

Protocol for a study to investigate the prevalence and nature of respectful maternity care during institution delivery in Gombe State, Nigeria and to improve measurement methods for respectful care

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Informed Decisions for Actions to Improve Maternal and Newborn Health
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Abbreviations and acronyms

ANC	Antenatal Care
BMGF	Bill and Melinda Gates Foundation
HFW	Health Facility Workers
LGA	Local Government Authority
MNCH	Maternal Newborn and Child Health
MDGs	Millennium Development Goals
PHC	Primary Health Care
RMC	Respectful Maternal Care
SDGs	Sustainable Development Goals
SAQIP	Social Accountability and Quality Improvement Project
SPHCDA	State Primary Health Care Development Agency
SBA	Skilled Birth Attendant
WHO	World Health Organization

1 Background

Reducing the deaths of women during pregnancy, childbirth or within forty-two days of termination of pregnancy from causes related to the pregnancy or its management remains a global priority, and a major challenge to the Nigerian health systems.^{1,2} Pregnancy related outcomes nationally are far from the acceptable levels enshrined in the past Millennium Development Goals (MDGs) and the current Sustainable Development Goals (SDGs). Worst still, are maternal mortality and morbidity indices in the Northeastern Nigerian states consisting of Adamawa, Bauchi, Gombe, Maiduguri, Taraba and Yobe states, which remained alarmingly poor in comparison to other Nigerian states.²

To address this challenge, substantial investments have been made and multiple strategies have been implemented in the past, driven by national institutions or international organisations, aimed at improving institutional deliveries with skilled assistance, an evidence based lifesaving intervention, though they have had limited success.³ Increases in the proportion of women delivering at health facilities have been marginal in Nigeria. In more than a decade, institutional delivery only increased by a 3-percentage point: 33% (in NHDS 2003), 35% (in NDHS 2008) and 36% (in NDHS 2013).^{2,4} In a recent household survey in Gombe state, more than 60% of women delivered at home in 2016.¹

Several reasons have been put forward to account for the low institutional delivery in Gombe state which includes women's preference to deliver at home due to cultural or religious beliefs, costs, geographical access and poor perception of the quality of available services at the health facilities including absence of essential medicines and staff, and attitude of health workers.^{3,5} Disrespectful treatment from health care providers is increasingly seen as one of the leading reasons behind the low utilisation of maternal and newborn health services in settings with poor MNH outcomes, sometimes even more powerful a deterrent to facility delivery than the more commonly recognized deterrents such as geographic and financial barriers.^{6,7}

Although, despite the wide acknowledgement of this behaviour by policy makers, program staff and community members, there is no empirical evidence to support the prevalence of disrespect & abuse in Gombe state. Further, there is limited understanding as to what constitute respectful maternal care (RMC) in this context, with the discourse mainly driven by findings in other countries or settings.

Studies on attitudes of health care workers towards women during pregnancy and childbirth conducted in Ethiopia, Kenya and Tanzania discovered that disrespectful and abusive behaviour at the health facilities was more prevalent than earlier thought, and that this was an important factor to influence women's decision to deliver in a health facility or not.⁸⁻¹⁰

¹ IDEAS household survey Gombe state 2016

1.1 Rational

To improve the survival of mother and their newborns, the Bill & Melinda Gates foundation has been funding a number innovations to generate demand and improve supply of MNH services through implementation grantees in Gombe state since 2009. Findings from three IDEAS surveys in Gombe state in 2012, 2015 and 2016 highlighted the need to do more, before desirable maternal and newborn health outcomes can be achieved in Gombe state. While some improvements were observed for example, increases in delayed bathing for both home and facility births, increases in clean cord care and immediate initiation of breastfeeding for facility births, and increases in hand washing with soap for home births,⁴ there was no evidence of improvement in the frequency of interactions between 2012 to 2015 across the continuum of care.⁴ Similarly, maternal PNC, newborn PNC and skilled attendant at birth remained low in 2016.¹

These findings led to the review and refinement of the strategies (to improve MNH outcomes) being implemented in Gombe. On the demand side, a Village Health Worker scheme has now replaced the use of 'Traditional Birth Attendants (TBAs)' and 'women volunteers' to reach mothers and newborns at home with the aim of promoting the uptake of antenatal care and facility delivery, promoting the uptake of life-saving behaviours at home, identification of pregnant women with danger signs and referring them to health facilities for extra care. On the supply side, the new strategy is focused on improving the health systems' responsiveness and quality of health services including provision of supplies and essential medicines, clinical training, and improving respectful maternity care among others.

