Integrated Community Case Management (iCCM) in sub-Saharan Africa

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Talk Outline

- Background on child mortality in Africa
- What is iCCM?
- Benefits of iCCM: lessons from Ghana, Mozambique, Uganda, and Zambia
- Quality of iCCM
- Challenges scaling up iCCM
- Research priorities
- Conclusions

Under-five mortality rate, by Millenium Development Goal region, 1990 and 2012 (deaths per 1,000 live births)

Under five mortality declined in all WHO regions from 1990 to 2012

UN Inter-agency Group for Childhood Mortality Estimates 2013 Report



MAP Children in Sub-Saharan Africa and Southern Asia face a higher risk of dying before their fifth birthday



Note: This map is stylized and not to scale. It does not reflect a position by UN IGME agencies on the legal status of any country or territory or the delimitation of any frontiers.

UN Inter-agency Group for Childhood Mortality Estimates 2013 Report

Share of global under-five deaths by Millennium Development Goal region, 1990–2012 (percent)

Nearly half of deaths of children under 5 occur in sub-Saharan Africa



Global Causes of Childhood Deaths, 2010 Liu L et al. Lancet 2012





Where are children managed and where do they die?



iCCM Rationale

- Delivery of health services is often weakest where needs are greatest
- Low coverage of most needed interventions results in unmet need for treatment of major causes of child mortality:
 - Pneumonia
 - Diarrhea
 - Malaria

Overlapping Manifestations of Illness

 Malaria, pneumonia and diarrhea all manifest as acute febrile illness with overlapping symptoms



What is iCCM?

- Delivery of integrated case management for malaria, pneumonia and diarrhea at the community level
- Basic package consists of:
 - RDTs and ACT
 - Respiratory timers and dispersible amoxicillin
 - Low osmolarity ORS and zinc
- Additional components may include:
 - Health promotion activities
 - Screening and referral for severe malnutrition
 - Screening and referral of newborns with signs of severe illness

Who delivers iCCM?

- Volunteer and paid cadres of communitybased health workers
- Numerous examples:
 - Ethiopia: Health extension workers
 - Malawi: Health surveillance assistants
 - Niger: Agents de Santé Communautaire
 - Zambia: Community health workers (unpaid) and Community Health Assistants (paid)
 - Mozambique Agentes Polivalente Elementare

iCCM Algorithm



Community health workers improve access to treatment in underserved areas



WHO-UNICEF Joint Statement: iCCM, 2012



Zambia Integrated Malaria and Pneumonia Study (ZIMMAPS)

OPEN O ACCESS Freely available online

PLOS MEDICINE

Community Case Management of Fever Due to Malaria and Pneumonia in Children Under Five in Zambia: A Cluster Randomized Controlled Trial

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ZIMMAPS: Objectives

- Will providing CHWs the tools to classify and treat lead to early and appropriate treatment for pneumonia?
- Will RDT use lead to a reduction of ACT overuse?
- How well are CHWs able to classify illness and prescribe treatment?
- What impact does the increased availability of iCCM have on health care seeking behaviors of community members?

ZIMMAPS Study Design

- Cluster randomized controlled trial
 - Follow-up at home 5-7 d after CHW visit

- Control CHWs

1) Provision of AL to febrile children

2) Referral of non-severe pneumonia to nearest health center

- Intervention CHWs

1) Performance of RDTs for all febrile children

2) Treatment of RDT+ children with AL

3) Treatment of non-severe pneumonia with amoxicillin

Eligibility criteria- children 6 mo – 5 y, fever and/or fast/difficulty breathing, non-severe illness

Study Site



- Mazabuka and Siavonga Districts-Southern Province
- Chikankata Mission Hospital area
- Population : 70,000
- Clusters: 31 CHPs and their catchment areas

Examples of Health Centers and Community Health Posts







Early and Appropriate Treatment for Pneumonia

	Intervention	Control	RR (95% CI)
Initiation of treatment (Visit CHW within 24- 48 hrs of onset of symptoms)	78.8%	75.4%	1.06 (0.91 – 1.23)
Appropriate treatment (13-15 doses of amoxicillin starting day of visit to CHW)	87.3%	18.7%	4.66 (3.49 – 6.23)
Early and appropriate treatment	68.2%	13.3%	5.32 (2.19 – 8.94)

