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ORIGINAL ARTICLE

NATIONAL SCALE-UP OF INTEGRATED COMMUNITY CASE MANAGEMENT IN RURAL ETHIOPIA: IMPLEMENTATION AND EARLY LESSONS LEARNED

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ABSTRACT

Background. *Although under-five mortality in Ethiopia has decreased 67% in the past two decades, many children still die from preventable or treatable conditions, mainly pneumonia, newborn problems, diarrhea, malaria and malnutrition. Most of these deaths can be avoided with timely and appropriate care, but access to and use of treatment remains inadequate. Community health workers, appropriately trained, supervised, and supplied with essential equipment and medicines, can deliver case management or referral to most sick children. In 2010, Ethiopia added pneumonia to diarrhea, malaria and severe acute malnutrition, targeted for treatment in the integrated community case management (iCCM) strategy.*

Purpose. *This article describes the national scale-up of iCCM implementation and early lessons learned.*

Methods. *We reviewed data related to iCCM program inputs and processes from reports, minutes, and related documents from January 2010 through July 2013. We describe introduction and scale-up through eight health system components.*

Results. *The government and partners trained and supplied 27,116 of the total 32,000 Health Extension Workers and mentored 80% of them to deliver iCCM services to over one million children. The government led a strong iCCM partnership that attracted development partners in implementation, monitoring, evaluation, and research. Service utilization and weak supply chain remain major challenges.*

Conclusion: *Strong MOH leadership, policy support, and national partnerships helped successful national iCCM scale-up and should help settle remaining challenges.*

Key Words: *Ethiopia, child health, community health worker, community case management, health system, implementation*

INTRODUCTION

Ethiopia has the second highest population in Africa, an estimated 86 million, of which 13 million are children under five years of age (1). About 86% of the population lives in rural areas. Ethiopia has reduced under five mortality by 67% from 1990 to 2012 (204 to 68/1,000 live births) (2). However, common childhood illnesses still account for 33% of under-5 mortality (pneumonia 18%, diarrhea diseases 13%, and malaria 2%); newborn conditions account for another third; and half of under-5 mortality is associated with malnutrition (3).

The coverage and utilization of evidence-based, high impact interventions and services for children remain low due to factors of supply (e.g., inaccessibility, unavailability) and demand (e.g., illness recognition, cultural beliefs, opportunity, and actual cost) (4). For example, the 2011 Demographic and Health Survey DHS showed that caregivers sought care for less than a third (27%) of under-five children with symptoms of acute respiratory tract infection (ARI). Only a third (32%) of children with diarrhea was taken to a health facility or provider for care, and only 40% received oral rehydration therapy solution (ORS) (5,6).

Integrated community case management (iCCM) is a strategy to improve coverage by delivering curative interventions to sick children in communities that lack access to health centers (HC). Ethiopia has invested heavily in this strategy. The purpose of this paper is to present the implementation process and

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early lessons learnt from the national scale-up of an iCCM program in Ethiopia, which to our knowledge is the largest iCCM program in Africa both in terms of the number of service providers trained and the population covered.

The Health System in Ethiopia/Health Extension Program: The public health system provides most health care in Ethiopia. Access to private sector providers is mainly limited to peri-urban and urban settings. This health system is decentralized with regional and *woreda* (district) autonomy.

The government of Ethiopia launched a community-based health care delivery system, the Health Extension Program (HEP), during the second Health Sector Development Program (HSDP II) in 2003. The HEP relies on salaried civil servants, mostly female, to bring health services to the community. The HEP aims to create a healthy society by reducing maternal and child morbidity and mortality through the delivery of preventive and promotive services and selected high impact curative interventions at the community level (7).

Primary hospitals, HCs, and their health posts (HP) make up the primary health care unit (PHCU). Each HP is staffed by two female Health Extension Workers (HEW) from nearby villages, having completed at least the 10^{th} grade. The Federal Ministry of Health (MOH) has trained and deployed about 32,000 HEWs in almost 16,000 HPs in rural areas serving a total population of 70,000,000 (8).They receive a 12-month theoretical and practical training on 16 health service packages (Box 1) of health promotion and disease prevention in the areas of family health, environmental sanitation and hygiene, disease prevention and control, and health education and communication. The "Maternal and Child Health" package (#3a) includes antenatal (ANC), delivery, and postnatal care (PNC) for mothers and newborns; optimal infant and young infant feeding; and selected, non-algorithm-based curative interventions for children (e.g. two ORS sachets for any diarrhea syndrome, paracetamol or first-line antimalarial for fever). Rapid diagnostic tests (RDT) and Artemesin in-based combination therapy (ACT) were added in 2006 to the management of malaria and distributed to *kebeles* with either high or low malaria risk (9). RDTs and ACT are not distributed to HP in *kebeles* with zero malaria risk, where HEWs consider malaria only if there is history of travel to malarious area. In such cases, they refer the sick child for management to the HC where blood tests and antimalarials are available.

