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Measuring Coverage in MNCH: Accuracy of Measuring Diagnosis and Treatment of Childhood Malaria from Household Surveys in Zambia

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We Can Do Better:
The PLoS Medicine Collection on Measuring Coverage in MNCH

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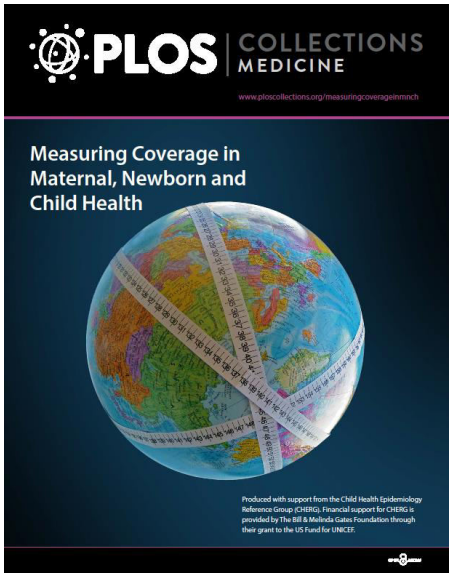

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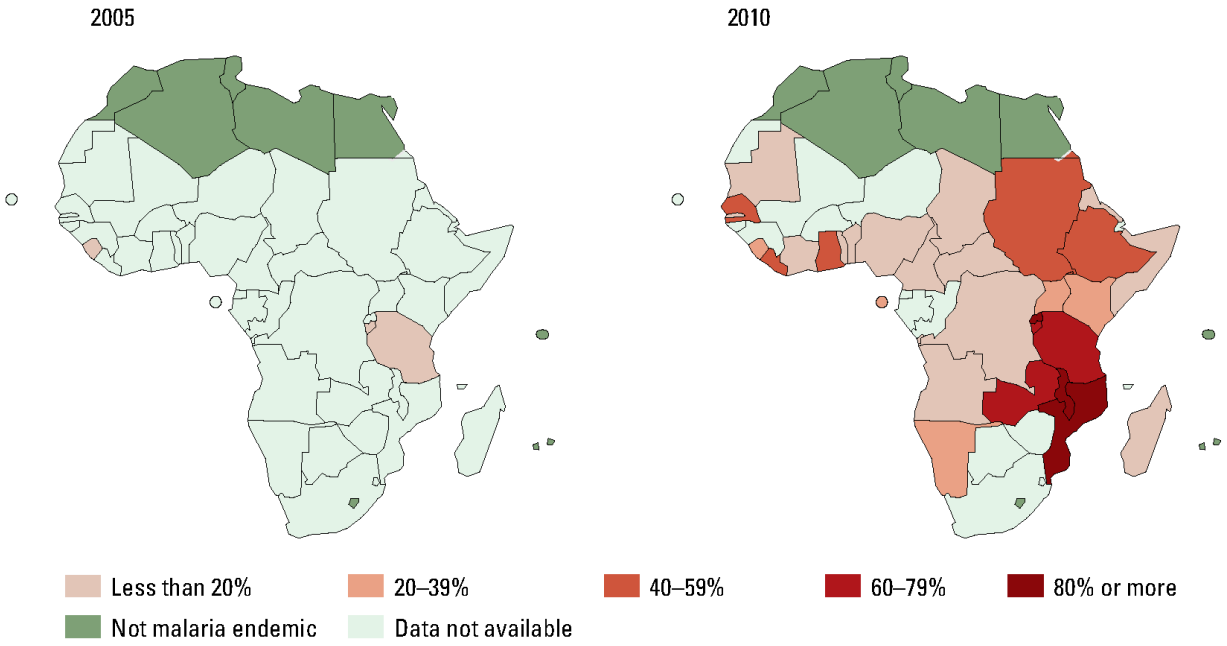
Background and rationale

