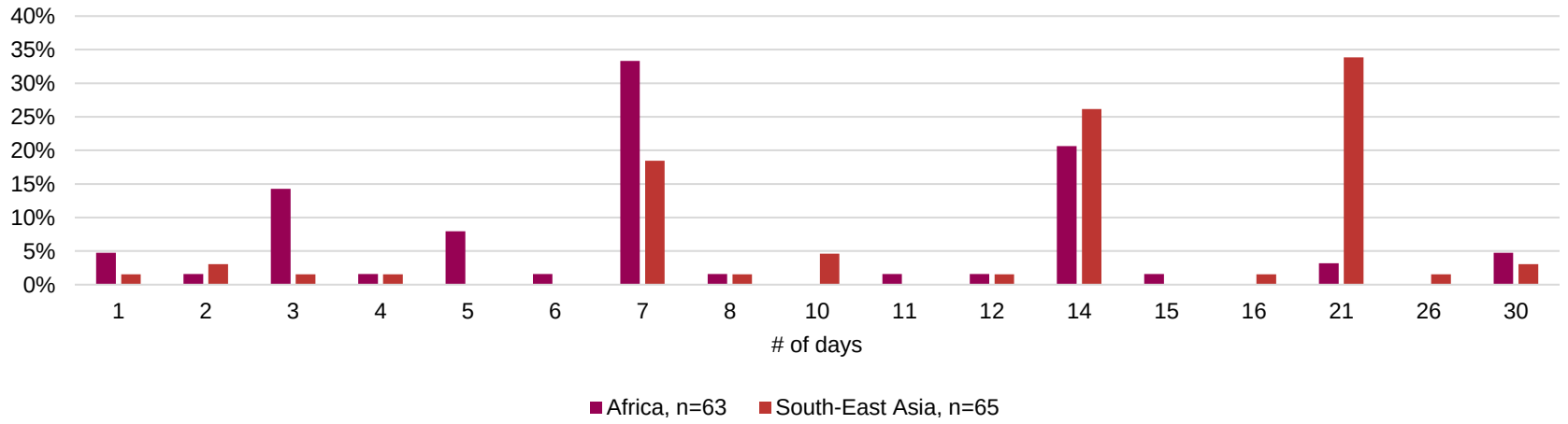


Figure 10b. Maximum # of days respondents reported catheterizing patients after prolonged/obstructed labor by region



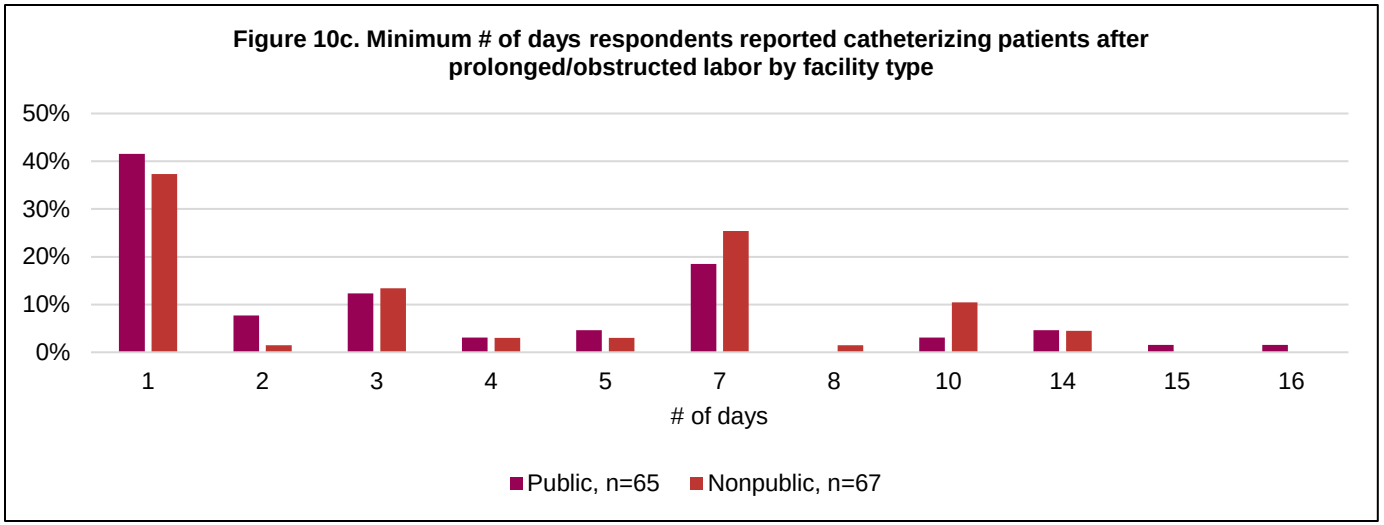


Figure 10c. Minimum # of days respondents reported catheterizing patients after prolonged/obstructed labor by facility type
50%
40%
30%
20%
10%
0%
1
2
3
4
5
7
8
10
14
15
16
# of days
Public, n=65
Nonpublic, n=67

