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Development and validation of short indices to measure the quality of labor and delivery care processes in sub-Saharan Africa

Vandana Tripathi, EngenderHealth
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What is known about L&D QoC?

- Evidence of poor QoC in developing countries
 - Settings of high/stalled maternal mortality despite high/increasing facility delivery
 - Indications that provider factors implicated as much or more than system/patient factors.

SBA and many other program indicators are not informative about quality of care (QoC) for mothers and newborns

A call for better information

- “Content, not contact” – Steve Hodgins/MCHIP
- “Unpacking the black box of service delivery” – Chris Elias/PHCPI

WHAT information do we need, and HOW do we get it?

WHAT to measure: QoC processes



Source: <http://www.ahrq.gov/qual/careatlas/careatlas3.htm>

Why processes?

- Complications are unpredictable
 - May occur in presence of “good” care and vice versa
- Facility outcomes are affected by volume, patient mix, prior care
 - Valid comparison across facilities can require complex adjustment
- Cannot assume that good care was provided from ‘readiness’ indicators, e.g., availability of drugs

HOW to measure?

- No standardized, validated definitions or indicators for the quality of the **process** of intrapartum/ immediate postpartum care (QoPIIPC)

Lit review

- QoC indicator selection mostly via clinical guidelines and clinician opinion.
 - Rarely empirically evaluated
- Most QoC measures rely on routine data (registers/records)
 - Observation is gold standard, but rarely used
 - Resource-intensive (time, cost)
 - Lengthy tools → measurement error/incomplete data
(Tripathi, *IJGO* - *in press*)
- Need to reduce burden of observation by identifying **core indicators** of processes of L&D care

Step 1: DEFINE the construct

- USAID/MCHIP MNC expert group convened to identify consensus dimensions of QoPIIPC and group/rate “items” representing this construct
 - Item pool: L&D observation checklist (>130 items) from MCHIP QoC Surveys (mchip.net/node/968)
- Consensus model developed through modified Delphi process

Consensus model of QoPIIPC

Dimension	Sample item
Evidence-based technical interventions	<i>Correct administration of uterotonic for PPH prevention (timing, dose, route)</i>
Interpersonal care	<i>At least once, explains what will happen in labor to woman and/or support person</i>
Screening/monitoring	<i>Takes mother's vital signs 15 minutes after birth</i>
Infection prevention	<i>Washes hands before examination of woman during labor</i>
Avoidance of harmful interventions	<i>Does not perform non-indicated episiotomy</i>

Step 2: VALIDATE a measure

- Data and tools from MCHIP QoC Surveys used to identify and validate a streamlined index of informative indicators of QoPIIPC
 - Sample: 1,145 deliveries in Kenya, Madagascar, and 2 rounds in Tanzania (incl. Zanzibar)
 - Data collection: Clinical observation of deliveries with structured observation checklist

Potential indices & QoC scores

- Checklist of >130 routine L&D care items rated by MNC experts
 - Original Delphi group and additional experts from global institutions and sub-Saharan Africa
- Potential indices from combinations of highly-rated items
 - 7 indices evaluated due to variation in ratings of different expert subgroups
 - Indices ranged from 13-23 items
- Each observed delivery assigned scores for overall/total QoC performance and for each potential QoPIIPC index

Index validation criteria

Validation domains

1. Representation of QoPIIPC dimensions
2. Association of index score with overall QoC performance
3. Association of each index item with overall QoC performance
4. Ability to distinguish poorly and well-performed deliveries
5. Inclusion of items across a range of performance frequency
6. Variability and distribution of index score

MNC experts also provided feedback on face validity:

- Acceptable as a snapshot of QoC
- Enables tracking of key interventions across settings