Proportion of febrile children younger than five years treated with any antimalarial drug who received ACT, based on the latest survey data available by the end of 2005 and 2010

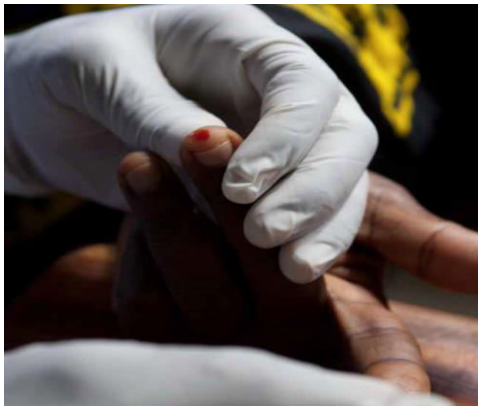
While ACTs are the recommended first-line treatment in many countries, rates of administration to febrile children began increasing only late in the decade.



- Household surveys measure if a child had blood taken for a malaria rapid diagnostic tests (RDT) and if the child received first-line malaria treatment (ACTs)

Background and rationale

- Primary diagnosis and treatment coverage indicators:
  - *Proportion of children <5 with fever in ≤2 weeks who had blood taken with a finger or heel stick (for malaria diagnostic test)*



  - *Proportion of children <5 with fever in ≤2 weeks who received an effective antimalarial (ACT)*

Background and rationale

- **However**, current diagnosis and malaria case management indicators are subject to caregiver recall of what happened during fever episode - potential information error / bias

➢ Until now these indicators and their means of measurement have not been validated against a gold-standard to assess accuracy of caregiver recall