1.2 Overview of this study

The IDEAS project is part of this wide partnership with GSPHCDA, Pact, SFH, C4C and E4A working on MNH in Gombe, as a measurement, learning and evaluation (MLE) grant. IDEAS project aims to improve the health and survival of mothers and babies through generating evidence to inform policy and practice. In line with IDEAS project's overarching aim, ***the study described here will generate empirical evidence on the quality of MNH care as it relates to the frequency and nature of RMC during institutional delivery in Gombe state, to inform state-level and global actions to better promote RMC, and to improve measurement methods for RMC.*** The study will aim to answer the following the research questions:

Q 1 What is the prevalence of respectful maternity care during institutional delivery in Gombe State? (Objective 1)

To be determined in two ways: 1) prevalence of respectful maternity care based on how frequently mothers regarded the interaction with health workers or health facility conditions

during their last institutional delivery to be respectful, through household surveys of mothers with births in the 24 months prior to interview; 2) prevalence of RMC based on how frequently the interactions with health workers or facility conditions during institutional delivery are deemed (by general consensus) to be humiliating or undignified, through observation of births (in line with submission by Freedman et al¹¹).

Q 2 What is the validity of self-reported measures of respectful maternity care?

To be determined by comparing observable respectful maternity care behaviors documented during observation of births as gold standard measures of RMC, compared to reported occurrence of RMC during exit interview with observed women on discharge from facility and again during household-follow interview with observed women 6-12 months after birth to test the validity of self-reporting i.e. do women report their experience of RMC consistently, and extent of normalization of RMC i.e. the extent to which some aspect of RMC are normalized in Gombe.

Q 3 What utilities do women attach to dimensions of respectful maternity care during institutional delivery in Gombe State?

To be determined using choice experiments to explore women's preferences for interactions with birth attendants (e.g. competency, friendliness...) and conditions of place of delivery (e.g. availability of equipment, cleanliness...) during institutional delivery, integrated within the household follow-up interviews (6-12 month post-delivery) and supported by qualitative interviews.

In combination, these different measurement approaches respond to the global call for more attention and effort around defining, improving, and accurately measuring RMC.¹¹⁻¹³ As the study is nested within IDEAS annual household surveys and 6-monthly facility surveys, changes in frequency or prevalence of these dimensions of RMC can be tracked or observed over more than one measurement period. Engagement – discussions and evidence sharing – with other stakeholders working on RMC in Nigeria such as white Ribbon Alliance, USAID and UKaid is expected.

1.3 Dimensions of respectful maternity care

In this study, the revised typology of RMC by Bohren *et al.* based on a systematic review of 65 studies from 34 countries would be used. Bohren *et al.* recently build on earlier work of Bowser and Hill⁶ and revised the dimensions of RMC to include seven domains: physical abuse, sexual abuse, verbal abuse, stigma and discrimination, failure to meet professional standards of care, poor rapport between women and health providers, and health system conditions and constraints described in table 1.^{7,14}