Ready-to-Use Therapeutic Feeding (RUTF) for selected high-risk *woredas* was added in 2008 (10). HEWs provide services at HPs, community outreach, and through home visits. They refer serious cases to HCs. HEWs promote key behaviors and practices using a standardized national communication tool, the Family Health Guide (FHG), which has 64 maternal, newborn, and child health action messages in picture and text, informed by formative research. The national Health Development Army (HDA) is a network of one female for every five in the neighborhood to enhance community engagement and adoption of healthy lifestyles, emphasizing use of maternal and newborn health services. HEWs use registers to record performance (e.g., immunization, family planning, ANC, and PNC). They regularly update a Family Folder for each household to record vital statistics and use of maternal and child health services. HEWs aggregate information from registers to provide a monthly activity report to the HC. The HC staff and the HEWs review performance every month.

The HEP has attracted health development partners' support for HEW training, supplies, and equipment. The government covers the HEW salary and cost of industrial materials for HP construction, and communities cover the cost of local construction materials and provide labor to construct HPs and HEW residences. The HEP is the platform on which iCCM was placed.

Box 1: The 16 essential health packages

1. Hygiene and environmental sanitation:
    a) Proper and safe excreta disposal and proper and safe solid and liquid waste management
    b) Water supply safety measures
    c) Food hygiene and safety measures
    d) Healthy home environment
    e) Arthropod and rodent control
    f) Personal hygiene
2. Disease prevention and control:
    a) HIV/AIDS prevention and control
    b) TB prevention and control
    c) Malaria prevention and control
    d) First aid
3. Family health services:
    a) Maternal and child health
    b) Family planning
    c) Immunization
    d) Adolescent reproductive health
    e) Nutrition
4. Health Education and Communication

Table 1: Key milestones and timeline

Butajira research (1987-1994)	**Liben pilot**: *Save the Children's child survival project in a pre-HEW setting in Liben District, Oromia* (1997-2006)		**Bolosore pilot**: *USAID/JSI ESHE child survival and system strengthening project, SNNPR*(2006-2008)	**Policy change** (2010)	**Scale up** (2010-2013)
Built health posts Trained community health agents to deliver cotrimox-azole for fast breathing, paracetamol for fever, and refer for immunization and severe illness Developed referral system from community to health centers	1997-2001: IMCI training for frontline health workers at facilities (junior nurses and health assistants) Health system strengthened through supervision, capacity building, and drug supply Community volunteers promoted illness recognition and care-seeking to facilities	2001-2006: Added CCM of fever, fast breathing and diarrhoea	HEWs trained and mentored on integrated case management of malaria, diarrhoea and pneumonia (with cotrimoxazole); and essential newborn care and classification and referral for newborn infection, dysentery, severe malnutrition, and HIV Strengthened immunization, infant and young child feeding promotion and other HEP packages	National implementation plan developed Implementing partners identified and PCA signed Training material developed, translated and printed Training kits packaged and distributed Monitoring plan and tools developed	National and regional launches National master trainers trained Regional training of trainers HEW and supervisor training Service provision Monitoring

Table 2: iCCM cases by syndrome and year

Syndromes Treated	**2011**	**2012**	**2013**	**Total**
Malaria	22,356	104,709	163,885	290,950
Suspected pneumonia	28,876	135,249	159,714	323,839
Diarrhea	33,534	157,064	371,446	562,044
Severe acute malnutrition	NA	41,174	47,153	88,327
Total	84,766	438,196	742,198	1,265,160
Number of health posts providing iCCM	4,510	8,990	13,500	

Table 3: Contents of iCCM supply starter or "replenishment" kits (non-malarious area kit excludes antimalarial drugs and RDTs)