Aim and objectives

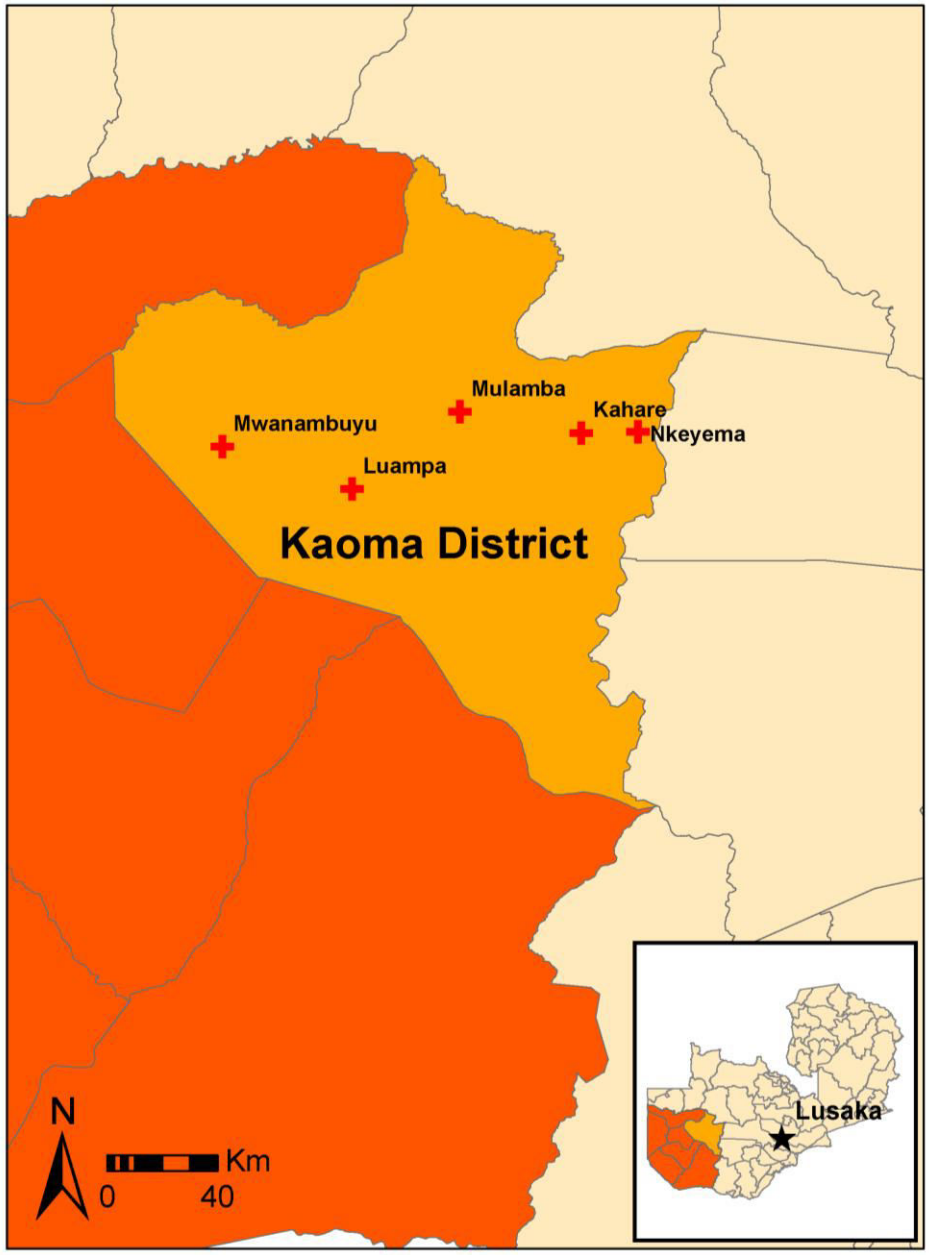
➢ ***Objectives***

Compared to a gold-standard of direct observation of child's sick visit for fever at health facility, assess caregiver's accuracy 2 weeks later in recalling:

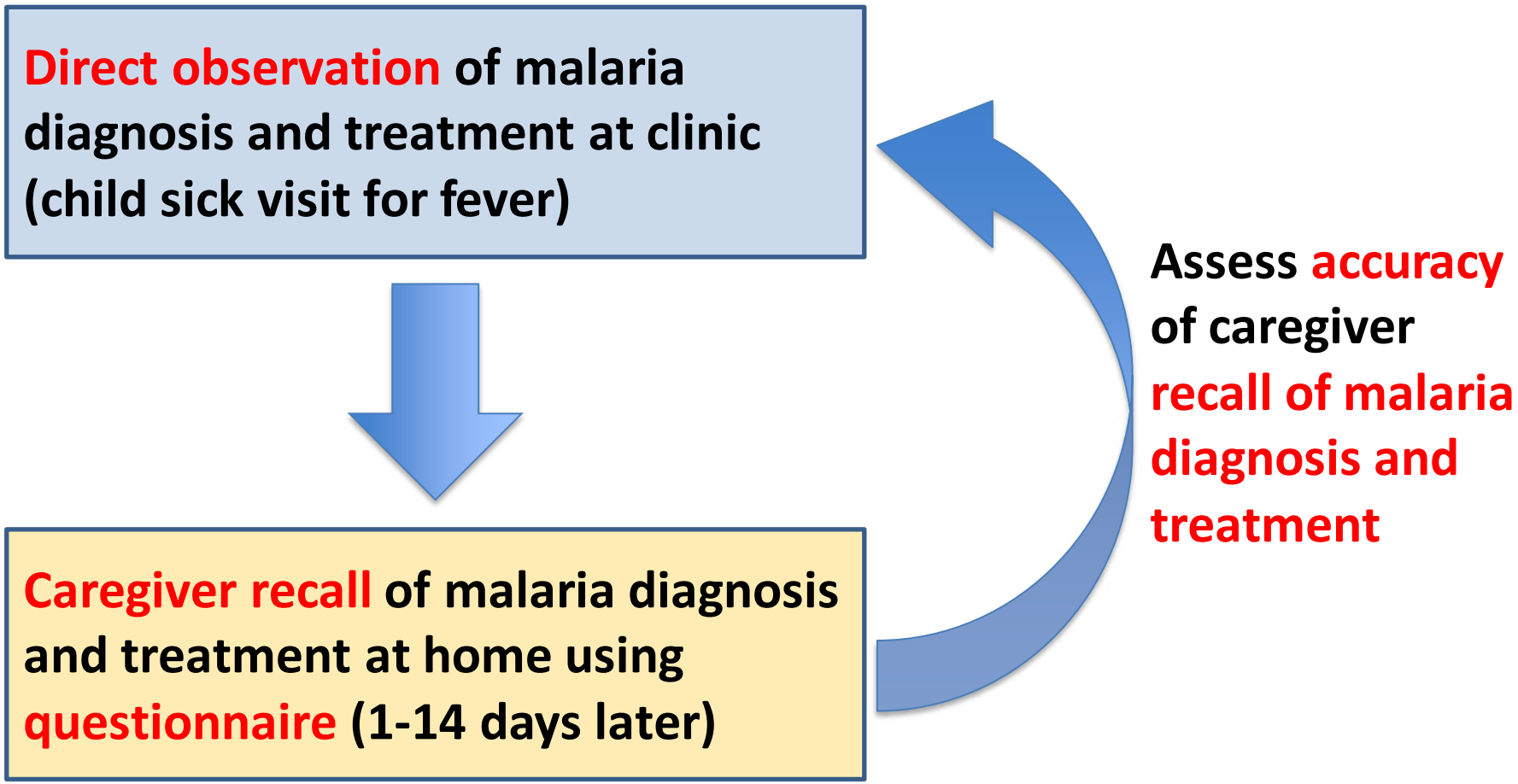
1. Whether child received a finger/heel stick
2. Result of malaria diagnostic test and malaria diagnosis
3. Whether malaria treatment was given, including type of antimalarial