Table 1. Typology of respectful maternity care during institutional delivery

Third-Order Themes	Second-Order Themes	First-Order Themes
Physical abuse	Use of force Physical restraint	- Being beaten, pushed, pinched, slapped or poked to facilitate the delivery - Physically restrained, tied or gagged during labour and delivery
Sexual abuse	Sexual abuse	- Sexual abuse or rape
Verbal abuse	Harsh language Threats and blaming	- Harsh or rude language Judgmental or accusatory comments - Threats of withholding treatment or poor outcomes Blaming for poor outcomes
Stigma and discrimination	Discrimination based on sociodemographic characteristics Discrimination based on medical conditions	- Discrimination based on ethnicity/race/religion - Discrimination based on HIV status - Discrimination based on age - Discrimination based on socioeconomic status
Failure to meet professional standards of care	Lack of informed consent and confidentiality Physical examinations and procedures Neglect and abandonment	- Lack of informed consent process - Breaches of confidentiality - Painful vaginal exams Refusal to provide pain relief - Performance of unconsented surgical operations - Neglect, abandonment, or long delays - Skilled attendant absent at time of delivery
Poor rapport between women and providers	Ineffective communication Lack of supportive care Loss of autonomy	- Poor communication - Dismissal of women's concerns - Language and interpretation issues - Poor staff attitudes - Lack of supportive care from health workers - Denial or lack of birth companions - Women treated as passive participants during childbirth - Denial of food, fluids, or mobility - Lack of respect for women's preferred birth positions - Denial of safe traditional practices - Objectification of women - Detainment in facilities
Health system conditions and constraints	Lack of resources Lack of policies Facility culture	- Physical condition of facilities Staffing constraints - Staffing shortages - Supply constraints - Lack of privacy - Lack of redress - Bribery and extortion - Unclear fee structures - Unreasonable requests of women by health workers

The dimensions presented in table 1 are based on Bohren revised typology of RMC¹⁴

2 Aims

This study aims to (i) generate empirical evidence on the quality of maternal and newborn health care as it relates to the frequency and nature of respectful maternity care during institutional delivery in

Gombe state, (ii) to improve measurement methods for respectful maternity care and (iii) to inform state-level and global actions to better promote respectful maternity care.

3 Objectives

- Obj 1* To determine the prevalence of RMC during institutional delivery in Gombe state.
- Obj 2* To validate self-report of respectful maternity care.
- Obj 3* To determine the utilities associated with different dimensions of RMC in Gombe state.
- Obj 4* To provide feedback to government and grantees promoting RMC in Gombe state.
- Obj 5* To engage other groups promoting RMC both within and outside Nigeria.

4 Study design and methods

4.1 Study setting

This study will build on ongoing IDEAS project's research activities in Gombe state. The study will be conducted in the same settings as the IDEAS ongoing surveys including household clusters and health facilities.

Briefly, Gombe State is one of the 36 states of the Federal Republic of Nigeria, located in the North-East region of the country. Gombe State has an estimated population of 2.8 million, based on 2011 projections from the 2006 national census, and an annual population growth rate of 3.2%. Gombe State is multi-ethnic and comprises 11 Local Government Areas (LGA). About 75% of the state is rural, with farming, cattle herding and trading as the predominant occupations. Gombe State has a high fertility rate of 7.0 live births per 1,000 females aged 15-49 and a high maternal mortality ratio.^{2,15}

Four grantees are implementing innovations aimed at generating demand for MNH services, promoting lifesaving interventions at home, improving the quality of health services, accountability and responsiveness of the health system in 57 wards and 57 priority health facilities out of a total of 114 wards in Gombe state – IDEAS project defines these 57 wards as 'intervention area' and the remaining 57 wards being 'comparison area'.

4.2 Study implementation

The study will be conducted in three phases 1) formative, 2) data collection and 3) data analysis, synthesis and dissemination phases:

Formative phase – a formative research will be carried out to identify an appropriate tool, generate additional items, adapt and translate the tool into Hausa language. The first phase will involve a comprehensive review of the literature to be followed by informal consultation and review of the identified tool (and its items) with women and local experts in Gombe to ensure appropriateness, and

pilot testing (alongside the IDEAS surveys) and refining the adapted tool. Data source in formative phase will come from published and grey literature on RMC in LMIC and pilot data from household surveys, observation of birth, exit interview and birth attendant interview. Data collection and analysis will be performed between November of 2016 and May 2017.