Item	Quantity
Zinc 20 mg tablet (pack of 100)	50
ORS sachet (box of 1000)	1
20mg Trimethoprim + 120mg Sulphamethoxazole (pack of 100 tabs)	30
Artesunate rectal sup. 50mg (box of 6)	2
Artesunate rectal sup. 200mg (box of 6)	2
Artemether 20 mg + 120 mg Lumefantrine tablet,	
1X6 of 30 strip box	1
2X6 of 30 strip box	1
3X6 of 30 strip box	1
4X6 of 30 strip box	1
Chloroquine syrup	20
multi-species RDT	300 tests
Paracetamol 100mg tablet (box of 1000)	1
Albendazole 400mg (pack of 100 tabs)	2
1% Tetracycline eye ointment (box of 50)	1

Table 4: Supervision, Performance Review, and Mentoring Approaches

Parameter	Health Sector Command Post Weekly Form	Checklist for Integrated Supportive Supervision to Health Post	Form C: ICCM Supportive Supervision/ Follow-up Checklist	Performance Review and Clinical Mentoring Meeting Guide
Description	Amharic; 8 p	English, 8 p, including instructions	English, 11 p (3 p for 2 Sick Child Rec. Forms)	37 p including form C and case abstraction forms
Where	Health post	Health post	Health post	2-day review at *woreda* with all (~10) HEWs of a PHCU
When	Weekly	Quarterly	Quarterly	As resources permit, annually
Who	Health center staff	*Woreda* staff and health center and sometimes partners	Partners and sometimes health center and *woreda* staff	Partners and *woreda* and health center staff
Official	Yes	Yes	No	No
Purpose	Track HEW and community activities according to plan	Child and maternal health; malaria, TB, HIV/AIDS; sanitation; model HH; management; supervision; HMIS; supplies; HP condition	Categorize HP function as high, medium, low (by register completeness/ consistency) and plan support every 1, 2, or 4 weeks.	Enhance quality of care and service uptake by peer learning through register review and experience sharing; identification of barriers and solutions and mentoring through direct observation
iCCM variables	Malaria cases; RDT availability	8/98 total variables: CCM training, CCM provision, ORT corner, diarrhea treatment, weigh/plot, feeding counselling (#14-20); ORS (#91)	Register review of 2 cases of each classification for completeness, consistency, referral, follow up, outcome; vitamin A, immunization, and deworm; classification vs. HMIS; supplies; drugs; ORT corner; knowledge; ENC; summary	Case management practice and recording, barriers and solutions
Use	Local	Local	Local	Local
Forwarding	Woreda collects from health center	4 copies: health post and health center, woreda, zone, and partner	To partner	To partner
Aggregation	*Woreda* compilation	*Woreda* computerizes	Partners enter into national Form C database	Partners enter into national Form C database

Table 5: Key indicators of iCCM implementation strength, quality of care, utilization of iCCM services, and service provision in intervention and comparison health posts in Jimma and West Hararghe zones, Oromia region, Ethiopia, 2012.

Parameter	Intervention Areas		Comparison Areas	
	n/N	% (95% CI)	n/N	% (95% CI)
HEW trained in iCCM	134/137[a]	98 (93-99)	0/64	0
Health post received supervision on iCCM in the previous three months	87/100[b]	87 (79-93)	18/42c	- 43 (28-59)
Health post received supervision on iCCM that included register review or observation of consultations in the previous three months	85/100	85 (77-91)	8/42	19 (9-34)
All essential iCCM commodities in stock on the day of data collection[d]	71/103	69 (59-78)	2/46	4 (1-15)
All essential supplies and job aids for iCCM in stock on the day of data collection [e]	40/103	46 (36-56)	0/46	0
Child checked for presence of cough, diarrhea, fever, and malnutrition	207/257	81 (74-86)	-	-
Child correctly classified for all iCCM illnesses [f]	136/257	53 (46-60)	-	-
Child correctly managed for all iCCM illnesses [g]	165/257	64 (57-71)	-	-
Child with severe illness correctly managed	13/38	34 (22-50)	-	-
Caretaker can correctly describe how to give all treatments	131/158	83 (75-89)	-	-
	Mean (95% CI)	**Range**	**Mean (95% CI)**	**Range**
Number of sick child consultations in the previous month	16.0 (13.2-18.8)	0-95	5.0 (2.3-7.7)	0-32
Number of hours health post was open in previous week	23.3 (21.0-25.5)	0-40	20.2 (17.0-23.5)	0-40