Study site

- 5 public health facilities
  - *1 urban 4 rural*
- Kaoma District, Western province, Zambia
- Covered by new rapid malaria reporting system



Study design



Study methods

- Data on recall of fever, diagnosis and treatment ascertained from modified MIS/DHS/MICS questionnaires
  - Questions added on result of malaria diagnostic test and diagnosis made

313	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES.....1 NO.....2 (GO TO 313 FOR NEXT CHILD OR, IF NO MORE CHILDREN, SKIP TO 345) DON'T KNOW.....8	YES.....1 NO.....2 (GO BACK TO 313 FOR NEXT CHILD OR, IF NO MORE CHILDREN, SKIP TO 345) DON'T KNOW.....8
314	How many days ago did the fever start? IF LESS THAN ONE DAY, RECORD '00'.	DAYS AGO.....|__|__| DON'T KNOW.....98	DAYS AGO.....|__|__| DON'T KNOW.....98
315	Did you seek advice or treatment for the fever from any source?	YES.....1 NO.....2 (SKIP TO 317) =——┘	YES.....1 NO.....2 (SKIP TO 317) =——┘
316	Where did you seek advice or treatment?[2] Anywhere else? RECORD ALL SOURCES MENTIONED.	PUBLIC SECTOR GOVT. HOSPITAL.....A GOVT. HEALTH CENTER.....B GOVT. HEALTH POST.....C MOBILE CLINIC.....D FIELD WORKER.....F OTHER PUBLIC _____ G (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC.....H PHARMACY.....I PRIVATE DOCTOR.....J MOBILE CLINIC.....K FIELD WORKER.....L OTHER PVT. MEDICAL _____ M (SPECIFY) OTHER SOURCE SHOP.....N TRAD. PRACTITIONER.....O OTHER _____ X (SPECIFY)	PUBLIC SECTOR GOVT. HOSPITAL.....A GOVT. HEALTH CENTER.....B GOVT. HEALTH POST.....C MOBILE CLINIC.....D FIELD WORKER.....F OTHER PUBLIC _____ G (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC.....H PHARMACY.....I PRIVATE DOCTOR.....J MOBILE CLINIC.....K FIELD WORKER.....L OTHER PVT. MEDICAL _____ M (SPECIFY) OTHER SOURCE SHOP.....N TRAD. PRACTITIONER.....O OTHER _____ X (SPECIFY)

