

Online Supplementary Document

Carter et al. Validity of maternal report of care-seeking for childhood illness

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Supplemental Table 1: Maternal report of source of care: original report, reclassified by specific provider name, and events reported at participating providers

Provider Type	Rural			Urban		
	Reported	Reclassified	Participating	Reported	Reclassified	Participating
Govt / Public Sector						
Govt hospital	12	0	-	6	5	0
Govt health center/post	105	123	122	109	110	110
Govt mobile hospital/clinic	0	0	-	0	0	-
Govt CBA/fieldworker	35	35	35	1	1	1
Private Sector						
Pvt hospital/clinic	0	0	-	1	1	0
Mission hospital/clinic	6	0	-	0	0	-
Pharmacy	1	1	0	2	2	2
Pvt doctor	0	0	-	0	0	-
Pvt CBA/fieldworker	1	0	-	0	0	-
Informal						
Shop	2	2	0	8	8	0
Traditional practitioner	4	5	4	0	0	0
Market	0	0	0	1	1	0
TOTAL	166	166	161	128	128	113

Supplemental Table 2. Accuracy of maternal report by reported illness type, by strata

A. Diarrhea	Source of Care (Provider Category)		Any Care-Seeking		Care-Seeking at Skilled Provider	
	Rural	Urban	Rural	Urban	Rural	Urban
TP	44	32	40	33	39	32
TP+FN	48	33	42	34	40	33
Sensitivity, percent (95% CI)	95.1 [54.4-99.7]	97 [81.4-99.6]	95.2 [82.9-98.8]	97.1 [81.9-99.6]	97.5 [84.3-99.6]	97 [81.4-99.6]
TN	14	41	14	41	16	44
TN+FP	17	52	16	52	18	55
Specificity, percent (95% CI)	82.4 [57.3-94.2]	84.9 [43.1-97.7]	87.5 [61.4-96.9]	84.9 [43.1-97.7]	88.9 [64.8-97.2]	85.8 [46.4-97.7]
TP+TN	58	73	54	74	55	76
TP+TN+FP+FN	65	85	58	86	58	88
Accuracy, percent (95% CI)	91.9 [70.9-98.1]	89.8 [65.9-97.6]	93.1 [83.0-97.4]	89.8 [66.5-97.5]	94.8 [85.2-98.3]	90.1 [67.0-97.6]
AUC, percent (95% CI)	87 [76.9-97.2]	87.9 [81.6-94.3]	91.4 [82.4-100]	88 [81.7-94.3]	93.2 [85.3-100]	88.5 [82.4-94.6]

B. Fever	Source of Care (Provider Category)		Any Care-Seeking		Care-Seeking at Skilled Provider	
	Rural	Urban	Rural	Urban	Rural	Urban
TP	132	80	123	80	122	80
TP+FN	143	81	128	80	127	80
Sensitivity, percent (95% CI)	92.3 [86.6-95.7]	98.8 [89.1-99.9]	96.3 [89.0-98.9]	100 --	96.3 [88.8-98.9]	100 --
TN	24	26	24	26	28	33
TN+FP	34	43	34	42	38	48
Specificity, percent (95% CI)	70.6 [53.4-83.4]	60.5 [45.4-73.8]	70.6 [53.4-83.4]	61.9 [46.6-75.2]	73.7 [57.6-85.2]	69.3 [52.1-82.5]
TP+TN	156	106	147	106	150	113
TP+TN+FP+FN	177	124	162	122	165	128
Accuracy, percent (95% CI)	88.1 [82.5-92.1]	85.5 [78.1-90.7]	90.7 [85.2-94.3]	86.9 [79.7-91.8]	90.9 [85.5-94.4]	88.3 [81.5-92.8]
AUC, percent (95% CI)	81.4 [73.4-89.5]	79.6 [72.1-87.1]	83.3 [75.4-91.3]	81 [73.5-88.4]	84.9 [77.6-92.2]	84.4 [77.7-91.0]