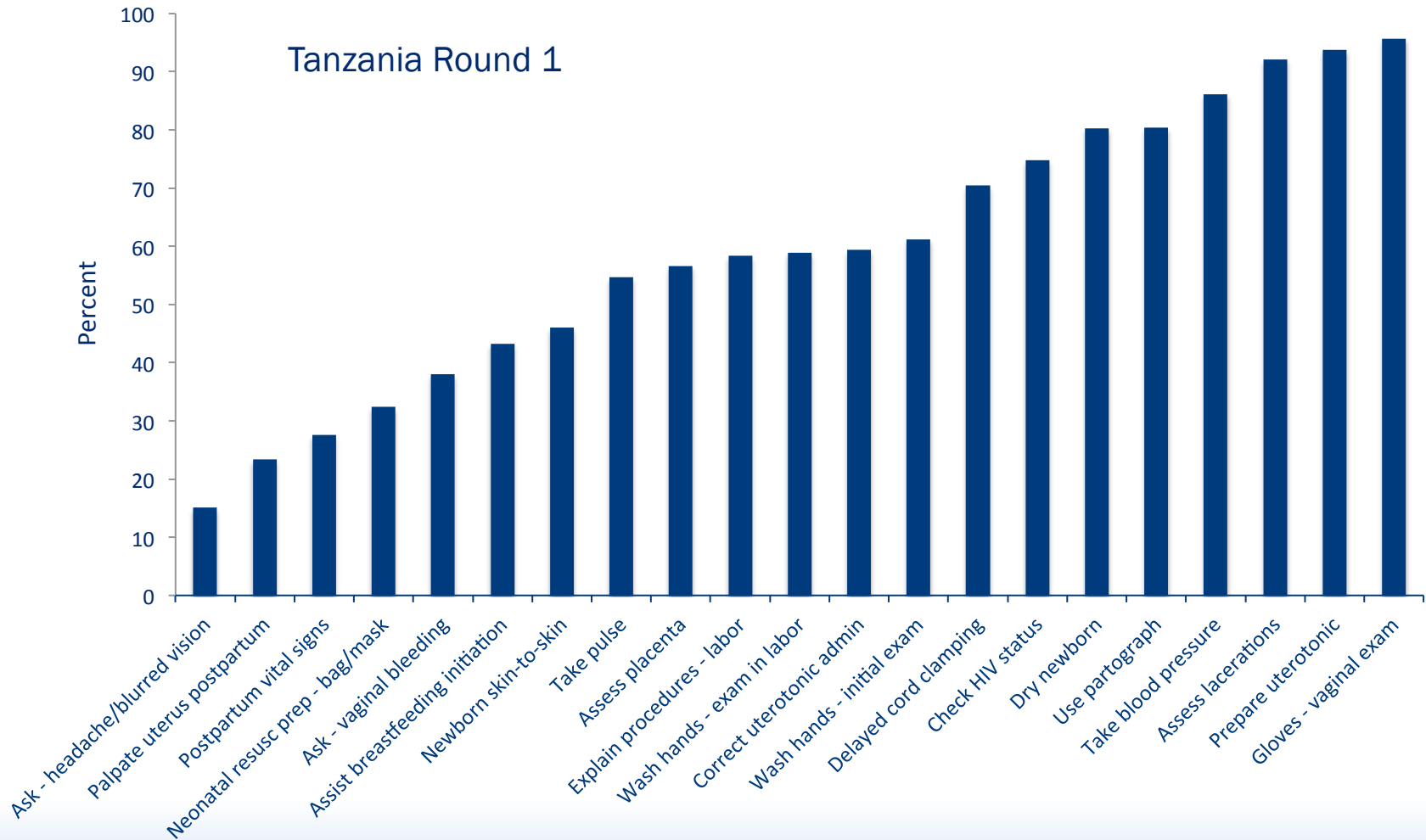
Recommended QoPIIPC index

Checks woman's HIV status (checks chart or asks woman) and/or offers woman HIV test	Self-inflating ventilation bag (500mL) and face masks (size 0 and size 1) are laid out and ready for use for neonatal resuscitation
Asks whether woman has experienced headaches or blurred vision	Correctly administers uterotonic (timing, dose, route)
Asks whether woman has experienced vaginal bleeding	Immediately dries baby with towel
Takes blood pressure	Places newborn on mother's abdomen skin-to-skin
Takes pulse	Ties or clamps cord when pulsations stop, or by 2 - 3 minutes after birth (not immediately after birth)
Washes his/her hand before any examination	Assesses completeness of placenta and membranes
Wears high-level disinfected or sterile gloves for vaginal examination	Assesses for perineal and vaginal lacerations
At least once, explains what will happen in labor to the woman and/or her support person	Takes mother's vital signs 15 minutes after birth
Prepares uterotonic drug to use for AMTSL	Palpates uterus 15 minutes after birth
Uses partograph (during labor)	Assists mother to initiate breastfeeding within one hour

Validation - Dimension representativeness

QoPIIPC dimension	Number of items
Screening/monitoring/action readiness	9 items
Evidence-based technical interventions	8 items
Infection prevention	2 items
Respectful care	1 items
Avoidance of harmful interventions	0 items

