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VALIDATING INTERVENTION COVERAGE INDICATORS FOR MATERNAL AND NEWBORN HEALTH CARE IN KENYA

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Background

To scale-up reductions in maternal mortality, country efforts have focused on increasing coverage of essential interventions

Wide use of population-based indicators to track progress but little is known about their validity

- Delivery with a **skilled attendant** – proxy for service quality, i.e. "skilled"
- **Place of delivery** – Proxy for infrastructure, service guidelines, policies? Range of services available?
- **Caesarean section** – Proxy for availability of EMOC
- Postnatal care with a skilled attendant

Study Objective

Additional information on the validity of coverage indicators of maternal and newborn health interventions is needed.

Can accurate information on the QoC received by women during labor and delivery be obtained from women by survey 13-15 months following delivery?

**Photo by Flynn Warren,
courtesy of the Population Council
Tigoni District, Kenya**

Study Design

Baseline:

1. **Direct Observation of Labor & Delivery Care**
   (2 health facilities in Kenya)

2. **Exit Interview with Women on MCH Care at Facility Discharge *(includes DHS/MICS questions)***

13-15 month period

4. Follow-up: **Re-interview Women at Home**

- **Same questions as exit interview**
- **Qualitative interviews with subgroup (N=20) on survey terms/ concepts**

3. Determine validity of self-reports immediately following birth

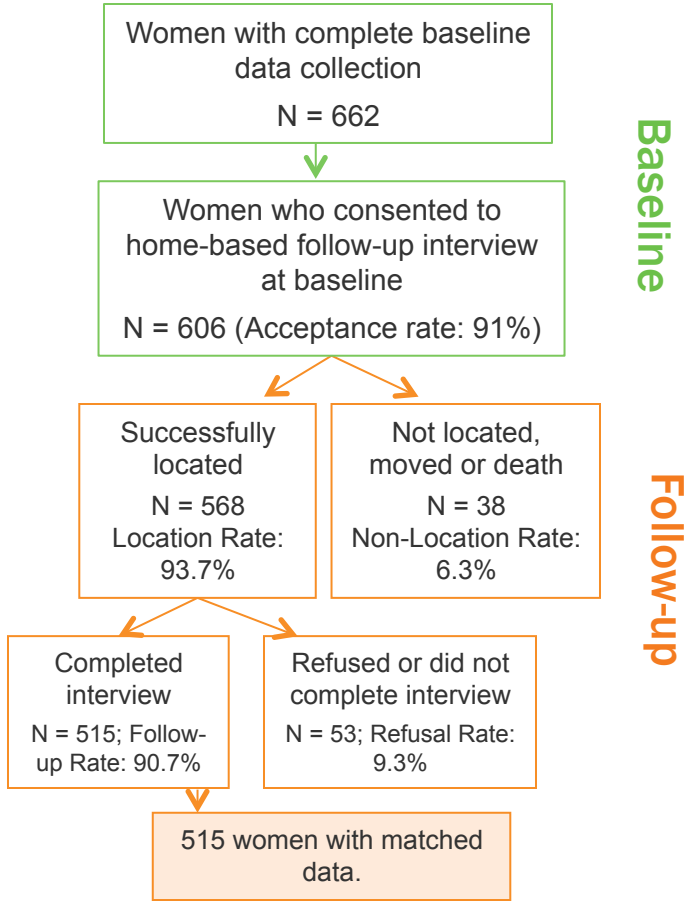
6. Compare validity over time

5. Determine validity and reliability of self-reports at 13-15 months post-birth

Participant Enrollment

Follow-up Sample:

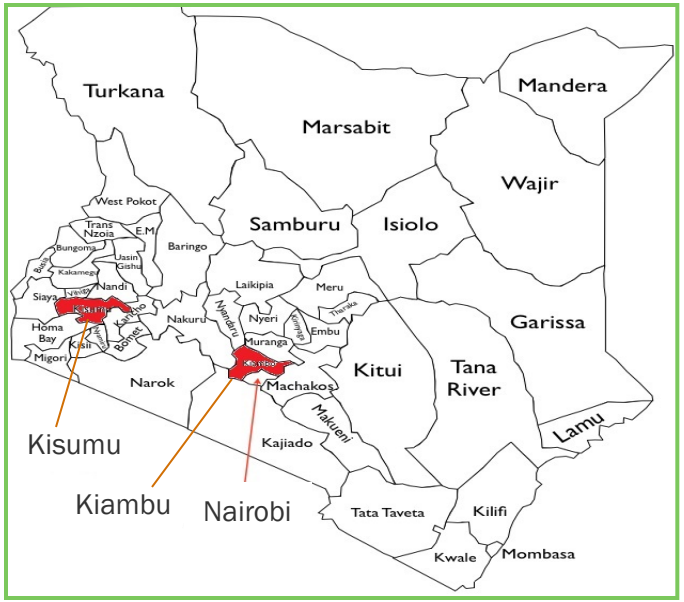
- Women ages 15-49 whose labor & delivery was observed and who consented to follow-up at baseline (N=606)
- 85% follow-up rate (N=515)



Sample Characteristics

Total Follow-up Sample: N=515 (Kiambu: N=315; Kisumu: N=200)

