

Appendix 2: Calculation and Measurement of Inputs and Outputs  
(*appendix to Pre-Analysis Plan published on AEA RCT registry*)

# Performance Based Contracts in Healthcare: Experimental Evaluation of Contracting Based on Inputs and Health Outcomes: Pre-Analysis Plan Appendix

October 2014

## Inputs Performance Calculations

Evaluation of inputs is based on responses to questions asked during household interviews 7 – 20 days after delivery. Rules for evaluating each domain of inputs are described in the fourth column and last two rows of each section. “Don’t know/can’t remember” responses are treated as missing; there is no penalty/gain to performance for missing responses, whether they arise from skip patterns or “don’t know/can’t remember” responses. Questions have been chosen to reflect factors that women could conceivably answer reliably and that do not depend on whether an adverse outcome occurred.

### SECTION A: PREGNANCY CARE (ANC)

WHO Recommendation	Qn #	Question	One point if: (0 otherwise)
<b>Monitoring of progress of pregnancy and assessment of maternal and fetal well-being</b>	Q301	During this pregnancy, did any health worker see you/provide checkups or advice?	A1. Yes
	Q304	How many months were you when you received first checkup for this last pregnancy?	A2. < 5
	Q305	How many times were you checked up during this pregnancy?	A3. > 3
<b>Detection of problems complicating pregnancy (e.g., anemia, hypertensive disorders, bleeding, malpresentations, multiple pregnancy)</b>	Q306B	As part of your checkups during this pregnancy, were any of the following tests or exams done at least once: weight?	A4. Yes
	Q306C	As part of your checkups during this pregnancy, were any of the following tests or exams done at least once: blood pressure?	A5. Yes
	Q306D	As part of your checkups during this pregnancy, were any of the following tests or exams done at least once: urine?	A6. Yes
	Q306E	As part of your checkups during this pregnancy, were any of the following tests or exams done at least once: blood test?	A7. Yes
	Q306F	As part of your checkups during this pregnancy, were any of the following	A8. Yes

		tests or exams done at least once: abdomen/ internal/ vaginal exam?	
	Q306H	As part of your checkups during this pregnancy, were any of the following tests or exams done at least once: ultrasound/ sonogram?	A9. Yes
	Q306I	As part of your checkups during this pregnancy, were any of the following tests or exams done at least once: anemia test (in this test, blood is taken from your finger tip or your eyes and palm are checked)?	A10. Yes
<b>Tetanus immunization, anemia prevention and control (iron and folic acid supplementation)</b>	Q313	During this pregnancy, were you given an injection in the arm or shoulder or other part of the body to prevent getting tetanus?	A11. Yes
	Q314	During this pregnancy, did you consume any iron tablets or iron syrup?	A12. Yes
	Q315	During this pregnancy, did you consume folic acid?	A13. Yes
<b>Information and counseling on self care at home, nutrition, safer sex, breastfeeding, family planning, healthy lifestyle</b>	Q308	During your ANC checkups, were you given any guidance about what kinds of things you should eat during pregnancy?	A14. Yes
	Q309	During your ANC checkups, were you given any guidance about breastfeeding?	A15. Yes
	Q310	During your ANC checkups, were you given any guidance about family planning?	A16. Yes
<b>Birth planning, advice on danger signs and emergency preparedness</b>	311	During your ANC checkups, were you given any guidance about birth planning?	A17. Yes
	312	During your ANC checkups, were you given any advice on danger signs during pregnancy and emergency preparedness?	A18. Yes
<b>Individual Level Inputs, Section A: Pregnancy Care (e.g., <math>y_{ip}</math>, <math>y_{ic}</math>):</b>		$IndInput_A = \frac{\sum A1: A18}{18}$	
<b>Provider Level Inputs, Section A: Pregnancy Care (e.g., <math>y_p</math>):</b> [Evaluated based on women who delivered at the provider's facility]		$ProvInput_A = \frac{\sum IndInput_A}{\# patients}$	

