

Introduction to a Special Supplement: Evidence for the Implementation, Effects, and Impact of the Integrated Community Case Management Strategy to Treat Childhood Infection

David R. Marsh,* Davidson H. Hamer, Franco Pagnoni, and Stefan Peterson

Save the Children, Westport, Connecticut; Center for Global Health and Development, Boston University, Boston, Massachusetts; Department of International Health, Boston University School of Public Health, Boston, Massachusetts; Section of Infectious Diseases, Department of Medicine, Boston University School of Medicine, Boston, Massachusetts; Zambia Centre for Applied Health Research and Development, Lusaka, Zambia; Global Malaria Programme, World Health Organization, Geneva, Switzerland; Uppsala University, Uppsala, Sweden; Makerere University, Kampala, Uganda; Karolinska Institutet, Stockholm, Sweden

In 2010, 7.6 million children died before the age of five,¹ two-thirds unnecessarily.² A concise list of evidence-based, life-saving interventions guides health policy makers, planners, and program implementers to decrease child mortality in low and middle income countries.^{2,3} Adding to the list, through discovery science, is challenging and exciting. Bringing existing interventions to families who need them, through delivery science, is at the same time more challenging, perhaps a bit less exciting, but more life-saving. The greatest gains to be made in intervention coverage across the continuum of care are for newly introduced interventions, as expected, and for existing curative interventions.⁴ Similarly, modeling exercises have repeatedly shown that the greatest reductions in mortality for children less than five years of age are to be achieved through increasing the coverage of treatment interventions for the three major causes of childhood mortality: pneumonia, malaria, and diarrhea.⁵

Because millions live at or beyond the periphery of the health system, there is a need to improve access to care for common childhood infectious diseases by bringing treatment closer to the community, especially in rural settings where distance, cost, and limited availability of primary health centers exist. Integrated community case management (iCCM) is a strategy to train, support, and supply community health workers (CHWs) to provide diagnostics and treatments for pneumonia, diarrhea, and malaria for sick children of families with difficult access to case management at health facilities. A pro-equity strategy, iCCM is not easy to implement.⁶ Health systems tend to be the most challenged in those high mortality settings in which iCCM is most needed. Moreover, iCCM has many steps that must be performed sequentially and completely for care to be successful. Deviations can result in bad outcomes for the sick child, the community (i.e., increased drug resistance), and the program. In addition, CHWs delivering iCCM must master ancillary skills, such as documentation and supply management, among others. The global health community needs guidance for implementing iCCM.

In response, a World Health Organization–Tropical Disease Research/United Nations Children’s Fund (WHO-TDR/UNICEF) Joint Meeting for Community Case Management

of Fever (Geneva, June 2008) produced a CCM research agenda.⁷ The global CCM Operations Research Group (ccm.org) further refined the agenda at a UNICEF meeting in New York (October 2008) and at a Program for Global Pediatric Research workshop on CCM for pneumonia in Vancouver (May 2010).⁸ This agenda remains in place today (Table 1).⁹ In Stockholm (May 2009), ccm.org proposed a generic evaluation framework for iCCM (Figure 1).⁹ On the basis of a results framework,¹⁰ the schema includes outcomes (boxes in top three rows) and processes (partitioned box at the bottom) to implement the strategy.

The World Health Organization and UNICEF have just released a Joint Statement for iCCM as an equity-focused strategy to improve access to case management.¹¹ This supplement commences with a re-publication of this document,¹² which summarizes much of the global evidence base until now. The purpose of these papers is to augment the experience base and evidence base for iCCM, and then chart the way forward for future research. We have mapped the included contributions against the research questions (Table 1) and results and/or processes (Figure 2). This large collection of CCM research informs 16 research questions. The country reports are almost exclusively from sub-Saharan Africa, with analyses from the Democratic Republic of the Congo, Ethiopia, Ghana, Côte d’Ivoire, Malawi, Mali, Rwanda, Sierra Leone, Uganda, Zambia, and Pakistan. Other papers address global issues, such as methods to measure access to case management¹³ and indicators to monitor iCCM programs.¹⁴

