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# Epistemic communities in global health and the development of child survival policy: a case study of iCCM

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## Abstract

Nearly all African countries have recently implemented some form of integrated community case management of childhood illness (iCCM), a strategy aimed at reducing child mortality by providing curative care for common yet fatal childhood illnesses. This case study describes the evolution of iCCM at the global level using the theory of epistemic communities first outlined by Haas, which explains how international policy coordination on technical issues takes place via transnational expert networks. We draw from in-depth interviews with global policy-makers ( $n=25$ ), a document review ( $n=72$ ) and co-authorship network analysis of scientific articles on iCCM. We find that members of the iCCM epistemic community were mainly mid- to upper-level technical officers working in the headquarters of large norm-setting bodies, implementing partners, funders and academic/research groups in global health. Already linked by pre-existing relationships, the epistemic community was consolidated as conflicts were overcome through structural changes in the network (including or excluding some members), changes in the state of technology or scientific evidence, shifting funding considerations, and the development of consensus through argument, legitimation and other means. Next, the epistemic community positioned iCCM as a preferred solution via three causal dynamics outlined by Haas: (1) responding to decision-makers' uncertainty about how to reduce child mortality after previous policies proved insufficient, (2) using sophisticated analytic tools to link the problem of child mortality to iCCM as a solution and (3) gaining buy-in from major norm-setting bodies and financial and institutional support from large implementing agencies. Applying the epistemic communities framework to the iCCM case study reveals the strengths and weaknesses of a focused policy enterprise with highly specialized and homogenous disciplinary origins, allowing for efficient sharing of complex, high-level scientific information, but possibly excluding voices with relevant methodological, operational or country-level perspectives.

**Key words:** Africa, antibiotics, child mortality, health policy, international agencies

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### Key Messages

- The epistemic communities framework, which puts forth transnational networks of technical experts as agents of policy change, helps describe how iCCM came to the fore as the preferred solution for reducing child mortality.
- The formation of epistemic communities and their influence over policy making is not automatic, but requires considerable efforts to resolve conflicts and facilitate consensus on values/normative beliefs, causal beliefs, notions of validity, and policy enterprise.
- Disease-specific silos within global health (particularly around malaria and pneumonia) had to be overcome for iCCM policy to be possible, demonstrating the fragmented and sometimes cloistered nature of global health policy-making.
- The case study underlines the dominance of technocratic expertise in the relatively uncontested arena of child health, with less reliance on country-based actors, social movements, or perspectives outside the health sector.

## Introduction

In 2013, an estimated 6.3 million children under five died worldwide, with almost a third dying from pneumonia, diarrhoea and malaria, a percentage that rises to nearly 40% in sub-Saharan Africa (You *et al.* 2014). Integrated community case management of childhood illness (iCCM) is a strategy to expand access to life-saving curative care for children with these diseases using community health workers (CHWs; Figure 1). Designed by a transnational network of technical experts and leading to a WHO/UNICEF Joint Statement (WHO/UNICEF 2012), iCCM was subsequently showcased in a 2012 supplement in the American Journal of Tropical Medicine and Hygiene (Young *et al.* 2012). iCCM has been promoted by prominent stakeholders in child health at the global level, including WHO, UNICEF, USAID and others, with funding provided by bi- and multi-lateral agencies and private foundations. To date, nearly all African countries have adopted some form of iCCM, including CCM for malaria, diarrhoea or pneumonia or some combination thereof (Rasanathan *et al.* 2014).

Preventable child deaths have long been a focus of global health policy-makers, whose proposed interventions consistently target malaria, diarrhoea and pneumonia, among other illnesses. Campaigns in the 1960s and 1970s such as malaria eradication, as well as the primary health care movement epitomized by the Alma Ata conference in 1978, represented major efforts to reduce deaths from these diseases (WHO 1978). These initiatives faltered as the 1980s ushered in a sustained financial crisis, whose effects on health systems in LMICs were aggravated by fiscal austerity measures instituted under structural adjustment. Global health policy-makers shifted to more targeted approaches such as selective primary health care, as in UNICEF's GOBI strategy (growth monitoring, oral rehydration, breastfeeding, immunization; Walsh and Warren 1979; Cueto 2004). Later in the 1990s, WHO came out with Integrated Management of Childhood Illness (IMCI), a diagnostic and treatment algorithm for malaria, diarrhoea, pneumonia, measles and malnutrition (WHO 1997). First introduced in Tanzania and Uganda in 1996, IMCI was adopted in over 100 countries. However, expected reductions in child mortality subsequently failed to materialize, as IMCI's impact was limited mainly to facilities and not community settings where most child deaths occurred (Bryce *et al.* 2005).

The articulation of the Millennium Development Goals (MDGs) in 2001 further focused global policy-makers' attention on reducing child mortality. Discussions variously emphasized interventions for specific pathologies (malaria, HIV/AIDS, pneumonia); a renewed emphasis on vaccine-preventable diseases following the development of vaccines against *Haemophilus influenzae* type b, pneumococcal

disease and rotavirus; and the perennial problems of under-nutrition and malnutrition. Concurrently, the universe of health policy actors grew institutionally broader (Glass *et al.* 2012). With respect to child health, U.N. agencies (primarily WHO and UNICEF) increasingly shared the stage with bilateral aid agencies, private foundations and non-governmental organizations (NGOs; WHO *et al.* 2003). Among policy discussions within and across these multiple policy networks, iCCM would emerge as a global strategy highly endorsed by international actors as a means to address child mortality in Africa.

This study describes the origins of iCCM policy and is linked to a policy analysis of iCCM in six countries in sub-Saharan Africa. We aimed to examine underlying causal determinants of iCCM's rise to prominence at the global level and identify processes facilitating network formation and reasons for the network's effectiveness. The case study takes as its endpoint the issuance of iCCM policy, defined as the 2012 WHO/UNICEF Joint Statement on iCCM (WHO/UNICEF 2012) and preceding implementation guidelines issued by USAID and the CORE Group (USAID *et al.* 2010). We first present our methodology for data collection and multi-stage analysis, then present results using the epistemic communities framework to show how the iCCM policy community initially formed, how members resolved internal conflicts about specific points of policy and how they positioned iCCM as a preferred policy solution. Finally, we review our findings and draw lessons from this case study with resonance for global health policy-making more broadly.

### Epistemic communities framework

Various theoretical frameworks have been proposed to analyse the networks of individuals responsible for national and global policy, which is increasingly made by diverse sets of actors connected through non-traditional governance arrangements (Ostrom *et al.* 1961). The range, diversity and fluidity of actors working on policy issues is captured by the concept of policy networks, which have variously been described as issue networks (Hecló 1974), policy communities (Wright 1988; Coleman and Skogstad 1990), global and transnational policy networks (Slaughter 1997; Walt *et al.* 2004; Stone 2008), advocacy networks (Keck and Sikkink 1998) and epistemic communities (Haas 1992). Policy network theory, in addition to providing a helpful heuristic to describe who participates in policymaking (Atkinson and Coleman 1992), can also be used to explain policy outcomes through examinations of network structure (Howlett 2002; Provan *et al.* 2007; Sandström and Carlsson 2008).

In his seminal 1992 article, Haas proposed 'epistemic communities' as agents of policy change in a framework bringing together

The provision by community health workers (CHWs) of integrated diagnosis and treatment for children under five of:

- (i) pneumonia with oral antibiotics,
- (ii) diarrhea with zinc and oral rehydration salts (ORS),
- (iii) malaria with artemisinin combination therapy (ACTs) and other antimalarials.