Study methods

- **Sensitivity of recall**: proportion of caregivers who correctly recalled child received finger/heel stick (RDT), malaria diagnosis and ACT (questionnaire), of those who actually received them (direct observation at clinic)

- **Specificity of recall**: proportion of caregivers who correctly recalled child did not receive finger/heel stick (RDT), malaria diagnosis and ACT (questionnaire), of those who did not receive them (direct observation at clinic)

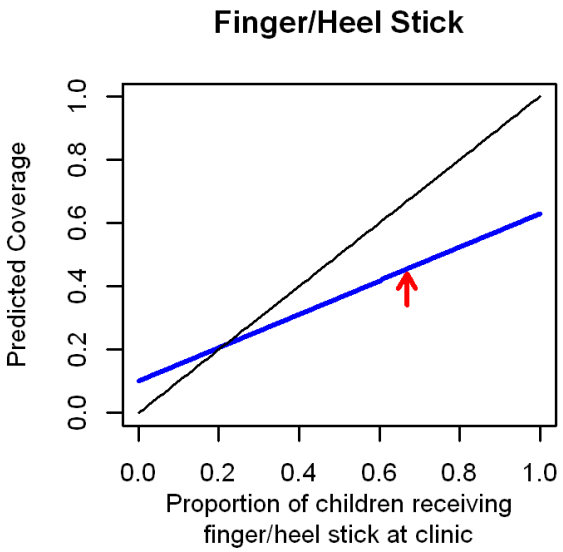
- **Accuracy of recall**: combination of sensitivity and specificity- *proportion of caregivers who got it right*

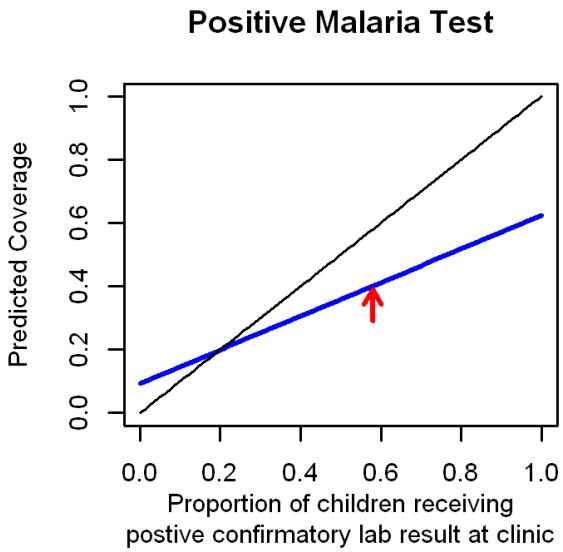
Results: Accuracy of caregiver recall of key questions of diagnosis and treatment of malaria