This supplement informs nearly all results and processes in the evaluation framework (Figure 2). Chinbuah and others¹⁵ evaluated the impact on all-cause mortality of children 2–59 months of age, adding an antibiotic for pneumonia to an existing home-based antimalarial for fever strategy in Ghana. Mukanga and others¹⁶ reported the effect of implementing the iCCM package on the clinical outcome of febrile disease and on the quality of drug use in Uganda, Ghana, and Burkina Faso. Regarding use of CCM in eastern Uganda, Rutebemberwa and others¹⁷ measured care-seeking from community medicine distributors in urban and rural settings, and Kalyango and others¹⁸ compared the effect of iCCM and home-based management of fever strategies on care-seeking from community medicine distributors and on community drug use. Kayemba and others¹⁹ reported health system implications for adding newborn care to iCCM in Uganda. In Malawi, Nsona and others²⁰ described the

*Address correspondence to David R. Marsh, 31 Wildflower Drive, Amherst, MA 01002. E-mail: dmarsh@savechildren.org

TABLE 1
Global CCM operations research agenda with contributions from this supplement*

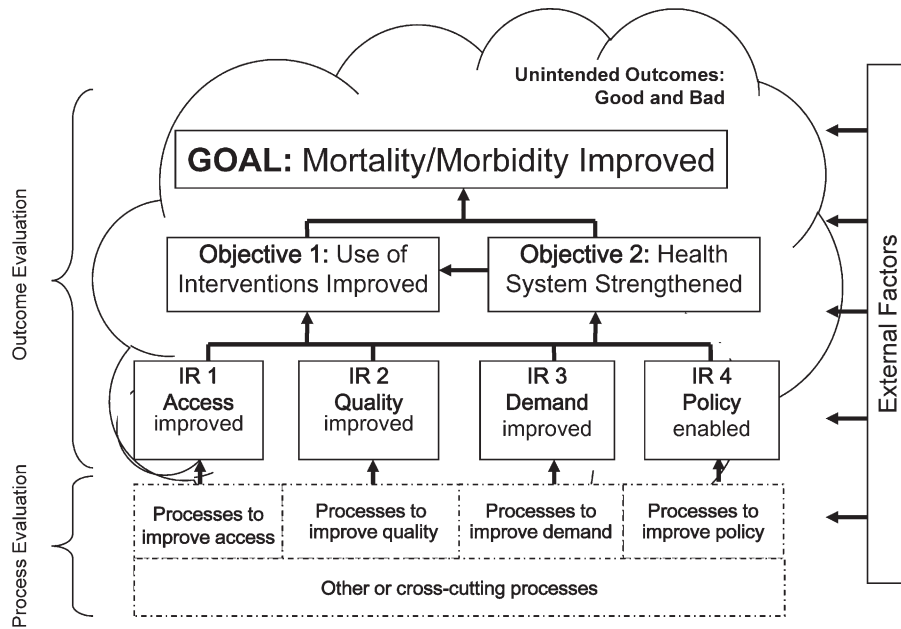
Topic	Question	Supplement contribution
Front-line health workers	1. What is the effect on the performance of CHW when management of one or more disease is added to the existing responsibility?	Chinbuah and others, ¹⁵ Kayemba and others ¹⁹
	2. Are CHWs able to assess, classify, and treat various illnesses under integrated CCM?	Mukanga and others ¹⁶
	3. What are the best ways to improve and sustain performance of CHWs?	
	4. What are the cost and performance of different training methods for (illiterate/literate) CHWs?	
	5. What are the best methods for evaluating the quality of service provided by CHW?	Cardemil and others ²⁸
	6. What is the optimal number of CHWs to give near universal coverage to a given geographic area?	Guenther and others ¹³
	7. What are the best ways of supervising CHWs?	
	8. Which factors increase recruitment and reduce attrition?	Strachan and others ²⁶
	9. Which methods of remuneration/incentivization are effective and sustainable?	
Implementation	10. What are the cost and cost-effectiveness of CCM?	Sadrudin and others ²⁹
	11. What are appropriate methods for cost recovery and financing?	
	12. How can effective coverage be achieved by CCM (equity, community effectiveness, etc.)?	Guenther and others, ¹³ Kalyango and others ¹⁸
	13. How can the private sector become involved in delivering integrated CCM?	Awor and others ²³
	14. How acceptable are CHWs to the health system, and how can CCM requirements for drugs, supplies, supervision, etc. be met?	Callaghan-Koru and others, ²¹ Chandani and others ²⁷
	15. What are health system effects of CCM on referral and caseload and mix?	Nsona and others, ²⁰ Lainez and others, ³⁰ Seidenberg and others ²⁵
	16. What is the effect of CCM on antibiotic resistance?	
	17. What is the impact of CCM on drug use and therapeutic outcomes in the community?	Kalyango and others, ¹⁸ Mukanga and others ¹⁶
	Management of illness	18. How can available tools (RDTs, clinical signs, timers, drugs, pulse oximeters, etc.) be combined into clinical algorithms?
19. What is the algorithm performance in different epidemiologic scenarios?		
20. What is the appropriate duration of antibiotic treatment of WHO-defined non-severe pneumonia in African settings?		
21. Can CHWs treat WHO-defined severe pneumonia in the community?		Sadrudin and others ²⁹
22. How can age-dose regimens for different drugs be harmonized, and what are the effects on treatment of different packaging techniques?		
23. What is the impact of pre-referral drugs on clinical outcomes of children with severe disease?		
24. What is the most appropriate antibiotic for treatment of pneumonia?		
25. What is the most appropriate formulation of antibiotics?		
26. Do family members recognize the disease and promptly seek care?		Seidenberg and others, ²⁵ Nanyongo and others, ²⁴ Awor and others ²³
Families and caregivers	27. What are the elements that facilitate family members to use CCM services?	Rutebemberwa and others ¹⁷
	28. Do family members follow treatment recommendations properly?	
	29. How does prescription of multiple medicines for multiple diseases (e.g., malaria and pneumonia) impact adherence?	
Impact	30. What is the impact of integrated CCM on health and survival of children?	Chinbuah and others, ¹⁵ Mukanga and others ¹⁶
	31. Does CCM lead to increased penetration in terms of reaching the poor? (effective coverage)	Guenther and others, ¹³ George and others ²²