C. ARI	Source of Care (Provider Category)		Any Care-Seeking		Care-Seeking at Skilled Provider	
	Rural	Urban	Rural	Urban	Rural	Urban
TP	23	11	21	11	21	11
TP+FN	27	11	24	11	23	11
Sensitivity, percent (95% CI)	85.2 [66.5-94.3]	100 --	87.6 [54.4-97.7]	100 --	93.2 [52.1-99.4]	100 --
TN	3	4	3	4	5	4
TN+FP	5	6	5	5	7	5
Specificity, percent (95% CI)	60 [20.0-90.0]	66.7 [26.8-91.6]	60 [20.0-90.0]	80 [30.9-97.3]	71.4 [32.7-92.8]	80 [30.9-97.3]
TP+TN	26	15	24	15	26	15
TP+TN+FP+FN	32	17	29	16	30	16
Accuracy, percent (95% CI)	81.3 [64.1-91.3]	88.2 [63.2-97.0]	82.6 [61.9-93.3]	93.8 [66.5-99.1]	87.4 [64.2-96.4]	93.8 [66.5-99.1]
AUC, percent (95% CI)	72.6 [47.6-97.5]	83.3 [62.7-100]	73.8 [48.8-98.7]	90 [70.4-100]	81.4 [62.4-100]	90 [70.4-100]

Supplemental Table 3. Characteristics associated with accuracy of maternal report of any care-seeking and seeking care from a skilled provider

Any Match	n	OR	[95% CI]	p-value
Demographic Characteristics				
Child Sex				
Female (Ref)	191	1	-	-
Male	178	1.56	[0.69-3.56]	0.287
Child Age	369	1.24	[0.90-1.71]	0.179
Number of children <5 years in household	369	1.41	[0.77-2.56]	0.263
Maternal Age	369	0.99	[0.93-1.05]	0.689
Maternal education				
None or primary incomplete (Ref)	77	1	-	-
Primary complete	74	1.36	[0.35-5.32]	0.658
Secondary incomplete	161	0.46	[0.15-1.39]	0.168
Secondary complete or higher	57	1.23	[0.24-6.34]	0.805
Household wealth (quintile)				
Poorest (Ref)	90	1	-	-
Second	67	3.96	[1.02-15.37]	0.047
Middle	78	0.95	[0.34-2.67]	0.927
Fourth	75	1.23	[0.35-4.32]	0.743
Highest (Wealthiest)	59	0.96	[0.22-4.09]	0.953
Household location				
Rural	194	1	-	-
Urban	175	1.63	[0.63-4.19]	0.312
Illness Characteristics				
Fever (Ref)	191	1	-	-
Diarrhea	73	3.53	[1.15-10.82]	0.027
ARI	9	0.55	[0.09-3.24]	0.506
Fever & Diarrhea	60	0.57	[0.19-1.71]	0.316
Diarrhea & ARI	3	1	-	-
Fever & ARI	25	0.23	[0.04-1.38]	0.107
Fever & ARI & Diarrhea	8	0.24	[0.02-3.02]	0.266
True Care-Seeking Behavior / Source of Care				
Public Sector Only (Ref)	229	1	-	-
Traditional Only	5	0.01	[0.00-0.03]	<0.001
Public & Private	1	1	-	-
Public & Traditional	6	1	-	-
No care sought	128	0.04	[0.01-0.12]	<0.001