[a] The three HEWs that were not trained in iCCM were not providing clinical services.
[b] Three health posts excluded because HEWs reported not being present for majority of previous three months.
[c] Four health posts excluded because HEWs reported not being present for majority of previous three months.
[d]Cotrimoxazole, ORS, zinc, ACT, chloroquine, RUTF, RDT.
[e] Functional timer, thermometer, weighing scale, clean water, MUAC, supplies to mix ORS, iCCM chart booklet, iCCM patient register [f] Danger signs, respiratory illness, diarrhea, malaria, measles, malnutrition.
[g] Includes danger signs, respiratory illness, diarrhea, febrile illness, measles, malnutrition

Integrated Community-Based Case Management

Timeline and Milestones: The evolution of iCCM in Ethiopia covers phases of partial introduction, policy debate, systematic demonstration, and rapid scale-up throughout regions across the country (Table 1) (11-13). Planners initially targeted the four agrarian regions (Amhara, Oromia, SNNP, and Tigray) comprising about 75% of Ethiopia's population because the population density was greater, the implementation of the HEP was uniform, and achievement of the 16 packages was good (14). In 2013, Ethiopia expanded iCCM implementation from four to seven regions (step-wise to Benishangul-Gumuz, Gambella, and Afar) with a total of 13,500 HPs in 600 *woredas*, reaching an estimated 10,230,450 under-5s. Since the program started, over one million children under five have received iCCM services (Table 2) (15). The following sections describe the iCCM program according to eight health system components. We restricted the term "quality" to refer to the technical quality of care or of supervision.

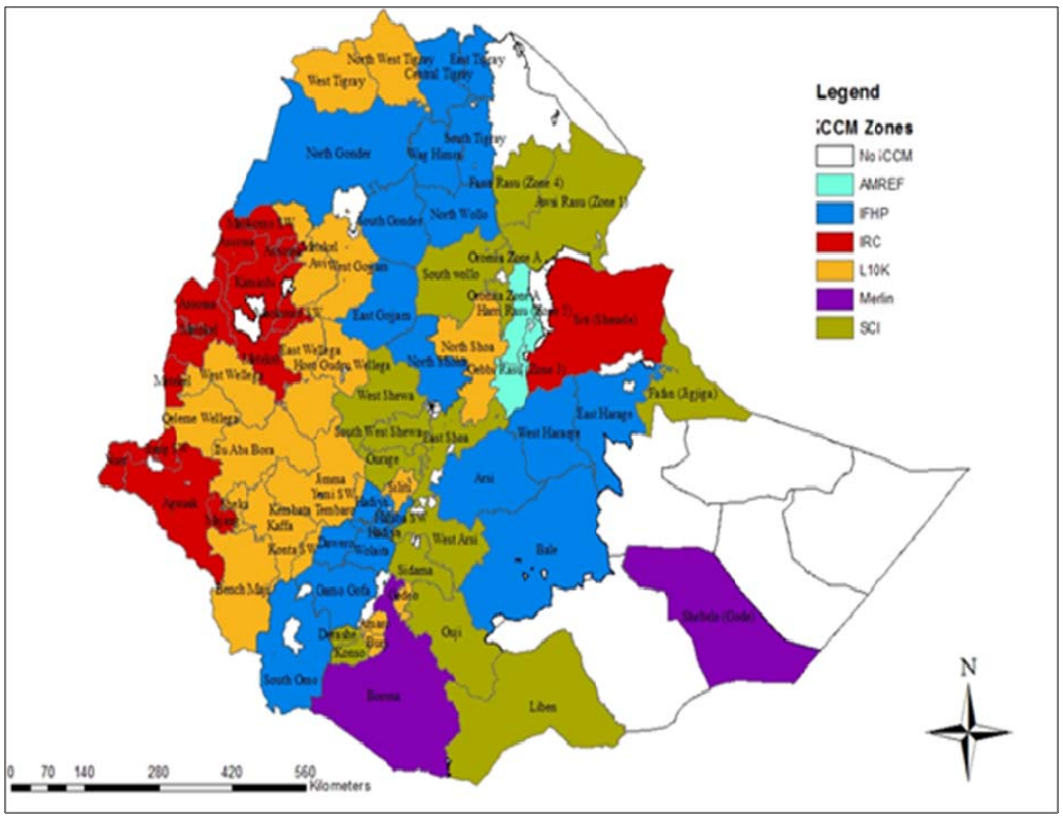

Figure 1: Partners working on iCCM implementation by zone and region as of 31 June, 2013