Febrile Children Receiving AL

	Received AL N (%)	Did not receive AL N (%)	Total N (%)
Intervention	265 (27.5)	698 (72.5)	963 (100)
Control	2066(99.1)	18 (0.9)	2084 (100)
Total	2331 (76.5)	716(23.5)	3047 (100)

RR = 0.23 (95% CI 0.14 - 0.38)

Treatment for RDT Negative Fever

- Negative RDT = 704 children
 - Received treatment from CHW = 3 (0.4%)
 - Received treatment from other source = 5 (0.7%)
 - -Other source was health facility

Received Appropriate Treatment Malaria Consortium Data

Percentage of children that received appropriate treatmentUgandaZambiaMozambique



Baseline

Endline

Timing of Treatment

Treatment within 24 hours of onset of fever or ARI





Mozambique





Source of First Care: Fever

	Model A (RDTs, AL, amox)			Model B (AL; pneumonia referral)		
	Baseline	Post	aRR ^a	Baseline	Post	aRR ^a
	(n = 149)	(n=179)	95% CI	(n = 154)	(n=190)	95% CI
Managed at home	10.1%	2.2%	0.48 (0.14-1.60)	5.2%	3.7%	0.37 (0.1-1.3)
CHW	48.3%	81.0%	1.42 (1.14-1.78)	51.3%	77.9%	1.55 (1.18-2.02)
Health center/hospital	39.6%	16.8%	0.45 (0.25-0.81)	41.6%	17.4%	0.48 (0.28-0.81)
Traditional/ spiritual healer	2.0%	0		5.9%	1.1%	

^aAdjusted for time and cluster sampling

Source of First Care: Fast or Difficult Breathing

	Model A (RDTs, AL, amox)			Model B (AL; pneumonia referral)		
	Baseline (n = 61)	Post (n=35)	aRR ^a 95% CI	Baseline (n = 59)	Post (n=25)	aRR ^a 95% CI
Managed at home	6.6%	2.9%	0.49 (0.05-4.82)	5.1%	12.0	1.79 (0.31-10.18)
CHW	50.8%	74.3%	1.39 (0.98-1.98)	54.2%	52.0	1.1 (0.68-1.77)
Health center/hospital	42.6%	22.9%	0.56 (0.23-1.32)	39.0%	36.0%	0.78 (0.42-1.47)
Traditional/ spiritual healer	0	0		1.7%	0	

Adjusted for time and cluster sampling

LiST: Modelling Impact of ICCM

Results

1. Uganda

indicator		Implementation period			projections			
		2009	2010	2011	2012	2013	2014	2015
U5 Mor	tality rate	100	96	90	86	79	75	72
Lives saved (1-59 months)		0	151	297	439	574	614	629
	% deaths averted				4%			7%

2. Zambia

indicator		Implementation period			projections			
		2009	2010	2011	2012	2013	2014	2015
U5 Mor	ality rate	102	96	88	81	75	73	72
Lives saved (1-59 months)		0	103	207	317	430	479	409
	% deaths averted				7%			12%

Impact of Community Management of Fever (Using Antimalarials With or Without Antibiotics) on Childhood Mortality: A Cluster-Randomized Controlled Trial in Ghana

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Jan–Dec 2006	Jan-Dec 2007		-Dec 2007 Jan-Dec 2008		
Control	Control	Artesunate am	odiaquine (AAQ only)		
Control	Control	Artesunate An	nodiaquine and amoxici	llin (AAQ+AMX)	
Control	Control	Control	(AAQ only)		
			AAQ+AMX		

FIGURE 1. Overall timeline of the trial with a stepped wedge introduction of the interventions.

