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Validating Women's Self Report of Emergency Cesarean Sections in Ghana and the Dominican Republic

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Measuring Coverage in MNCH: Validating Women's Self-Report of Emergency Cesarean Sections in Ghana and the Dominican Republic

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Abstract

Background: Cesarean section is the only surgery for which we have nearly global population-based data. However, few surveys provide additional data related to cesarean sections. Given weaknesses in many health information systems, health planners in developing countries will likely rely on nationally representative surveys for the foreseeable future. The objective is to validate self-reported data on the emergency status of cesarean sections among women delivering in teaching hospitals in the capitals of two contrasting countries: Accra, Ghana and Santo Domingo, Dominican Republic (DR).

Methods and Findings: This study compares hospital-based data, considered the reference standard, against women's self-report for two definitions of emergency cesarean section based on the timing of the decision to operate and the timing of the cesarean section relative to onset of labor. Hospital data were abstracted from individual medical records, and hospital discharge interviews were conducted with women who had undergone cesarean section in two hospitals. The study assessed sensitivity, specificity, and positive predictive value of responses to questions regarding emergency versus non-emergency cesarean section and estimated the percent of emergency cesarean sections that would be obtained from a survey, given the observed prevalence, sensitivity, and specificity from this study. Hospital data were matched with exit interviews for 659 women delivered via cesarean section for Ghana and 1,531 for the Dominican Republic. In Ghana and the Dominican Republic, sensitivity and specificity for emergency cesarean section defined by decision time were 79% and 82%, and 50% and 80%, respectively. The validity of emergency cesarean defined by operation time showed less favorable results than decision time in Ghana and slightly more favorable results in the Dominican Republic.

Conclusions: Questions used in this study to identify emergency cesarean section are promising but insufficient to promote for inclusion in international survey questionnaires. Additional studies which confirm the accuracy of key facility-based indicators in advance of data collection and which use a longer recall period are warranted.

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Abbreviations: AUC, area under the receiver operating characteristic curve; DHS, Demographic and Health Survey/s; IF, inflation factor; IQR, interquartile range; MICS, Multiple Indicator Cluster Survey/s; OR, odds ratio.

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Introduction

Cesarean section rates are rising in many low- and middle-income countries. For the first time, the World Health Organization's (WHO) *World Health Statistics 2012* reports a global cesarean section rate (16%) that exceeds the frequently used upper recommended limit of 15% [1,2]. Even in a low-income country like Bangladesh, recent data show the cesarean section rate increased from 3% to 12% between 2001 and 2010 [3]. Some middle-income Latin American and Asian countries report rates between 30% and 46%, and the cesarean section rate for upper-middle-income countries has surpassed that of high-income countries (31% and 28% respectively) [2]. Extreme socio-economic disparities in access to cesarean section exist within low-income countries as well. Women in the wealthiest households often have rates above 20%, whereas among the poorest households in many countries, cesarean section rates are less than one percent [4].

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Aim and Objectives

- To validate self-reported data on the classification of cesarean sections in Ghana and the Dominican Republic

1. To validate self-reported data on emergency C-sections among a sample of women who delivered by cesarean section.

2. To estimate the percentage of emergency C-sections that would be obtained from a population-based survey, given the assessment of sensitivity and specificity from this study.

3. To identify characteristics of women who accurately report the status of their delivery by C-section.

Emergency C-Section

C-section by decision time: C-section for which the decision to perform the operation is made after the onset of labor.

C-section by operation time: C-section performed after the onset of labor.

- Dichotomous
- Why two definitions?

Study Sites

	Ghana	The Dominican Republic
Maternal Mortality Ratio	378 per 100,000 live births	100 per 100,000 live births
Skilled Attendance	60%	98%
C-section Rate	7%	44%

