



UNICEF-WHO
Overview and Latest Update on Integrated Community Case Management:
Potential for Benefit to Malaria Programs
February 2015

KEY MESSAGE

Integrated community case management (iCCM) is a strategy to increase access to effective case management for young children suffering from malaria, pneumonia and diarrhea, especially in hard to reach areas and among vulnerable populations who otherwise may be neglected. Programmatic experience shows that this can be a highly cost effective approach if well-utilized, and the current evidence base establishes iCCM as a key public health strategy to increase coverage of quality treatment services for children, especially in malaria-endemic countries in Africa.

Executive summary

Every year 6.3 million children die before the age of five. Malaria, pneumonia and diarrhea account for about one-third of these deaths, despite the availability of effective medicines to treat these diseases. However, physical access to these medicines and care remains a major challenge. There is, however, good evidence that community health workers (CHWs) can diagnose and correctly treat these children, significantly lowering the burden of these diseases. Evidence also shows that integrated community case management (iCCM) can increase the coverage of services that deliver treatments for the above mentioned illnesses. iCCM can increase early care seeking for illness and early access to appropriate treatment for children, reduce the workload of health centres, and potentially decrease all-cause mortality for children under age five years. iCCM programs especially have the potential to benefit malaria treatment programs through more rational use of artemisinin-based combination therapy (ACTs), thereby bringing about better use of malaria resources and lowering the potential of developing antimicrobial resistance.

Justification for an integrated community-based approach

Young children often present with multiple conditions and there is also significant overlap in symptoms of malaria and pneumonia. In many settings, with a high burden of child mortality, access to timely treatment and care is limited. Most children who die from malaria, pneumonia or diarrhea live in areas underserved by the health system, with poor access to health facilities for prompt, appropriate management of common childhood illnesses (1). In addition access to care is often complicated by shortages of essential medicines and insufficient human resources (2). Weak and fragmented health systems in many countries hinder the scaling-up of essential interventions for maternal, newborn, and child health (3), and improvement in health facilities alone is insufficient to avert a large proportion of child deaths (4). However, experience has demonstrated the critical role of Community Health Workers (CHWs) in bringing quality care close to home, and there is growing recognition that strengthening community-based interventions has the potential to accelerate progress in reaching the MDGs in high mortality settings (5-7). In response, the WHO, UNICEF, USAID and other partners have developed a strategy for integrated case management of malaria, pneumonia and diarrhea at the community level, termed integrated community case management (iCCM) (8). iCCM is an equity-based strategy to equip, train, support and supervise CHWs to deliver life-saving treatment interventions for malaria, pneumonia and diarrhea to children in communities

who otherwise lack easy access to case management in health facilities. To reach the full benefit of iCCM, the implementation needs to be a country-led and owned process to ensure sustainability. A recent survey shows that 28 countries in sub-Saharan Africa are implementing iCCM programs (treatment for all three conditions) – an increase since 2010 – and most countries are planning further expansion (9). The purpose of this document is to provide a collection of evidence on the feasibility, safety, effectiveness and impact of iCCM on the three treatable diseases it targets.

Community case management of individual diseases

The effectiveness and feasibility of community-based management for individual disease conditions has been demonstrated for pneumonia, diarrheal disease, and malaria. It is estimated that community case management of malaria can reduce overall and malaria-specific mortality in under-five children by 40% and 60% respectively (10), and severe malaria morbidity by 53% (11). Community based pneumonia case management has the potential to reduce under five mortality by up to 24% (12), and could result in up to 70% mortality reduction for pneumonia (13) with universal coverage. Treatment with oral rehydration solution (ORS) and zinc has been found to reduce diarrhea mortality in home and community settings, with ORS estimated to prevent 93% of diarrhea deaths, and zinc estimated to decrease diarrhea mortality by 23% (14). Regarding feasibility, there is evidence that effective CHWs require adequate initial training, regular re-supply of essential commodities, and ongoing supportive supervision (15-22). However a recent systematic review of factors influencing success or failure of community case management of malaria with rapid diagnostic tests (22) noted that the inappropriate provision of ACTs may be a problem in some settings, particularly if only community case management for malaria is in place (23-25)¹.