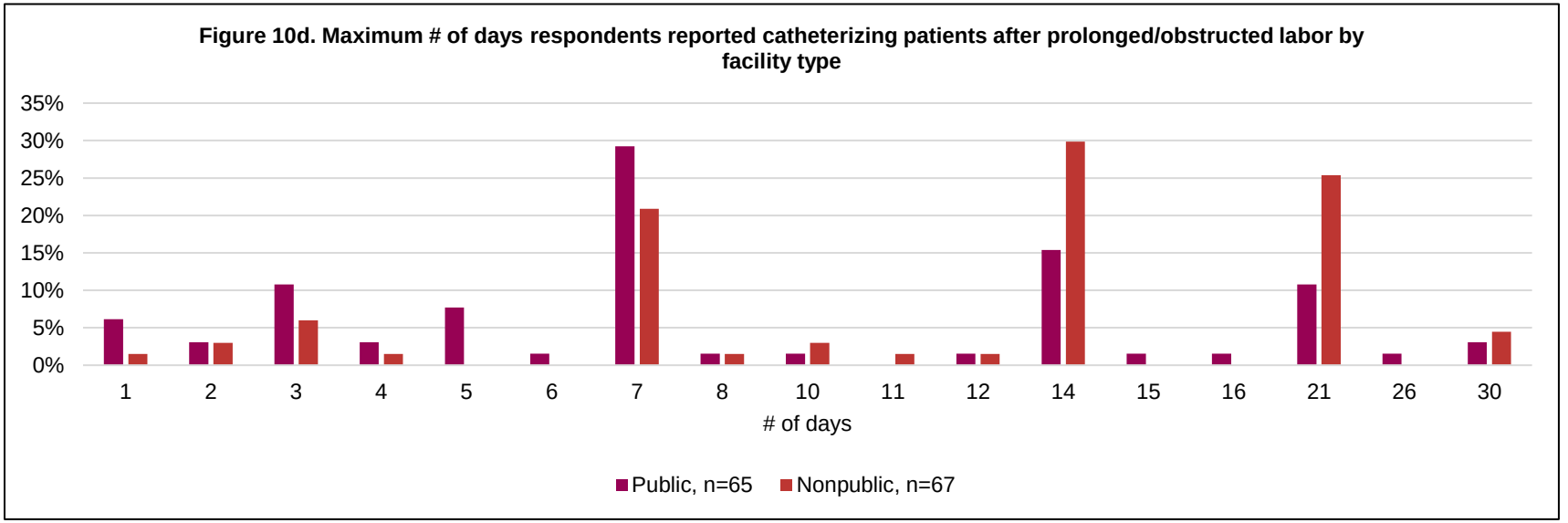


Figure 10d. Maximum # of days respondents reported catheterizing patients after prolonged/obstructed labor by facility type
35%
30%
25%
20%
15%
10%
5%
0%
1
2
3
4
5
6
7
8
10
11
12
14
15
16
21
26
30
# of days
Public, n=65
Nonpublic, n=67

Figure 10e. Minimum # of days respondents reported catheterizing patients after prolonged/obstructed labor by facility geography

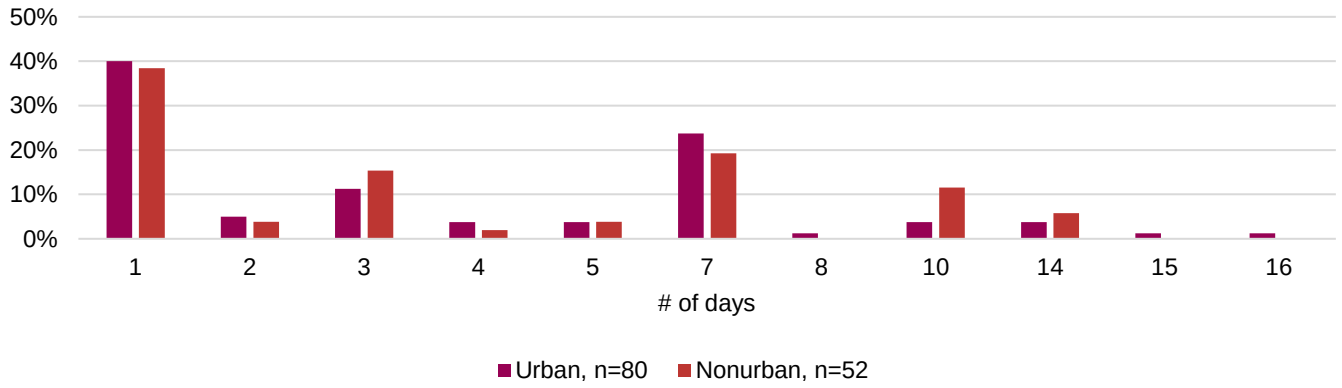


Figure 10f. Maximum # of days respondents reported catheterizing patients after prolonged/obstructed labor by facility geography