Data collection phase – will involve (a) generating data on prevalence of RMC during facility-based childbirth from household surveys (June July 2017, May-July 2018), observation of birth and exit interviews (June July 2017, November December 2017) – the prevalence of RMC will be assessed in subsequent IDEAS household surveys, observation of births, birth attendant interviews and exit interviews to update indicators of RMC in the results framework; (b) in-depth interviews and focus group discussions (FDG), the qualitative studies will seek to explore women experience from their recent facility-based birth (i.e. women-health worker interaction & condition of place of delivery) in Gombe, identify the attributes and attribute levels and generate items for the choice experiment: 3) conduct the choice experiments at follow-up (at home) 6-months later in November December 2017.

Analysis and synthesis phase – will involve continuous sharing of findings with the grantees and government and engagement with groups working on RMC both within and outside Nigeria and wider dissemination of result findings – to catalyse changes and inform future policy and practice towards promoting RMC in Gombe, Nigeria and globally. All data collection instruments and procedures will be thoroughly pilot-tested prior to being used. Data collection instruments will be embedded within the IDEAS surveys except for the in-depth interviews and focus group discussion. Table 2 shows the different phases of implementation of the study and how each data collection activity contributes to the study objectives.

Table 2. Phases of implementation

	2016				2017				2018				2019				Contributing to:
	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	
Literature review				■													Obj 1+2+3
In-depth interviews							■										Obj 3
FDGs							■										Obj 3
Household survey						■	■	■		■							Obj 1+4+5
Observation of births						■	■	■		■							Obj 2+4+5
Exit interviews						■	■	■		■							Obj 2+4+5
Home follow-up								■									Obj 3+4+5
DCE								■									Obj 3+4+5
Dissemination							■	■	■	■	■	■	■	■			All

5 Sampling, data collection methods and sources

This section describes the data collection method, data sources and sampling strategy, arranged in order of study objective.

5.1 Household survey

Sample – prevalence of respectful maternity care at the population level (objective 1) will be determined through household survey data. IDEAS project conducts an annual household survey each year 2017-2018. The annual household survey use cluster sampling with 40 intervention household clusters and 40 comparison household clusters from ‘priority’ and ‘non-priority’ areas respectively, to generate population level coverage estimate of MNH indicators from women aged 13-49 years with livebirth 24 months prior to each survey. Each household cluster is defined as an enumeration area segmented to include 75 households. Enumeration areas are selected using simple random sampling from a list of all enumeration areas in each area. 3000 households are sampled in each area, a total of 6000 from the 80 clusters (40 intervention and 40 comparison clusters). From this sample, approximately 2000 women with recent birth are expected in total from the 6000 households, minimum of 100 women in each area (each 40 clusters). At each household, the household head is interviewed about residents and socio-economic characteristics, and each resident woman aged 13-49 is individually interviewed. Interviewed women with a live birth in the 12 months prior to survey are asked to complete a detailed survey module about their experiences during pregnancy through to post-partum periods for that birth.

Sample size - The previous household survey indicated coverage of institutional delivery to be 46%, thus the expected number of interviews with women who delivered in a facility in the last two years is approximately 1000. To estimate a proportion of 0.5 (most conservative) with high precision (to within +/- five percentage points) and with 95% confidence the required number of interviews with women who delivered in a facility is 593 (after adjusting for a cluster effect of 1.4 and 10% losses). The prevalence of an illustrative set of RMC indicators is shown in table 3. These indicators suggest that the conservative sample size estimate is appropriate across the range of indicators, while allowing the potential for further analysis as the project proceeds (for example to compare proportions over time, or to restrict births to those that occurred in the last 12 months rather than 2 years).

Table 3: Prevalence of illustrative RMC indicators based on observations of birth in 10 primary health facilities, March 2017

Indicator	Levels from 'clinical observation of birth' March 2017
% of women with a recent birth allowed birth companion during labour and delivery	58
% of women with a recent birth with desired physical privacy during labour and delivery	23
% of women with a recent birth listened to and provided support during labour and delivery	55
% of women with a recent birth informed of what will happen during labour and delivery	47
% of women attended to by skilled birth attendant	32

The next section describes IDEAS health facility survey, the second quantitative data source for the study, and which component of the health facility survey contributes to the study objectives.