Integrated community case management – feasibility and safety

Studies provide evidence that CHWs can accurately and safely manage malaria, pneumonia, and diarrhea in children through integrated community-based service delivery. A study in Zambia that evaluated two models of integrated delivery of treatment for malaria and pneumonia demonstrated that CHWs correctly classified children who presented with fever or fast or difficult breathing as having malaria and/or pneumonia 94% to 100% of the time, and appropriate treatment based on disease classification was correct in 94% to 100% of episodes (26). A study in Uganda found that case management of multiple diseases carried out with appropriate diagnostic technologies at the community level (iCCM) is acceptable, increases access, and is the first choice for caregivers of febrile children (18). The same study found that CHWs can be trained to use RDTs and timers to assess and manage malaria and pneumonia in children (27), and that the additional tasks of iCCM do not have a negative impact on how malaria cases are handled (28). Similarly, studies in Malawi (29) and Ethiopia (30) have shown that CHWs can correctly manage multiple illnesses and provide good quality of care for sick children. A few studies, however, have highlighted the challenges CHWs encounter in measuring respiratory rate and/or classifying pneumonia without intensive supervision and follow-up (31-32). There is also a lack of evidence on the efficacy and effectiveness of pneumonia case management in communities in sub-Saharan Africa (33).

A recent review on care seeking for illness in children in sub-Saharan Africa suggests that the availability of a comprehensive diagnostic and treatment package for multiple diseases may promote appropriate care seeking behaviours (34). Recent systematic reviews have analysed findings from over 25 studies on community case management of childhood illness (22, 35) and show that iCCM maintains the quality of malaria case management provided sufficient training and supervision occurs. Studies in Zambia (26, 36), Uganda (18), and in a multi-country study conducted in Burkina Faso, Ghana and Uganda (37) show that inappropriate prescription of ACTs to children with a negative RDT occurs much less frequently in programs in which ACTs are dispensed in the context of an iCCM package that includes alternative diagnostic and treatment measures for pneumonia and diarrhea together with malaria.

Integrated community case management – effectiveness and impact

iCCM offers the opportunity to increase access to effective treatment at the community level (38), while decreasing the workload at primary health care centers (21, 39). National Community Health Worker programs which include curative interventions for malaria, pneumonia and diarrhea have the potential to decrease all-cause mortality for children under age five years by up to 63% (40). The integration of pneumonia with malaria management in rural Zambia resulted in 68% of children with pneumonia receiving early and appropriate therapy, defined as within 24-48 hours of symptom onset, as opposed to only 13% of children referred to health centers for evaluation (36). In rural Uganda, a cluster-randomized trial that compared malaria case management only versus integrated community case management of malaria and pneumonia at the community level demonstrated that children in areas where case management was integrated were significantly more likely to receive prompt and appropriate antibiotics for pneumonia compared to children in areas where only malaria CCM was offered (18). Notably, this study also found that children in iCCM areas were less likely to have persistent fever on day four than in the malaria-only management areas (18). A recent scoping review of 29 selected iCCM programs found that large, multi-faceted iCCM programs with strong components of training, supervision, and including additional support for equipment and supplies, seemed to improve selected quality of care outcomes (21)