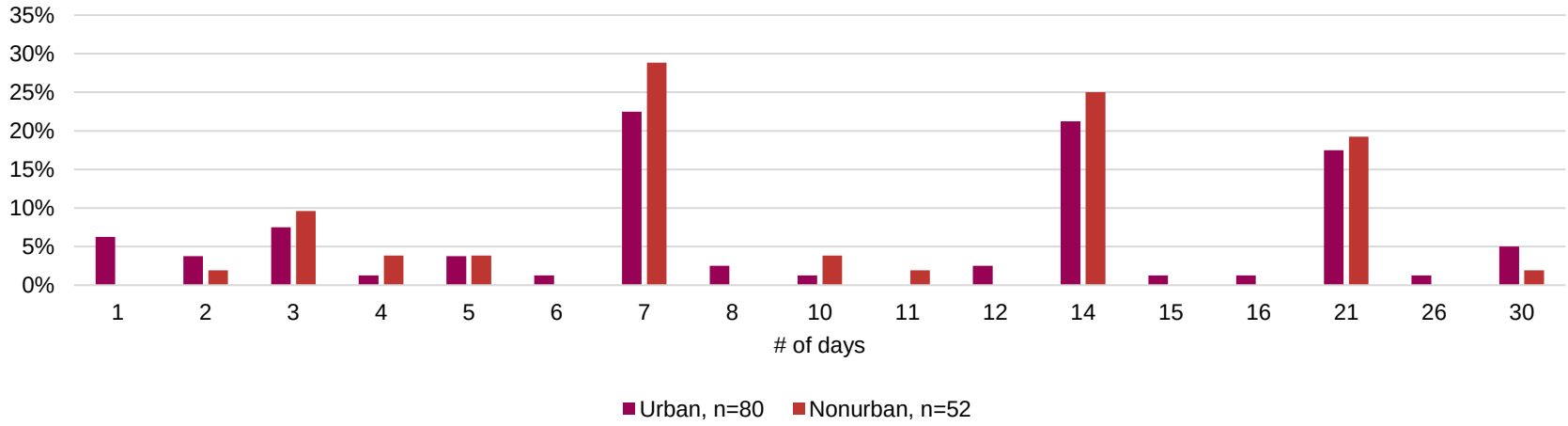


Table 27. Percentage of respondents who reported agreeing with the following beliefs about postpartum UC for patients who experience P/OL by region, facility type, and geography and associated chi-square test

Belief	Region			Facility type			Facility geography			Total, n=126
	Africa, n=57	South-East Asia, n=65	X^2	Public, n=61	Non-public, n=65	X^2	Urban, n=77	Non-urban, n=49	X^2	
Women should be catheterized when the duration of labor exceeds or is reported to exceed 18 hours (i.e., P/OL)	*84%*	*92%*	4.5	82%	91%	2.1	86%	88%	.8	87%
Women who have survived P/OL should be treated by routine urethral catheterization for a period of 14 days, with a high-fluid-intake regime immediately after delivery or as soon as they present at the facility	*60%*	*78%*	5.7	67%	71%	.4	71%	65%	1.1	69%
Early catheterization treatment after P/OL following vaginal delivery or cesarean section may heal fistulas <2 cm with bladder drainage	*74%*	*65%*	2.1	79%	60%	5.1	69%	69%	1.1	69%
UC during or immediately after P/OL can be performed at BEmONC/CEmONC facilities by trained health providers, who have midwifery competencies/skills and authorization to insert and manage urinary catheters	*93%*	*92%*	5.6	87%	94%	3.5	88%	94%	1.2	90%
Women who have experienced P/OL and are being treated with catheters could be managed as either inpatient or outpatient with the catheter in situ, depending on the trained health care provider's assessment	*82%*	*83%*	1.2	80%	83%	.8	82%	82%	.1	82%

Percentage of respondents who reported disagree or not sure/don't know to the statement are not included in the table. Chi-square tests in table are with df=2. Significance is noted by *p<.05, **p<.01, and ***p<.001.

Table 28. Percentage of respondents who reported always using antibiotics during L&D by region, facility type, and geography and associated chi-square test