Inputs	Processes	Outputs	Outcomes and Effects		Impact
Funding Policies Plans focussed on major causes of death Procurement of commodities Partner coordination	Dissemination of guidelines Training, supervision, capacity building Supply and distribution of commodities IEC activities Community mobilization Program monitoring	Provision anduse of services Continuous availability of commodities District Plan and resources tied to major causes of death	Quality of service and supervision	Increased coverage for high impact interventions Behaviour change	Improved child (and maternal) survival Improved nutrition and reduction in stunting Cost- effectiveness
Equity and Costs					
Change in the program as a result of the independent evaluation					

Figure 2: Common results framework for the scale-up to MDG 4 &5 (based on the Operational Framework. Geneva: WHO; 2010)

1. Coordination and Policy: n January 2010, Ethiopia introduced treatment of pneumonia to the mandate of the HEW. Previously, Ethiopia endorsed all relevant global policy recommendations for iCCM including treatment of diarrhea with low osmolarity ORS and zinc, RDT assessment of fever and ACT treatment for malaria, and home visits for postnatal care to identify newborns with danger signs. With the addition of a pneumonia case management policy, the full iCCM package was at last in place.

The Health Promotion Disease Prevention Directorate was responsible for HEP and iCCM until August 2013, when responsibility shifted to the HEP and Primary Care Directorate. For iCCM, the MOH engaged in a partnership that brought together UNICEF, the Catalytic Initiative of the Canadian International Development Assistance (CI/CIDA), the United States Agency for International Development (USAID), the World Health Organization (WHO), the Bill & Melinda Gates Foundation (BMGF), and non-governmental implementing partners to support delivery of iCCM (Figure 1). Implementing partners worked hand-in-hand with the MOH and initially included Save the Children, John Snow Inc./Last Ten Kilometers Project, and USAID's Integrated Family Health Program (IFHP). The International Rescue Committee and MERLIN joined as scale-up progressed in 2011 and 2012. Each partner had a specific geographic area where it supported the MOH. Written agreements assured accountability for performance and results.

The MOH and the partners established Technical Working Groups (TWG) at national and regional levels to support and guide implementation. The TWG is a technical and stakeholder forum and a subgroup of the Child Survival Working Group. The MOH initially convened monthly, then quarterly, meetings including senior personnel from all participating agencies. TWGs prepared implementation plans, training materials, job aids, and monitoring and evaluation frameworks and tools. Between late 2008 and 2010, the MOH led and worked with partners to harmonize and standardize HEW in-service training that resulted in a single set of integrated refresher training (IRT) materials for each component of the HEP package, including iCCM. They were organized into six thematic areas, one of which was iCCM.

Community coordination and support for HEP and iCCM were also extensive through the Command Post structure and through local government. The Command Post strategy extends through region to *woreda* to *kebele* and coordinates all political and socio-economic multi-sectoral development through the Health Development Army (see below). In addition, one of the usually two HEWs represents health on the *kebele* council.

2. Human Resources. The TWG adapted and simplified the WHO/UNICEF Integrated Management of Newborn and Childhood Illness (IMNCI) curriculum and replaced reading modules with exercise booklets. Training materials include oral rehydration treatment (ORT) supplies, wrist watch, thermometer, infant weighing scale, training manikins, videos, charts, exercise and photo booklets for managing sick young infants (<2 months) and sick children (2-59 months), checklists and facilitator guides for performance review and clinical mentoring (PRCMM), and treatment registers in three local languages (Table1). Each row in the register (one row per case) is designed to recapitulate all the evidence-based case management steps in the IMNCI-iCCM Chart Booklet.

The training has defined learning objectives and tasks aligned with HEW roles and responsibilities, specifically: providing essential newborn and postnatal care for mothers and newborns; counselling caretakers; treating pneumonia, diarrhoea, malaria, and uncomplicated severe acute malnutrition; and referring severe illnesses and sick newborns promptly. The training cascade included national and regional training of trainers, who in turn trained the HEWs in a six-day, competency-based training of which 60% percent was practical. The trainers received a seven-day training that included the same six-day case management training and one day of supervision training in "Form C," the partner-supported supervision checklist for iCCM (see below). From 2010 to April 2013, the MOH and partners trained 900 facilitators, 7,000 supervisors (including facilitators, IMNCI supervisors and iCCM supervisors), and 27,116 HEWs. All HEWs received a certificate, and the training report specified those needing more support through post-training follow-up. In theory, since each HP had two HEWs, the stronger would coach the weaker.