Limited data exists about the cost effectiveness of iCCM. An economic analysis of a study in Ghana found that the cost per DALY averted was US\$90.25 in ACT-alone clusters and US\$114.21 in ACT plus amoxicillin clusters (41). A cost-effectiveness analysis of malaria case management using RDTs and artemether-lumefantrine in Zambia revealed that home-based management was more cost effective than facility-based management (US\$4.22 per case at the home versus US\$6.12 at the facility) (42). A cost analysis from Pakistan that focused on household costs of illness found that home management of chest indrawing pneumonia by CHWs was associated with a substantially lower cost to the household than for children who were referred for treatment (43). A recent multi-country analysis of iCCM program costs found total recurrent cost per treatment to range between US\$1.70 and US\$17.54, and concluded that, to be cost-effective and affordable, iCCM programs must be well-utilized while program management and supervision should be organized to minimize costs and ensure quality of care (44). A recent external evaluation of iCCM programs in six countries of sub-Saharan Africa found that careseeking to CHWs for diarrhea, malaria, and suspected pneumonia ranged from 3% to 16% but iCCM's share of total public health expenditure ranged from 1% to 3% (or 1% to 6% of government's own health expenditure), suggesting a favorable cost to outcome ratio (45).

Conclusion

Programmatic experience clearly shows that iCCM can increase the coverage of high quality treatment services for diarrhea, malaria, and pneumonia. There is evidence that iCCM increases correct treatment coverage of malaria control programmes in tandem with other programmes and strengthens health systems – including ensuring more effective use of resources (financial as well as pharmaceutical (e.g. anti-malarials, etc), thus providing a strong argument for establishing iCCM as a key catalytic public health strategy for increasing service coverage.

Sustainable iCCM implementation is not a stand-alone activity but fits within the existing health system. It needs to be country led and owned with high-level political commitment and broad-based community support. The success of an iCCM program is determined in part by a broader multi-sectoral, in-country process that links immediate needs (through iCCM) and long-term health vision (46). And strong links between the community and the health system are critical for successful iCCM - its implementation therefore needs to be rationalized within existing activities aimed at improving health at both community and facility level.

References

1. Committing to Child Survival: A Promise Renewed Progress Report 2014. United Nations Children's Fund (UNICEF), New York, September 2014. First edition.
2. Herlihy JM, D'Acromont V, Burgess DCH, Hamer DH. Diagnosis and Treatment of the Febrile Child. *Eds. Black R, Laxminarayan R, Temmerman M, Walker N. In Continuum of Reproductive, Maternal, Newborn, and Child Health, Disease Control Priorities 3*, in press.
3. Haines A. et al. (2007) Achieving child survival goals: potential contribution of community health workers. *Lancet* 369, 2121–2131
4. Schellenberg JA et al Inequities among the very poor: health care for children in rural southern Tanzania. *Lancet* 2003; **361**: 561–66
5. Bryce J et al : Programmatic pathways to child survival: results of a multi-country evaluation of Integrated Management of Childhood Illness Health Policy Plan. 2005 Dec;20 Suppl 1:i5-i17
6. Rosato M et al: Community participation: lessons for maternal, newborn, and child health. *Lancet*. 2008 962-71.
7. Freeman P et al: Accelerating progress in achieving the millennium development goal for children through community-based approaches. *Global Public Health* 2009, 1_20
8. Young M, Wolfheim C, Marsh D, Hammamy D. World Health Organization/United Nations Children's Fund Joint Statement on Integrated Community Case Management: An Equity-Focused Strategy to Improve Access to Essential Treatment Services for Children. *Am J Trop Med Hyg.* 2012, 87(Suppl 5), 2012, pp. 6-10
9. Rasanathan K et al: Community case management of childhood illness in sub-Saharan Africa – findings from a cross-sectional survey on policy and implementation. *Journal of Global Health* 2014, Vol 4, No. 2, doi: 10.7189/jogh.04.020401
10. Kidane, G. and Morrow, R.H. (2000) Teaching mothers to provide home treatment of malaria in Tigray, Ethiopia: a randomised trial. *Lancet* 2000, 356, 550–555
11. Sirima BS et al: Early treatment of childhood fevers with pre-packaged antimalarial drugs in the home reduces severe malaria morbidity in Burkina Faso. *Trop Med Intl Health*, 8 (2): 133-139, 2003
12. Sazawal S and Black RE for the Pneumonia Case Management Trials Group: Effect of pneumonia case management on mortality in neonates, infants, and preschool children: a meta-analysis of community-based trials. *THE LANCET Infectious Diseases* Vol 3 September 2003
13. Theodoratou, E et al : The effect of case management on childhood pneumonia mortality in developing countries, *International Journal of Epidemiology* 2010;39:i155–i171
14. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS; Bellagio Child Survival Study Group. How many child deaths can we prevent this year? Child survival II. *Lancet*. 2003;362:65-71. Medline:12853204 doi:10.1016/S0140-6736(03)13811-1
15. Hamer D et al : Improved Diagnostic Testing and Malaria Treatment Practices in Zambia, *JAMA* May 23/30, 2007—Vol 297, No. 20
16. Harvey S et al: Improving community health worker use of malaria rapid diagnostic tests in Zambia: package instructions, job aid and job aid-plus-training. *Malaria Journal* 2008, 7:160 doi:10.1186/1475-2875-7-160
17. Mubi M et al: Malaria Rapid Testing by Community Health Workers Is Effective and Safe for Targeting Malaria Treatment: Randomised Cross-Over Trial in Tanzania. *PLoS ONE* July 2011 | Volume 6 | Issue 7
18. Mukanga D et al: Access, acceptability and utilization of community health workers using diagnostics for case management of fever in Ugandan children: a cross-sectional study. *Malar J.* 2012 May 24;11:121