## SECTION B: CHILDBIRTH CARE

WHO Recommendation	Qn #	Question	One point if: (0 otherwise)
<b>Diagnosis of labor</b>	Q404	[For institutional deliveries] When you arrived at the facility for delivery, were you asked about the details of the pain (onset/type, association of pain with leaking) while the child was in your womb?	B1. Yes
		[For attended home deliveries] When the health provider reached your home for delivery, were you asked about the details of the pain (onset/type, association with leaking) while the child was in your womb?	
<b>Monitoring progress of labor, maternal and fetal well-being with partograph</b>	Q405	Were you asked about the movement of your baby in your womb?	B2. Yes
	Q413	Was the heart rate of the baby checked while the baby was still in your womb?	B3. Yes
	Q416	Was a per vaginal examination (the healthcare provider inserting fingers in the mother's vagina) done to you?	B4. Yes
<b>Providing supportive care and pain relief</b>	Q419	Were you encouraged to bear down?	B5. Yes
<b>Detection of problems and complications (e.g., malpresentations, prolonged and/or obstructed labor, hypertension, bleeding, and infection)</b>	Q407	Were you asked about your previous deliveries including live birth/stillbirth/abortion, etc.?	B6. Yes
	Q408	Were you asked if you have ever had hypertension or high blood pressure?	B7. Yes
	Q409	Were you asked whether you are diabetic?	B8. Yes
	Q410	Were you asked about whether you have hyper or hypo thyroidism (increased/decreased palpitation & perspiration for which is on treatment)?	B9. Yes
	Q411	Were you asked whether you have asthma?	B10. Yes
	Q412	Was your blood pressure checked?	B11. Yes
	Q414	Was an anemia test done on you? In this test, blood is taken from your finger tip, your eyes and palm are checked, or blood sample.	B12. Yes
	Q415	Was a per abdominal examination (touched and examined the bare abdomen) done to you?	B13. Yes
<b>Delivery and immediate care</b>	Q502	Was the baby dried immediately after	B14. Yes

<b>of the newborn baby, initiation of breastfeeding</b>		birth?	
	Q503	Was the baby subsequently wrapped in different clothes from what were used to dry the baby?	B15. Yes
	Q504	Was the head of the baby covered?	B16. Yes
	Q506	Was the heart rate of the baby checked during the first five minutes after birth?	B17. Yes
	Q507	Were you counseled to start breastfeeding shortly after delivery?	B18. Yes
	Q508	How long after birth did you put (BABY NAME) to the breast?	B19. Immediately (within 1 hr)
	Q510	Was (BABY NAME) weighed at birth?	B20. Yes
<b>Active management of third stage of labor</b>	Q423	Did the doctor/other assistants/nurses press your abdomen after the delivery?	B21. Yes
	Q605	After delivery of your baby were you given medicine/injections/drip (oxytocin) to decrease bleeding?	B22. Yes
<b>Monitoring and assessment of maternal well being, prevention and detection of complications (e.g., hypertension, infections, bleeding, anemia)</b>	Q601	Was your blood pressure monitored after delivery?	B23. Yes
	Q602	Was a vaginal examination done after delivery?	B24. Yes
	Q603	Was your episiotomy checked?	B25. Yes
	Q417	Did the healthcare provider wear gloves while doing the per vaginal examination?	B26. Yes
<b>Individual Level Inputs, Section B: Childbirth Care (e.g., <math>y_{ip}</math>, <math>y_{ic}</math>):</b>		$IndInput_B = \frac{\sum B1: B26}{26}$	
<b>Provider Level Inputs, Section B: Childbirth Care (e.g., <math>y_p</math>):</b> [Evaluated based on women who delivered at the provider's facility]		$ProvInput_B = \frac{\sum IndInput_B}{\# patients}$	

## SECTION C: POSTNATAL MATERNAL CARE

WHO Recommendation	Qn #	Question	One point if: (0 otherwise)
Anemia prevention and control (iron and folic acid supplementation)	Q802-3	[For institutional deliveries] Before discharge, were you given counseling by hospital staff on any of the following topics? Iron and calcium intake for 3 months	C1. Yes
		[For home deliveries] Before the attending healthcare provider left, did she give you any counseling on any of the following topics? Iron and calcium intake for 3 months	
Information and counseling on nutrition, safe sex, family planning and provision of some contraceptive methods	Q802-2	[For institutional deliveries] Before discharge, were you given counseling by hospital staff on any of the following topics? Normal diet	C2. Yes
		[For home deliveries] Before the attending healthcare provider left, did she give you any counseling on any of the following topics? Normal diet	
	Q802-4	[For institutional deliveries] Before discharge, were you given counseling by hospital staff on any of the following topics? Family planning	C3. Yes
		[For home deliveries] Before the attending healthcare provider left, did she give you any counseling on any of the following topics? Family planning	
Postnatal care planning, advice on danger signs and emergency preparedness	Q807-1	Were you advised to report immediately if you had any of the following? High grade fever	C4. Yes
	Q807-2	Were you advised to report immediately if you had any of the following? Foul smelling vaginal discharge	C5. Yes
	Q807-3	Were you advised to report immediately if you had any of the following? Excessive bleeding	C6. Yes
	Q807-4	Were you advised to report immediately if you had any of the following? Wound gaping or oozing wound	C7. Yes
	Q807-5	Were you advised to report immediately if you had any of the following? Convulsions	C8. Yes
Individual Level Inputs, Section C: Postnatal Maternal Care (e.g., $y_{ip}$ , $y_{ic}$ ):		$IndInput_c = \frac{\sum C1:C8}{8}$	