Results and Conclusions

Significant mortality reduction:

- AAQ vs. standard care 33%
- AAQ+AMX vs. standard care 44%

Non significant mortality reduction:

AAQ vs. AAQ+AMX clusters - 21%

Conclusion

- Treating fever in children 2-59 months with antimalarials with or without an antibiotic significantly reduces mortality compared with standard care
- Adding an antibiotic may be beneficial

Quality of iCCM

Evidence from Ethiopia and Zambia

iCCM in Ethiopia

- Health extension program introduced in 2004
- CCM excluded pneumonia
- Policy change in 2010 allowing pneumonia CCM
- ICCM rolled out in 2011 in 6 most populous regions
 - CCM of pneumonia, diarrhea, malaria, malnutrition, anemia, ear infection
 - ICCM training
 - Supportive supervision
 - Supply of commodities
 - Enhanced M&E

iCCM Evaluation

- Jimma & West Hararghe zones, Oromia region
- Randomized intervention and comparison woredas
 - Intervention: iCCM
 - Comparison: routine CCM
- Data collection:
 - ⇒ Baseline survey completed Feb 2011
 - ⇒ Health post survey completed June 2012
 - ⇒ Qualitative study completed Jan 2013
 - ➡ Endline survey completed June 2013



Training & Supervision

Selected indicators of training and supervision in intervention and comparison areas in Jimma and West Hararghe zones

Indicator	Inter	Intervention areas Comparison areas		Comparison areas	
	Na	% (95% CI)	N	% (95% Cl)	
HEW trained in iCCM	137	97.8 (93.3-99.3)	64°	0.0	<0.001
Health post received supervision on iCCM in the previous three months	100 ^d	87.0 (78.8-92.9)	42°	42.9 (27.7-59.0)	<0.001
Health post received supervision on iCCM that included register review or observation of consultations in the previous three months	100 ^d	85.0 (76.5-91.4)	42°	19.1 (8.6-34.1)	<0.001
HEW received instruction in iCCM clinical practice at a health center in the previous three months	137	57.7 (48.8-66.0)	64	7.8 (3.1-18.3)	<0.001

* Number of HEWs or health posts eligible for indicator.

^b Two sample binomial test of difference in proportions between intervention and comparison areas.

^e HEWs in comparison areas were not expected to be trained in ICCM, so this result confirms that there was little to no spillover of ICCM training to HEWs outside of the intervention areas.

^d Three health posts excluded because HEWs reported not being present for the majority of the previous three months.

* Four health posts excluded because HEWs reported not being present for the majority of the previous three months.

Assessment of Sick Children

Indicators of quality of assessment of sick children by HEWs in health posts in intervention areas in Jimma and West Hararghe zones, Oromia region, Ethiopia, 2012



Assessment task

Quality of Care

Comparison of quality of care indicators for HEWs and higher-level health workers in Ethiopia



workers: 7 out of 10 key assessment tasks measured

Quality of Care Indicator

Correct Classification: Intervention CHWs in ZIMMAPS

Classify as malaria if RDT (+) and not malaria if RDT (-)

Classify as pneumonia if RR \ge 50 in 6 -11 mo and RR \ge 40 in 12 mo – 5 y and not as pneumonia if RR < 50 in 6 -11 mo and RR < 40 in 12 mo – 5 y

RDT test results of clinical feature	Expected (correct) classification	Appropriate classification N (%)
RDT positive and	Both malaria and pneumonia	100/103 (97.1%)
RDT positive and absence	Malaria	162/162 (100%)
of fast breathing		
RDT negative and	Pneumonia	223/239 (93.3%)
RDT negative and	RDT-negative fever	460/460 (100%)
absence of fast breathing		

Correct Treatment

Prescribe AL if classified as malaria; AL not prescribed if classified as not malaria

Prescribe amoxicillin if classified as pneumonia; and amoxicillin not given if not pneumonia

Classification	Correct Treatment	Appropriate treatment (%)
All malaria	AL	267/272 (98.2%)
Malaria only	AL	170/170 (100%)
All pneumonia	Amoxicillin	358/362 (98.9%)
Pneumonia only	Amoxicillin	257/260 (98.8%)
Malaria and pneumonia	AL and amoxicillin	96/102 (94.1%)
RDT-negative fever	Analgesics or no treatment	464/485 (95.7%)