Skilled Provider	n	OR	[95% CI]	p-value
Demographic Characteristics				
Child Sex				
Female (Ref)	195	1	-	-
Male	183	1.32	[0.58-2.98]	0.511
Child Age	378	1.25	[0.91-1.72]	0.167
Number of children <5 years in household	378	1.5	[0.83-2.72]	0.184
Maternal Age	378	0.97	[0.92-1.04]	0.405
Maternal education				
None or primary incomplete (Ref)	81	1	-	-
Primary complete	74	1.28	[0.32-5.22]	0.728
Secondary incomplete	163	0.38	[0.13-1.13]	0.082
Secondary complete or higher	60	0.91	[0.18-4.64]	0.91
Household wealth (quintile)				
Poorest (Ref)	92	1	-	-
Second	68	4.75	[1.21-18.60]	0.025
Middle	79	1.16	[0.41-3.29]	0.784
Fourth	77	2.24	[0.59-8.46]	0.235
Highest (Wealthiest)	62	1.51	[0.36-6.37]	0.572
Household location				
Rural	197	1	-	-
Urban	181	2.05	[0.80-5.27]	0.135
Illness Characteristics				
Fever (Ref)	197	1	-	-
Diarrhea	73	2.97	[0.94-9.44]	0.064
ARI	9	0.74	[0.10-5.17]	0.758
Fever & Diarrhea	62	0.52	[0.18-1.48]	0.219
Diarrhea & ARI	3	1	-	-
Fever & ARI	26	0.25	[0.04-1.43]	0.118
Fever & ARI & Diarrhea	8	0.19	[0.02-2.44]	0.204
True Care-Seeking Behavior / Source of Care				
Public Sector Only (Ref)	229	1	-	-
Traditional Only	5	1	-	-
Public & Private	1	1	-	-
Public & Traditional	6	1	-	-
No care sought	137	0.04	[0.01-0.13]	<0.001

Supplemental Table 4. Inflation factor for maternal report of care-seeking at true prevalence in study population, by strata

A. Diarrhea	Source of care (Provider Category)		Any Care-seeking		Care-seeking at Skilled Provider	
	Rural	Urban	Rural	Urban	Rural	Urban
True Prevalence	73.8%	38.8%	72.4%	39.5%	69.0%	37.5%
Sensitivity	95.1%	97.0%	95.2%	97.1%	97.5%	97.0%
Specificity	82.4%	84.9%	87.5%	84.9%	88.9%	85.8%
Estimated Prevalence	74.8%	46.9%	72.4%	47.5%	70.7%	45.2%
Inflation Factor	1.01	1.21	1.00	1.20	1.02	1.21

B. Fever	Source of care (Provider Category)		Any Care-seeking		Care-seeking at Skilled Provider	
	Rural	Urban	Rural	Urban	Rural	Urban
True Prevalence	80.8%	65.3%	79.0%	65.6%	77.0%	62.5%
Sensitivity	92.3%	98.8%	96.3%	100.0%	96.3%	100.0%
Specificity	70.6%	60.5%	70.6%	61.9%	73.7%	69.3%
Estimated Prevalence	80.2%	78.2%	82.3%	78.7%	80.2%	74.0%
Inflation Factor	0.99	1.20	1.04	1.20	1.04	1.18

C. ARI	Source of care (Provider Category)		Any Care-seeking		Care-seeking at Skilled Provider	
	Rural	Urban	Rural	Urban	Rural	Urban
True Prevalence	84.4%	64.7%	82.8%	68.8%	76.7%	68.8%
Sensitivity	85.2%	100.0%	87.6%	100.0%	93.2%	100.0%
Specificity	60.0%	66.7%	60.0%	80.0%	71.4%	80.0%
Estimated Prevalence	78.1%	76.5%	79.4%	75.0%	78.1%	75.0%
Inflation Factor	0.93	1.18	0.96	1.09	1.02	1.09

Supplemental Table 5. Accuracy of maternal report provider category match by strata, without correcting incorrect provider classifications