Administer antibiotics to women	Region			Facility type			Facility geography			Total, n=144
	Africa, n=65	South-East Asia, n=71	X^2	Public, n=71	Non-public, n=73	X^2	Urban, n=84	Non-urban, n=60	X^2	
For the prevention of puerperal infection	62%	70%	1.3	68%	64%	.4	74%	55%	5.7	66%
With documented antenatal infection	82%	70%	5.4	85%	67%	7.0*	85%	63%	9.2*	76%
With group B streptococcus colonization	69%	65%	.3	68%	63%	.5	76%	50%	12.5**	65%
With preterm labor	45%	58%	5.7	56%	48%	1.2	56%	47%	2.1	52%
With preterm pre-labor rupture of membranes	86%	82%	6.0*	87%	77%	3.2	85%	78%	1.6	82%
Who show clinical signs of chorioamnionitis	86%	80%	8.4*	83%	79%	9.6**	86%	75%	7.9*	81%
Prior to cesarean section	54%	72%	4.8	61%	64%	.9	58%	68%	11.0**	63%
Following cord clamp at the time of cesarean section	37%	30%	1.6	38%	30%	6.1*	45%	18%	28.8***	34%
Following uncomplicated vaginal birth	22%	24%	.1	28%	16%	3.8	30%	12%	12.7**	22%
Following complicated vaginal birth	60%	66%	6.1*	66%	60%	1.5	73%	50%	8.4*	63%
Following cesarean section	68%	68%	9.2*	80%	55%	12.2**	80%	50%	17.9***	67%
To take for some period following departure from health facility	28%	45%	4.6	39%	33%	.7	39%	32%	6.3*	36%
Who arrive at facility postpartum with a complication	62%	65%	4.7	68%	59%	1.8	67%	58%	1.1	63%
Who must be transferred to another facility	8%	10%	1.4	10%	10%	.3	5%	17%	10.6**	10%

Percentage of respondents who reported sometimes or never to the statement are not included in the table. Chi-square tests in table are with df=2. Significance is noted by *p<.05, **p<.01, and ***p<.001.

Table 29. Percentage of respondents reporting access to supplies for UC during intrapartum or postpartum care by region, facility type, and geography and associated chi-square test

	Always	Sometimes	Difficult to obtain	Never available	X^2
Region					27.9***
Africa, n=55	42%	55%	4%	0%	
South-East Asia, n=69	78%	13%	1%	7%	
Facility type					56.3***
Public, n=62	29%	56%	6%	8%	
Nonpublic, n=68	93%	7%	0%	0%	
Facility geography					6.8
Urban, n=77	55%	35%	4%	6%	
Nonurban, n=53	74%	24%	2%	0%	
Total, n=130	62%	31%	3%	4%	

Chi-square tests are with df=3. Significance is noted by *p<.05, **p<.01, and ***p<.001.

Table 30. Percentage of respondents reporting always having access to specific UC supplies during intrapartum or postpartum care by region, facility type, and geography and associated chi-square test

	Unused sterile new catheter		Sterile lubricant for catheter insertion		Attachable collection bags		Urine collection containers	
	%	X^2	%	X^2	%	X^2	%	X^2
Region		2.5		16.2***		5.5		2.7
Africa, n=55	80%		53%		69%		62%	
South-East Asia, n=69	90%		78%		84%		71%	
Facility type		8.0*		7.4*		11.6**		
Public, n=62	77%		60%		68%		60%	
Non-Public, n=68	94%		76%		85%		74%	
Facility geography		2.2		4.1		.1		2.1
Urban, n=77	83%		74%		77%		66%	
Non-Urban, n=53	91%		60%		77%		68%	
Total, n=130	86%		68%		77%		67%	

Percentage of respondents who reported sometimes or never to the statement are not included in the table. Chi-square tests in table are with df=2. Significance is noted by *p<.05, **p<.01, and ***p<.001.

Annex B: Survey Instrument

Section 1: Respondent Inclusion Criteria *This section asks a few questions to help determine whether the survey is appropriate for you.*			
Question		**Answer choices**	**Next step**
1)	Are you a skilled birth attendant? *"A skilled attendant is an accredited health professional – such as a midwife, doctor or nurse – who has been educated and training to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns."* ***Select one answer.***	◯ Yes ◯ No ◯ Don't know	If the answer is: "Yes" → Proceed to Question 2. "No" or "Don't know" → End survey. Respondent does not meet inclusion criteria for survey.
2)	Have you attended a birth in the last three years? ***Select one answer.***	◯ Yes ◯ No ◯ Don't know	If the answer is: "Yes" → Proceed to Question 3. "No" or "Don't know" → End survey. Respondent does not meet inclusion criteria for survey.
3)	In which country do you attend births? Please write the country where you work the most.	Write in:	If the answer is: Low- or middle-income country → Proceed to Question 4. High-income country → End survey. Respondent does not meet inclusion criteria for survey.