**Source** : Adapted from WHO/Unicef Joint Statement: Integrated community case management (2012)

**Figure 1.** Definition of iCCM

**Table 1.** Contents of document review

	Number of documents
Global policy (guidelines, recommendations, strategic plans)	15
Meetings (conference reports, meeting minutes, PowerPoint presentations)	19
Scientific journal articles	16
Programmatic documents (programme evaluations, working papers, operational research, calls for proposals)	8
Implementation tools (guides, training manuals, planning documents)	9
Public communications (websites, fact sheets, declarations of support)	5
Total	72

elements of structural, institutional and normative theories (Haas 1992). Epistemic communities are networks of technical professionals who gather, synthesize and interpret technical bodies of knowledge and as such play a strong role in determining which policies are selected in highly specialized policy arenas.

Under Haas' framework, epistemic communities are defined by the fact that their members hold shared (i) values/normative beliefs, (ii) causal beliefs, (iii) notions of validity and (iv) a common policy enterprise, or set of common practices associated with specific policy problems (Haas 1992). Epistemic communities influence change by articulating problems and potential solutions, framing the issues for debate, proposing policies and sometimes offering funding (Haas 1992; Hafner and Shiffman 2013). In so doing, members of epistemic communities promote the solutions they favour via three causal mechanisms: (i) by relieving decision-makers' uncertainty about which policies best address complex issues; (ii) by engaging in interpretation of so-called raw data or observations, filtering them through worldviews, disciplinary perspectives and stated and unstated beliefs; and (iii) by seeking to institutionalize their preferred policy solutions (Haas 1992).

The epistemic communities approach is well-adapted to analysing policy networks like the one around iCCM, whose transnational membership of technocrats and researchers of diverse national origin was nonetheless homogenous in terms of educational status (including many medical doctors and PhDs), disciplinary background or area of specialization (usually medicine or public health) and socio-professional profile. Together, these actors were, or were in dialogue with, policy-makers in global health agencies, donor organizations and research universities, and were thus positioned to relieve their uncertainty about policy options, interpret

**Table 2.** Organizational membership of interview respondents

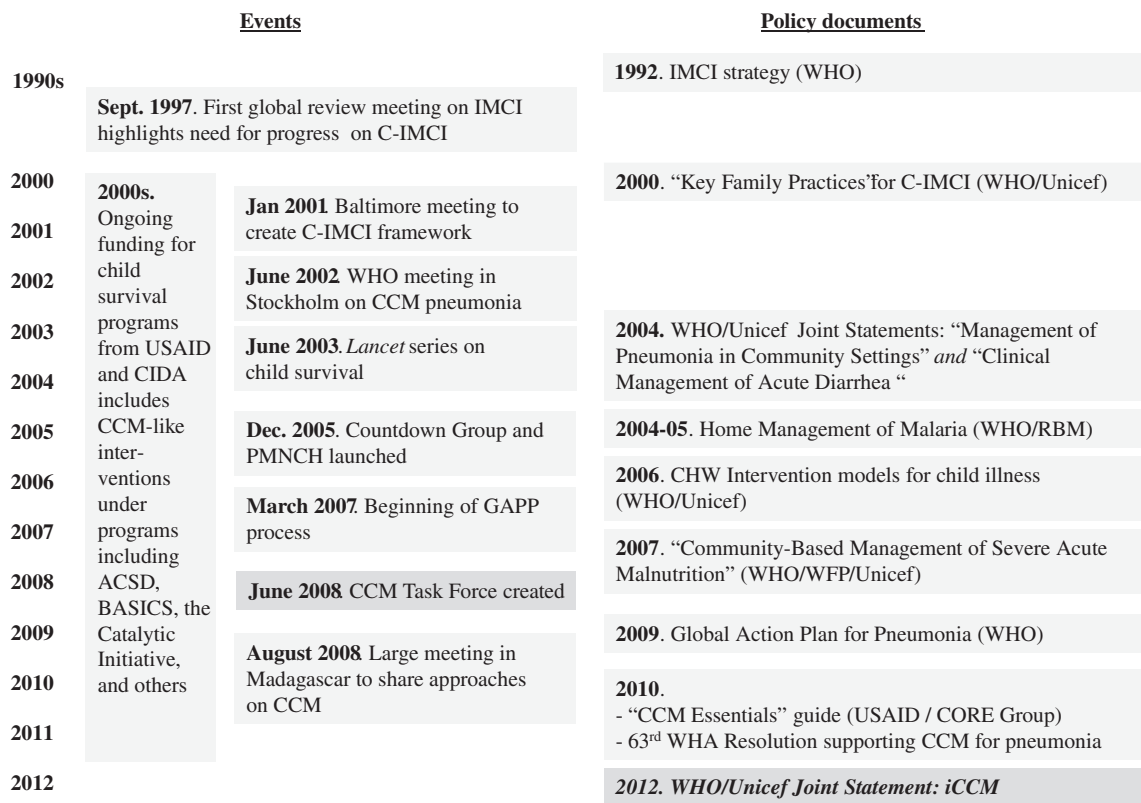
	Number of interviews
Multi-lateral agencies	11
Bilateral agencies	7
NGOs/private foundations	3
Academic/research organizations	4
Total	25

data and institutionalize policy solutions, following the causal mechanisms driving epistemic communities. The epistemic communities framework is also highly relevant to global public health policy making because it examines power dynamics deriving from experts' authority on technical matters and explores how large organizations broker the creation of far-reaching policies.

## Methods

Data collection took place from May to August 2013 and included a document review ( $N = 72$  documents, Table 1) and semi-structured in-depth interviews ( $N = 25$ , Table 2). We used initial purposive selection of respondents followed by a snowball approach, targeting key informants involved in or knowledgeable about iCCM policy formulation, including technical officials working at major international agencies, bilateral aid agencies, NGOs, private foundations and academic/research organizations. Interviewees were associated with policy communities focusing on specific pathologies including malaria, pneumonia (often linked with diarrhoea and/or the broader child survival community), and more rarely nutrition or health systems issues. Interviews were conducted mainly by telephone and lasted ~45 min; these were audio recorded and transcribed verbatim.

Preliminary data analysis began with the document review, which we used to populate a timeline capturing key events in iCCM global policy creation and compare how iCCM policy and related topics were framed by individuals, groups and institutions in terms of themes, reasoning and interpretation of the data, as well as underlying values, principles and causal beliefs (Eyles *et al.* 2009). For interviews, we performed primary thematic analysis using NVivo 9 software to apply codes on the origins of iCCM; policy content; policy-making processes; actors and the types and uses of scientific evidence (QSR 2010). Emerging themes and links to theory (including policy network theories and the epistemic communities frameworks) were documented and discussed by research team members as data collection was ongoing. The epistemic communities approach was selected as best according with observations that actors



**Figure 2.** Timeline of iCCM development

were mostly technical and acted in a transnational policy space; the framework also captured the interplay between ideas and institutions better than competing theories.

We then applied the epistemic communities approach to emerging understandings of policy creation, refining our analysis to define the epistemic community’s membership and using the theory’s three causal dynamics—uncertainty, interpretation and institutionalization—to explain how iCCM came to the fore in the policy sphere. To obtain greater clarity about the shape and structure of the epistemic community, we used co-authorship network analysis to examine how authors formed a larger network structure. Relevant publications were retrieved using the search terms ‘community case management’ in ISI Web of Science, excluding irrelevant categories (e.g. GERONTOLOGY). Abstracts were read to exclude studies in high-income countries, resulting in 62 publications and 276 unique authors from 2005 to 2013 (no lower limit for search dates; upper limit of June 2013). Network analyses were performed using Science of Science (Sci2) software, version 1.0 (Indiana University).