Validation – Range of item difficulty



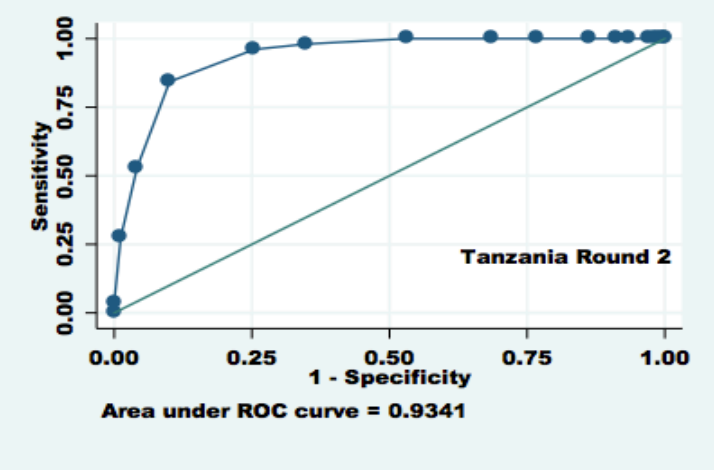
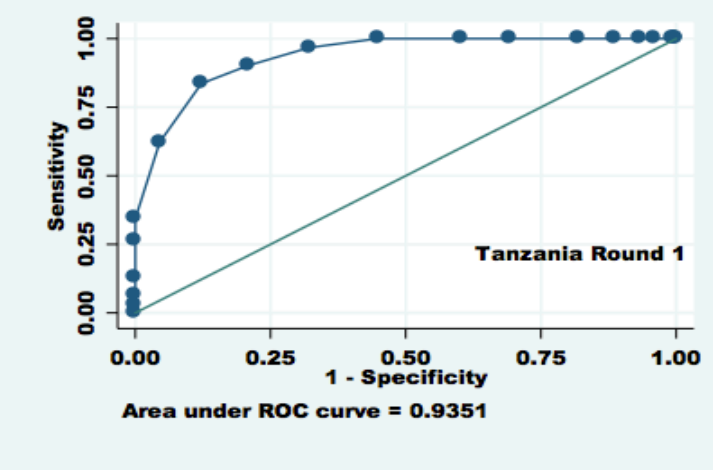
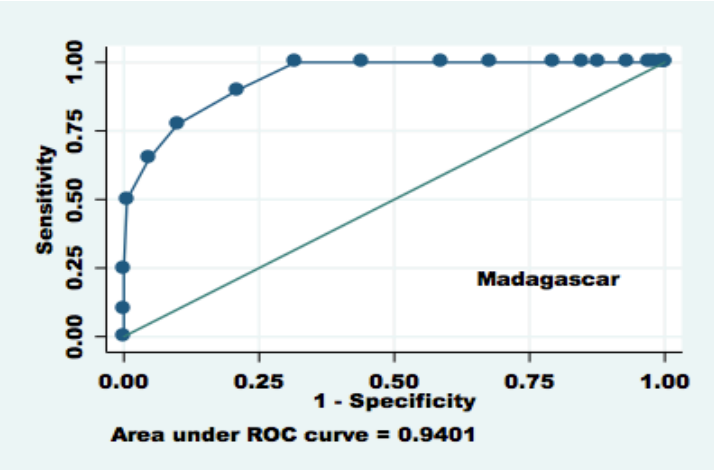
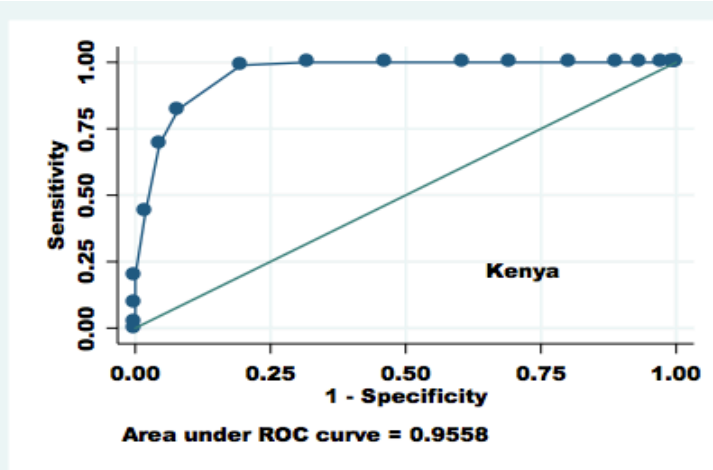
Validation – Discriminating good/poor performance

Odds ratios of good performance by QoPIIPC index score		
	Top 25%	≥80% Correct
	OR (p-value)	
Kenya	3.22 (<0.001)	3.29 (<0.001)
Madagascar	2.72 (<0.001)	3.81 (<0.001)
Tanzania R1	2.78 (<0.001)	3.12 (<0.001)
Tanzania R2	3.36 (<0.001)	2.92 (<0.001)

- Each 1 point increase in the QoPIIPC index score associated with a significant, several-fold increase in the odds of being a “well-performed” delivery.