Section 2: Clinician Profile *This section includes questions about your clinical background and experience.*			
Question		**Answer choices**	**Next step**
4)	What type of health professional are you? ***Select one answer.***	◯ Obstetrician/ Gynecologist ◯ General Surgeon ◯ Doctor (other than Obstetrician/Gynecologist or General Surgeon) ◯ Medical or Clinical Officer (no specialist training after internship) ◯ Assistant Medical/Clinical Officer ◯ Midwife/Nurse-Midwife ◯ Nurse ◯ Other. Please specify: _____ _____	Proceed to Question 5.
5)	How many years have you been attending births? ***Select one answer.***	◯ Less than two years ◯ 2-5 years ◯ 6-9 years ◯ 10+ years	Proceed to Question 6.
6)	In what country did you obtain your training and certification?	Write in:	Proceed to Question 7.
7)	How many years of pre-service clinical training did you undertake for this position? ***Select one answer.***	◯ Up to one year ◯ 2-3 years ◯ 4-5 years ◯ 6+ years	Proceed to Question 8.
8)	Have you had in-service clinical training on any of the following topics? ***Select all that apply.***	◯ Partograph ◯ Intrapartum or postpartum bladder care ◯ Postpartum urinary catheterization ◯ Basic emergency obstetric and newborn care (BEmONC) ◯ Comprehensive emergency obstetric and newborn care (CEmONC) ◯ Management of prolonged and obstructed labor ◯ Prevention and management of puerperal sepsis ◯ None of the above	Proceed to Question 9.

Section 3: Facility Profile *This section includes questions about the health facility where you currently work.*			
Question		**Answer choices**	**Next step**
9)	At which type of facility do you primarily attend births? ***Select one answer.***	◯ Dispensary or general clinic ◯ Health center ◯ Maternal and Child Health (MCH) or Reproductive Health (RH) house/clinic ◯ Sub-district or district hospital ◯ Referral, regional/provincial, academic, or national hospital ◯ Other. Please specify: _____	Proceed to Question 10.
10)	How is this facility managed? ***Select one answer.***	◯ Public ◯ Private ◯ Religious / Faith-based ◯ Other. Please specify: _____	Proceed to Question 11.
11)	Where is this facility located? ***Select one answer.***	◯ Urban ◯ Peri-Urban ◯ Rural	Proceed to Question 12.
12)	Has your facility ever been supported by EngenderHealth's Fistula Care project and/or Fistula Care *Plus* project? ***Select one answer.***	◯ Yes ◯ No ◯ Don't know	Proceed to Question 13.

13)	Which of the following Emergency Obstetric and Newborn Care (EmONC) services does your facility provide on a routine basis (i.e. within past three months)? ***Select all that apply.***	◯ Administer parenteral antibiotics (injection or intravenous infusion) ◯ Administer uterotonic drugs (i.e. parenteral oxytocin) ◯ Administer parenteral anticonvulsants for pre-eclampsia and eclampsia (i.e. magnesium sulfate) ◯ Manually remove the placenta ◯ Remove retained products (e.g. manual vacuum extraction, dilation and curettage) ◯ Perform assisted vaginal delivery (e.g. vacuum extraction, forceps delivery) ◯ Perform basic neonatal resuscitation (e.g. with bag and mask) ◯ Perform surgery (e.g. cesarean section ◯ Perform blood transfusion ◯ None of the above	Proceed to Question 14.
14)	Is your facility classified as BEmONC or CEmONC? ***Select one answer.***	◯ Yes, BEmONC-1 (all BEmONC functions except assisted vaginal delivery) ◯ Yes, BEmONC (all BEmONC functions) ◯ Yes, CEmONC ◯ No, neither ◯ Don't know	Proceed to Question 15.
15)	Does your facility perform operative delivery? ***Select one answer.***	◯ Yes ◯ No ◯ Don't know	If the answer is: "Yes" → Proceed to Question 16. "No" or "Don't know" → Skip to Question 17.
16)	What type of deliveries are you, as a clinician, able to provide? ***Select all that apply.***	◯ Forceps for live births ◯ Forceps for destructive delivery of stillbirths ◯ Vacuum-extractor (Ventouse) ◯ Cesarean section	Proceed to Question 17.

Section 4: Clinical Practices related to Intrapartum Bladder Care

This section asks questions about your opinions and practices related to bladder care during the intrapartum period for all women.

	Question	Answer choices	Next step
17)	Do you use the partograph to monitor labor? ***Select one answer.***	◯ Yes, always ◯ Yes, sometimes ◯ No	If the answer is: "Yes, always" or "Yes, sometimes" → Proceed to Question 18. "No" → Skip to Question 20.
18)	Do you use the partograph to identify and manage prolonged/obstructed labor? ***Select one answer.***	◯ Yes, always ◯ Yes, sometimes ◯ No	Proceed to Question 19.
19)	Do you document the frequency of the patient's voiding on the partograph? ***Select one answer.***	◯ Yes ◯ No	Skip to Question 21.
20)	How do you monitor the progress of labor? ***Only answer if answered "No" to question 17.***	Write in:	Proceed to Question 21.
21)	What do you consider a healthy frequency for urinary voiding during labor? ***Select one answer.***	◯ Every hour ◯ Once every 2-4 hours ◯ Once every 4-6 hours ◯ More than 6 hours ◯ It is not necessary for patient to urinate during labor ◯ Don't know ◯ Other. Please specify: _____	Proceed to Question 22.
22)	Describe how you typically provide intrapartum bladder care. Please select the most accurate response for each practice in the table below (if you manage intrapartum care as part of a team, describe how your team provides intrapartum bladder care). ***Answer questions 22a-22i below.***		Proceed to Question 22a.
22a)	Document frequency of voiding on the partograph. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 22b.
22b)	Monitor maternal urine output every two hours, correctly recording color/amount on partograph. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 22c.