This study was deemed exempt from ethical review by the Johns Hopkins Bloomberg School of Public Health.

### Study limitations

It was not possible to interview all targeted key informants. Approximately 35 people were contacted, resulting in 25 interviews. A comparison of respondents and non-respondents found no significant differences in the profile of these two groups. As in many types of qualitative research, respondents may have sought to reflect well on themselves or the group they represent. We mitigated this bias by triangulating among data types and sources. Finally, the authors of

this analysis are or have been affiliated with organizations involved in iCCM policy development. To improve the trustworthiness of the findings, we prioritized viewpoints from data sources not associated with these organizations in matters involving them, and checked emerging analyses against possible social desirability bias and other biases.

### Results

In this section, we describe how the epistemic community around iCCM coalesced and how members reached consensus by resolving conflicts over values/normative beliefs, causal beliefs, notions of validity and common policy enterprise. We then describe how the epistemic community used the dynamics of uncertainty, interpretation and institutionalization to promote iCCM as a favoured solution in the global health policy sphere. [Figure 2](#) presents an overall timeline of events and policy documents important in the creation of iCCM.

### An epistemic community forms around iCCM

Over the course of a decade or more, actors working on different facets of child survival came together to form an epistemic community that would design iCCM as a way to meet the MDG on child survival. After giving an overview of the child survival policy landscape and iCCM policy community that emerged out of it, we attempt to understand this process using co-authorship analysis to describe the growth of linkages, and use interview data to describe the qualitative nature of ties among epistemic community members.

**Table 3.** Main organizations involved in iCCM policy development

	Early policy development (late 1990s–2008)	Later policy development (2008–2012)
WHO	<ul style="list-style-type: none"> <li>Child and Adolescent Health Dept. involved in creating early guidelines for community-level IMCI;</li> <li>Pneumonia/ARI programme solicited ongoing research and evidence reviews but reluctant to push for CCM-pneumonia despite positive findings;</li> <li>Co-authored Joint Statements on CCM for pneumonia and diarrhea;</li> <li>Roll Back Malaria publishes its “Home Management of Malaria” strategy.</li> </ul>	<ul style="list-style-type: none"> <li>WHO-led GAPP process convenes actors, raises support for CCM-pneumonia;</li> <li>Steering committee member of CCM Task Force;</li> <li>Supported operational research for and evaluation of iCCM;</li> <li>2010 WHA resolution supported CCM for pneumonia;</li> <li>WHO-TDR and the Global Malaria Programme joined discussions on iCCM;</li> <li>GMP administered RAcE funding from CIDA for iCCM beginning in 2012.</li> </ul>
UNICEF	<ul style="list-style-type: none"> <li>Failed to provide leadership on C-IMCI despite its responsibility for this policy, partly due to leaderships emphasis on other priorities;</li> <li>Implemented Accelerated Child Survival (ACSD) programme in 11 West African countries (2001–2005), case management not emphasized;</li> <li>Co-authored Joint Statements on CCM for pneumonia and diarrhea;</li> <li>Renewed focus on child survival following 2005 change in leadership.</li> </ul>	<ul style="list-style-type: none"> <li>Main implementer of Catalytic Initiative to Save a Million Lives, including large-scale iCCM programmes in Africa (2008–2011);</li> <li>Steering committee member of CCM Task Force;</li> <li>Supported operational research for and evaluation of iCCM.</li> </ul>
USAID	<ul style="list-style-type: none"> <li>Bureau for Global Health led BASICS programme of child survival strategies, which initiates pilot studies of CCM approaches in a number African countries beginning in 2004;</li> <li>Diffused CCM approaches throughout the African region in a series of meetings (Dakar 2005, DRC 2007 and Madagascar 2008).</li> </ul>	<ul style="list-style-type: none"> <li>PMI (launched in 2005) brings enhanced funding possibilities after joining in later discussions of iCCM policy;</li> <li>MCHIP (created in 2008 as USAID’s flagship maternal and child health project) served as the secretariat for the CCM Task Force.</li> </ul>
Canadian aid agency (CIDA, now DFATD)	<ul style="list-style-type: none"> <li>Funded more than half of the ASCD programme testing child survival interventions in West Africa.</li> </ul>	<ul style="list-style-type: none"> <li>Provided major funding for the Catalytic Initiative (CI), insisting on evaluations that measured iCCM’s impact on mortality;</li> <li>Required implementation of iCCM as a conditionality mid-way through CI;</li> <li>Funded several NGOs to implement iCCM in multiple countries.</li> </ul>
Bill & Melinda Gates Foundation	<ul style="list-style-type: none"> <li>Provided grants to JHSPH for the development of the LIST tool;</li> <li>Provided support to PMNCH for advocacy on child survival issues.</li> </ul>	<ul style="list-style-type: none"> <li>Co-funded the Catalytic Initiative;</li> <li>A Gates call for proposals coins the name ‘iCCM’;</li> <li>Funded operational research for and evaluation of iCCM.</li> </ul>
Save the Children	<ul style="list-style-type: none"> <li>Leadership role within CORE Group in early work on creating a framework for C-IMCI;</li> <li>Organized pilot studies of CCM-like approaches in a number of countries.</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing programmatic work on CCM with operations research;</li> <li>Strong individual advocates for child survival;</li> <li>Steering committee member of CCM Task Force;</li> <li>Involved in preparing the AJTMH supplement.</li> </ul>
Academic actors	<ul style="list-style-type: none"> <li>JHSPH contracted by USAID and CIDA to support child survival work, reviewing CHW profiles, participating in drafting of joint statements and guidelines; anchors CHERG; contracted to externally evaluate ACSD;</li> <li>Karolinska Institutet provided research on symptom overlap of malaria and pneumonia and home management of malaria;</li> <li>Boston University performed early studies on antibiotics regimens.</li> </ul>	<ul style="list-style-type: none"> <li>JHSPH contracted by CIDA to externally evaluate Catalytic Initiative;</li> <li>JHSPH review of ACSD points out need to focus on iCCM;</li> <li>Karolinska wins one of several Gates funded iCCM implementation research protocols in collaboration with Malaria Consortium.</li> </ul>

First, networks of policy actors working on child survival in the late 1990s and early 2000s were organized along a number of axes, including specific pathologies, (malaria, diarrhoea and pneumonia, nutrition), child survival programmes (notably IMCI and C-IMCI) and broader issue areas such as child survival, health systems and CHWs. These networks had varying degrees of overlap and spanned different organizations and departments, for example in the case of the malaria network, which linked officials from WHO (Global Malaria Programme, Tropical Disease Research Programme, Roll Back Malaria), USAID (PMI), and academic researchers working on malaria, among others.