19. Chanda P et al: Community case management of malaria using ACT and RDT in two districts in Zambia: achieving high adherence to test results using community health workers. *Malaria Journal* 2011, 10:158
20. Counihan H et al: Community Health Workers Use Malaria Rapid Diagnostic Tests (RDTs) Safely and Accurately: Results of a Longitudinal Study in Zambia. *Am. J. Trop. Med. Hyg.*, 87(1), 2012, pp. 57–63
21. Bosch-Capblanch X, Marceau C: Training, supervision and quality of care in selected integrated community case management (iCCM) programmes: A scoping review of programmatic evidence. *Journal of Global Health* 2014, Vol 4, No. 2, doi: 10.7189/jogh.04.020403
22. Ruizendaal E et al: Success or failure of critical steps in community case management of malaria with rapid diagnostic tests: a systematic review. *Malaria Journal* 2014, 13:229
23. Elmardi KA et al: Feasibility and acceptability of home-based management of malaria strategy adapted to Sudan's conditions using artemisinin-based combination therapy and rapid diagnostic test. *Malar J.* 2009 Mar 9;8:39
24. Ndiaye, Y. et al. Community case management in malaria: review and perspectives after four years of operational experience in Saraya district, south-east Senegal. *Malar. J.* 12, 240 (2013)
25. Chinkhumba, J. et al. Comparative field performance and adherence to test results of four malaria rapid diagnostic tests among febrile patients more than five years of age in Blantyre, Malawi. *Malar. J.* 9, 209 (2010)
26. Hamer D et al: Quality and safety of integrated community case management of malaria using rapid diagnostic tests and pneumonia by community health workers. *Pathog Glob Health.* 2012;106:32-9.
27. Mukanga D et al: Can lay community health workers be trained to use diagnostics to distinguish and treat malaria and pneumonia in children? Lessons from rural Uganda. *Trop Med Int Health* volume 16 no 10 pp 1234–1242 2011
28. Kalyango JN et al: Performance of community health workers under integrated community case management of childhood illnesses in eastern Uganda. *Malaria Journal* 2012, 11:282
29. Gilroy KE et al, on behalf of the CCM-Malawi Quality of Care Working Group: Quality of sick child care delivered by Health Surveillance Assistants in Malawi. *Health Policy and Planning* 2013;28:573-585 doi:10.1093/heapol/czs095
30. Miller NP et al: Integrated Community Case Management of Childhood Illness in Ethiopia: Implementation Strength and Quality of Care. *Am. J. Trop. Med. Hyg.*, 91(2), 2014, pp. 424–434
31. Kelly JM et al: Community Health Worker Performance in the Management of Multiple Childhood Illnesses: Siaya District, Kenya, 1997–2001. *Am J Public Health.* 2001 ; 91:1617–1624
32. United Nations Children's Fund. Review of systematic challenges to the scale-up of integrated community case management emerging lessons & recommendations from the catalytic initiative (CI/IHSS). New York: UNICEF, 2012. Available at: http://www.unicef.org/infobycountry/files/Analysis_of_Systematic_Barriers_cover_1163.
33. Druetz T et al: The community case management of pneumonia in Africa: a review of the evidence. *Health Policy and Planning* 2013;1–14. doi:10.1093/heapol/czt104
34. Colvin et al, Understanding careseeking for child illness in sub-Saharan Africa: A systematic review and conceptual framework based on qualitative research of household recognition and response to child diarrhoea, pneumonia and malaria. See comment in PubMed Commons below *Soc Sci Med.* 2013 Jun;86:66-78. doi: 10.1016/j.socscimed.2013.02.031.
35. Smith Paintain L et al: Community Health Workers and Stand-Alone or Integrated Case Management of Malaria: A Systematic Literature Review. See comment in PubMed Commons below *Am J Trop Med Hyg.* 2014 Sep;91(3):461-70
36. Yeboah-Antwi et al. : Community Case Management of Fever Due to Malaria and Pneumonia in Children Under Five in Zambia: A Cluster Randomized Controlled Trial. *PLoS Med.* 2010 Sep 21;7(9):e1000340. doi: 10.1371/journal.pmed.1000340.