* CCM = community case management; CHW = community health worker; RDT = rapid diagnostic test; WHO = World Health Organization.

national scale-up of iCCM, and Callaghan-Koru and others²¹ studied health workers' and managers' perceptions of the iCCM strategy and the CHWs delivering it. McGorman and others¹⁴ proposed, through a health systems lens, benchmarks and indicators for planning, introducing, and scaling up iCCM. Guenther and others¹³ measured and modeled access to case management with and without iCCM in Malawi, Mali, and Zambia. George and others²² characterized the CHWs relied upon to increase access to case management across sub-Saharan Africa. Regarding demand for iCCM in Uganda, Awor and others²³ studied care-seeking for sick children, noting the potential role for and the uneven quality of care in the private sector; and Nanyongo and others²⁴ reported community acceptability of iCCM. In Zambia, Seidenberg and others²⁵ reported the effect of iCCM on care-seeking practices for sick children. Regarding policy, the joint statement of

Young and others¹² endorses iCCM globally, to encourage countries and donors alike.

Regarding processes to ensure access, Strachan and others²⁶ reported stakeholder perceptions of approaches to improve CHW retention and motivation. Chandani and others²⁷ studied determinants of medicine supply for CCM in three countries, and Cardemil and others²⁸ compared methods to assess case management performance; both papers highlighted processes to ensure service quality. Sadrudin and others²⁹ reported the household cost savings afforded by CCM for severe pneumonia in Pakistan, an important process to enable the policy environment. Lainez and others³⁰ report practical applications of routine CCM service statistics, a cross-cutting process informing several intermediate results. The 19 reports in this supplement make important additions to a growing evidence base, which must still grow further.³¹



*IR=Intermediate Result

FIGURE 1. Evaluation framework.