Institutionally, the main actors who would become involved in the creation of iCCM at the global level were located at WHO, UNICEF, bilateral aid agencies [USAID and Canadian International Development Agency (CIDA), now DFATD], private foundations (principally the Gates Foundation), NGOs such as Save the Children and other members of the CORE Group, and academics and researchers (Table 3). Actors were mainly mid- to upper-level technical officers working in the headquarters of these agencies and were often connected via coordinating mechanisms (Table 4) such as the CORE Group, the Child Health Epidemiology Research Group (CHERG), and more recently the Partnership for Maternal,



**Table 4.** Coordinating mechanisms involved in iCCM policy development

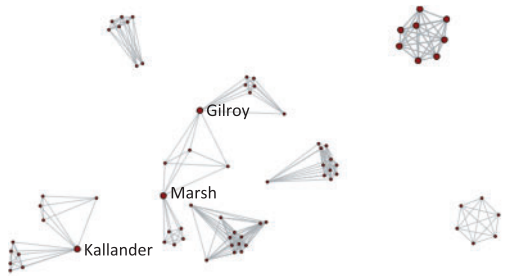
	Description	Membership	Early policy development (late 1990s–2008)	Later policy development (2008–2012)
CORE Group	A coalition of non-profit global health organizations created in 1997 and funded by USAID.	– 70+ NGOs including Care, IRC, CRS, World Vision, PATH, Save the Children, several of which implement iCCM, among other child survival efforts;	– Contributed to producing C-IMCI framework; – Provided a forum for implementers to communicate and share best practices.	– Created guidelines and implementation tools for iCCM such as the “CCM Essentials” handbook (2010); – Member organizations implement iCCM under USAID and RaCE funding, among other sources.
CHERG	Established in 2001 primarily by WHO as an independent source of technical expertise on child health estimates.	– Technical experts from University of Toronto, JHSPH, London School of Hygiene and Tropical Medicine, UNC-Chapel Hill, etc.	– Estimation of levels and causes of child mortality using Global Burden of Disease data.	– Continued to highlight gaps in the coverage of evidence-based interventions and highlight iCCM’s place in the continuum of care.
PMNCH	Hosted by the WHO from 2005 to allow partners to “share strategies, align objectives and resources, and agree on interventions.”	– Academics; donors and foundations; health-care professionals; multilateral agencies; NGOs; partner countries; and the private sector.	– Promotion of LiST as a tool to select interventions; – Created the Countdown to 2015 partnership in 2005.	– Supported implementation of iCCM with Gates Foundation funding as part of the Catalytic Initiative. – Served as a locus for experts on child survival.
Countdown to 2015	Established in late 2005 as a multi-institutional collaboration to speed progress toward MDGs 4 and 5 on maternal and child health.	– Academics (LSTMH, JHSPH, Harvard), the Lancet, WHO, UNICEF, World Bank, Gates Foundation; also implementing partners such as JHPIEGO and SCF.	– Focused attention on the problem of access to health facilities and the major pathologies blocking progress on MDG4.	– Creation of country scorecards/ dashboards linking core indicators to problems to be resolved.
CCM Task Force	Grew out of GAPP process in 2007–2008 to track iCCM policy change and programme status.	– Steering committee: UNICEF, WHO, USAID and Save the Children; – Other members: MCHIP (Secretariat), CORE Group, MSH, PSI, URC, JSI and others.	N/A	– Established CCM.org website; – Consolidated available research evidence and existing implementation tools for CCM for broader dissemination; – Used matrices of work in specific countries to avoid duplication.

Neonatal and Child Health (PMNCH) and the Countdown to 2015 Group, as well as via meetings (such as an important 2001 Baltimore meeting on C-IMCI), evidence reviews (the 2002 Stockholm meeting on pneumonia) and global-level forums such as the Global Action Plan on Pneumonia (GAPP) process (see the timeline, Figure 2).

In June 2008, following initial discussions at meetings under the GAPP process, members of WHO, UNICEF, USAID, Save the Children, the CORE Group, Karolinska Institutet and the Johns Hopkins University, among other organizations formed the CCM Task Force as a forum for facilitating iCCM policy development (see Table 4 for details). Members of the CCM Task Force were mid-level technical staff of diverse national origin (including from LMICs) working out of agency headquarters, as well as researchers affiliated with mainly Western institutions. These actors worked to formulate the specifics of iCCM policy through ongoing meetings, reviews and communication, with sharing and consultation facilitated by the creation of a website (CCM.org) in 2011.

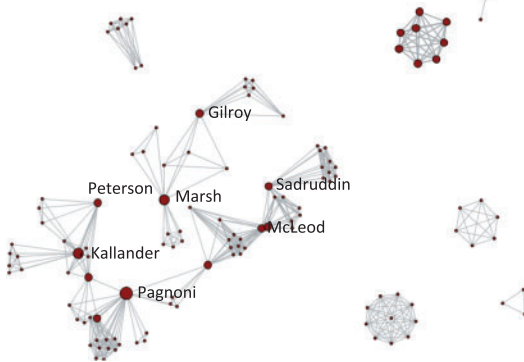
Co-authorship network analysis (Figure 3) demonstrates how the iCCM policy community, as represented by technical authors publishing in scientific journals from 2005 to 2012, were initially clustered by pathology, with distinct authorship communities linked to malaria (such as around Kallander K, Yeboah-Antwi K) and pneumonia (Marsh D, Gilroy K) visible as late as 2010 (network ‘A’). By the following year, links had been established between authors of the first CCM study including both malaria and pneumonia (Yeboah-Antwi *et al.* 2010) and the larger malaria group working on Home Malaria Management (HMM) in Uganda via a shared publication with malaria expert F. Pagnoni (network ‘B’). In 2012, many principal members of the iCCM policy network were linked through the publication of a 2012 supplement on iCCM in the *American Journal of Tropical Medicine and Hygiene* closely following the issue of the Joint Statement on iCCM in June of that year (network ‘C’). Accounting for delays inherent to the publication process, the analysis highlights the increasing consolidation of actors around iCCM as researchers focusing on different pathologies begin

## A 2005-2010



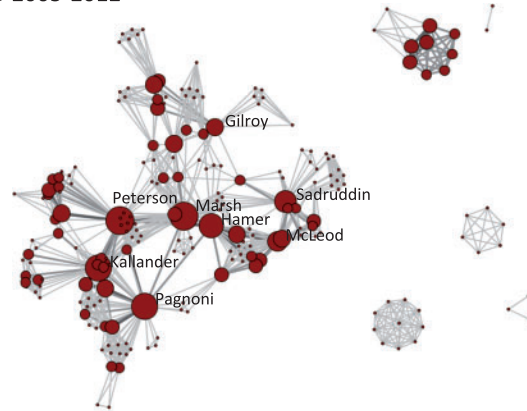
Pneumonia authorship networks (Marsh, Gilroy) distinct from those more associated with malaria and early integrated packages (Kallander)

## B 2005-2011

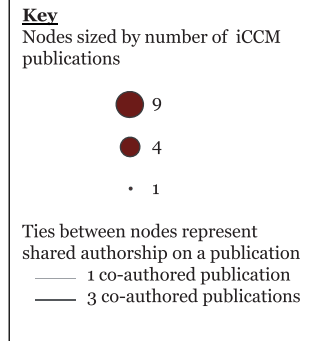


Researchers working on integrated care for malaria and pneumonia (MacLeod and co-authors) are linked to other malaria researchers via Pagnoni; pneumonia authors (Marsh, Gilroy) remain separate

## C 2005-2012



Special supplement in AJHTM links communities working on malaria and integrated care primarily because of paper co-authored by Hamer, Marsh, Peterson and Pagnoni.



**Figure 3.** Evolving co-authorship network of publications including the term “iCCM”

to collaborate and publish together, with the academic literature mirroring the shape of policy. Although no specific ‘diarrhoea’ authorship community is visible, this is likely due to long-standing acceptance of CCM for diarrhoea as highly safe and effective.