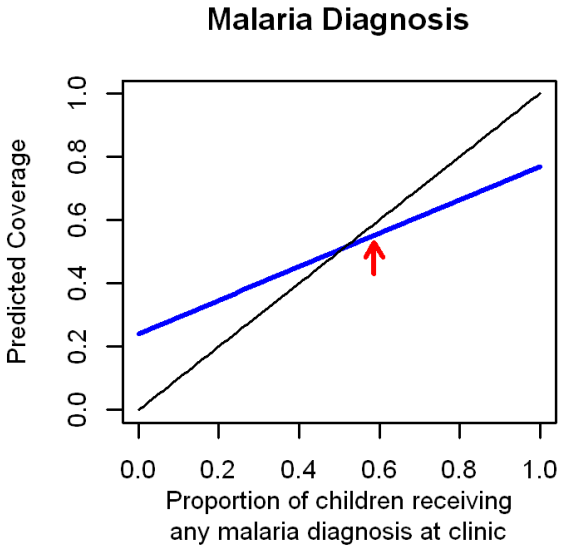
	Sensitivity		Specificity		Accuracy		n
Caregiver recall	(%)	(95% CI)	(%)	(95% CI)	(%)	(95% CI)	
Recall of fever in past 2 weeks	96.0	(94.4 - 97.6)	100.0	-	96.0	(94.4 - 97.6)	601
Recall of finger/heel stick*	62.9	(58.1 - 67.7)	90.0	(85.7 - 94.2)	71.8	(68.1 - 75.4)	577
Recall of positive malaria test result (of those tested at clinic)	62.4	(56.1 - 68.7)	90.7	(86.3 - 95.2)	74.2	(69.9 - 78.6)	388
Recall that malaria diagnosis was made*	76.8	(72.4 - 81.3)	75.9	(70.4 - 81.4)	76.4	(73.0 - 79.9)	577
Recall of any antimalarial given*	82.0	(78.1 - 85.9)	88.8	(84.5 - 93.1)	84.4	(81.4 - 87.4)	577
Recall of ACT given*	81.0	(76.8 - 85.2)	91.5	(87.9 - 95.1)	85.3	(82.4 - 88.2)	577

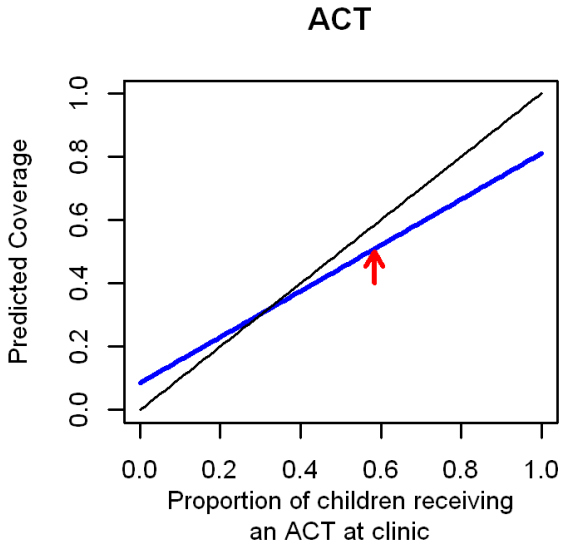
*Of those with fever reported by caregiver

Results: Modeled population coverage from sensitivity and specificity of caregiver recall across actual intervention coverage









- Red arrow shows observed coverage from survey in this study
- Diagonal black line represents perfect sensitivity and specificity
- Estimated coverage from caregiver recall = (true coverage at clinic ***x*** sensitivity) ***+*** [(1 **-** true coverage at clinic) ***x*** [1 **-** specificity)]

Key conclusions and recommendations

- In this setting, sensitivity and specificity of caregiver recall of finger/heel stick, test result, and malaria diagnosis were sub-optimal (63-77%)
  - Specificity better for finger/heel stick and test result (~90%)- but poor for malaria diagnosis (75%)

- Sensitivity and specificity reasonable for caregiver recall of ACT (or any antimalarial) given
  - Lab diagnosis appears to improve recall of malaria diagnosis and ACT treatment

Key conclusions and recommendations

- For tracking progress towards targets for prompt, effective treatment of malaria, household survey data should only be used for measuring coverage of treatment seeking for fevers and access to antimalarial drugs
  - Conforms to Roll Back Malaria Monitoring and Evaluation Reference Group recommendations

- If possible, survey data should be supplemented with data from health systems or exit interview studies to get proportion of suspected malaria cases where national policy on malaria diagnosis and treatment followed

Thanks!

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