Resources:
WHO, 2010
DR DHS, 2007
Ghana DHS, 2008

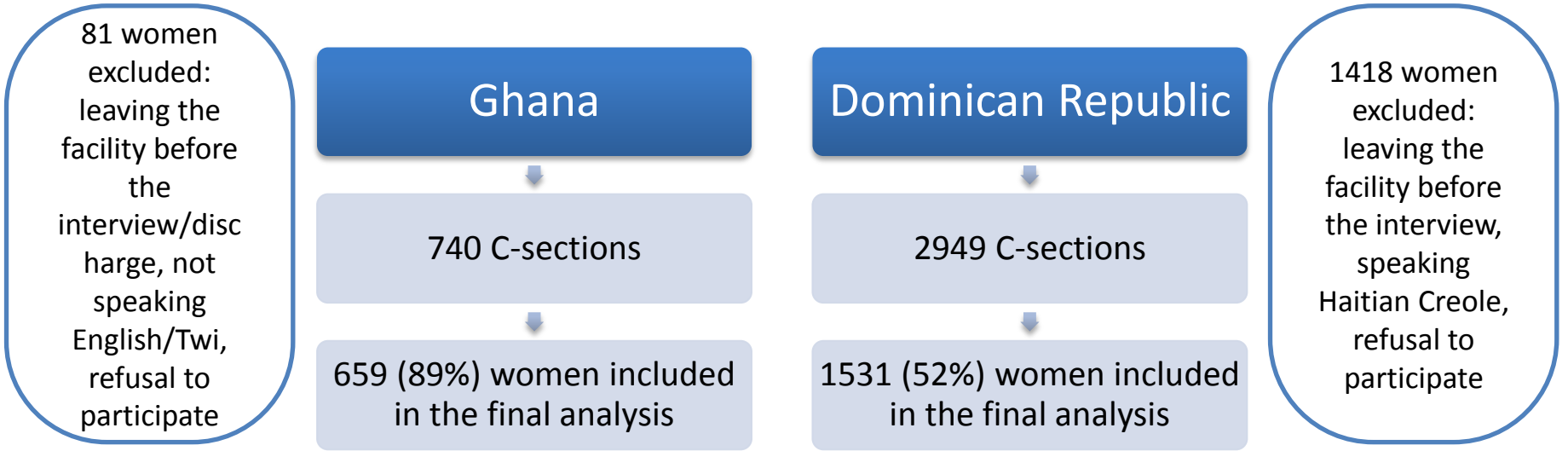
Data Collection

Ghana	DR
June-August 2011	August-November 2011
Korle-Bu Teaching Hospital, Accra	Maternity Hospital Nuestra Señora de la Altagracia, Santo Domingo
Data extraction from patient filed at the end of each day (Reference Standard)	
Face-to-face interviews in English or Twi with women before discharge	Face-to-face interviews in Spanish and Haitian Creole with women before discharge
Epidata for the data extraction and iForm Builder for the interviews	iForm Builder for the data extraction and the interviews
Ghana University School of Medicine	HSPH, Local IRB in DR

Methods

- Sensitivity, specificity and positive predictive value (PPV) calculated based on comparing women's responses to hospital-based data (reference standard)
- Population-based survey estimate (Inflation factor)
  - ***Pr = P * (SE+SP-1)+(1-SP)***
- Unadjusted logistic regression (associations between accurate reporting and women's characteristics i.e. age, education, referral status)

Flowchart of Participation



Results - 1

	Ghana	DR
Background	Higher mean age & parity More rural 86% Christian, 14% Muslim	Higher education 70% Christian, 29% no religion
Obstetric	Previous C-section 35% Previous pelvic surgery 4.7%	Previous C-section 38% Previous pelvic surgery 2.7%
Current Pregnancy	Multiple pregnancy 5.5% Preterm delivery 27.3%	Multiple pregnancy 4.3% Preterm delivery 17.2%
Delivery Plan **Referral**	KBTH 42.5% KBTH 77.1%	Mat. Altagracia 78.5% Mat. Altagracia 25.6%

These data are based on women's exit interviews.

Results - 2

	Ghana	DR
Reporting of C-section	659 (100)	1531 (100)
Reporting of Time of C-section Decision		
During antenatal visits	208 (31.6)	751 (49.1)
Before labor	169 (25.6)	165 (10.8)
After labor	276 (41.9)	597 (38.9)
Don't know	6 (0.9)	18 (1.2)
Reporting of Time of C-Section		
Spontaneous labor	328 (49.8)	1047 (68.4)
Induced labor	35 (5.3)	5 (0.33)
C-Section before labor	278 (42.2)	359 (23.4)
Don't know	18 (2.7)	120 (7.8)

These data are based on women's exit interviews.

Validation Assessment- Emergency C-Section

	%*	Sensitivity (95% CI)	Specificity (95% CI)	AUC Estimate (95% CI)	PPV (%)	Pop-based Survey Est (%)	IF
DECISION TIME							
Ghana	39.8	79 (73-83)	82 (78-85)	0.80 (0.77-0.83)	74	42	1.06
DR	64.7	50 (47-53)	80 (77-83)	0.65 (0.62-0.67)	82	39	0.61
OPERATION TIME							
Ghana	48.8	84 (80-88)	68 (63-73)	0.79 (0.72-0.79)	74	57	1.18
DR	66.0	83 (80-85)	53 (48-57)	0.67 (0.65-0.70)	79	71	1.07

* Within the study population (reference standard)

Validation Assessment – Other related indicators

	%*	Sensitivity (95% CI)	Specificity (95% CI)	AUC Estimate (95% CI)	PPV (%)	Pop-based Survey Est (%)	IF
PREVIOUS C-SECTION							
Ghana	36.9	95 (91-97)	98 (97-99)	0.96 (0.95-0.98)	97	37	0.98
DR	38.2	96 (94-98)	97 (96-98)	0.96 (0.96-0.98)	95	38.5	1.01
INDUCED LABOR							
Ghana	7.2	37 (23-51)	97 (96-98)	0.67 (0.59-0.74)	49	5	0.76
DR	5.0	1.4 (-24-27)	99.7 (0.99-1)	0.5 (0.49-0.52)	20	0.3	0.07

Accurate Reporting of Emergency Status

Ghana:

- Referred women were half as likely to report accurately on the emergency status by decision time.
- None of the other associations were statistically significant.