37. Mukanga et al.: Integrated Community Case Management of Fever in Children under Five Using Rapid Diagnostic Tests and Respiratory Rate Counting: A Multi-Country Cluster Randomized Trial. *Am J Trop Med Hyg.* 2012 doi:10.4269/ajtmh.2012.11-0816
 38. Guenther T et al: Beyond Distance: An Approach to Measure Effective Access to Case Management for Sick Children in Africa, *Am. J. Trop. Med. Hyg.*, 87(Suppl 5), 2012, pp. 77–84
 39. Tiono A et al: Implementation of Home based management of malaria in children reduces the work load for peripheral health facilities in a rural district of Burkina Faso. *Malaria Journal* 2008, 7:201
 40. Christopher JB, Le May A, Lewin S and Ross DA: Thirty years after Alma-Ata: a systematic review of the impact of community health workers delivering curative interventions against malaria, pneumonia and diarrhoea on child mortality and morbidity in sub-Saharan Africa. *Human Resources for Health* 2011, 9:27 <http://www.human-resources-health.com/content/9/1/27>
 41. Nonvignon J et al: Is home management of fevers a cost-effective way of reducing under-five mortality in Africa? The case of a rural Ghanaian District. *Trop Med Int Health* volume 17 no 8 pp 951–957
 42. Chanda P et al: Relative costs and effectiveness of treating uncomplicated malaria in two rural districts in Zambia: implications for nationwide scale-up of home-based management. *Malaria Journal* 2011, 10:159
 43. Sadruddin S et al: Household costs for treatment of severe pneumonia in Pakistan. *Am J Trop Med Hyg.* 2012 Nov;87(5 Suppl):137-43
 44. Collins D et al: The costs of integrated community case management (iCCM) programs: A multi-country analysis. *Journal of Global Health* 2014, Vol 4, No. 2, doi: 10.7189/jogh.04.020407
 45. Doherty T, Besada D, Zembe W, Daniels K, Kinney M, Kerber K, Daviaud E, Rohde S, Ngandu N, Jackson D for the IHSS Evaluation study group*. Report on the Summative External Evaluation of the Catalytic Initiative (CI)/ Integrated Health Systems Strengthening (IHSS) Programme in Ethiopia, Mali, Mozambique, Ghana, Malawi and Niger. Cape Town: South African Medical Research Council, University of the Western Cape and Save the Children, 2014.
 46. Kurvilla S et al. Success factors for reducing maternal and child mortality. *Bull WHO* 2014; 92-533-544.
-