5.2 Health facility survey

The validity of women's reports on RMC (objective 2) will be determined from studies within the health facility survey. IDEAS project conducts a bi-annual survey of MNH facilities in the State during the same time period as the household survey. In the intervention area all 57 priority facilities are surveyed. In comparison areas, a sample of 40 primary level facilities are surveyed, sampled by identifying the primary level facility assigned to provide routine MNH care to the sampled household cluster. In addition, the 17 referral facilities in the State are also surveyed to capture information on emergency care. At each facility an inventory of infrastructure, supplies and staff employed is recorded, in addition to data extraction from maternity registers on the volume of events taking place in each facility during the six months prior to survey, other components of the facility survey include a birth attendant survey (all facilities), and observation of births and exit interviews in the 10 highest volume facilities.

5.2.1 Observation of births

Sample – this is nested within the facility survey in a sub-set of the **10 highest volume primary facilities within the intervention area facility sample**. Using data on volume of births in each of the 57 priority facilities, facilities were ranked from highest to lowest number of births in the six months prior to survey and the top ten selected. In each of these ten facilities, and alongside the facility survey, two medically trained observers are posted in shifts covering day and night deliveries, 7 days a week (for approximately 3 weeks, determined by volume of births and time taken to recruit a sample of **320 births** (see *IDEAS Gombe data collection protocol for further details*)). During working shifts these observers identify and observe women during labour and childbirth using a checklist to

document indicators of clinical and respectful care provided by birth attendants. Data collectors will be well trained to maximise the reliability of assessment.

5.2.2 Exit interviews with observed women

Sample – each woman whose birth was observed (target recruitment of 320 women) is invited to interview as she leaves the facility. Women are asked a set of questions about the clinical and respectful care they received during labour and childbirth. Data collectors will be well trained to maximise reliability of assessment.

5.2.3 Household follow-up with observed women

Sample – each woman whose birth was observed and was interviewed after discharge before exit will be asked for her consent for a follow-up interview at home six months later. At follow-up, women will be asked the same set of questions and same choice experiment as in the exit interview. Data from the choice experiment at follow-up will be compared with data on choice experiment from the exit interview to assess the stability of derived utilities from time-1(t0-month) and time-2 (t6-months). Data collectors will be well trained to maximise reliability of assessment.

Sample size for validity testing of exit interview and household follow-up interview responses compared to the gold standard observations. To analyse the agreement between observed and reported RMC behaviours we will calculate sensitivity and specificity of reported to observed. This statistical approach does not test a specific hypothesis, but focuses on the width of the confidence intervals around agreement when interpreting results: the larger the number of follow-up interviews we are able to achieve the more narrow the confidence intervals will be.

5.2.4 Data analysis

Table 4: Analysis plan

Research questions	Data sources	Analysis
Objective 1 – To determine the prevalence of respectful care during institutional delivery in Gombe state	Household survey	<ul style="list-style-type: none"> - Descriptive statistics to profile the study sample in numbers & percentages - Descriptive statistics to determine the frequency of reported cases of respectful care from household interviews - Descriptive statistics to determine the frequency of reported case of respectful care across socio-demographics - Appropriate regression models will be used to explore the relationship between respectful care indicators and demographic characteristics. Potential confounders will be accounted for in all regression models
Objective 2 – To validate self-report of respectful maternity care	Observation of birth (gold standard) Exit interviews Follow-up interviews	<ul style="list-style-type: none"> - Descriptive statistics to characterize the study sample in numbers & percentages - Descriptive statistics to determine the frequency of observed cases of respectful care from direct observation of births, exit and follow-up interviews - Descriptive statistics to determine the frequency of reported case of respectful care across socio-demographics

		<ul style="list-style-type: none"> - Sensitivity and specificity - McNemar's test
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Table 5: Socio-demographic characteristics & potential cofounders

Potential cofounders	Measures
Age in years	Mean/ SD
Education level	Primary or less/ Secondary or more
Religion	Christianity/ Islam/ Other/ None
Ethnic group	Fulfulde/ Hausa/ Igbo/ Yoruba/ Others
Marital status	Never married/ Married/ Divorced/Separated/ Widowed
Employment status	Employed/ Unemployed
Wealth quintile	Lowest/Second/ Middle/ Fourth/ Highest
Number of previous births	Mean/ SD
Antenatal care visits for the/ index pregnancy	Mean/ SD
Time of delivery	Day/ Night
Days of the week (for observation of births)	Monday/ Tuesday/ Wednesday/ Thursday/ Friday/ Saturday/ Sunday

5.3 Choice experiment

The study design for objective 3 (to determine the utilities associated with different dimensions of RMC) is described here.