A handbook describes task-sharing and working arrangements between HEWs and the HDA. HEWs train HDA members who, in turn, give health promotion messages, refer sick children to the HP, notify HEWs of births, and conduct postnatal visits mainly in partner-supported areas. The roles and responsibilities of HEWs and the HDA are generally clear to communities. HEWs use a national HDA implemen-

tation guide to provide community orientation and training. The HDA is explicitly a voluntary, non-paid, non-incentivized cadre (16).

3. Service Delivery and Referral. The HEW's iCCM service responsibilities include: (1) sensitizing the community and creating demand for iCCM; (2) providing essential newborn care; (3) assessing, classifying, treating, counselling, and following up children with pneumonia, diarrhea, malaria, and uncomplicated severe acute malnutrition; (4) checking and updating child immunization status; (5) checking, counselling, and referring for HIV testing; (6) referring sick young infants and children with general danger signs or severe illness; (7) maintaining registers; (8) reporting; (9) monitoring supply and requesting timely re-supply of drugs, job aids, and equipment; and (10) ensuring that iCCM issues are discussed in community conversations in the *kebele*.

Referral is facilitated by pre-referral treatment, referral slip, and occasional problem solving for transport or financial assistance. HEWs are trained on back-referral, but it is generally lacking. Work patterns were recently reviewed and revised. Initially HEWs were trained to spend 75% of their time in the community and 25% at the HP. As of Oct 2012, the policy states that one HEW should remain at the HP Monday-Friday, 35 hours/week to improve utilization of maternal and child health (iCCM) services delivered at the HP. In practice, both HEWs may sometimes be absent due to meetings, trainings given or received, campaigns, personal reasons, or inadvertently adhering to the former policy, among other reasons. According to an iCCM implementation strength and quality of care assessment by JHU-IIP in West Hararghe and Jima Zones in Oromia Region, HEWs self-reported that the HPs were open on average 20 hours per week (17).

Adherence to guidelines is facilitated by the evidence-based IMNCI Chart Booklet, by the registers that match the steps in the booklet, and by the many hand-made flipchart sheets taped to the HP walls that specify respiratory rate cut-offs, steps of case management, general danger signs, and more.

4. Supply Chain. The TWG developed a standardized list of iCCM supplies to guide procurement. All iCCM medicines are in the national Essential Medicines list. Distribution had three strategies: short-, intermediate-, and long-term. The short-term strategy distributed "training kits" to HEWs at the end of the training to allow immediate service delivery. UNICEF assembled and distributed 28,000 training kits, each with enough cotrimoxazole for 80 treatments (HEWs already had supplies of other medicines). The intermediate-term strategy developed "replenishment kits" for both malarious and non-malarious *kebeles* with 12 months of essential drugs and supplies (Table 3). The TWG with the Pharmaceutical Fund and Supply Agency (PFSA) quantified replenishment kits, assuming 50% care-seeking at HPs for the following estimated episodes/child/year: 0.27 (pneumonia), 0.10 (malaria in malarious *kebeles*), and 3.0 (diarrhea). HPs could obtain additional drugs if use exceeded forecast. The long-term strategy, not yet implemented, will involve local quantification and replenishment through an integrated (i.e., more than just iCCM) "pull" mechanism supported by a fully functional logistic management information system. Thus far, the iCCM supply system has been parallel to the national system.

As part of the TWG's Logistics Sub-Group, JSI's Supply Chain for CCM (SC4CCM) Project has conducted a baseline assessment (18), assisted national quantification, and piloted a "pull" system in two zones in SNNP and Amhara Regions.

5. Behavior and Social Change. Launch meetings at region, zone, and *woreda* helped introduce iCCM. After training, trained HEWs sensitized their *kebele's* administration, community and religious leaders, and HDAs on the availability of iCCM services.

Ethiopia's Family Health Guide (FHG) was developed in 2003-04 and informed by experience from Madagascar. The FHG has been revised several times to become a 64-message guide. It was last vetted in 2009 through a national review to inform the current Integrated Refresher Training module, "Communication Skills for Community Maternal, Newborn, and Child Health." Unsatisfactory progress in adopting health behaviors through the previous "model family" strategy led to the current HDA strategy of one female leader for five households. The leaders are locally influential, respected individuals who engage their neighbors through interpersonal and group communication at market places, community gatherings, coffee ceremonies, and other social occasions. HDA members meet weekly together and monthly with the HEWs to review progress.