Co-authorship network analysis only documents formalized relationships and gives little indication of the depth, longevity or affective nature of ties between epistemic community members. In interviews, however, several respondents discussed the importance of long-standing ties among members of the iCCM epistemic community, created by actors’ movement across organizations and issue areas, in facilitating policy development:

[Y]ou have people that have known each other, worked together for 30 years. And you can talk about this stuff and agree on how to move forward ... it certainly made [policy discussions] a lot more fun. (GLO\_2013-07-11, multi-lateral agency)

[I]t’s a small community. ... Information circulated pretty fast. We knew each other. We had collaborated. So I don’t remember having had any problem of getting information from them. And I hope they never had any problem in getting information from me. For example, when I worked I used to see [a researcher] at least six times a year, maybe more. And we talk to each other almost weekly. (GLO\_2013-6-27, multi-lateral agency)

While our data does not comprehensively reveal the extent of such ties or how they were clustered within the epistemic community, at least some core members of the iCCM epistemic community appear to have enjoyed substantial familiarity and collegial relations, creating an atmosphere of trust and facilitating collaborative

work on iCCM. Our research did not turn up evidence of pre-existing ties hindering progress on iCCM, although a few respondents reported professional disagreements that bordered on personal conflicts, such as in arguments over whether the existing evidence base was sufficient (discussed in greater detail below).

### Resolving conflicts within the epistemic community

Epistemic communities are a sub-set of policy networks in which members hold shared (1) values/normative beliefs, (2) causal beliefs, (3) notions of validity and (4) a common policy enterprise (Haas 1992). Initially, policy actors had points of conflict across all four dimensions (Figure 4); indeed they agreed only on broad policy objectives. These conflicts were resolved through structural changes in the network (i.e. including or excluding some members), changes in the state of technology or scientific evidence, shifting funding considerations, and the development of consensus through argument, legitimation and other means.

### Values/normative beliefs

While actors agreed on the importance of addressing child survival and the acceptability of task-shifting in general, they held conflicting normative beliefs about the ability of lower-level health workers to safely and effectively administer antibiotics for the treatment of pneumonia. Respondents said some policy actors (located mainly at WHO) were reluctant to accept CCM for pneumonia, voicing concerns about antimicrobial resistance, and indeed WHO lagged behind in advancing the policy even as countries began to implement it

	Points of consensus	Points of conflict	Forces of reconciliation	Agreed by iCCM epistemic community members
<i>Values/normative beliefs</i>	<ul style="list-style-type: none"> <li>- More widespread access to curative care for sick children is needed;</li> <li>- Some degree of task shifting is an appropriate response to limited human resources for health.</li> </ul>	<ul style="list-style-type: none"> <li>- Normative disagreement about allowing lower-level health workers to prescribe antibiotics;</li> <li>- Tradeoff between risk of antibiotic resistance and treating sick children now.</li> </ul>	<p>Accruing evidence on safety &amp; efficacy of CCM-pneumonia; Clinicians' resistance is overcome via argument? Opponents leave WHO?</p>	<ul style="list-style-type: none"> <li>- High rates of child mortality require a forceful policy response based on scientific evidence;</li> <li>- Community-based workers can safely and effectively prescribe antibiotics.</li> </ul>
<i>Causal beliefs</i>	<ul style="list-style-type: none"> <li>- Most child deaths occur outside the health system;</li> <li>- A few common illnesses cause most preventable child deaths, and these including malaria, diarrhea and pneumonia.</li> </ul>	<ul style="list-style-type: none"> <li>- Disagreement about whether pneumonia or malaria was the leading cause of child deaths in Africa.</li> </ul>	<p>RDTs demonstrate prevalence of non-malarial fever in Africa.</p>	<ul style="list-style-type: none"> <li>- Pneumonia causes many more deaths in African children than was previously believed;</li> <li>- Malaria and pneumonia must both be targeted and in an integrated fashion.</li> </ul>
<i>Notions of validity</i>	<ul style="list-style-type: none"> <li>- Epidemiological evidence is the best basis for policy;</li> <li>- "Gold Standard" is large-scale experimental designs testing the mortality impact of iCCM.</li> </ul>	<ul style="list-style-type: none"> <li>- Debate on whether sufficient evidence existed to move forward or whether more evidence was needed.</li> </ul>	<p>Argument that action is needed, despite lack of "Gold Standard" evidence.</p>	<ul style="list-style-type: none"> <li>- "Gold Standard" evidence for integrated CCM will not soon be available;</li> <li>- It is acceptable to extrapolate from evidence on single-pathology CCM programs.</li> </ul>
<i>Common policy enterprise</i>	<ul style="list-style-type: none"> <li>- Find innovative solutions to advance on the child survival MDG;</li> <li>- Maintain up-to-date strategies &amp; guidelines.</li> </ul>	<ul style="list-style-type: none"> <li>- Sectoral vs. multi-sectoral;</li> <li>- Simple vs. complex interventions;</li> <li>- Integrated vs. separate;</li> <li>- Health promotion vs. preventive vs. curative.</li> </ul>	<p>Complex, multi-sectoral interventions fall out of favor after C-IMCI; Fundraising incentivizes integration; Legitimation of task-shifting for curative care.</p>	<ul style="list-style-type: none"> <li>- Create an integrated community case management strategy to reduce preventable child deaths from malaria, diarrhea and pneumonia.</li> </ul>

Figure 4. Resolving conflicts within the iCCM epistemic community

(GLO\_2013-6-14, academic; GLO\_2013-07-23, bilateral agency). At a June 2002 meeting in Stockholm on pneumonia care, researchers presented an updated meta-analysis of pneumonia trials (Sazawal and Black 2003), which respondents described as a 'wake-up' moment about the solidity of the evidence for scaling up CCM pneumonia. However, shortly thereafter, an earlier set of CCM guidelines from WHO's Acute Respiratory Infection (ARI) program was removed from the WHO website (GLO\_2013-07-11-2, GLO\_2013-07-23, bilateral agencies). As one respondent said,

Fifteen years ago or even 20 years ago there were research agendas around diarrhea and pneumonia management... Only some of those pieces of an agenda were actually advanced... [W]ith all due respect to our friends in Geneva, it was a process of incremental change. (GLO\_2013-07-23, bilateral agency)

Advocates of allowing CHWs to prescribe antibiotics (who often had positive experiences with CHWs early in their careers) argued that evidence favouring the intervention had 'been there for a very long time: community-based trials, not one, two but rather eight, nine trials in the early '80s' (GLO\_2013-07-22-2, multi-lateral agency). However, the issue was seemingly not over scientific evidence; as one respondent said,

I think [iCCM] is one of the most evidence driven areas of policy, perhaps with the possible exception of how much more difficult it's been to push the pneumonia treatment. (GLO\_2013-07-02-3, NGO/private foundation)

Rather, the conflict appears to have stemmed from an over-riding normative belief about the appropriateness of allowing CHWs to prescribe antibiotics. Respondents provided conflicting accounts or were unable to fully articulate the reasons for this normative conflict:

I don't know if it's the pediatric mafia or the medical mafia that doesn't want to put antibiotics in the hands of a paraprofessional cadre. That's what you hear. (GLO\_2013-07-02-2, NGO/private foundation)

There is something unique about the use of antibiotics in children that creates a certain dynamic... that makes it distinctly different from many of the other things we work on and... leads to a more conservative, cautious approach. (GLO\_2013-07-23, bilateral agency)

This 'conservative, cautious approach' to modifying or expanding professional norms was most common in 'rarified policy circles', said the same respondent, as opposed to actors with more field experience who had personally observed positive outcomes with CHWs or were perhaps more attuned to the extent of needs on the ground.