5.3.1 In-depth interviews

To have a deeper understanding of mother's experience of RMC in their recent birth an in-depth interview will be conducted first. Due to the sensitive nature around the topic of disrespect and abuse, a more relaxed atmosphere in which to collect detailed information on thoughts, behaviours and experiences in-depth is required. As stated above, women with recent births will be recruited and interviewed, the person that accompanied them to the health facility will also be recruited and interviewed to capture comprehensive information on both the mothers experience of RMC and what was observed by the person that accompanied them.

Potential participants will be recruited by the researcher in collaboration with the community leaders. Study participants will be recruited from two LGAs: LGA with the lowest facility birth (Kwami LGA), and LGA with the highest facility birth (Kaltungo LGA), based on IDEAS household survey August 2016. For the in-depth interviews, from the 2 LGAs 25 women with recent facility birth (0-6 months or later, but not more than 12 moths since last birth) will be interviewed, if possible the person that accompanied them as well. 25–30 participants are the minimum sample size required to reach saturation and redundancy in grounded theory studies that use in-depth interviews.²

The interviews will be conducted in the women's homes (or a place of their choosing) by the researcher (NU), to be assisted by a trained female research assistant who will take notes and record

² Shari L. Dworkin (2012). Sample Size Policy for Qualitative Studies Using In-Depth Interviews. Arch Sex Behav (2012) 41:1319–1320

the interviews. In instances where the husband or household head does not agree to having a male interviewer or the mother herself is not comfortable with a male interviewer, the trained female research assistant will conduct the interview and capture the interview on audio recorder. The interview will focus on general problems faced by pregnant women, their motivations for giving birth in health facility and for selecting a health facility, their attitudes towards health facility deliveries, their perception on quality and satisfaction with interaction with the provider. Standard IDI procedures will be followed, an interviewed guide will be used to ensure that all relevant issues are covered. The interviews will be conducted in July 2017. Data collection will take the form of field notes, supported by recordings. Interview sessions will be recorded using audio capturing devices, with the permission of the participants and saved in a password locked computer. At the end of each data collection session, the sound recordings, field notes and consent forms, will be stored securely. Recording will be transcribed, and the data analysed using content analysis.

5.3.2 Focus group discussions

The in-depth interview will be followed by focus group discussions to gain insights into the women's shared understandings of RMC during facility delivery and the ways in which individuals are influenced by others in a group situation. The FGDs will be used to explore women experiences from their recent facility-based birth including their interaction with health workers and condition of place of delivery to review or validate the attributes derived from the in-depth interviews. Four FGDs will be conducted, two FGDs in each the LGA: with low facility birth (Kwami LGA) and two FGDs in LGA with high facility births (Kaltungo LGA), with mothers with recent births 0-6 months or later, but not more than 12 months since last birth – 3 to 4 FGDs are considered sufficient to answer simple research questions³. Twenty-four participants will be recruited, 6 per focus group – for optimal result, 6-12 participants per focus group has been recommended⁴. To account for possible drop-out, 5 additional participants will be recruited as stand by, as recommended by Krueger RA⁵. Participants for the FGDs will be recruited by the researcher in collaboration with the community leaders from the communities around the health facilities. Standard FGD procedures will be followed, due to the sensitive nature of RMC, a trained female will moderate the sessions, supported by the researcher (NU) who will take notes and record the sessions. The objectives of the FGDs will be to have group consensus around themes on reasons for giving birth in health facility, perception of quality of care received and interaction with health care providers. Further, mother's opinions and perceptions on manifestations and indicators of disrespectful care during facility birth will be explored, dimensions of RMC identified in literature and document review and in-depth interviews will be used as a guide.