**Provider Level Inputs, Section C: Postnatal Maternal Care**

**(e.g.,  $y_p$ ):**

[Evaluated based on women who delivered at the provider's facility]

$$ProvInput_c = \frac{\sum IndInput_c}{\# patients}$$

## SECTION D: NEWBORN CARE

WHO Recommendation	Qn #	Question	One point if: (0 otherwise)
<b>Promotion, protection, and support for breastfeeding</b>	Q704	In the first 12 hours after birth, did the health care provider/staff ask whether the baby had been fed?	D1. Yes
	Q803	[For institutional deliveries] Did you receive advice on breastfeeding during your stay in the hospital? [For attended home deliveries] Before the attending health care provider left, did she give you any advice on breastfeeding?	D2. Yes
<b>Monitoring and assessment of wellbeing, detection of complications (breathing, infections, prematurity, low birth weight, injury, malformation)</b>	Q701	Was the baby's heart rate checked during the first 6 hours after birth?	D3. Yes
	Q702	Was the baby's temperature measured with a thermometer during the first 12 hours after birth?	D4. Yes
	Q703	Did the healthcare provider ask the mother whether the baby has urinated or was the urine checked directly by the healthcare provider?	D5. Yes
<b>Infection prevention and control, rooming-in</b>	Q708	Was the baby bathed within 6 hours after birth?	D6. No
<b>Eye care</b>	Q701A	Was the baby given eyedrops in the first 6 hours after birth?	D7. Yes
<b>Information and counseling on homecare, breastfeeding, hygiene</b>	Q802-1	[For institutional deliveries] Before discharge, were you given counseling by hospital staff on any of the following topics? Exclusive breastfeeding [For home deliveries] Before the attending healthcare provider left, did she give you any counseling on any of the following topics? Exclusive breastfeeding	D8. Yes
	Q804	Were you told that breast milk or formula milk is better?	D9. Breast milk
	Q802-5	[For institutional deliveries] Before discharge, were you given counseling by hospital staff on any of the following topics? Hygiene [For home deliveries] Before the attending healthcare provider left, did she give you any counseling on any of the following topics? Hygiene	D10. Yes
<b>Postnatal care planning, advice on danger signs and</b>	Q802-8	[For institutional deliveries] Before discharge, were you given counseling by	D11. Yes



<b>emergency preparedness</b>		hospital staff on any of the following topics? Warning signs indicating that you should take the baby to see a doctor [For home deliveries] Before the attending healthcare provider left, did she give you any counseling on any of the following topics? Warning signs indicating that you should take the baby to see a doctor	
<b>Immunization according to the national guidelines</b>	Q706-1	What immunizations did the baby receive? BCG (right upper arm)	D12. Yes
	Q706-2	What immunizations did the baby receive? HEP-B1	D13. Yes
	Q706-3	What immunizations did the baby receive? Polio (oral drops)	D14. Yes
<b>Individual Level Inputs, Section D: Newborn Care (e.g., <math>y_{ip}</math>, <math>y_{ic}</math>):</b>		$IndInput_D = \frac{\sum D1: D14}{14}$	
<b>Provider Level Inputs, Section D: Newborn Care (e.g., <math>y_p</math>):</b> [Evaluated based on women who delivered at the provider's facility]		$ProvInput_D = \frac{\sum IndInput_D}{\# patients}$	

## SECTION E: POSTNATAL NEWBORN CARE

WHO Recommendation	Qn #	Question	One point if: (0 otherwise)
Detection of complications and responding to maternal concerns	Q808	Were you given any contact number to call during the time of emergency/need?	E1. Yes
Information and counseling on home care	Q805	Did the hospital staff/health care provider advise you to keep the baby warm?	E2. Yes
Individual Level Inputs, Section E: Postnatal Newborn Care (e.g., $y_{ip}$ , $y_{ic}$ ):		$IndInput_E = \frac{\sum E1: E2}{2}$	
Provider Level Inputs, Section E: Postnatal Newborn Care (e.g., $y_p$ ): [Evaluated based on women who delivered at the provider's facility]		$ProvInput_E = \frac{\sum IndInput_E}{\# patients}$	

## Health Outcomes Calculations

Evaluation of inputs is based on responses to questions asked during household interviews 7 – 20 days after delivery. Every output is a binary adverse health outcome when evaluated at the individual level (e.g.,  $y_{ip}$ ,  $y_{ic}$ ). Provider level outputs (e.g.,  $y_p$ ) represent the share of respondents who delivered at the provider’s facility evaluated to have experience the health outcome. “Don’t know/can’t remember” responses are treated as missing; there is no penalty/gain for missing responses, whether they arise from skip patterns or “don’t know/can’t remember” responses.