Hamer DH et al. Pathogens & Global Health 2012;106;32-39.

iCCM status in East and Southern Africa



Zambia iCCM Bottleneck Analysis Malaria

Illness and Programme Parameter	Indicator	Baseline	Target	Gap
Malaria	Malaria treatment			
Commodities	Proportion of CHWs with zero absolute stockouts of ACT lasting more than 1 week at any time during the past three months	100%	100%	0%
Human resources	Proportion of CHWs trained in malaria case management	55%	100%	45%
Geographic access	Proportion of villages with access to CHWs trained in malaria case management	55%	100%	45%
Utilisation	Among children under age five with fever, proportion for whom fever was tested for confirmation of malaria diagnosis	17%	50%	33%
Continuity	Among children ages 0-59 months with confirmation of malaria diagnosis, proportion who received treatment with any anti-malarials	34%	80%	46%
Effective coverage	Among children ages 0-59 months with confirmation of malaria diagnosis, proportion who received treatment with ACT	26%	100%	74%

Zambia iCCM Bottleneck Analysis *Pneumonia*

Illness and Programme Parameter	Indicator	Baseline	Target	Gap
Pneumonia	Antibiotics for pneumonia			
Commodities	Proportion of CHWs with zero absolute stockouts of antibiotics lasting more than one week during the past three months	1%	90%	89%
Human resources	Proportion of CHWs trained in pneumonia case management	55%	100%	45%
Geographic access	Proportion of villages with access to CHWs trained in pneumonia case management	55%	100%	45%
Utilisation	Among children ages 0-59 months with symptoms of ARI, proportion for whom treatment was sought from a trained provider in a health facility	68%	80%	12%
Continuity	Among children ages 0-59 months with symptoms of ARI, proportion for whom treatment was sought from a trained provider in a health facility and who received antibiotics	47%	80%	33%
Effective coverage	Among children ages 0-59 months with symptoms of ARI, proportion for whom treatment was sought from a trained provider in a health facility and who received antibiotics and took them for the required period	80%	100%	20%



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THE AMERICAN JOURNAL OF **TROPICAL MEDICINE AND HYGIENE**

official Journal of the American Society of Tropical Medicine and Hygiene

NUMBER 5

SUPPLEMENT

NOVEMBER 2012

Special Supplement on integrated **Community Case Management**

Guest Editors: David R. Marsh, Save the Children, Westport, CT, USA; Davidson H. Hamer, Center for Global Health and Development, Boston University, USA; Franco Pagnoni, WHO/TDR and Global Malaria Program, Geneva, Switzerland; Stefan Peterson, Karolinska Institutet and Uppsala University, Sweden, and Makerere University, Uganda

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Implementation Research Agenda Major Categories

- Front line health workers
 - Supervision, addition of more tasks, incentives, etc.
- iCCM implementation
 - Cost, cost-effectiveness, private sector, etc.
- Illness management
 - Algorithms, treatment options, etc.
- Community
 - Acceptance, care seeking behaviors, adherence
- Impact
 - Hamer DH et al. AJTMH 2012; 87 (Suppl. 5): 151-3.

Acknowledgments

- Kojo Yeboah-Antwi, Portipher Pilingana, Bill MacLeod and the ZIMMAPS team
- Mark Young and Nathan Miller Ethiopia data
- Helen Counihan and Karin Kallander Malaria Consortium
- David Marsh Save the Children
- Stefan Peterson Karolinska Institut
- Franco Pagnoni WHO GMP
- Funding from USAID and PMI

UNICEF Documents relating to iCCM More info at: www.ccmcentral.com





Severe acute malnutrition - 2007



COMMUNITY BASED MANAGEMENT OF SEVERE ACUTE MALNUTRITION

Home visits for newborn care - 2009



(A) Nert Manh unicef 😳

iCCM - 2012

WHO/UNICEF JOINT STATEMENT

Integrated Community Case Management (iCCM)



An equity-focused strategy to improve access to essential treatment services for children



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Any Questions?