The exact way this normative conflict over the appropriateness of CCM for pneumonia was resolved remains somewhat obscure in our data. One respondent said the stalemate was eased when one or two stalwarts against allowing CHWs to prescribe antibiotics (at least pending further research) left WHO around the time the CCM Task Force was gaining momentum (GLO\_2013-6-14, academic). In any case, opponents of CCM for pneumonia began to cede ground following the advent of the GAPP process in 2007 (WHO *et al.* 2007), as further indicated by a 2008 WHO Bulletin article urging countries to adopt CCM for pneumonia (Marsh *et al.* 2008), and finally a 2010 World Health Assembly Resolution in favour of the policy (WHA 2010).

**Causal beliefs**

Actors in the iCCM policy network agreed on the broad outlines of what illnesses caused child deaths and under what conditions, but



initially held conflicting beliefs about the relative contribution of malaria and pneumonia to overall child mortality in Africa. The received wisdom that malaria was by far the primary aetiology of fever was supported by high malaria mortality estimates, though these were derived from epidemiological data based mainly on clinical diagnosis, which is less precise than laboratory tests. Actors with professional experience in Asia, where pneumonia was by far the greater problem, suspected the disease also caused many deaths in Africa and having separate programs for pneumonia and malaria did not make sense, especially given their overlapping clinical presentation. Still, in the early 2000s, global policy-makers moved forward on strategies for community level treatment of malaria only, notably HMM (WHO/RBM and WHO/TDR 2004; WHO-TDR 2005), a tactic made possible by the ample availability of funding for malaria programmes in the early 2000s. In these years, malaria stakeholders at WHO offices (Global Malaria Programme, Tropical Disease Research Programme, Roll Back Malaria), the Global Fund and PMI/USAID tended to resist calls to integrate CCM for malaria with care for other diseases.

In reality, many cases of pneumonia in Africa were being misclassified as malaria due to the reliance on clinical diagnosis and high degree of symptom overlap (Kallander *et al.* 2004). The widespread introduction of malaria rapid diagnostic tests (RDTs) in the mid-2000s 'changed the picture substantially' by providing concrete evidence that many sick children did not have malaria (GLO\_2013-06-14, academic):

The push [toward integrated case management] happened when the RDTs came and the powerful malaria group realized that there's RDT negative fever. That's when we got the push. (GLO\_2013-08-15, academic)

The new evidence from RDTs modified the causal beliefs of the malaria (and other) stakeholders, who now saw the greater number of child deaths in Africa was likely caused by pneumonia, not malaria. To further encourage this shift in thinking, non-malaria policy network members used arguments that were at once scientific and effective to convince malaria stakeholders that integrated CCM was a necessity:

How I wrote it up—and I stand by this—is that those children were being treated for malaria, and they were dying because they didn't have malaria but they had symptoms that are very similar . . . . Malaria programs, if they don't treat the other diseases, would be creating really a catastrophe . . . . (GLO\_2013-07-12, bilateral agency)

Following the introduction of RDTs, malaria stakeholders fully adopted this reasoning, incorporating it into later working documents such as a 2010 WHO-TDR PowerPoint presentation which mentions the "obligation to manage patients with negative RDTs" (Pagnoni 2010).

### Notions of validity

While there was general consensus among actors on standards of validity used to judge scientific evidence, there was less agreement on the exact amount of evidence judged sufficient for advancing the iCCM policy agenda. The 'Gold Standard' of evidence was agreed to be experimental designs that could assess mortality impacts; however, such trials are difficult to realize for practical, financial and ethical reasons. Actors disagreed on the validity of basing policy on existing studies, which mainly included evaluations of CCM for single pathologies and few large trials. Indeed, many respondents said scientific support for iCCM was 'weak' (GLO\_2013-6-14 and

GLO\_2013-08-15, academics; GLO\_2013-07-22-2, and GLO\_2013-07-26, multi-lateral agencies; GLO\_2013-07-08-2, bilateral agency). One respondent, when asked whether there was strong evidence for iCCM, said, 'No. <Laughter> . . . That evidence base is pending' (GLO\_2013-07-02-2, NGO/private foundation). The disagreement between actors had to do with pursuing further research versus proceeding with policy development and implementation:

[Some actors] were just about at each other's throat[s] . . . [some] people were really interested in research only versus the practical and implementation, and that was really one thing that annoyed a lot of [actors]. (GLO\_2013-08-13, bilateral agency)

As mentioned before, our data does not fully elucidate how these points of discord were resolved within the epistemic community. One respondent said resolution came following the departure of a few key figures at WHO as previously mentioned, as well as change in personnel at CIDA, where advocates had focused the evidence agenda on mortality impacts (GLO\_2013-06-14, academic). In any case, as opposition faded, a prevailing view would emerge in the epistemic community:

[The 2012 Joint Statement on iCCM] summarizes the disease-specific efficacy and effectiveness trials, and that seemed enough to justify rolling it out. Yes, it's not the same when you combine all three [diseases] . . . but, you know, public health is the art of incomplete information. (GLO\_2013-07-02-2, NGO/private foundation)

There was a leap of faith in terms of bringing the three conditions together. (GLO\_2013-07-08-2, bilateral agency)

In the meantime, policy actors continued to engage in evidence building, through for example the Operational Research working group of the CCM Task Force and resulting outputs such as the 2012 American Journal of Tropical Medicine and Hygiene supplement (Young *et al.* 2012).

### Common policy enterprise

As the aforementioned conflicts were resolved, actors in the iCCM network were positioned to embark upon a common policy enterprise, with the ultimate goal of making progress toward the child survival MDG. As with any global health policy, epistemic community members were faced with a set of choices: whether the intervention would focus on the health sector or be multi-sectoral, whether an integrated approach to pathologies was merited, how simple or complex it would be, and where along the spectrum of care (health promotion, prevention, curative) the emphasis would be placed.

Multi-sectoral approaches had fallen out of favour after C-IMCI failed to launch (discussed further below), disfavouring the addition of activities related to poverty, agriculture and gender (GLO\_2013-07-23, bilateral agency). Furthermore, the question of separate versus integrated care for pathologies was resolved once malaria stakeholders accepted the implications of RDT-negative fever, a move embraced by other actors for clinical reasons and thanks to the promise of funding from the malaria side. Malaria programs had been prime beneficiaries of a wave of vertical funding in the early 2000s, and other policy actors were eyeing malaria's coffers:

[Malaria] brought a lot of resources, both from PMI and also from Global Fund. We basically decided that this was the star we needed to hitch to if we wanted to make iCCM go forward. So we groveled a little bit. (GLO\_2013-07-11-2, bilateral agency)

Malaria stakeholders may have had their own incentives to make the strategic alliance following higher prices for the new artemisinin combination therapies compared to previous treatment regimes in the mid-2000s.