22c)	Test urine for presence of glucose, acetone, and protein and record on partograph. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 22d.
22d)	Encourage the laboring woman to void at regular intervals (i.e. every two to four hours). ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 22e.
22e)	If laboring women has difficulty passing urine after four hours, consider an in/out urethral catheter. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 22f.
22f)	Catheterize the laboring woman if the partograph “Action Line” is crossed. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 22g.
22g)	Avoid urethral catheterization in labor, if possible, to prevent risk of urinary tract infection and urethral trauma. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 22h.
22h)	If urethral catheterization in labor is used, practice intermittent catheterization, as this reduces the risk of urinary tract infections. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 22i.
22i)	If necessary, catheterize (Foley catheter) before assisted delivery or cesarean section and document and monitor urinary output. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 22j.
22j)	Please describe any other aspects of intrapartum bladder care practices that you or your team typically conduct not listed above. ***Answer only if necessary.***	Write in:	Proceed to Question 23.
23)	Have you received guidance and/or training on the use of the partograph for diagnosis and management of prolonged and obstructed labor? ***Select one answer.***	◯ Yes ◯ No ◯ Don’t know	Proceed to Question 24.
24)	Does your facility have a protocol for intrapartum bladder care? ***Select one answer.***	◯ Yes ◯ No ◯ Don’t know	Proceed to Question 25.

Section 5: Clinical Practices related to Postpartum Bladder Care *This section asks questions about your opinions and practices related to bladder care during the postpartum period for all women.*			
Question		**Answer choices**	**Next step**
25)	Do you ask postpartum patients if they have had any problems with their bowels or bladder function? ***Select one answer.***	◯ Yes, always ◯ Yes, sometimes ◯ No	Proceed to Question 26.
26)	Do you monitor voiding frequency for postpartum patients during the first 24 hours after delivery at your facility? ***Select one answer.***	◯ Yes, always ◯ Yes, sometimes ◯ No	If the answer is: "Yes, always" or "Yes, sometimes" → Proceed to Question 27. "No" → Skip to Question 30.
27)	Do you (or your team) perform urinary catheterization for postpartum patients who are not able to pass urine successfully? ***Select one answer.***	◯ Yes, always ◯ Yes, sometimes ◯ No	If the answer is: "Yes, always" or "Yes, sometimes" → Proceed to Question 28. "No" → Skip to Question 30.
28)	After which hour (1-24) of not voiding during the postpartum period, do you or your team perform urinary catheterization? If after 24 hours, please explain when you perform urinary catheterization.	Write in:	Proceed to Question 29.
29)	In addition to time without voiding, how else do you assess bladder function and whether urinary catheterization is needed? ***Answer questions 29a-29d below.***		Proceed to Question 29a.
29a)	Check if bladder palpable. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 29b.
29b)	Ask about discomfort before, during, or after voiding. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 29c.
29c)	Ask about bleeding post-voiding. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 29d.
29d)	Assess vital signs. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 29e.

29e)	Please describe any other ways that you or your team assess bladder function and whether urinary catheterization is needed that are not listed above. ***Answer only if necessary.***	Write in:	Proceed to Question 30.
30)	Describe how you typically provide postpartum bladder care. Please select the most accurate response for each practice in the table below (if you manage postpartum care as part of a team, describe how your team provides postpartum bladder care). ***Answer questions 30a-30d below.***		Proceed to Question 30a.
30a)	Retain an indwelling catheter for a minimum of eight hours postoperatively, if there was: uterine rupture; prolonged/obstructed labor; massive perineal oedema; or puerperal sepsis with pelvic peritonitis. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 30b.
30b)	For operative delivery: if urine is clear, remove catheter eight hours after surgery or after first postoperative night. If urine is not clear, leave catheter in place until urine is clear. Ensure that urine is clear before removing catheter. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 30c.
30c)	If the bladder was injured (e.g. uterine rupture or during cesarean section): leave the catheter in place for a minimum of seven days and until urine is clear. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 30d.
30d)	If the woman is not currently receiving antibiotics: give nitrofurantoin 100 mg by mouth once daily until the catheter is removed, for prophylaxis against cystitis. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 30e.
30e)	Please describe any other ways that you or your team assess bladder function and whether urinary catheterization is needed that are not listed above. ***Answer only if necessary.***	Write in:	Proceed to Question 31.
31)	Does your facility have a protocol for postpartum urinary catheterization? ***Select one answer.***	◯ Yes ◯ No ◯ Don’t know	Proceed to Question 32.