### Pre-Eclampsia

Qn #	Question
Q206	Have you ever had a fit/convulsion when you were not pregnant?
Q316	At any point during pregnancy did you have a fit/convulsion?
Q629	Did you experience convulsions? [within 24 hrs of delivery, 24 hrs post-delivery – 1 week post]
<b>Pre-eclampsia Identification Rule</b>	<ul style="list-style-type: none"> <li>• <b>No fit or convulsion when not pregnant (206 = no), and</b></li> <li>• <b>At least one of:</b> <ul style="list-style-type: none"> <li>○ <b>Fit or convulsion during pregnancy (316 = yes)</b></li> <li>○ <b>Convulsion within 24 hours of delivery (629a = yes)</b></li> <li>○ <b>Convulsion in period from 24 hours post-birth to 1 week post-birth (629b = yes)</b></li> </ul> </li> </ul>

### Sepsis

Qn #	Question
Q426	At any point during labor and delivery, did you have a fever?
Q627	Did you experience high grade fever? [within 24 hrs of delivery, 24 hrs post-delivery – 1 wk post]
Q636	Did you have foul smelling vaginal discharge or pus?
<b>Sepsis Identification Rule</b>	<ul style="list-style-type: none"> <li>• <b>At least one of:</b> <ul style="list-style-type: none"> <li>○ <b>Fever during labor or delivery (426 = yes)</b></li> <li>○ <b>High grade fever from 24 hours post-birth to 1 week post-birth (627b = yes)</b></li> <li>○ <b>Foul smelling vaginal discharge or pus (636 = yes)</b></li> </ul> </li> </ul>

### Postpartum Hemorrhage

Qn #	Question
622	Did you have any bleeding along with experiencing dizziness? [within 24 hrs of delivery, 24 hrs post-delivery – 1 wk post]
623	Did you have any bleeding along with experiencing weakness? [within 24 hrs of delivery, 24 hrs post-delivery – 1 wk post]
624	Did you have any bleeding along with losing consciousness? [within 24 hrs of delivery,

	24 hrs post-delivery – 1 wk post]
PPH Identification Rule	<ul style="list-style-type: none"> <li>• <b>At least one of:</b> <ul style="list-style-type: none"> <li>○ <b>Bleeding along with experience dizziness (622a or 622b = yes)</b></li> <li>○ <b>Bleeding along with experiencing weakness (623a or 623b = yes)</b></li> <li>○ <b>Bleeding along with losing consciousness (624a or 624b = yes)</b></li> </ul> </li> </ul>

## Neonatal Mortality

Qn #	Question
117a	Did the baby cry immediately after delivery?
118	Was the baby born alive?
118a	Did the doctor/health care provider do anything to attempt to resuscitate the baby?
119	How is the baby doing now?
MU 201	Is the baby still alive? [note this question is asked at least 28 days post birth]
MU 204	When did the baby die? [note this question is asked at least 28 days post birth]
28-Day Neonatal Mortality Identification Rule	<ul style="list-style-type: none"> <li>• <b>Baby cried immediately after delivery and has now passed away (117a = Yes &amp; 119 = Passed Away), or</b></li> <li>• <b>Baby did not cry immediately after delivery, was born alive, and has now passed away (117a = No &amp; 118 = Yes &amp; 119 = Passed Away), or</b></li> <li>• <b>Baby did not cry immediately after delivery, and doctor/health care provided attempted to resuscitate the baby (117a = No &amp; 118 = No &amp; 118a = Yes), or</b></li> <li>• <b>Baby was alive at time of initial survey, but has died within one month of delivery (119 = alive and healthy or alive and sick &amp; MU201 = No &amp; MU204 &lt; 1 month)</b></li> </ul>
Stillborn Death Identification Rule	<ul style="list-style-type: none"> <li>• <b>Baby did not cry immediately after delivery, was not born alive, and doctor did not do anything to attempt to resuscitate the baby (117a = No &amp; 118 = No &amp; 118a = No), or</b></li> <li>• <b>Baby did not cry immediately after delivery, baby was not born alive, and question about resuscitating the baby was not applicable (117a = No &amp; 118 = No &amp; 118a = Not applicable)</b></li> </ul>