- Mean age: 26 ± 0.22
- 48% 1 prior birth, range: 1-8 prior births
- 44% primary school is highest education
- 85% married or living together
- 13% cesarean rate



Validation Analysis

1. Individual Level Accuracy:

- Sensitivity and specificity, summarized as **area under receiver operating curve (AUC)**
- 0 – 1 scale
  - AUC<0.60 = low validity
  - 0.60<AUC<0.7 = moderate
  - AUC>0.70 = high validity

2. Population Level Accuracy:

- **Inflation factor (IF)**- ratio of estimated survey-based prevalence to true prevalence
- $P_{survey\text{-}based} = P_{true}*(Sensitivity+Specificity-1) + (1-Specificity)$
  - 0.75 < IF < 1.25 = low bias
  - 0.50<IF<1.50 = moderate bias
  - IF<0.50 or IF>1.5 = large bias

High overall performance: AUC>0.60 and 0.75<IF<1.25 (Stanton et al., 2013)

Changes over time: Roc regression to compare AUC estimates over time
IF point estimates- assessed if classification changed from baseline

Validation Results

38 indicators had sufficient data for validation

- 4 measured in DHS/MICS: type of provider, cesarean delivery, immediate breastfeeding (first hour), newborn weight

What Aspects of Care Can Women Recall 13-15 Months Postpartum?

5 indicators met both individual and population accuracy criteria

INDICATORS	Individual Accuracy (AUC>0.60)	Population Accuracy (0.75<IF <1.25)	Decline in Individual or Population Accuracy from Baseline?
A support person is present during birth	+	+	No
Main provider during delivery was a nurse/midwife (Type of provider, DHS/MICS)	+	+	No
Injection was received 1-3 minutes following delivery (Proxy for uterotonic for PPH)	+	+	NA
Cesarean operation (DHS/MICS Indicator)	+	+	No
Low birthweight infant (<2,500 grams) (Gram weight, DHS/MICS Indicator)	+	+	No

Indicators with Individual Accuracy at Both Time Points

- Episiotomy
- Main provider delivery- doctor or medical resident (Type of provider, DHS/ MICS)
- Induces labor with a uterotonic (IV, IM, tablet)
- Augments labor with a uterotonic (IV, IM, tablet)
- Uterotonic received some time before birth (to induce or augment labor)
- Complications- hemorrhage
- Complications- prolonged labor
- Received pain relief medication

Indicators with Population Accuracy at Both Time Points

- Takes blood pressure on initial examination
- Encourages/assists woman to ambulate during labor
- Main provider delivery- skilled (doctor, nurse/midwife or medical resident) (Type of provider, DHS/MICS)
- Newborn placed with mother immediately following birth

How Consistent is Women's Reporting?

- Reporting consistency is generally poor (31 of 38 indicators r_{phi} <0.40)
- At aggregate level, individual variability cancels out

Indicator	Correlation (r_{phi})	Level of agreement
Cesarean section	0.90	Near-perfect
Low birthweight infant (<2500 g)	0.71	High
Episiotomy	0.63	Moderate
Skin to skin newborn care	0.53	Moderate
Uterotonic received some time before birth (to induce or augment labor)	0.50	Moderate
A support person/companion is present during birth	0.47	Moderate
Augments labor with a uterotonic (IV, IM, tablet)	0.44	Moderate

Dancey and Reid classification of correlation, 2002.

What Aspects of Care Are Not Recalled with Accuracy?

- Women had greater difficulty recalling aspects of immediate postnatal care, particularly for the mother

"*You know that time* [after the birth] *I was over excited so after the caesarean section I was happy to see my child like this and I gave God my thanks, so I cannot know because once I saw the baby I was tired so whatever happened after that I don't know*".

Women's Postnatal Experiences

"...*When you asked me if the baby was placed on my chest against my skin, that was hard for me to remember because at that time I was tired because I had gone without sleep for two days.*"

"*Like when you asked if I was injected after delivery, yes I can remember I was injected only once, but not sure if it was after delivery of baby or placenta... And you know* [I] *am always so afraid of injections but the joy* [of giving birth] *made me forget about the pain and the fear of injection*."

Can Women Recall Their Type of Provider?

- Women accurately recall a nurse-midwife (most common provider in Kenya)
- 'Skilled' provider – accurate at population level only
  - Greater difficulty discerning between doctors vs. medical residents and doctors vs. nurse-midwives
  - If receiving competent care, does this matter?

Can Women Recall Their Type of Provider?

"I knew it was a doctor because she is the one who tested me, ruptured my membrane to assist the baby to come out, took my blood pressure and then tested my urine… I knew this is a doctor it is not a TBA or a student.

[Interviewer: Okay, how do you differentiate a doctor and a nurse?]

A doctor and a nurse, that one is hard."

Conclusions

- Only a few indicators are reported with a high level of validity.
- Indicators with the highest overall validity mostly related to care received between the first stage of labor and the birth.
- Indicators of initial assessment and immediate postnatal care are less likely to be reported with accuracy.
- Reporting is generally inconsistent at the individual level, but tends to cancel out at the aggregate level.

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