Section 6: Identification & Management of Prolonged/Obstructed Labor: Intrapartum/Postpartum Care *This section asks questions about your opinions and practices related to the identification and management of prolonged/obstructed labor during the intrapartum and postpartum periods.*			
Question		**Answer choices**	**Next step**
32)	For primapara women, prolonged / obstructed labor is active labor lasting longer than?	Write in:	Proceed to Question 33.
33)	For multipara women, prolonged / obstructed labor is active labor lasting longer than?	Write in:	Proceed to Question 34.
34)	Which of the following criteria do you use to identify prolonged/obstructed labor? ***Select all that apply.***	◯ No advance of the presenting part despite strong uterine contractions ◯ Slow or no dilation of the cervix despite strong uterine contractions ◯ Fetal distress ◯ Maternal distress ◯ Clinical signs of shock (systolic blood pressure <100 mmHg, pulse ?100/min ◯ Temperature ≥37.5◦ C ◯ Odorous vaginal discharge ◯ Active phase of labor > 12 hours ◯ Uterine tetany ◯ Uterine atony ◯ Abnormal pelvis ◯ Bandl's ring ◯ Haematuria ◯ Caput and /or molding ◯ Other. Please describe any criteria used to identify obstructed labor not listed above: _____ _____ _____	Proceed to Question 35.
35)	What are some potential outcomes of prolonged/obstructed labor? ***Select all that apply.***	◯ Infection ◯ Ruptured uterus ◯ Fistula ◯ Stillbirth ◯ Perinatal/birth asphyxia ◯ Newborn death ◯ Other. Please describe any other outcomes not listed above: ____	Proceed to Question 36.

36)	Describe how you typically manage obstructed labor. Please select the most accurate response for each practice in the table below (if you manage obstructed labor as part of a team, describe how your team typically manages obstructed labor). ***Answer questions 36a-36h below.***		Proceed to Question 36a.
36a)	Route of delivery is based on degree of obstruction ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 36b.
36b)	Route of delivery is based on whether fetus is alive or dead ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 36c.
36c)	Urinary bladder is drained ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 36d.
36d)	Delivery of the fetus occurs within two hours of diagnosis of obstructed labor ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 36e.
36e)	An observation chart is maintained (urine output, pulse, blood pressure, temperature), with measurements every 15-30 minutes ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 36f.
36f)	Intravenous access and hydration are achieved ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 36g.
36g)	Broad-spectrum antibiotics are given ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 36h.
36h)	Typing and cross-matching of blood is carried out ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 36i.
36i)	Please describe any other key practices that you or your team typically conduct in managing obstructed labor that are not listed above. ***Answer only if necessary.***	Write in:	Proceed to Question 37.

37)	Do you provide urinary catheterization to women who experience prolonged/obstructed labor? ***Select one answer.***	◯ Yes, always ◯ Yes. sometimes ◯ No	If the answer is: "Yes, always" or "Yes, sometimes" → Proceed to Question 38. "No" → Answer Question 38 and then skip to Question 44.
38)	What are the potential clinical benefits to the woman of providing postpartum urinary catheterization after prolonged/obstructed labor? ***Answer only if necessary.***	Write in:	Proceed to Question 39.
39)	What is the appropriate duration of time that a patient should have a postpartum urinary catheter? ***Write in minimum and maximum number of days for urinary catheter insertion after prolonged/ obstructed labor***	Minimum # of days: Maximum # of days:	Proceed to Question 40.
40)	What are your considerations when determining the appropriate duration of time for a postpartum urinary catheter? ***Answer only if necessary.***	Write in:	Proceed to Question 41.
41)	Describe how you typically provide postpartum urinary catheterization for patients who have experienced prolonged/obstructed labor. Please select the most accurate response for each practice in the table below (if you manage postpartum urinary catheterization as part of a team, describe how your team provides postpartum urinary catheterization). ***Answer questions 41a-41d below.***		Proceed to Question 41a.
41a)	While catheter is in situ, monitor for the following every four hours for 24 hours post-natally and then daily for 14 days for: hematuria, cloudy or purulent urine, and urine output. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 41b.
41b)	Prior to catheter removal, perform pelvic examination. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 41c.
41c)	Prior to catheter removal, retain catheter if there is clinical suspicion of fistula and refer to facility with fistula expertise. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 41d.