Next, given the approaching deadline for the MDGs, members of the epistemic community focused on a simple, targeted approach to treating the three main pathologies that could be quickly implemented at scale. And though actors agreed malnutrition was a common underlying cause of a substantial portion of child deaths, the interventions involved in caring for children with severe or moderate acute malnutrition were complex in their own right, and in many cases not suitable to be undertaken by CHWs with limited training (GLO\_2013-07-11-2, bilateral agency). For these reasons, epistemic community members were inclined to exclude malnutrition from the iCCM policy enterprise, in the meantime creating space to resolve other disagreements. As one respondent said,

There's full recognition of the nutrition element of this, but also a concern that it might weigh down efforts to resolve disagreements over pneumonia. (GLO\_2013-07-23, bilateral agency)

Lastly, along the continuum of care, actors in the iCCM policy network were led to focus on curative care based on the objective of making rapid progress toward the approaching deadline for the MDGs (Druetz *et al.* 2014). And though significantly expanding curative care has far-reaching implications for countries' health infrastructure and human resources, policy communities working on health systems remained separate from members of the iCCM epistemic community (GLO\_2013-06-14, GLO\_2013-08-15, academics), though some were performing highly relevant work regarding CHWs' role in expanding access to child survival interventions (Haines *et al.* 2007). It is conceivable that the broader legitimization of task-shifting taking place in health systems policy communities may have seeped into the iCCM epistemic community, allaying concerns about using CHWs to provide curative services. Our data do not permit us to verify this conjecture; however, these communities have subsequently been in more visible contact. For example, the Global Health Workforce Alliance (GHWA) funded recommendations on implementing iCCM and other community based interventions in conflict situations, as investigators involved in iCCM overlapped with GHWA (GHWA *et al.* 2011).

### How the iCCM epistemic community influenced policy development

Once constituted, the iCCM epistemic community was poised to influence policy, and did so via the three causal dynamics outlined by Haas: (1) by relieving decision-makers' uncertainty about complex issues; (2) by interpreting data and observations and (3) by institutionalizing preferred policy solutions.

### The epistemic community gains power by reducing uncertainty

Policymakers seeking to address ongoing high rates of child mortality were in a difficult place in the early to mid 2000s. C-IMCI, which aimed to reach children at community level, was vague on implementation details and did not include curative care. By the time the 2001 Baltimore conference on C-IMCI provided a clearer path to implementation (BASICS *et al.* 2001), the policy was "already dead," partially due to limited support at UNICEF, which had been assigned responsibility for supporting the policy (GLO-2013-07-08-2, bilateral agency). In 2003, health policy-makers at global and national levels were both dismayed and re-energized by a Lancet series highlighting ongoing high rates of child mortality worldwide and

particularly in Africa (GLO\_2013-6-14 and GLO\_2013-6-20-2, academics; GLO\_2013-6-20 and GLO\_2013-7-31, multi-lateral agencies; GLO\_2013-7-2-2 and GLO\_2013-7-10, NGO/private foundation). The series made clear that fast action was needed and that previous policies had had disappointing results. Evaluations of IMCI were also showing smaller than expected reductions in child mortality rates, mainly because children failed to reach facilities where IMCI was available (WHO *et al.* 2003; Bryce, Victora *et al.* 2005). Similarly, UNICEF's Accelerated Child Survival and Development (ACSD) program, implemented in 11 west African countries between 2001 and 2005, failed to substantially reduce mortality relative to comparison areas, in part because coverage of malaria and pneumonia treatment at community level was not sufficiently realized (Bryce *et al.* 2010).

As lessons from these programs accrued, national policy-makers understood that greater access to curative care was needed for children sick with a few specific illnesses; however, uncertainty remained around operational specifics regarding the CHW cadre. In this context, ongoing work by members of the iCCM epistemic community offered fairly specific guidelines and best practices for programs using CHWs, building on substantial groundwork by implementing partners who had reviewed their respective field experiences in forums such as the CORE Group. Indeed, implementation of iCCM-like policies in sub-Saharan African countries occurred preceding and throughout policy development. USAID's BASICS programme began implementing CCM-like strategies in the late 1990s through 2009, and facilitated three large African regional meetings on CCM with international agencies (Dakar 2005, DRC 2007 and Madagascar 2008). ICCM-like strategies were further implemented in other countries after 2007, when the CIDA signed a C\$ 100 million agreement with UNICEF called the Catalytic Initiative, with additional funding by the Gates Foundation. By the time global iCCM policy was issued in 2012, large-scale iCCM-like programmes and implementation research funded by the Gates Foundation were underway in more than a half dozen countries in sub-Saharan Africa. This supported an increasingly precise conception of operational specifics, reducing uncertainty while at the same time offering initial proof of iCCM's feasibility.

### Interpretation of evidence matches problem and solution

In the case of iCCM, those responsible for designing policy were nearly all members of the epistemic community and vice versa. As a result, epistemic community members were not interpreting evidence for a separate body of policymakers. As part of their analysis, epistemic community members used advanced modelling tools such as LiST (Lives Saved Tool), which estimates potential mortality impacts due to increases in coverage of specific health interventions. These analyses linked iCCM as a solution to the problem of child mortality in a convincingly 'scientific' and data-driven way that measured the number of potential 'lives saved' (GLO\_2013-06-20-2, academic; GLO\_2013-07-02, multi-lateral agency, GLO\_2013-07-11-2, bilateral agency; GLO\_2013-07-11-3, NGO/private foundation). One respondent said,

We've known for 30 years that kids are dying in the community of diarrhoea and malaria. I mean, that's really old ... Quantifying the causes and risk factors, I think, was an important thing, and the more specific burden ... It had a lot to do with the packaging of that information. (GLO\_2013-07-11-3, NGO/private foundation)

Members of the epistemic community also relied on data that suggested iCCM as a solution via the Countdown Group's country

profiles (also known as ‘dashboards’), which charted coverage of key child survival interventions (Bryce *et al.* 2006). These dashboards seemed to imply an iCCM-like approach:

If you look at the indicators, the dashboard ... if you read that carefully ... with the thought of what do you do, what pops out of them is community case management, at least the way I see it. (GLO\_2013-07-11-3, NGO/private foundation)

The emphasis on complex algorithms and highly technical interpretations is no doubt linked to the backgrounds of members of the epistemic community, a substantial portion of whom were medical doctors or held advanced degrees in epidemiology, public health and related fields. This disciplinary homogeneity permitted high-level discussions of the policy’s clinical content and projected epidemiological impact. However, despite the substantial field and implementation work described above, there may not have been equal consideration of broader practical concerns related to scaling up iCCM, such as the health systems implications of creating or rehabilitating cadres of health workers and the resulting financial burden for countries. (For a synthesis of this point based on six country case studies of iCCM, see George *et al.*, 2015).

### Institutionalization secures an imprimatur and resources

Actors working on iCCM were quite often members of powerful institutions in global health; however, the policy initially lacked (1) the imprimatur of the main norm-setting body (WHO), (2) support from the main international agency with jurisdiction over the issue area (UNICEF) and (3) sufficient resources to pursue policy development. First, gaining the imprimatur of the main norm-setting body in global health, WHO, was critical, particularly for the controversial pneumonia component, as countries were unlikely to move forward on a policy they felt the world’s experts did not condone in terms of safety and efficacy. In its role as the global norm-setting body, WHO had a necessarily cautious approach made more stringent in 2003 by new rules on the use of evidence in policy development (Oxman *et al.* 2007). Despite WHO’s release of a Joint Statement on pneumonia that supported community treatment in early 2004 (WHO/UNICEF 2004), further policy endorsement lagged at the agency. While the mechanisms of how WHO changed its position and began to support CCM for pneumonia are not fully elucidated by our data, by 2010 the policy can be said to have received WHO’s full imprimatur in the form a WHA resolution (WHA 2010).

Second, even with the legitimacy conferred by WHO’s approval, the iCCM policy endeavour could not succeed without what Haas calls the ‘consolidat[ion] of bureaucratic power’, including support from the main international agency with jurisdiction over the issue area (Haas 1992). Here, an important boost was provided by the revival of the child survival agenda at UNICEF after a change in leadership in 2005 (GLO\_2013-07-08, academic; GLO\_2013-07-02-3, NGO/private foundation). This followed a period during which UNICEF had followed a ‘human rights approach’ that put less emphasis on reducing child mortality compared to other priorities, spurring criticism of the agency for abdicating its leadership role on child survival (Horton 2004). After 2005, child survival once again became a top priority at UNICEF, and UNICEF officials would be key partners in the CCM Task Force and throughout policy formulation.