DR:

- Decision time: Negative relationship with age and number of pregnancies
- Operation time: Negative relationship with age

Conclusions & Future Directions

- Promising results for emergency C-section
  - Insufficient to promote universal inclusion
  - Further research is warranted
  - India DHS: Included in the draft questionnaire - last stages of review

- Related indicators (i.e. induction of labor)
  - Qualitative research leading to refined formulation and improvement in validity

THANK YOU!

Ghana

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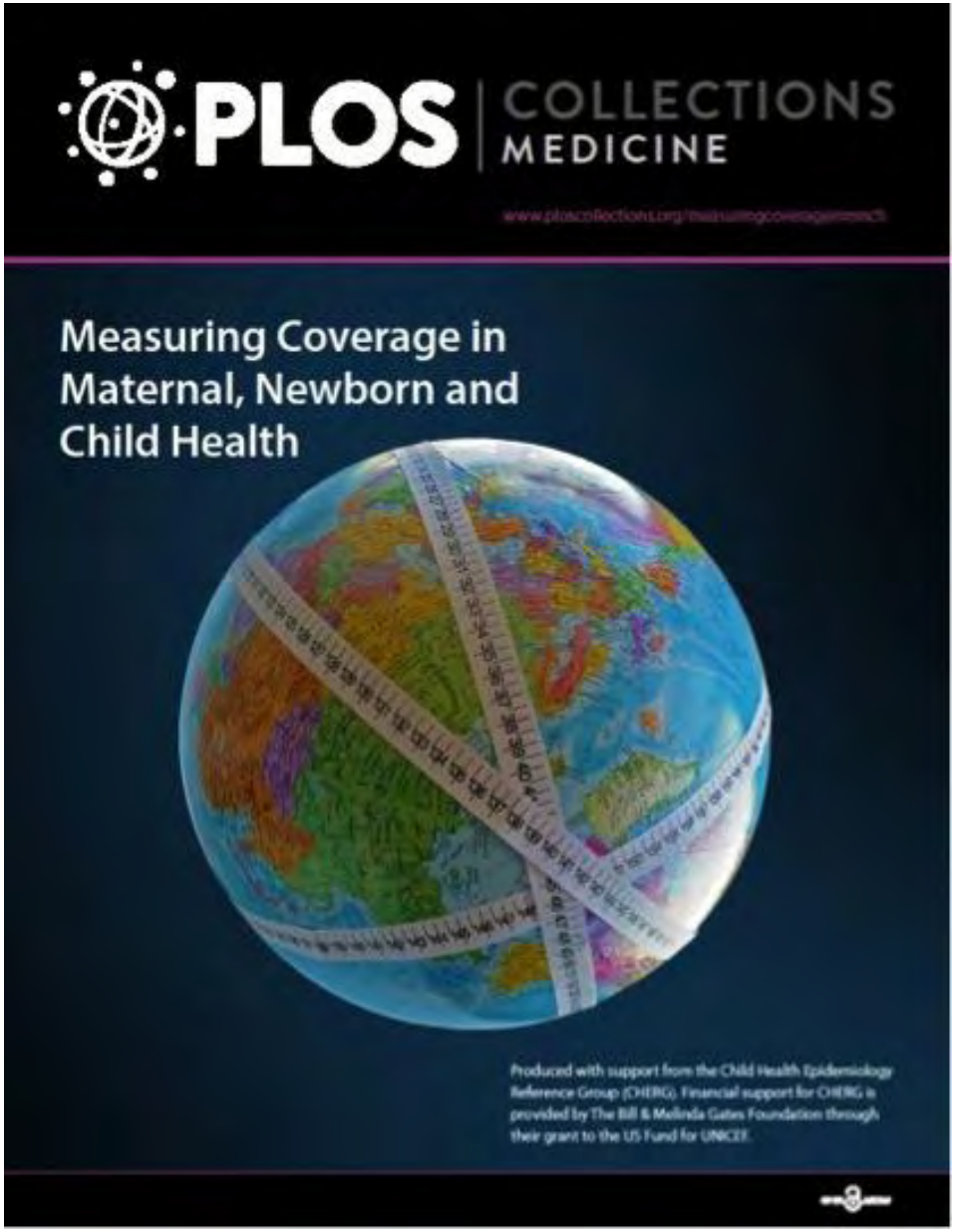
- Jean-René Louis
- Merary Mota
- Angel Peguero



EXTRA SLIDES

Emergency C-section Questions

Decision Time:

When was the decision made for you to have a cesarean/operation?

- During antenatal clinic visits
- Before the labor pains began
- After labor pains began
- Don't know

Operation Time:

Did you go into labor by yourself/spontaneously?

- Yes
- No
- Don't Know

Did the health care provider give you a medication or drip to START your labor?

- Yes
- No
- Don't Know

Did you get a cesarean section BEFORE your labor pains began?

- Yes
- No
- Don't Know

Three-Question Algorithm