6. Supervision, Performance Review, and Clinical Mentoring Meetings: Supervising, supporting, and mentoring HEWs is complex (Table 4). Five HPs are linked to one HC, and the HC staff provide weekly supervision and on the job mentoring. The HEWs collect needed supplies every month from the super-

vising HC. Occasionally, supervisors deliver supplies during regular visits. The health workers from HCs provide weekly supervision, and *woreda* health staff lead quarterly joint integrated supportive supervision with HC staff and partners. The checklists for these two official approaches devote minimal space to iCCM. Thus, partner-supported supervisors also use a standardized, unofficial, partner-supported checklist ("Form C") to assess performance through detailed register review and/or direct case observation. They check HEW knowledge and stock status and provide clinical mentoring. The HEW-supervisor problem-solving dialogue is standard, but of uneven quality. A *kebele* Command Post weekly review assesses HEP implementation, including HDA activities, and reports to the *woreda* Command Post.

According to the national iCCM database 2013 report, 75% of HEWs (20,330/27,120) were supervised at least once between February 2011 and April 2013 in Amhara, Tigray, SNNP, Oromia, and Beninshangul Gumuz Regions, and 80% (21,700/27,120) attended at least one two-day Performance Review and Clinical Mentoring Meeting (PRCMM) (15). The same report revealed that stock-outs were not unusual in the 10,000 HPs supervised. While most health facilities (90%) had ORS, cotrimoxazole, and ACT, only three quarters (75%) had RUTF and RDT, and only about half (54%) had zinc on the day of visit (15).

Supervisors receive a one-day training in Form C that includes practice administering it at a HP. Supervisors are not systematically supervised regarding their supervision (quality of supervision or actual vs. planned encounters), although a modified, partner-supported Form C is under development to measure what supervisors actually do at a sample of HPs.

7. Monitoring and Evaluation. The TWG adopted the John Hopkins Institute for International Programs (JHU-IIP) conceptual framework shown in Figure 2, and an adaptation of the global CCM Task Force's monitoring framework (17, 19). Ethiopia's partners adopted 27 indicators, informed by global consensus and national priority with supporting registers, checklists, and review meeting guides and tools. Measures of success for iCCM include indicators of scale, use, and quality.

The TWG established a national database consisting of data from training, supervision, and PRCMM. UNICEF and MOH manage the database, and implementing partners enter, analyse, and use data for monitoring and quality improvement. The new national health management information system has many documents at the HP level: registers, Family Folder for the HEP, tally sheets, and Monthly Service Delivery and Disease Report Forms, among others. Relevant to iCCM, the service report includes ORS and ACT availability and outpatient sick visits for under-fives by sex, while the disease report tallies malaria (falciparum and non-falciparum), diarrhea by syndrome, and pneumonia cases among under-fives. Moreover, these data are forwarded up through the system maintaining source of treatment – valuable to assess iCCM. However, few HEWs and health workers have been trained in the new system.

The national TWG reviewed global research priorities and identified the following national priorities (19). (a) What are the level and determinants of service utilization at PHCUs? (b) What is the best way to supervise iCCM? (c) What is the quality of iCCM? (d) What is the effect of iCCM on the preventive and promotive components of HEP?

The JHU-IIP was commissioned by CIDA and UNICEF to conduct an independent evaluation of the implementation of iCCM in Ethiopia. As part of the evaluation, JHU-IIP conducted an assessment of the strength of iCCM and quality of care in HPs through an "implementation snapshot" in West Hararge and Jima zones of the Oromia region. The assessment documented good program strength and quality of care at the HP (Table 5) (17).

8. Costing and Finance. The program has received substantial donor attention and support. The implementing partners have leveraged matching resources to a greater extent than before 2011. The government has covered the cost of salaries which is more than 30 million USD annually, capital costs, and most of the consumables.

Lessons Learned and Continued Challenges:

Coordination and Policy: Strong government commitment and leadership were essential to drive national iCCM scale-up. Likewise, strong coordination among development partners was vital to introduction and scale-up. Many partners engaged in planning, preparing, and implementing iCCM. Accountability mechanisms specified clear responsibilities and deliverables among the government, UNICEF, and implementing partners. The government-led national TWG reviewed and adapted previous local experience to harmonize and superintend a single national implementation plan that led to rapid, coherent national scale-up. The program has reached every *woreda* and *kebele* in the big agrarian regions and

Beninshangul Gumuz Region, aiming for universal coverage and equitable access to service in these areas. The introduction of a national policy for pneumonia treatment at the community level was a critical milestone.