	Source of Care (Provider Category)		Any Care-Seeking		Care-Seeking at Skilled Provider	
	Rural	Urban	Rural	Urban	Rural	Urban
TP	131	92	139	94	136	93
TP+FN	161	95	146	95	142	94
Sensitivity, percent (95% CI)	83 [71.4-90.5]	96.8 [90.7-99.0]	95.4 [89.3-98.1]	98.9 [92.9-99.9]	95.8 [90.9-98.1]	98.9 [92.8-99.9]
TN	35	61	35	61	42	69
TN+FP	49	81	48	80	55	87
Specificity, percent (95% CI)	71.4 [57.4-82.3]	75.5 [62.1-85.3]	72.9 [58.8-83.6]	76.8 [61.1-87.4]	76.4 [63.4-85.8]	80.2 [63.5-90.5]
TP	131	92	139	94	136	93
TP+FP	145	112	152	113	149	111
PPV, percent (95% CI)	90.3 [84.4-94.2]	82.1 [73.9-88.2]	91.4 [85.8-95.0]	83.2 [75.1-89.0]	91.3 [85.6-94.9]	83.8 [75.7-89.5]
TN	35	61	35	61	42	69
TN+FN	65	64	42	62	48	70
NPV, percent (95% CI)	59.7 [33.4-81.4]	95.3 [86.5-98.5]	85.4 [60.4-95.8]	98.4 [89.4-99.8]	87.8 [71.1-95.5]	98.6 [90.6-99.8]
TP+TN	166	153	174	155	178	162
TP+TN+FP+FN	210	176	194	175	197	181
Accuracy, percent (95% CI)	80 [71.0-86.6]	86.9 [81.1-91.2]	89.7 [84.6-93.3]	88.6 [82.9-92.5]	90.4 [85.4-93.8]	89.5 [84.1-93.2]
AUC, percent (95% CI)	76.4 [69.3-83.5]	86.1 [81.0-91.1]	84.1 [77.5-90.6]	87.6 [82.8-92.4]	86.1 [80.2-92.0]	89.1 [84.7-93.5]

Supplemental Table 6. Accuracy of maternal report provider category match by strata, without excluding non-participating providers

	Source of Care (Provider Category)		Any Care-Seeking		Care-Seeking at Skilled Provider	
	Rural	Urban	Rural	Urban	Rural	Urban
TP	147	93	139	94	137	93
TP+FN	162	95	146	95	142	94
Sensitivity, percent (95% CI)	91.2 [83.6-95.5]	97.9 [92.0-99.5]	95.4 [89.3-98.1]	98.9 [92.9-99.9]	96.6 [90.1-98.9]	98.9 [92.8-99.9]
TN	35	61	35	61	42	69
TN+FP	54	96	53	90	57	91
Specificity, percent (95% CI)	65.2 [49.0-78.5]	64.1 [48.0-77.6]	66 [52.4-77.4]	68.2 [52.8-80.5]	73.7 [60.8-83.5]	77.1 [58.5-88.9]
TP	147	93	139	94	137	93
TP+FP	166	128	157	123	152	115
PPV, percent (95% CI)	88.6 [82.8-92.6]	72.7 [64.3-79.7]	88.5 [82.5-92.7]	76.4 [68.1-83.1]	90.1 [84.3-94.0]	80.9 [72.6-87.1]
TN	35	61	35	61	42	69
TN+FN	50	63	42	62	47	70
NPV, percent (95% CI)	74.1 [45.4-90.7]	96.8 [88.2-99.2]	85.4 [60.4-95.8]	98.4 [89.4-99.8]	91.5 [68.8-98.1]	98.6 [90.6-99.8]
TP+TN	182	154	174	155	179	162
TP+TN+FP+FN	216	191	199	185	199	185
Accuracy, percent (95% CI)	84.7 [77.3-90.0]	80.6 [74.4-85.6]	87.4 [82.1-91.4]	83.8 [77.8-88.4]	89.9 [84.9-93.4]	87.6 [82.0-91.6]
AUC, percent (95% CI)	77.8 [71.0-84.6]	80.7 [75.7-85.8]	80.6 [74.0-87.3]	83.4 [78.4-88.3]	85.1 [79.1-91.0]	87.4 [82.8-91.9]

Supplemental Table 7. Sensitivity of maternal report provider category match by method of confirmation

	n	OR	[95% CI]	p-value
Source of care				
Govt health center / post (Ref)	211	1	-	-
Govt CBA	34	0.31	[0.06-1.47]	0.139
Pharmacy	1	1	[1.00-1.00]	-
Traditional practitioner	11	0.02	[0.00-0.10]	<0.001
Confirmation Method				
Register Only (Ref)	59	1	-	-
Ribbon	58	0.3	[0.03-2.87]	0.296
Scan	42	0.3	[0.03-3.18]	0.319
Ribbon & Scan	98	1.23	[0.11-14.15]	0.868