41d)	Prior to discharge, counsel patient to return immediately to the facility in case of urine leakage/incontinence. ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 41e.
41e)	Please describe any other practices related to postpartum urinary catheterization for patients who have experienced prolonged obstructed labor that you or your team typically conduct that are not listed above. ***Answer only if necessary.***	Write in:	Proceed to Question 42.
42)	The following are a set of statements about postpartum urinary catheterization for patients who have experienced prolonged obstructed labor. Please select whether you agree or disagree with each statement. ***Answer questions 42a-42e below.***		Proceed to Question 42a.
42a)	Women should be catheterized when the duration of labor exceeds or is reported to have exceeded 18 hours (i.e. prolonged / obstructed labor). ***Select one answer.***	◯ Agree ◯ Disagree ◯ Don't know/Not sure	Proceed to Question 42b.
42b)	Women who have survived prolonged / obstructed labor should be treated by routine urethral catheterization for a period of 14 days, with a high-fluid-intake regime immediately after delivery or as soon as they present at the facility. ***Select one answer.***	◯ Agree ◯ Disagree ◯ Don't know/Not sure	Proceed to Question 42c.
42c)	Early catheterization treatment after prolonged / obstructed labor following vaginal delivery or cesarean section may heal fistulae smaller than 2 cm with bladder drainage. ***Select one answer.***	◯ Agree ◯ Disagree ◯ Don't know/Not sure	Proceed to Question 42d.
42d)	Urinary catheterization during or immediately after prolonged/obstructed labor can be performed at BEmONC/CEmONC facilities by trained health providers, who have midwifery competencies and skills/authorization to insert and manage urinary catheters. ***Select one answer.***	◯ Agree ◯ Disagree ◯ Don't know/Not sure	Proceed to Question 42e.

42e)	Women who have experienced prolonged / obstructed labor and are being treated with catheters could be managed as either inpatient or outpatient with the catheter in situ, depending on the trained health care provider's assessment. ***Select one answer.***	◯ Agree ◯ Disagree ◯ Don't know/Not sure		Proceed to Question 43.
43)	What are some potential challenges, risks, or barriers related to intrapartum or postpartum urinary catheterization for a patient experiencing prolonged/obstructed labor at each of these four stages? ***Answer only if necessary.***	Before delivery – vaginal birth:	Write in:	Proceed to Question 44.
		Before delivery – cesarean section:	Write in:	
		After delivery – vaginal birth:	Write in:	
		After delivery – cesarean section:	Write in:	
44)	Does your facility have a protocol for urinary catheterization during postpartum care after prolonged/obstructed labor? ***Select one answer.***	◯ Yes ◯ No ◯ Don't know		Proceed to Question 45.
45)	Does your facility have a protocol for prevention, identification, and treatment of obstetric fistula after prolonged/obstructed labor? ***Select one answer.***	◯ Yes ◯ No ◯ Don't know		Proceed to Question 46.

Section 7: Clinical Practices related to Antibiotic Use *This section asks a question about your practices related to antibiotic use across different stages of pregnancy and delivery care.*			
Question		**Answer choices**	**Next step**
46)	Describe how you use antibiotics during labor and delivery, Cesarean section or the postpartum period. Please select the most accurate response for each practice below. ***Answer questions 46a-46o below.***		Proceed to Question 46a.
46a)	Administer antibiotics to women for the prevention of puerperal infection ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 46b.
46b)	Administer antibiotics to women with documented antenatal infection ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 46c.
46c)	Administer antibiotics to women with group B streptococcus colonization ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 46d.
46d)	Administer antibiotics to women with preterm labor ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 46e.
46e)	Administer antibiotics to women with preterm pre-labor rupture of membranes ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 46f.
46f)	Administer antibiotics to women who show clinical signs of chorioamnionitis ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 46g.
46g	Administer antibiotics to women prior to cesarean section ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 46h.
46h)	Administer antibiotics to women following cord clamp at the time of cesarean section ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 46i.
46i)	Administer antibiotics to women following uncomplicated vaginal birth ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 46j.

46j)	Administer antibiotics to women following complicated vaginal birth ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 46k.
46k)	Administer antibiotics to women following cesarean section ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 46l.
46l)	Administer antibiotics to women to take for some period following departure from health facility ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 46m.
46m)	Administer antibiotics to women who arrive at facility postpartum with a complication ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 46n.
46n)	I am not authorized to administer antibiotics ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 46o.
46o)	Women who require antibiotics must be transferred to another facility ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 46p.
46p)	Please describe any other ways you use antibiotics during labor and delivery, Cesarean section or the postpartum period that are not listed above. ***Answer only if necessary.***	Write in:	Proceed to Question 47.

Section 8: Supplies for Intrapartum and Postpartum Bladder Care

This section asks questions about the preparedness of your facility concerning supplies for the management of intrapartum and postpartum bladder care.

Question		Answer choices	Next step
47)	When urinary catheterization is necessary during intrapartum or postpartum care, do you have access to: ***Answer questions 47a-47d below.***		Proceed to Question 47a.
47a)	Unused sterile new catheters ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 47b.
47b)	Sterile lubricant for catheter insertion ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 47c.
47c)	Attachable collection bags ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 47d.
47d)	Urine collection containers ***Select one answer.***	◯ Always ◯ Sometimes ◯ Never	Proceed to Question 48.
48)	What is the typical availability of supplies for intrapartum and postpartum bladder care at your facility? ***Select one answer.***	◯ Supplies always/generally available ◯ Supplies sometimes available ◯ Supplies difficult to obtain even when patient has means to purchase outside facility ◯ Supplies never available – patient must purchase outside facility	End Survey.