³ Krueger RA & Casey MA (2000) Focus Groups: A Practical Guide for Applied Research, 3rd ed. Thousand Oaks, CA: Sage Publications.

⁴ Krueger RA & Casey MA (2000) Focus Groups: A Practical Guide for Applied Research, 3rd ed. Thousand Oaks, CA: Sage Publications.

⁵ Krueger RA (1994) Focus Groups: A Practical Guide for Applied Research. Thousand Oaks, CA: Sage Publications.

The FGDs will be conducted in July 2017, after the in-depth interviews. Data collection will take the form of field notes, and audio recordings. Interview sessions will be recorded using audio capturing devices, with the permission of the participants and saved in a password locked computer. At the end of each data collection session, the sound recordings, field notes and consent forms, will be stored securely. Data analysis will be carried out using content analysis.

5.3.3 Choice experiment – conjoint analysis

“Preferences” are an economic concept that refers to the values individuals attach to options from which they must make choices. In health care, patients or clients often have strong preferences associated with treatment or service options.¹⁶ A survey based on conjoint analysis (also called “choice experiments”) will be used to measure women preferences for dimensions of RMC. Conjoint analysis is theoretically grounded within the field of economics and routinely used in consumer research. More recently, the method has been applied in health economics and public health research to measure preferences for health care delivery and treatment options.¹⁷

For the conjoint analysis, identified dimensions of RMC will be decomposed into their general attributes (e.g. physical abuse, verbal abuse, stigma & discrimination etc.) and attribute levels (e.g. attribute levels for physical abuse: beaten, slapped, kicked, or pinched during delivery etc.). Then, scenarios that reflect RMC during facility birth will be created by randomly choosing among attribute levels. When the survey is administered, the respondent will be presented with pairs of RMC scenarios. From each pair, the respondent will be asked to choose the scenario they prefer. Based on the choices made, the path-worth utilities for RMC attributes can be derived. Further, important potential covariates (e.g. age, gender, etc.) will be included to facilitate aggregation of utilities for different subgroups.

Sawtooth software (www.sawtoothsoftware.com), part of the SSI Web software platform, will be used to design the choice-based conjoint-analysis survey. Using the choice-based conjoint module, a fixed set of profiles can be created that draws from a subset of the full-choice design. The software’s module could sample from a subset of the full-choice design for each respondent while ensuring level balance and near-orthogonality within each respondent’s profile.⁶ With this approach, systematic correlations among interactions common in fixed designs can be avoided, allowing for both main effects and higher-order interactions to be robustly estimated especially with good sample sizes. Additionally, by using a unique randomized design for each respondent context effects are reduced. However, with

⁶Johnson R, Orme B. Getting the most from CBC. Sequim: Sawtooth Software Research Paper Series, Sawtooth Software; 2003.

this design heterogeneity could be confounded in case of taste heterogeneity and scale differences.¹

Table 3 describe the steps involved.

Table 6. Steps and activities involved

Steps	Activities
Identifying attributes	Identify dimensions or attributes of RMC through qualitative research involving (1) review of published and grey literature and (2) focus group discussion with the target population to augment the secondary data. Example of attributes of RMC includes physical abuse, non-consented care, non-confidential care, non-dignified care.
Assigning attribute levels	Use information generated from qualitative methods above to assign attribute levels. Attribute levels will reflect the range of RMC situations that mothers are likely to experience, e.g. attribute levels for non-dignified care: harsh tone; harsh language; unkind expression. To aid cognition each attribute will have not more than three levels.
Generating the choice sets	Use conjoint Sawtooth software to generate attribute level combination to create hypothetical scenarios – create choice sets. To obtain orthogonal and balance design fractional factorial design will be used.
Pre-testing the questionnaire and data collection	Pre-test, evaluate the process and revise the survey. Use trained fieldworkers to administer the questionnaire to respondents.
Analysing of DCE data	Generate individual level estimates of the part-worth of each mother's utility function. Determine the value associated with each dimension of RMC. Perform segmentation/sub-group analysis based on mother's socio-demographic characteristics.