The last component of successful institutionalization was the allocation of sufficient resources to pursue policy development in early 2010, when higher-level officials at UNICEF and USAID agreed ‘CCM [was] an important priority for both agencies’, and followed up with specific institutional commitments such as assigning USAID’s MCHIP programme as the Task Force’s secretariat (GLO\_2013-07-

11-4, bilateral agency). At the same time, the financial prospects for implementation were looking rosier due to the malaria community’s involvement in the policy. These partnerships enhanced the policy’s seeming viability as institutional partners began to understand that collaboration would result in a bigger pot to draw from:

Big global health siloed programs ... [began] to cast this as a win-win rather than a Peter robbing Paul scenario, and that was ... really important [in] providing a conducive environment for a mission such as iCCM. (GLO-2013-07-31, multi-lateral agency)

## Discussion

iCCM was created by a community of international technocrats spanning different agencies, continents and issue areas, who lent their focused attention to the problem of child mortality. Members of the epistemic community were mainly technical health professionals with higher-level degrees in medicine, public health, epidemiology and similar fields. Professional relationships in this group went back several decades as actors moved between agencies and topic areas, forming connections via ‘institutional junctions’ such as research departments, conferences and meetings and coordinating mechanisms (Stone 2004). The epistemic community around iCCM evolved as members resolved outstanding conflicts on values/normative beliefs (about the ability of CHWs to safely prescribe antibiotics), causal beliefs (malaria vs pneumonia as the leading cause of child deaths in Africa), notions of validity (whether the evidence basis was sufficient to move forward on policy) and a common policy enterprise (including questions of intervention complexity, integration, etc.). These conflicts were resolved via structural changes in the network (the departure of key opponents, the decision to exclude malnutrition), negotiation (potential public health benefits overriding uncertainties about the evidence base), new technology and evidence (spurred by the advent of RDTs), and the existence of funding incentives (favouring integration with malaria). Once constituted via the CCM Task Force after 2008, the epistemic community influenced policy content by answering uncertainties about technical details and offering operational guidance, interpreting complex evidence in a way that framed iCCM as the ideal solution, and securing support and resources from the most powerful institutions in global public health.

One interesting feature of the iCCM epistemic community was the near total overlap between its membership and the set of policy actors assigned responsibility for creating the policy, whereas epistemic communities are usually conceptualized as one set of actors among others who influence policy decision makers. As the epistemic communities framework has not frequently been applied to global health policy, it is difficult to assess how unusual or unique this situation may be. However, there was no such overlap of the epistemic community in a study of WHO’s 2005 adoption of the Framework Convention on Tobacco Control, which documents how a group of health researchers and scientists prevailed over opposing trade and industry representatives (Mukherjee and Ekanayake 2009). In another case in Bangladesh, members of a policy community working on neonatal mortality revitalized a dormant policy sphere, with its members invited into the policy-making process by the Ministry of Health (Shiffman and Sultana 2013). Further application of the epistemic communities framework for global health policy is required to assess how much overlap tends to occur between technocrats and policymakers and whether such overlap is a positive feature for policy development.



Our case study of the iCCM epistemic community offers insights into how global health policies are formed and how policy-making processes affect policy content, for example when issue-area experts decide not just technical details but the broad shape of policy. In this respect, our case study mirrors findings from a study on the use of evidence in WHO recommendations, which showed a heavy reliance on experts in a particular specialty, rather than on experts from relevant methodological areas or representatives of groups who would subsequently live with the recommendations (Oxman *et al.* 2007). The finding recalls criticisms of Haas' epistemic communities framework from within Science and Technology Studies holding that so-called 'expertise', including notions of validity, causal beliefs and so on, is socially constructed. Thus, the shared perception of problems in epistemic communities may have less to do with problems' essential 'technical' nature than with the epistemic communities' disciplinary orientations, political ideologies or discursive framing (Jasanoff 1996; George 2004). In our case study, consensus was indeed achieved at times by excluding certain actors and setting issue-area boundaries, the better to build on homogenous worldviews, dynamics that are elucidated but perhaps not fully problematized under the epistemic communities framework.

The epistemic communities framework offered many insights; however, our data did not allow us to fully explain the controversy over allowing CHWs to administer antibiotics. By the early to mid-2000s, numerous high-quality studies and two meta-analyses ought to have satisfied policy actors' own standards of scientific validity about the safety and efficacy of CCM for pneumonia (Sazawal and Black 1992, 2003). The articulated reason for some actors' continued opposition was the fear of antimicrobial resistance, a serious consideration as it could lead to many common conditions becoming untreatable (Review on Antimicrobial Resistance 2014). However, unarticulated rationales are also worth considering. One reason for the widespread popularity of Western medicines is because they are associated with authoritative professionals and represent the medical realm; 'in them, healing is objectified' (van der Geest and Whyte 1989). Such potent symbolic associations could explain the unspoken and perhaps unconscious proprietary feelings over antibiotics within the culture of clinically-trained policy actors ('the medical mafia'), who simultaneously articulated justifiable worries about the dangers of anti-microbial resistance.

Finally, while the agencies involved in developing iCCM often had strong relationships with country offices (particularly at UNICEF and USAID), the policy was forged by an epistemic community operating at the global level. In other studies of global policies adopted by African countries, analysts observed a looped process by which treatment protocols were experimented with at the country level, 'confirmed' at the global level and then filtered back down to countries (Ogden *et al.* 2003; Walt *et al.* 2004). In Mozambique, country-level actors were observed to be more receptive to tuberculosis treatment guidelines because they had already been involved in pilots (Cliff *et al.* 2004). This type of back and forth between global and national policy-makers was not characteristic of iCCM and country case studies in this series suggest a disconnect between global policy-makers' goals and the health systems implications and service delivery needs that national policy-makers would subsequently have to address [Juma *et al.* 2015; Chilundo *et al.* 2015]. Similarly, a quantitative study of iCCM policy makers found divergences in research priorities between experts working in organizations headquartered in high-income countries, who prioritized technical questions on diagnostic and treatment algorithms, and those working in-country or regionally, who preferred research on CHW retention, motivation and supervision; determinants of

non-use of iCCM by caretakers; and other operational concerns (Wazny *et al.* 2014). Thus, while global iCCM policy-makers were highly efficient at sharing complex, detailed, high-level scientific information and data among themselves, as the epistemic communities framework demonstrates, this may also explain members' observed detachment with issues of high priority for field workers, operational actors and others who subsequently have to implement the strategy.

## Conclusion

In this case study, we analysed a network of actors involved in developing global child health policy during the late 1990s and 2000s and how they formed an epistemic community framing iCCM as a solution to the problem of child mortality. Our study underlines the importance of technocratic expertise in the relatively uncontested arena of child health and illustrates the relevance of the epistemic community framework for understanding global health policies. Further applications of the epistemic communities framework to health policies could help shed light on how these policies are formed and how policy-making processes affect policy content.

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## Ethical approval

This study was deemed exempt from ethical review by the Johns Hopkins Bloomberg School of Public Health.

*Conflict of interest statement.* The authors of this analysis (S.L.D., A.G., J.S., S.B.) are or have been affiliated with organizations involved in iCCM policy development (principally JHSPH and UNICEF).

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