Human Resources. The presence of the PHCU with salaried HEWs was a robust platform for iCCM implementation. The HC with its director and dedicated supervisors provides institutionalized support and monitoring of HEWs, including salary payment.

Service Delivery and Referral. The HEP was maturing during 2009 in the sense that preventive and promotive interventions were achieving good coverage and served as a foundation for iCCM. However, despite the increased use of iCCM with time, utilization remains low for both 0-2 and 2-59 month old children, especially for the former group. A quality of care and implementation strength survey conducted by the JHU-IIP showed an iCCM consultation of only 16 sick children per HP per month – or only about 0.26 episodes per child per year for a typical population of 730 children in a kebele (14.6% of a total population of 5000) (17).The same survey found that more than three times as many sick children were treated in iCCM implementing HPs than in non-iCCM implementing HPs. However, the service utilization still remained low compared to the expected number of sick children. A qualitative survey of care-seeking by JHU-IIP showed that the main barriers to care-seeking at HPs were sociocultural and religious factors, and lack of information on availability of treatment at the HP. In addition, some informants reported expecting costs from a visit to a HP, specifically that it would lead to a costly referral and the burden of carrying a child for more than an hour over difficult terrain (21).The skills-based training of HEWs (in iCCM), of supervisors (in iCCM supervision), and of HC staff and woreda focal persons (in IMNCI); the joint post-training follow up; and the joint performance review and mentoring are intended to improve quality of care, strengthen links between HPs and HCs, and increase service utilization. These findings indicate these efforts are insufficient to fully address the barriers to care-seeking.

Current iCCM scale-up has not reached most pastoralist settings with scattered populations, limited resources, lower capacity, and weaker HEP implementation. iCCM should be expanded in these areas in a phased manner through prior strengthening the HEP preventive and promotive packages to which iCCM will be added. Afar and Somali regions have developed a specific iCCM implementation plan and started iCCM in a few selected *woredas* (22).

Supply Chain. The short-term iCCM supply distribution strategies that Ethiopia followed have helped to overcome the challenges of a weak supply chain. Training kits ensured start-up of service immediately after HEWs returned to their HP after training, a recognized best practice. The replenishment kits provided HPs enough supplies for at least one year. This approach is temporary, and the MOH/PFSA and partners should emphasize a long-term "pull" strategy through the LMIS.

Behavior and Social Change. Low health care seeking behavior among families is one of the contributors to low service utilization witnessed. In the first one to two years of iCCM implementation, more attention was given to building technical capacity of HEWs and supervisors and distribution of supplies. More focus should be given to improve care-seeking behavior through community mobilization and behavior change communication by the HDA network.

Supervision, Performance Review, and Clinical Mentoring Meetings. The PRCCM data and the JHU -IIP/UNICEF implementation strength and quality of care findings show that the HEWs may be providing better care than CHWs in other countries, which is likely due to solid standardized training, job aids and registers that detail case management steps, post-training follow-up, structured supportive supervision, and mentoring.

Monitoring and Evaluation. The health management information system is not fully established to capture the iCCM service data. Multiple competing priorities were also among the major challenges. In response, the child survival TWG has prioritized action research questions to be answered through operations research, many of the results of which are included in this supplement.

Costing and Finance. The introduction of a national policy for pneumonia treatment at the community level, a costed implementation plan, and inclusion of iCCM in HSDP4 and *woreda* core plans were keys to success (14, 23, 24). The main iCCM cost drivers were training, medicines, supervision, and PRCMM. The government mobilized sufficient resources for iCCM from UNICEF, USAID, CI/CIDA, and the BMGF for implementation at scale in three years. The successful implementation catalyzed other donor resources to address pastoralist areas (i.e., Micronutrient Initiative in the Afar region iCCM and The International Rescue Committee and Save the Children for the Somali region) and to expand services to include community-based newborn care (25, 26).

Sustainability. The iCCM program is now part of the HEP packages, which is at the core of the Ethiopian HSDP. The decentralized annual plans of the rural woreda have iCCM as their major intervention strategy (23,24). These all will provide good ground for sustainability.

In conclusion, Ethiopia's iCCM strategy has accomplished much and contributed to national and global learning. There is more to do to further consolidate and sustain it in the already covered regions while expanding it in the pastoralist communities of the Somali and Afar Regions. Nonetheless, the iCCM program is part of the HEP package, which is central to the Ethiopian HSDP. The decentralized annual plans of the rural *woredas* have iCCM as a major intervention strategy.

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