Validation – Discriminating good/poor performance

Good performance: in top 25% of total QoC score distribution



Strengths of QoPIIPC index

- Triangulation: literature review, expert survey, empirical data
- Developed with data from L&D observation, not record review
- Starting item pool provides foundation for content validity
- Integration of maternal and newborn care
- Routine care focus complements widely-used tools focusing on complications
- Piloted in Tanzania: Tool is feasible and acceptable for use by providers, with targeted training and guidance.

Poster Group C: Tuesday, 17:00-18:00 | Don Diego Foyer; Piloting a Streamlined Index for Assessment of Quality of Labor and Delivery Care: Findings from Tanzania

An even shorter tool?

Challenge

- L&D is long!
 - Even streamlined observation measure may be burdensome for **regular use**
- Is a QoPIIPC measure focusing on time of delivery possible?

Response

- Identified items in comprehensive QoPIIPC index that could be measured at/immediately after delivery
- “Delivery-only” index validated with same criteria as comprehensive index

Delivery-only index

At least once, explains what will happen in labor to the woman and/or her support person	Ties or clamps cord when pulsations stop, or by 2 - 3 minutes after birth (not immediately after birth)
Prepares uterotonic drug to use for AMTSL	Assesses completeness of placenta and membranes
Uses partograph (during labor)	Assesses for perineal and vaginal lacerations
Self-inflating ventilation bag (500mL) and face masks (size 0 and size 1) are laid out and ready for use for neonatal resuscitation	Takes mother's vital signs 15 minutes after birth
Correctly administers uterotonic (timing, dose, route)	Palpates uterus 15 minutes after birth
Immediately dries baby with towel	Assists mother to initiate breastfeeding within one hour
Places newborn on mother's abdomen skin-to-skin	

Comprehensive vs. delivery-only index

- Relative to comprehensive QoPIIPC index, validation suggests that delivery-only index has:
 - Fewer QoPIIPC dimensions
 - Fewer “easy” (nearly-universally performed) items
 - Significant, though reduced, association with overall QoC
- **The delivery-only index may be a robust alternative to the comprehensive QoPIIPC index for quality assessment if complete episodes of L&D care cannot be observed**

Implications

- Availability of validated measures may promote research on QoC determinants and QI effectiveness
- Comprehensive, streamlined, reliable, validated QoPIIPC measures can be used in:
 - Ongoing supervision by facility/district managers
 - Complementing QA/QI based on record review
 - Verification in settings of performance-based incentives
 - Integration into HMIS?
- Essential to develop accompanying guidance – underway

Conclusion

- Global recognition that QoC must improve to enable further reductions in maternal and newborn mortality
- Tools needed to bring observation out of the research setting and into health systems and programs
- The indices developed through this study may improve assessment of care for mothers and newborns in settings where facility deliveries are increasing but information about quality is limited

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- Maternal & newborn care expert group members
- Johns Hopkins Bloomberg School of Public Health faculty: Cynthia Stanton, Linda Bartlett, Donna Strobino, Kitty Chan, Luke Mullany
- All the women who allowed their deliveries and first moments with their newborns to be observed

For more information, please visit
www.mcspprogram.org

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Supplemental/Q&A Slides

QoC Survey sample sizes

Country	Facilities	Deliveries – full sample	Deliveries – in analysis (%)
Tanzania (incl. Zanzibar) Round 1	56	706	282 (39.9%)
Tanzania Round 2	48	558	220 (39.4%)
Kenya	170	626	403 (64.4%)
Madagascar	36	347	210 (60.5%)
Total	506	2,238	1,145 (51.2%)

Deliveries included in analysis if observed at intake, in labor, at delivery, and immediately postpartum.

Potential QoPIIPC indices

Potential Index	Description	# of items
A. Preliminary index	Items highly rated by MCHIP/USAID Delphi group	20
B. 3+ index	Items highly rated by ≥ 3 expert subgroups	17
C. All-survey index	Items highly rated by all surveyed experts	21
D. Global index	Items highly rated by experts based at global health institutions	23
E. Africa region index	Items highly rated by experts based in sub-Saharan Africa	21
F. Constructed index 1	3+ index and 3 items recommended by MNC experts during initial face validity assessment	20
G. Constructed index 2	Adapted from constructed index 1. <ul style="list-style-type: none"> - Removed 3 items that were universally performed or identified by expert group as difficult to observe accurately. - Added 3 items that were less frequently performed and/or recommended during expert group feedback. 	20