Sample – the choice experiment will be administered during home follow-up interviews: during follow-up at home in November December 2017 to the same post-partum women with live birth that were observed during childbirth and interview at exit in July 2017.

Sample size – For the choice-based experiment, suggestion of sample size determination by Johnson and Orme will be used, which suggests that the sample size required for the main effects depends on the number of choice tasks (t), the number of alternatives (a), and the largest number of levels for any of the attributes (c) according to the following equation: $N > 500c / (t \times a)$,⁷ if t =15 (i.e. 15 choice tasks) and a =2 (i.e. # of alternatives) and c =6 (i.e. largest # of levels), then the required sample size = $500 \times 6 \div 15 \times 2 = 100$.

5.3.4 Analysis

Using Sawtooth software 'SSI software platform' the partial utilities ("partworths") for elements of RMC will be determined – the 'SSI software platform' includes analysis instrument for choice-based conjoint-analysis. Partworths utilities derived will be used to compute the total utilities associated

⁷Orme B. Sample size issues for conjoint analysis studies. Sequim: Sawtooth Software Technical Paper; 1998.

with each dimension of respectful care and their relative importance as attributes of RMC. Table 8 highlights the analysis planned.

Table 7. Analysis plan

Research questions	Data sources	Analysis
Objective 3 – What is the utility associated with global dimensions of respectful maternity care in facility-based childbirth in Gombe?	Choice experiment (from household follow up)	<ul style="list-style-type: none"> - Descriptive statistics to characterize the study sample in numbers & percentages - Generate individual level estimates of the part-worth of each mother’s utility function from household follow up - Determine the value associated with each dimension of RMC from household follow up - Segmentation/sub-group analysis based on mother’s socio-demographic characteristics - For the choice-based conjoint analysis, maximum likelihood estimation and logistic regression will be conducted.

6 Field procedures & data management

6.1 Recruitment, training and data collectors

IDEAS MLE partner in Nigeria will be responsible for the recruitment, training and management of data collectors, with support from IDEAS staff in Nigeria and London. It is required that data collectors have the requisite language skills appropriate for working in Gombe state. Prior to the data collection, data collectors and supervisors will receive 5 days of training in data collection and on the study tools.

6.2 Field procedures & data management

The study is going to be implemented as part of IDEAS surveys in Gombe state. Except for the focus groups discussions, all survey instruments will be implemented using personal digital assistants (tablets), programmed using CSPro. Confidentiality of every respondent will be guaranteed. Unique identifiers will be constructed for use of the questionnaire and no identifiers will be released. All data will be stored on password-protected computers.

6.3 Ethical Considerations

Risks to study participants for involvement in the study are low. But, questions of disrespect and abuse may evoke emotions, similarly, there is the potential for emotional risks associated with discussion of sensitive questions regarding health and survival of mothers and children. Interviewers will be trained to minimize this risk. Participants will not gain any direct benefits by participating in the study. However, information obtained will be used to improve health service delivery in the community as well as at health facilities.

6.4 Costs and compensation

Respondent will be recruited at home or at the health facility therefore, will not incur any out-of-pocket costs, and no monetary compensation will be given.

6.5 Conflict of interest

There are no other gains from taking part in this study other than the normal scholarly gains.

6.6 Ethical clearance

The study is going to be embedded within the ongoing IDEAS surveys in Gombe. Therefore, ethical clearance from the National Ethics Review Board, Nigeria, and Gombe state Ministry of Health will be obtained together with the IDEAS surveys before the commencement of the study. The study protocol will be reviewed further internally within the IDEAS team.

7. Dissemination plan

Data generated from the study will be shared continuously with implementation partners to inform programming. Similarly, the data will be included in the Gombe results framework to share with other partners. We will seek to engage other groups working to promote respectful care, for example, White Ribbon Alliance, USAID, UKAID and Nigerian association of obstetrics and gynaecology. The result will be presented in Nation and international conferences (depending on opportunities), in scientific journal articles and blog posts.

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