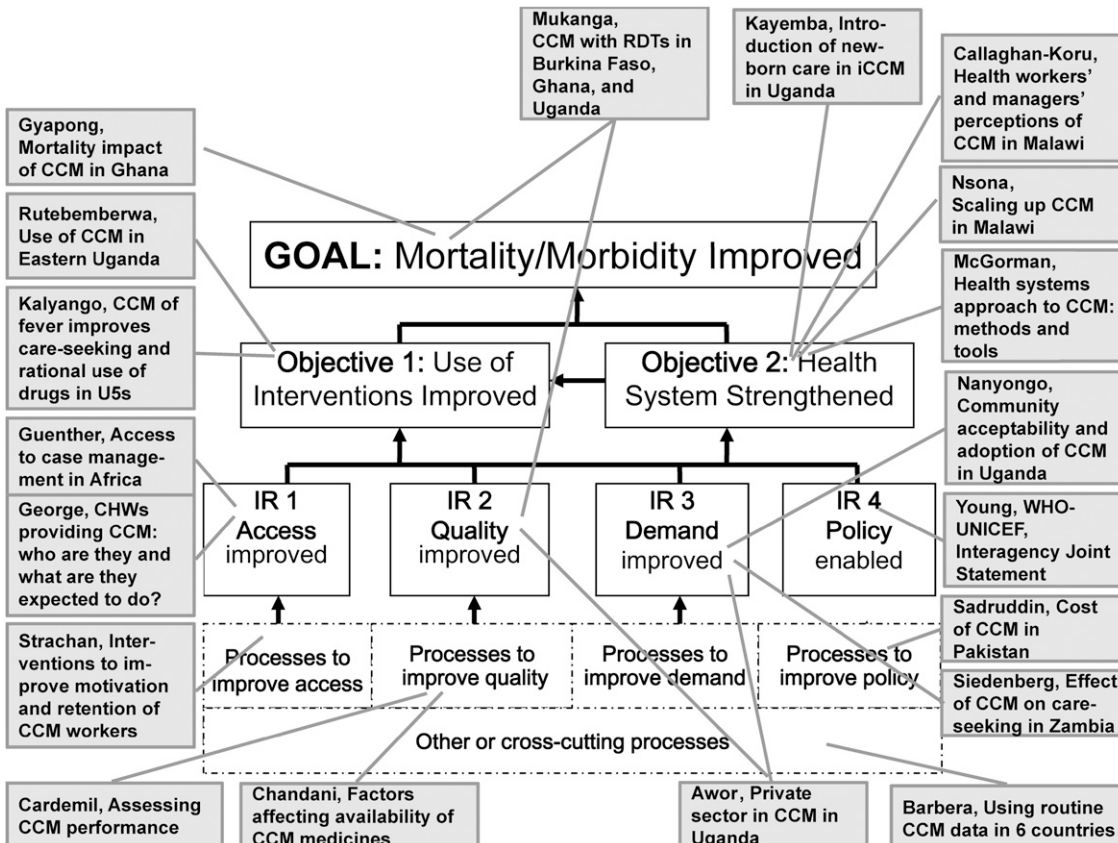


FIGURE 2. Evaluation framework with Supplement contributions. iCCM = integrated community case management; CHW = community health worker; WHO-UNICEF = World Health Organization–United Nations Children’s Fund.

Received August 11, 2012. Accepted for publication August 17, 2012.

Authors' addresses: David R. Marsh, Save the Children Federation, Westport, CT, E-mail: dmarsh@savechildren.org. Davidson H. Hamer, Center for Global Health and Development, Boston University, Boston, MA, E-mail: dhamer@bu.edu. Franco Pagnoni, Global Malaria Programme, World Health Organization, Geneva, Switzerland, E-mail: pagnonif@who.int. Stefan Peterson, Uppsala University, Uppsala, Sweden, Makerere University, Kampala, Uganda, and Karolinska Institutet, Stockholm, Sweden, E-mail: Stefan.Peterson@ki.se.

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